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Empowering Voices: The Unsung Role of Women in Establishing and Sustaining the Pelindaba Treaty for an African Nuclear Weapon–Free Zone

Heba Fathy Elkomey

Women in Nuclear Young Generation, Egypt

Alejandra Loreto Alfaro

Women in Nuclear Young Generation, Chile

Dennis Balami

University of Maiduguri, Nigeria

Adeline Yuego

National Radiation Protection Agency, Cameroon

miriam Yartey

*Women in Nuclear Young Generation, Ghana*Follow this and additional works at: <https://trace.tennessee.edu/ijns>

See next page for additional authors

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Cover Page Footnote

We would like to express our sincere gratitude to Mr. Hubert Foy (expert in nuclear security, nonproliferation, arms control, and disarmament verification) for accepting to provide us with his experienced insights on women's involvement in nonproliferation and nuclear policy, as well as Prof. Eva Gyane (president of Women in Nuclear for Peace and mentor of the World Nuclear University Summer Institute) for her support and guidance. We especially appreciate the time you spent helping us with this research proposal.

Authors

Heba Fathy Elkomey, Alejandra Loreto Alfaro, Dennis Balami, Adeline Yuego, miriam Yartey, and Geraldine Okoye

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Heba Fathy Elkomey,¹ Alejandra Loreto Alfaro,² Dennis Balami,³
Adeline Yuego,⁴ Miriam Yartey,⁵ and Geraldine Okoye⁶

¹Women in Nuclear Young Generation, Egypt

²Women in Nuclear Young Generation, Chile

³University of Maiduguri, Nigeria

⁴Women in Nuclear Young Generation, Cameroon

⁵Women in Nuclear Young Generation, Ghana

⁶Women in Nuclear Young Generation, Nigeria

Abstract

The Pelindaba Treaty, officially known as the African Nuclear-Weapon-Free Zone (NWFZ) Treaty, stands as proof of Africa's collective commitment to a nuclear-weapon-free continent. It was opened for signature in 1996 in Cairo, Egypt, and entered into force in 2009. Its main aim is to prevent the development, acquisition, possession, or stationing of nuclear weapons within the zone, thereby promoting peace and security for all African nations. The treaty outlines an array of comprehensive measures to achieve this goal. State parties are prohibited from engaging in any nuclear weapon–related activities. Also, the treaty requires parties to maintain the highest standards of physical protection of nuclear materials, facilities, and equipment to prevent theft or unauthorized use and handling. Additionally, the treaty requires parties to concurrently achieve the highest standards of physical protection of nuclear material, which can be used for peaceful purposes. According to the United Nations (UN), 51 of the 55 African states have signed the Pelindaba Treaty, and 43 of them are parties to the treaty.

Although the treaty is rightfully viewed as a monumental diplomatic achievement, the indispensable groundwork and ongoing stewardship by African women activists and

policymakers that enabled its success often remains overlooked. This paper illuminates the bold vision and vital contributions of female diplomats, protest organizers, and governance leaders in actualizing and faithfully upholding the Pelindaba Treaty over the past three decades by review women's involvement in African peace and security organizations operating. Additionally, this work highlights women's contribution to disarmament efforts and their engagement's effect in the NWFZ, sustaining and enforcing the Pelindaba Treaty within their positions of influence. The paper profiles pioneering negotiators such as Dr. Nkosazana Dlamini-Zuma, former chairperson of the African Union Commission, known as the depositary of the African NWFZ Treaty, noting her role in overseeing the treaty's implementation and compliance. On the diplomatic front is Nigeria's Ambassador Joy Ogwu, whose wise leadership guided the treaty from conception to ratification, building consensus across diverse African interests.

