

## Leading with Security Culture: A Nigerian Nuclear Experience

Patrick Lynch

Indiana Institute of Technology (Indiana Tech)

[Pdlynch01@indianatech.net](mailto:Pdlynch01@indianatech.net)

### Abstract

Nigeria is a fast-growing country, in terms of both population and economy. To keep up with this growth, nuclear power and other nuclear research may be included. If expanded, the Nigerian nuclear community must maintain a strong nuclear security culture, free from outside influence. A qualitative case study pilot project is used to understand how a leader of Nigeria's nuclear research community describes the way national culture influences their nuclear security culture. A semi-structured interview and accompanied existing literature inform the assessment that the Nigerian culture is evolving and influential with a nuclear security culture.

*Keywords: Nigeria, Culture, Nuclear Security Culture, Nuclear, Hofstede Cultural Dimensions, Transformational Leadership*

### Leading with Security Culture: A Nigerian Nuclear Experience

Nigeria boasts the largest population and the largest economy in Africa (Oberheim, 2022), as well as a rich culture home to over 525 languages across 36 states (World Data, n.d.). In an effort to best support the energy demands of this growing population, and support the economy's rise, Nigeria has repeatedly expressed interest in developing plans for peaceful nuclear power technology (WNA, 2021), in addition to the current nuclear research reactor located at Ahmadu Bello University in Zaria, Nigeria. The International Atomic Energy Agency (IAEA), which focuses on peaceful uses of nuclear infrastructure, has published numerous documents supporting nearly all facets of safe and secure nuclear operations. One document in particular, is an implementation guide for a strong nuclear security culture, which is identified as a key element to a nation's nuclear security posture (IAEA, 2008). Appreciating and understanding the experiences of the Nigerian nuclear leaders in relation to the IAEA recommendations of a nuclear security culture, will be important as Nigeria considers expanding their nuclear infrastructure.

The purpose of this qualitative case study was to understand how a leader of Nigeria's nuclear research community describes the way national culture influences their nuclear security culture. Nuclear security culture, which the IAEA defines as an assembly of specific characteristics, attitudes, and behaviors (IAEA, 2008) will be evaluated in the context of Hofstede's cultural dimensions based on extensive Nigerian research (Hofstede Insights, 2021). The experiences of a Nigerian nuclear leader and the influence of the national culture on those experiences, are important components of this research, necessitating the use of a qualitative research method. In this study, the Head of the Science and Technology at the Centre of Energy, Research, and Training (CERT) on the Ahmadu Bello University campus was interviewed to learn more about the role of culture in Nigeria and the ways in which leadership use nuclear security culture to maintain a strong security posture.

The interview questions examples included,

- What elements of a Nigerian national culture are most influential?

## NIGERIAN NUCLEAR SECURITY CULTURE

- What are motivations to work in the nuclear field and, specifically the promotion of nuclear security culture?
- Describe the role of multiple cultures within Nigeria.
- What is the role of security culture on leadership within CERT?
- Describe the association with either an “I” or “we” mentality in relation to security culture at CERT.

The answers to these questions, as well as others, coupled with complementary data on both Nigeria’s culture and security culture, begin to identify the most important elements of a nuclear security culture in the context of Nigeria’s national culture. The value of this research is to create a pathway for future discussions and training with new staff on the subject, in an effort to best support the capacity building efforts required to introduce additional nuclear infrastructure, as defined by Egieya et al. (2021). Because each country’s national culture is different, and it can have a varying effect on the security posture of a country, Geert Hofstede’s research on cultural dimensions will be used to measure how Nigeria may be best positioned to adapt current practices to address future discussions and training.

### Literature Review

The relationship and level of influence between a national culture and a nuclear security culture is specific and has not been widely researched. In preparation for this research, the existing literature on topics such as cultural dimensions, security culture, transformational leadership, and the IAEA recommendations will be included to illustrate the need for further attention in the field of nuclear security culture based on national culture influence on leadership. This study used Hofstede’s dimensions of national culture as the theoretical framework for the research, which was is the basis of a theoretical explanation of national culture influence, from the results of over 100,000 questionnaires in 66 countries (Harvey, 1997).

### Culture

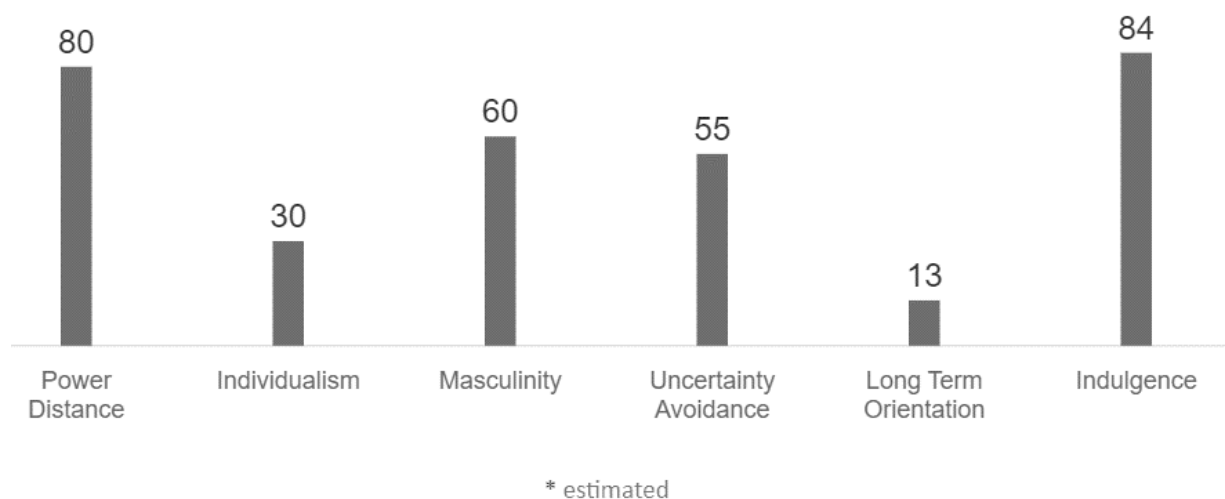
Dutch social psychologist Geert Hofstede defines culture as “the collective programming of the mind that distinguishes the members of one group or category of people from others” (Hofstede, G., p. 3, 2011). This definition was the basis for Hofstede’s extensive research, culminating in his 1979 research in which four dimensions of culture were identified: power distance, individualism, masculinity, and uncertainty avoidance and later added two additional dimensions; long term orientation, and indulgence (Vitell et al., 1993). This research area grew over the decades and led to the creation of an interactive site managed by his foundation, Hofstede’s Insights, which includes a thorough assessment of a nation’s culture across the six cultural dimensions. The research will examine whether Hofstede’s theoretical framework applies to the current Nigerian culture context, in relation to nuclear security culture. These six dimensions, defined in Table 1, have been assessed and applied to many countries, the Nigerian context is included in Figure 1, to best illustrate how Nigeria was depicted when the assessment was conducted.

## NIGERIAN NUCLEAR SECURITY CULTURE

**Table 1***Brief Descriptions of the Six Cultural Dimensions*

Power Distance	Related to the varying approaches or solutions to inequality
Uncertainty Avoidance	Related to the amount of stress within a group or culture when faced with an unknown
Individualism versus Collectivism	Related to the integration or acceptance of individuals or groups
Masculinity versus Femininity	Related to the role of emotions in decision making and what is common or assumed
Long Term versus Short Term Orientation	Related to the choice on influencing the future, past, and present
Indulgence versus Restraint	Related to the satisfaction versus control of desires, wants, and needs

*Note.* Hofstede (2011) defined these dimensions in numerous research publications as well as the Hofstede's Insights site. These are generalized definitions based on the multiple sources of the dimensions.

**Figure 1***Nigerian Culture as Depicted by the Hofstede Six Dimensions Model*

*Note.* Adapted from <https://www.hofstede-insights.com/country/nigeria/> Copyright 2022 by Hofstede's Insights.