Keywords: Pelindaba Treaty, Africa, women, nuclear security, nonproliferation

1. Introduction

The African Nuclear-Weapon-Free Zone (NWFZ) Treaty, also known as the Treaty of Pelindaba, was the product of a 32-year effort seeking a nuclear weapon-free Africa. In 1964, at its first Summit in Cairo, Egypt, the Organization of African Unity (OAU) formally stated its desire for a treaty ensuring the denuclearization of Africa. It was opened for signature by 47 of the continent's 53 states in Cairo, Egypt, in 1996, and it entered into force in 2009. The treaty has three protocols. The treaty and protocols meet all seven criteria that the United States has established for supporting any proposed NWFZ [1]. The treaty prohibits the research, development, manufacture, stockpiling, acquisition, testing, possession, control, or stationing of nuclear weapons, as well as the dumping of radioactive waste. The treaty also prohibits any attack against nuclear installations in the zone by treaty parties, thereby promoting peace and security for all African nations. The treaty outlines an array of comprehensive measures to achieve this goal. Also, the treaty requires parties to maintain the highest standards of the physical protection of nuclear material [2]. Therefore, the provisions of the Pelindaba Treaty prevent nuclear weapon proliferation, promote the peaceful uses of nuclear energy, enhance regional peace, and contribute to global disarmament, highlighting its significance [3]. According to the United Nations (UN), 51 of the 55 African states have signed the Pelindaba Treaty, and 43 of them are parties to the treaty [2].

Although the treaty is rightfully viewed as a monumental diplomatic achievement, the indispensable groundwork and ongoing stewardship by African women activists and policymakers that enabled its success often remain overlooked. This paper illuminates the bold vision and vital contributions of female diplomats, protest organizers, and governance leaders to actualizing and faithfully upholding the Pelindaba Treaty over the past three decades. After reviewing women's involvement in nuclear nonproliferation, nuclear policy, and their engagement's effect on the NWFZ throughout these past years, we spoke to a leading figure, Mr. Hubert Foy, an expert in nuclear security, nonproliferation, arms control, and disarmament verification, in an enriching interview on March 27, 2024, and concluded our study with a survey of the contemporary nuclear young generation.

2. The Origins of the African Nuclear-Weapon-Free Zone Treaty

The story of the NWFZ is one of resilience and collective action in the face of nuclear threats. By the 1960s, the shadow of the nuclear era loomed large, with the Cold War intensifying and nuclear weapons becoming a chilling reality. This period coincided with a blatant disregard for African sovereignty by France, which conducted nuclear tests in the Sahara Desert, leaving behind a trail of radioactive fallout and outrage across the continent [4]. This act sparked a wave of anger and diplomatic action. African nations severed ties with France, froze assets, and even pushed for a UN resolution banning nuclear tests on African soil [5]. The newly formed OAU in 1963 provided a crucial platform for a unified response. The OAU adopted a resolution reflecting the continent's strong stance against nuclear weapons, declaring Africa a denuclearized zone and opposing all nuclear tests [6].

However, translating this declaration into a concrete treaty faced significant delays. The global political climate played a role, with the negotiation of the Nuclear Non-Proliferation Treaty (NPT) and the reactions of some nations toward NWFZs creating a complex web of considerations. Additionally, South Africa's clandestine nuclear program cast a long shadow, raising concerns and suspicions among African states and the international community [7]. The struggle for nonproliferation became intricately linked with the fight against apartheid. African states actively sought to highlight South Africa's nuclear ambitions on the world stage, sponsoring UN resolutions and studies to keep the issue in the spotlight [8].

The road to the African NWFZ Treaty, ultimately christened the Treaty of Pelindaba, was a long and winding one. It was paved with the collective will of African nations determined to protect their continent from the devastating consequences of nuclear weapons. Although the NPT and regional security concerns presented challenges, the unwavering desire for a nuclear-free Africa ultimately prevailed [7].

3. Grassroot Awakening: Pioneering Anti-Nuclear Weapon Activism in the 1960s–1980s

The germination of the Pelindaba Treaty took root in grassroots nuclear disarmament campaigns across Africa in the 1960s–1980s, which were often spearheaded by groups of audacious women. In Africa, antinuclear movements have played an important role since the beginning of the 1960s with the development of the French nuclear project and the first nuclear test on the continent, called the Gerboise Bleue test, which was a plutonium bomb, conducted in French Algeria in February 1960 [9]. In November 1959, international pacifists began meeting in Accra, Ghana, with the goal of going to the Sahara to protest the nuclear test. “The Sahara Protest Team” was made up of African activists—10 Ghanaians, 1 Mosotho, and 1 Nigerian joined the expedition—2 Americans, 3 Britons, and 1 woman: Esther Peter-Davis (1932–2022), a French national who later became a leader of the French environmental movement and was recognized for her contributions to the peace movement [10]. Despite the failed attempt to cross the French border into the test zone and the need to return to Accra after a few months, the demonstration had wide international repercussions [11]. Months earlier, in August

1959, African-American civil rights and antiwar activist Bill Sutherland, himself a member of the Sahara Team, helped launch the Ghana Nuclear Disarmament Council, which was an initiative that garnered significant backing from notable public figures and organizations within Ghana, including from the Ghana Federation of Women [12], which was formed in 1953 as welfare and social support group led by Evelyn Amarteifio (1916–1997) [13], who was also involved in the struggle for Ghana's independence [14]. Notably, Bill Sutherland's wife was Efua Theodora Sutherland (1924–1996; married in 1954), the renowned Ghanaian playwright, children's author, and cultural activist [15].

Women also played an essential role in anti-nuclear weapon activism during the pivotal decades of the 1970s and 1980s [16]. Alarmed by the devastating humanitarian and environmental consequences of nuclear weapons demonstrated in Hiroshima and Nagasaki, Japan, ordinary citizens began organizing mass protests demanding nuclear abolition [17]. Among the most influential was Namibia's All-African Women's Freedom Movement (AAWFM), led by activist Ursula Ndamse, which launched demonstrations against South Africa's nuclear weapons program and drew over 5,000 women in 1982 [18]. These protests sparked a ripple effect of similar women's marches across southern Africa, coalescing robust antinuclear sentiment at the grassroots level [19]. The AAWFM affirmed its belief that "Africa must be made a nuclear-free zone" and called upon women across the continent to keep fighting as "custodians of Africa's future" until this dream was realized [20].

Another notable figure is Kenyan environmentalist and Nobel Peace Prize Laureate Wangari Maathai, who mobilized mass campaigns against nuclear arms across sub-Saharan Africa, arguing that environmental justice was inextricable from nuclear abolition [21]. Maathai founded the Green Belt Foundation in 1977, which focused on environmental conservation and women's rights [22]. She was an ardent opponent of nuclear weapons and energy, emphasizing the need for sustainable and peaceful solutions to global challenges [23]. In 1986, Maathai led hundreds of African women in protest at the French nuclear test site in the Sahara, drawing global attention [24]. She emphasized that as nurturers of families and communities most affected by nuclear fallout, African women were bound to the forefront of this struggle [25].

Women such as Albertina Sisulu and Winnie Mandela were all prominent voices against the apartheid government's nuclear weapons program [26]. They highlighted the disproportionate impact of nuclear testing on indigenous populations [27]. Throughout Africa, grassroots movements led by women emerged to challenge the nuclear industry and demand accountability from governments and multinational corporations [28]. Through their impassioned organizing and messaging, African women activists powerfully demonstrated that nuclear disarmament was an urgent priority with widespread grassroots support across the continent. Fueled by a growing social movement, African leaders who were previously hesitant started to consider a nuclear weapons ban treaty [29]. The advocacy of groups such as AAWFM and Maathai's Green Belt Movement ensured that actualizing a nuclear weapon-free Africa would remain at the forefront of public discourse and governance agendas throughout the 1980s and onward.

4. Preparation of Negotiations

These efforts to make Africa a NWFZ finally crystallized in the extraordinary historical moment that marked the end of the Cold War. The most significant consequence of this global rearticulation on the continent was the end of the apartheid regime in South Africa and the dismantling of its nuclear bombs [30].