According to Hofstede's Insights (2022), as shown in Figure 1, a score of 80 for Power Distance in Nigeria indicates an acceptance of hierarchical order and a reliance on autocracy of leadership. The 30 score for the Individualism indicates Nigeria is a Collectivist society, in which a membership of a group, whether a family, extended family, or work environment is very important. Additionally, in a Collectivist society, loyalty is incredibly significant and responsibility falls within a group, with members each working toward a unified goal. The 60 score for Masculinity indicates that Nigeria is indeed more masculine in this context, relying on management to be assertive and decisive. The score of 55 on the Uncertainty Avoidance

## NIGERIAN NUCLEAR SECURITY CULTURE

dimension does not indicate that the Nigerian culture is deferential to this topic, but may trend to want to know what the future holds versus letting it happen and accepting of that. The score of 13 for the Long-Term Orientation dimension is quite low, indicating a great respect for traditions and more normative in their approach, versus pragmatism. Finally, the high score of an 84 for Indulgence indicates that Nigerians may accept their impulses and desires and will pursue them if possible. There is likely a positivity and optimism among the groups and generally appreciate the time away from work, spending it with family.

Hofstede's cultural dimensions alone do not incorporate the influence of leadership in promoting a nuclear security culture. Future research may seek to include a leadership theory, such as transformational leadership which includes elements unique to this research question. Transformational leadership can inspire change in followers, focusing on motivation, morale, and performance, in an effort to transform followers into leaders Jung et al., (1995). Including leadership theories will strengthen the value of this research, while identifying examples of how future leaders of the Nigerian community may seek to inspire the next generation workforce.

### **Security Culture**

Hoffman and Skovira (2020) also reviewed the role of Hofstede's cultural dimensions on a security culture, though comparing Slovenia and the United States' Information Security attitudes. This research built another layer onto the six dimensions, an organizational security index tool, applying key factors of information security to the existing cultural dimension data. In doing so, a two-phase, mixed methods research design was used with surveys and semi-structured interviews. The key findings confirmed that elements of Slovenian and U.S. national culture did in fact have an influence on the information security culture of the firms in each country. Though, interestingly, the data did not identify similarities or opposite dimensions, indicating that each culture influenced the dimension differently.

In other research, Hoffman (2021) researched the role of national culture's influence on organizational security culture, in which is defined as including information technology, cybersecurity and physical security, which do also align with IAEA recommendations of security system elements. In this research, Hoffman also compares Slovenia and the United States and again determines that an effective organizational culture is influenced by core tenants of a nation's culture. Using Hofstede's six cultural dimensions, Hoffman (2021) determined that leaders are often positioned well to identify deviations from norms associated with a national or organizational culture and, therefore, are positioned to recognize and address problem areas, such as in cybersecurity or information security as elements of an organizational security culture.

### **Nuclear Security Culture**

There are not many instances of nuclear security culture assessment. Geraskin et al., (2015) detail the Russian experiences reviewing safety incidents at nuclear sites and make the case that human error and cultural issues are nearly always to blame, as many as 80% of the time. There was not an assessment of the Russian cultural influence on the organizations, nor if the organizational culture would be positioned to accept the IAEA recommendations of a nuclear security culture. The most predominant nuclear culture research includes safety culture, which is often associated with organizational culture and management experience, thus nuclear security culture is still a young field.

The IAEA Nuclear Security Series No. 7 is an implementing guide, which is created to allow for adoption and implementation of the key concepts. However, this is not easily

## NIGERIAN NUCLEAR SECURITY CULTURE

accomplished and often is not tailored to allow for cultures to accept and implement the themes discussed. For example, this document defines the roles of managers and the attitudes of individuals, both may be heavily influenced by a national culture component. Key to the success of the nuclear security culture program lies with the behaviors, values, and attitudes of a nuclear organization as well as accepting that the threat to nuclear security is real (IAEA, 2008). Without direct comparisons to Hofstede's work, the IAEA does identify key attributes for a robust security culture, which include topics such as accountability, teamwork, adherence to procedures, vigilance, and a management system. Hofstede's cultural dimensions Power Distance, Individualism versus Collectivism, and Uncertainty Avoidance each have complementary elements to the IAEA attributes. This review does indicate that Hofstede's cultural dimension theory has elements associated with nuclear security culture, but more research needs to be conducted to specifically assess the role of cultural dimensions, as currently defined in a country, with the IAEA attributes.