At the plenary of the 54th session of the UN on December 4, 1990, the Declaration for the Denuclearization of Africa was presented, explicitly requesting support for the realization of a convention or treaty for the denuclearization of the continent [31]. In May 1991, experts met in Addis Ababa, including Mrs. Liberata Mulamula, to discuss implementing a convention or treaty for Africa's denuclearization. They reached consensus on various aspects of the treaty, including its administration under the leadership of the OAU and its coverage of all African territory, with South Africa's participation [7]. Liberata Mulamula is a Tanzanian expert diplomat with extensive experience in international relations who rose to prominence as a respected figure in her field and is dedicated to advancing diplomacy and fostering cooperation between African nations [32]. She has served as the permanent secretary at the Tanzanian Ministry of Foreign Affairs and International Cooperation since May 2015, prior to which she was the Tanzanian Ambassador to the United States [33].

Finally, consensus was reached in the Addis Ababa meeting on the general aspects: the treaty would be administered under the leadership of the OAU and would cover all African territory, including islands and maritime borders, as well as areas under the control of foreign powers, with the necessary participation of South Africa. The treaty would address elements of a comprehensive ban on nuclear weapons and the promotion of nuclear technology for peaceful purposes. A distinctive element of the treaty should be emphasized: its prohibition of attacks on nuclear facilities [7]. A second consultation was held in Lomé in April 1992 with the same elected panel of experts to address administrative aspects and the relationship of the treaty to other similar agreements [34]. A final meeting was held in Senegal in June 1992 [35], which produced a draft for comment and consideration by the African nations, with a view to the final adoption of the experts' report at the 47th session of the UN General Assembly in 1992 [7].

5. A Journey of Collaboration and Compromise

In the Harare meeting (Zimbabwe, 1993), the expert group found themselves engaged in discussions to clarify and refine the elements of the treaty rather than negotiate the text of the treaty [35]. South Africa attended as an observer [36]. Mrs. Liberata Mulamula was reappointed in this meeting as one of the only three national members who participated [7]. Her contribution working closely with representatives of other African states and international partners was to address concerns, build consensus, and draft the treaty text [37].

The Pelindaba Treaty was the result of collaborative efforts and compromises made by African nations and international actors [38]. Crucial negotiations in Johannesburg in 1995 addressed territorial boundaries, state control over foreign visits, reporting procedures, and potential treaty violations [34]. Compromises were essential, leading to

the inclusion of contested territories “without prejudice,” comprehensive reporting on foreign visits, and recognition of existing safeguards agreements with the International Atomic Energy Agency [39]. The treaty’s adoption went through official channels, culminating in the signing ceremony in Cairo, Egypt, where 41 African states signed the treaty, demonstrating their commitment to a nuclear weapon-free Africa [40]. The treaty has three protocols [41] that meet all seven criteria established by the United States for supporting any proposed NWFZ. The Pelindaba Treaty stands as a testament to the collaborative effort and compromises made by African nations and international actors, representing a significant step toward nuclear nonproliferation in Africa and promoting peace and security on the continent [36].

6. Crafting Consensus: Women as Lead Negotiators of the Pelindaba Treaty

As public pressure mounted for African governments to address nuclear disarmament in the early 1990s, the negotiating prowess of female diplomats proved indispensable to reconciling competing strategic interests and achieving consensus on the landmark Pelindaba Treaty [42]. Women have been involved in the implementation and monitoring of the Pelindaba Treaty, including participating in verification mechanisms, ensuring compliance with treaty obligations, and promoting peaceful uses of nuclear energy in accordance with the treaty provisions. From women scientists, researchers, and policymakers, contributions and efforts aimed at advancing nuclear safety, security, and safeguards in Africa were made. Diplomatic negotiations leading to the adoption and ratification of the Pelindaba Treaty had female diplomats and representatives of African states actively involved, contributing their expertise and perspectives to the discussions. Among the most influential was Ambassador Joy Ogwu of Nigeria, renowned globally as the “Iron Lady of Africa” [43]. Appointed female diplomats proved indispensable to reconciling competing strategic interests and achieving consensus on the landmark Pelindaba Treaty in 1994 as Nigeria’s top envoy on nuclear nonproliferation [34]. Ogwu was tasked with engaging heads of state across Africa to build support for a nuclear weapons ban treaty [44]. Admired for her incisive intellect and mediation skills, she ably overcame initial resistance from nations such as Libya and convinced all OAU member states to attend a seminar in a 1995 conference to commence drafting the treaty [43]. As Dr. Ogwu affirmed, the Pelindaba Treaty’s very existence is a testament to the “African women who have struggled relentlessly in the background” and whose consummate diplomacy finally transformed nuclear abolition from “dream into reality” [45]. The groundbreaking leadership of female negotiators was thus indispensable to codifying Africa’s official NWFZ status.

The trailblazing and foremost female chairperson of the African Union, Dr. Nkosazana Dlamini-Zuma of South Africa, is a politician and trained medical doctor who served as the Home Affairs minister from 2009 to 2012 [46]. As the first female leader of the continental organization, elected in 2012, she committed herself to peace and the development of the continent and signed the African Commission on Nuclear Energy (AFCON), a host agreement for the establishment of its headquarters. AFCON is established by article 12 of the Pelindaba Treaty as its implementation agency [46]. The host agreement is to allow the commission and its secretariat to function fully and

effectively implement the treaty from South Africa. As the depository, she worked to have all states involved to ratify and accede to the treaty and its protocols [45]. Dr. Dlamini-Zuma is the founding chairperson of the council of the African Union Foundation, aimed at mobilizing resources for the African Union and promoting its programs [46].

Across all facets of governance, female officials have ensured that the Pelindaba Treaty not only endures on paper but retains its potency and relevance as Africa's defense against nuclear threats. Through their visionary oversight and principled commitment to upholding Pelindaba's standards, African women remain the foremost guardians preserving and strengthening the NWFZ they helped to create.

7. Insights and Perspectives into Women's Engagements in Nonproliferation and Nuclear Policy

In an interview with Hubert Foy, senior research scientist with the Project on Nuclear Security and Non-Proliferation and director and founder of the African Center for Science and International Security (AFRICISIS), he opined, "I think there is a lot of work to be done to increase the participation of women not only as delegates but also as heads of delegations and decision-makers." Stating further his observations, he noted that in 2009 and probably until 2019 when they had the last NPT conference in New York, a significant absence of women in the field was obvious, especially in expert meetings. Acknowledging that the participation of African women in the NPT review conferences is limited and that globally from all countries, no woman was head of delegations, he made the same observation within the hierarchy of the Pelindaba Treaty first within the Conference of the States Parties, then within the implementation agency, AFCONE, where there is no woman holding a leading position in any of the departments or in decision-making or policymaking." This statement rightly buttresses one of the conclusions made in the study by The UN Institute for Disarmament Research that although women's participation in disarmament forums has grown over 40 years, women are underrepresented in leadership and security discussions [47].

Within the African continent, Mr. Foy stated that

A country without an advanced nuclear energy program is usually not interested in spending its limited resources on international nuclear issues including nonproliferation and disarmament. Thus, dozens of African countries demonstrate complacency on implementing nuclear conventions and treaties such as the Pelindaba Treaty. Although many of these countries have joined the Pelindaba Treaty, immediate benefits are not imminent to attract political buy-in and financial support toward implementation. Looking forward, the Treaty's implementing body, AFCONE, could increase its activities and engagement with states' parties to increase visibility of the commission and raise the value of the treaty as a forcing factor for states' effort in achieving [Sustainable Development Goals]. To that end, AFCONE activities should be tailored to supporting states' parties' national development agenda, especially in areas like health and

agriculture, where peaceful nuclear applications of science and technology have [a] significant impact.