### **Method and Procedure**

Using a qualitative case study research design was provided for the inclusion of the IAEA nuclear security culture elements, as artifacts, when assessing the role of Nigeria's national culture on leadership. McGregor (2018) defines the case study format as useful when accounting for real-life situations and the solving of real-life problems, which is what the management of CERT is faced with on a daily basis. A semi-structured interview was used with CERT's Head of Science and Technology, a position that is required to be aware of the security implications of decisions made at CERT. Prior to the interview, brief descriptions of Hofstede's cultural dimensions and the IAEA key attributes of a strong security culture were shared to ensure these themes were familiar and there was context for any follow-up question specifically identifying an example from Hofstede or the IAEA. The interviewee also was asked to not provide any security sensitive information or comment on any specific element of the security environment near the nuclear powered research reactor. With the purpose to learn from the experiences of CERT's management in relation to the role of Nigeria's culture, the site specific details were of no value in the analysis.

This researcher is familiar with the topic, nuclear security culture, and the facility, CERT and works at a nuclear research center in the U.S. This familiarity with the topic provides insight into the difficulty in defining security culture and the process of measuring when defined. This researcher also acknowledges the opportunity to use the findings and apply the methodology to other nations which have Hofstede cultural dimension data available as well, in an effort to further promote implementation and training programs to coincide with the IAEA implementing guidance. Purposeful sampling was conducted for the semi-structured interview to ensure the interviewee was aware of nuclear security culture elements as well as someone familiar with Nigerian culture.

### **Initial Findings**

Upon thorough review of the responses, it appears that there are discrepancies with how Hofstede's cultural dimensions are measured in Nigeria. But it also appears that some of the experiences from the Nigerian national culture do in fact influence the way CERT's nuclear security culture is promoted, adopted, and assessed. The IAEA document (2008) identified the role of management and leadership in making security decisions, which was well defined. Though, when discussing the role of management in the Nigerian context, the interviewee added

## NIGERIAN NUCLEAR SECURITY CULTURE

that authority figures ultimately can change decisions based on culture and beliefs, perhaps not in the organization's best interest. That is one example of a deviation of a security culture attribute and a response from the interviewee.

Another example of a deviation from Hofstede's country comparison focuses on Nigeria defined as a Collectivist society. When asking the interviewee whether "I" or "we" were more associated with a nuclear security culture, the answer was the "I", which initially seemed to contradict the Collectivist society definition provided by Hofstede's Insights. The interviewee expanded and shared that the Nigerian society is changing quickly and that individuals are now being influenced, sometimes negatively and sometimes positively based on the culture. The topic of nepotism came up in this context, the "I" answer was in relation to the fact that management now are looking out less for a team and more for their individual accomplishments because merit alone may not be good enough in this society. This is a deviation from the Hofstede definitions, as well as the IAEA nuclear security culture examples provided.

Regarding Power Distance, where hierarchy is identified as a key cultural dimension, the interviewee stressed the importance of hierarchies in society and within an organization. Specifically, the family unit and tribal elders can influence individuals and organizations. In addition to hierarchy, titles were identified as incredibly influential in decision making. These examples do show a correlation to the Power Distance (Figure 1), though the relationship to the IAEA recommendations is not as close. The IAEA documentation (2008) encourages management to lead by example and to hold themselves accountable, but in the interviewee's example, it seems as if there is a concern with the decision making of a tribal elder if they are misinformed and the role that may have on society because it must be followed. The IAEA continued that a questioning attitude is welcomed in a strong nuclear security culture, which appears to not be the case in the Nigerian culture context as elders are rarely questioned or challenged.