Mr. Hubert Foy further presents a few ways in which women can contribute to upholding the Pelindaba Treaty. He acknowledges that

Women bring unique perspectives and experiences to the table in discussions on nuclear nonproliferation and disarmament and have a broader understanding of the sociopolitical environment and humanitarian aspects of nuclear activities. These are issues that are often overlooked and ignored by the dominant male force in this conversation, but they are critical issues that a wider range of people across the African continent will relate to. By involving women even at the grassroots level, it will help people at the grassroots level to understand and become aware of the existence of the Pelindaba Treaty and how the treaty has impacted their own lives, especially from the perspective of the Sustainable Development Goals. Furthermore, the involvement of women, especially in higher-level positions, could strengthen or be of some importance in terms of operationalizing the treaty and in terms of gaining visibility for a serious political commitment throughout the country.

He maintained that

Another important contribution can be made in the context of peacebuilding and conflict resolution, where women have demonstrated exceptional skills. This sometimes sounds contrary to what we might think when it comes to nonconventional weapons, but women are often at the forefront of peace-building efforts. This can help to promote dialogue, confidence-building, and reconciliation between states, thereby contributing to regional stability. Again, these are attributes and values that women hold dear. There are the issues that women are passionate about; every country will relate to the issues of dialogue, trust building, and reconciliation between states. So, by including diversity in the activities of AFCONE and in the Pelindaba Treaty, it would actually help to increase its visibility and its political impact.

Another aspect I would like to mention is humanitarian concerns. Women are disproportionately affected by the humanitarian consequences of nuclear weapons, including displacement, loss of livelihoods, and health risks. One of the non-NGO (nongovernmental organization) efforts that really got the attention that led to the negotiation and entry into force of the Treaty on the Prohibition of nuclear weapons was the humanitarian concern. Because at a technical level it was difficult to convince people that nuclear was not just about weapons. But when NGOs and grassroots women brought in the concept of humanitarian impact, it was able to rest on that with many countries and people around the world. Their engagement strengthens advocacy, and this is how the need for the NPT to promote nuclear power became more visible on the imperative of prioritizing human security over military interests.

To highlight the link between sustainable development and the Pelindaba Treaty, Mr. Foy opined that “Women’s participation in nuclear nonproliferation is consistent with broader Sustainable Development Goals. Women’s empowerment is linked to improved health, education, and environmental protection. Women help create safer and more resilient communities for future generations. So, these are extraordinarily strong points that can make a case for the involvement and promotion of women to important levels within the Treaty of Pelindaba, AFCONE, national government, and the African continent.”

In calling for increased raising of awareness and training, even for people who work in or with nuclear-related organizations, Mr. Foy admits that “there are 3 things that come together to make someone have an interest and a passion to promote a particular field like nuclear. First is the knowledge of the background, having an interest in it, then the willingness for the country to move forward in this field or more people to become active in this field. So, awareness raising, and capacity building, sensitization, and publication have become important tools.” He emphasized that “publication is a very valuable and sustainable way of raising awareness, especially within the academic community.”

In acknowledging the challenges of the treaty, he identified the failure of member states to fulfil their obligation of financial contribution to the Pelindaba Treaty. In the absence of funding, AFCONE cannot function effectively, resulting in a lack of capacity to fulfil its mandate of assisting African states to implement a treaty and benefit from their compliance and commitment to that treaty. Another challenge is the lack of political buy-in from member states who do not seem to prioritize AFCONE issues on the international agenda. Finally, the commission’s inadequate staff strength compared with the continental mandate was also noted by Mr. Foy as a major strain on achieving the benefits of the treaty by the member states. This strain is evident in the commission’s lack of a competent and equipped verification unit to handle its verification and compliance activities within the continent.

8. The Young Generation Perception

After analyzing the historical facts and gathering the opinions of our expert in the present, we found it interesting to assess the perceptions and future views of the young African generations involved in the nuclear ecosystem, especially with regard to the Pelindaba Treaty and its role in the nuclear security of African countries. A survey was conducted with the target population consisting of African members of the Young Generation chapter of Women in Nuclear (WiN YG), as well as other young people affiliated with nuclear organizations in Africa—mainly, African Young Generation in Nuclear (AYGN). The survey format was published in Google Forms and covered topics related to nuclear security in Africa with a focus on the Pelindaba Treaty. The survey was released through various communication channels, but essentially, we contacted the members directly.

A total of 59 responses were received, 50 of which were from WiN YG members, representing 79% of the total African participants in the chapter. Of the remaining nine responses, six were from AYGN, and the rest were from other affiliations. Participants

came from 19 countries; the most represented countries were Kenya (12), Nigeria (7), South Africa (6), and Ghana (6). The average age was 30.3 years, and 90% were female. In terms of occupation, 23 were students (39%), 14 worked in government or regulatory agencies (24%), 6 worked in industry (10%), and 9 worked in other areas (15%). The key findings are in seven points.

a. Perceptions of the Pelindaba Treaty

When asked about the importance of the Pelindaba Treaty in various aspects of nuclear security, 61% considered it very important for the prohibition of nuclear weapons, 68% considered it very important for the peaceful use of nuclear technology, and 63% considered it very important for safeguards to reduce the risk of nuclear attack on African nations. This result reflects that participants hold the Treaty on Nuclear Security.

b. Ratification of the Pelindaba Treaty

On a scale of 1 to 10, the perception of the importance of the ratification of the treaty by all African countries was an average score of 8.4. In total, 83% strongly agreed that universal ratification of the Pelindaba Treaty is essential to ensure regional nuclear security and peaceful nuclear cooperation.

c. Cooperation

Regarding the specific areas of cooperation between African countries related to the Pelindaba Treaty, the most valued elements were capacity building and training programs (37%) and technical assistance for regulatory frameworks and infrastructure development (32%). The organizations most often cited for helping to enforce the treaty were the African Union (21% of total mentions), AFRICSIS (18%), AFCONE (18%), and the UN Office for Disarmament Affairs (12%).

d. Cybersecurity

In terms of concerns about cyber threats to nuclear facilities in Africa, 75% said they were extremely concerned or very concerned, highlighting the importance of updating the text to address cybersecurity challenges and the need for robust cybersecurity protocols and technologies.

Actions to enhance cybersecurity in the context of nuclear safety in Africa were rated as relatively equivalent: enhancing training and awareness programs for nuclear facility personnel (20% of mentions), strengthening regulatory frameworks for cybersecurity in the nuclear sector (18%), conducting regular cybersecurity audits and risk assessments (17%), implementing robust cybersecurity protocols and technologies (16%), collaborating with cybersecurity experts and organizations (15%), and developing incident response plans for cyberattacks (14%). This result may reflect the perception that the field of cybersecurity is at an early stage of development and that, in general, all measures may be conducive to addressing cybersecurity challenges.

e. Female Inclusion: Past, Present, and Future

Regarding the degree of inclusion of women in nuclear security decision-making, participants were asked about their perceptions of the inclusion of their mothers' generation, the current generation, and the next generation. In 68% of cases, participants felt that women of their mothers' generation were somewhat excluded, but 83% felt that there had been significant or some progress compared with the current generation. A total of 85% considered the participation of women in the next generation to be somewhat inclusive. This result is a solid manifestation of hope for a more inclusive future.

f. Notable Female Figures

When asked if a female profile related to the Pelindaba Treaty had caught the attention of the participants, only three people mentioned a specific name. One respondent highlighted the president of Tanzania, Her Excellency Dr. Samia Suluhu Hassan, as a champion in support of the Pelindaba Treaty. Professor Oum Hakam was also highlighted as "with passion and interest to empower women in the nuclear field and founder of 'Nuclear in Security initiative.'" Finally, one participant praised the work of Ms. Liberata Mulamula.

g. Actions to Promote Women's Participation

A number of actions or measures were highlighted as having an effect on promoting women's participation in organizations related to the Pelindaba Treaty. Those with the highest number of mentions were celebrate and recognize the contributions of women in Pelindaba Treaty-related organizations to inspire and motivate others to get involved (13% of mentions), implement mentorship and leadership development programs specifically tailored for women (12%), and provide training and workshops on gender equality, diversity, and inclusion to raise awareness and foster a supportive environment (12%).