Throughout the interview, themes related to Nigerian culture, Hofstede's cultural dimensions and the IAEA recommendations began to emerge. When reviewing the transcripts, categories and codes were identified, the main themes that align with the literature review included: Nigerian Culture, with codes: Tribal Roots and Current Generation POV, Hofstede's Cultural Dimensions, with codes: Collectivist, Individualist, and Power Distance, and IAEA Recommendations, with the more specific themes: Security Culture Attributes. "Tribal Roots" was chosen to depict the deeper cultural influences of the Nigerian culture, elements that have not changed and are unique to Nigeria. "Current Generation POV" (point of view) was chosen to identify where the culture may have changed over the past few years and the where current leadership is required to be agile. The other codes are likely self-explanatory and relate directly with the main themes of the research. The frequency of the categories and codes are included in Table 2 and show the influence of the Current Generation POV, accounting for 29.6% of the codes. This is also depicted in the chart, Figure 2, which it is clear that the interviewee's current understanding of the Nigerian culture may be different that the definitions provided by Hofstede and that this current understanding is influential in the decision made when leading with a nuclear security culture at the CERT site. The interviewee's use of the recurring themes did indicate that Hofstede's cultural dimension theory has both evolved and still holds true today. This is seen with the references to "Tribal Roots" and "Current Generation POV" themes.

### **Table 2**

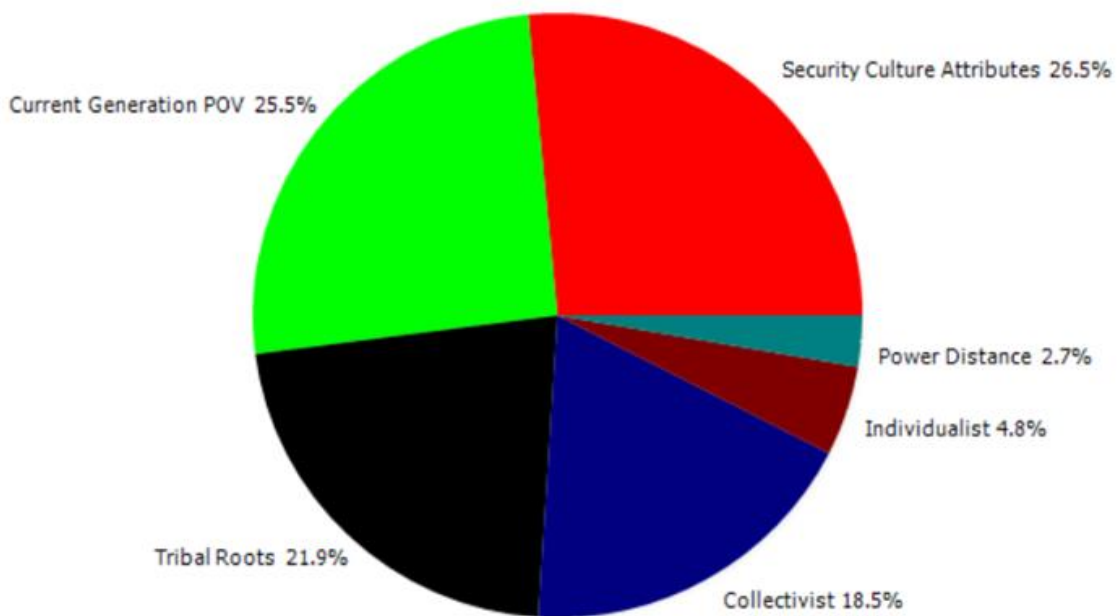
#### *Interview Code Frequency*

### NIGERIAN NUCLEAR SECURITY CULTURE

Themes	Count	% Codes
Main Theme: Nigerian Culture		
Sub-Theme: Tribal Roots	16	22.5%
Sub-Theme : Current Generation POV	21	29.6%
Main Theme: Hofstede Cultural Dimensions		
Sub-Theme : Collectivist	9	12.7%
Sub-Theme : Individualist	5	7.0%
Sub-Theme : Power Distance	3	4.2%
Main Theme: IAEA Recommendations		
Sub-Theme: Nuclear Security Culture	17	23.9%
Attributes		

**Figure 2**

*Pie Chart Depiction of the Code Frequency*



## NIGERIAN NUCLEAR SECURITY CULTURE

*Note:* This pie chart indicates the themes identified in the interview as well as the percentage of occurrences during the interview.

### **Conclusions**

The purpose of this study was to understand how a leader of Nigeria's nuclear research community describes the way national culture influences on their nuclear security culture. The interview provided data on the role of the Nigerian culture influencing nuclear security culture as well as the evolution of Hofstede's cultural dimension theory in Nigeria. As depicted in Table 2 and Figure 2, the theme of Nuclear Security Culture Attributes is present with the nuclear security leader interviewed. This interviewee also identified two perspectives of the Nigerian culture, from a historical perspective (Tribal Roots) and the recognition of the change in culture (Current Generation POV). These two themes occurred next in order of frequency, indicating a high influence of Nigerian culture, both old and new, on leadership. Based on existing, related, literature and an interview, it appears that the rich traditions of Nigerian culture do in fact influence the process in which nuclear research leaders implement a security culture. The next generation decision maker will need to leverage the Nigerian culture, while also leveraging new and innovative approaches to leadership as the culture in Nigeria is evolving. Future research may include more participants in the interviews as well as additional literature to be reviewed, such as relevant World Values Survey data, which may lead to a mixed method design.



### References

- Egieya, J. M, Ayo-Imoru, R.M. Ewim, D.R.E., 2021. Human resource development and needs analysis for nuclear power plant deployment in Nigeria, *Nuclear Engineering and Technology*, <https://doi.org/10.1016/j.net.2021.08.019>
- Geraskin, N. I., Krasnoborodko, A. A., Glebov, V. B., & Piskureva, T. A. (2015). Nuclear security culture enhancement: the role of culture coordinators at Russian nuclear sites. *Defense & Security Analysis*, 31(4), 330-345. <https://doi.org/10.1080/14751798.2015.1087103>
- Harvey, F. (1997). National cultural differences in theory and practice evaluating Hofstede's national cultural framework. *Information Technology & People*, 10(2), 132-146. <https://doi.org/10.1108/09593849710174986>
- Hoffman, F., Skovira, R. (2020). The organizational security index: A tool for assessing the impact of national culture on information security attitudes in Slovenia and the United States. *Issues in Information Systems*, 21(3), 95-104. [https://doi.org/10.48009/3\\_iis\\_2020\\_94-104](https://doi.org/10.48009/3_iis_2020_94-104)
- Hoffman, F. (2021). Assessing U.S. and Slovenian organizational security culture with Hofstede's national culture framework. *Issues in Information Systems*, 22(3), 114-128. [https://doi.org/10.48009/3\\_iis\\_2021\\_127-141](https://doi.org/10.48009/3_iis_2021_127-141)
- Hofstede, G. (2011). Dimensionalizing cultures: the Hofstede model in context. *Online Readings in Psychology and Culture*, Unit 2. <http://scholarworks.gvsu.edu/orpc/vol2/iss1/8>
- Hofstede Insights. Country comparison Nigeria. (2022, June 21). <https://www.hofstede-insights.com/country-comparison/nigeria,the-usa/#:~:text=Nigeria%2C%20with%20a%20score%20of,other%20societal%20rules%20and%20regulations.>
- IAEA International Atomic Energy Agency, Nuclear Security Culture, *Implementing Guide*, (2008). <https://www.iaea.org/publications/7977/nuclear-security-culture>
- Jung, D. I., Bass, B. M., & Sosik, J. J. (1995). Bridging leadership and culture: A theoretical consideration of transformational leadership and collectivistic cultures. *Journal of Leadership Studies*, 2(4), 3-18. <http://dx.doi.org/10.1177/107179199500200402>
- McGregor, S. L. T. (2018). *Understanding and evaluating research: A critical guide*. Sage Publications.
- Oberheim, D. (2022, January 8). *Nigeria prepares to play a central role as it embraces intra-African trade*. Global Banking & Finance Review. <https://www.globalbankingandfinance.com/nigeria-prepares-to-play-a-central-role-as-it-embraces-intra-african-trade/>
- Vitell, S. J., Nwachukwu, S. L., & Barnes, J. H. (1993). The effects of culture on ethical decision-making: An application of Hofstede's typology. *Journal of Business Ethics*, 12(10), 753. <https://doi.org/10.1007/BF00881307>
- World Data (n.d.). *Nigeria: Country data and statistics*. Worlddata.info. <https://www.worlddata.info/africa/nigeria/index.php>
- World Nuclear Association (WNA). (n.d.). *Country profiles emerging nuclear energy countries new nuclear build countries*. World Nuclear Association. <https://world-nuclear.org/information-library/country-profiles/others/emerging-nuclear-energy-countries.aspx>