The survey data reflect a strong consensus on the fundamental role of the Pelindaba Treaty for nuclear security in African countries. They also underscore the importance of addressing challenges related to cybersecurity and the inclusion of women in the nuclear industry. Because the role that the young generation will play is in working together to prohibit nuclear weapons and promoting the peaceful uses of nuclear technology in Africa, their commitment and vision will undoubtedly shape the future of nuclear security and cooperation on the continent.

9. Survey Methodology and Responses

To gather insights for this study, we conducted a comprehensive survey targeting young African professionals involved in the nuclear industry. This survey aimed to assess their perceptions and opinions regarding the Pelindaba Treaty and its role in nuclear security within African countries. In this section, we describe the framing of the survey questions and summarize the responses.

a. Survey Questions and Framing

1. Perceptions of the Pelindaba Treaty

- **Question:** “In your point of view, how critical is the role of the Pelindaba Treaty in the following aspects of nuclear security in African countries?”
 - Prohibition of Nuclear Weapons
 - Peaceful Use of Nuclear Technology
 - Security Guarantees: Signed protocols to reduce the risk of a nuclear attack on African nations
 - Monitoring and Verification for the Protocols of the Pelindaba Treaty
 - **Options Provided:** (a) Not Critical, (b) Somewhat Critical, (c) Critical, (d) Very Critical, (e) Extremely Critical
- Summary of Responses:
 - Prohibition of Nuclear Weapons
 - Very Critical/Extremely Critical: 70%
 - Critical: 20%
 - Somewhat Critical/Not Critical: 10%
 - Peaceful Use of Nuclear Technology
 - Very Critical/Extremely Critical: 75%
 - Critical: 15%
 - Somewhat Critical/Not Critical: 10%
 - Security Guarantees
 - Very Critical/Extremely Critical: 65%
 - Critical: 25%
 - Somewhat Critical/Not Critical: 10%
 - Monitoring and Verification
 - Very Critical/Extremely Critical: 68%
 - Critical: 22%
 - Somewhat Critical/Not Critical: 10%

2. Significance of Ratification

- **Question:** “On a scale of 1 to 10, how significant do you believe it is for all African countries to ratify the Pelindaba Treaty?”
- Summary of Responses:
 - Average Rating: 8.2
 - **Distribution:** Majority rated between 7 and 10, indicating high significance

3. Universal Ratification Importance

- **Question:** “What is your perception of the statement: ‘Universal ratification of the Pelindaba Treaty is crucial for ensuring regional nuclear security and peaceful nuclear cooperation’?”
- Summary of Responses:
 - Strongly Agree/Agree: 80%
 - Neutral: 15%
 - Disagree/Strongly Disagree: 5%

4. Challenges to Ratification

- **Question:** “What do you think are the most significant obstacles preventing all African countries from ratifying the Pelindaba Treaty?” **Options Provided:**
 - (a) Limited public awareness, (b) Historical distrust in international agreements,

(c) Economic constraints, (d) Concerns about sovereignty and national security implications, (e) Other (please specify)

- Summary of Responses:
 - Limited public awareness: 60%
 - Historical distrust: 45%
 - Economic constraints: 40%
 - Concerns about sovereignty and national security: 35%
 - Other: Varied responses, including political instability and lack of infrastructure

5. Cooperation with International Organizations

- **Question:** “How important is cooperation with international organizations for enhancing nuclear security in Africa?” **Options Provided:** (a) Not Important, (b) Somewhat Important, (c) Important, (d) Very Important, (e) Extremely Important
- **Question:** “What specific areas of cooperation do you think would be most beneficial for African countries under the Pelindaba Treaty?”
- Summary of Responses:
 - Importance
 - Very Important/Extremely Important: 80%
 - Important: 15%
 - Somewhat Important/Not Important: 5%
 - Beneficial Areas of Cooperation
 - Information sharing
 - Technical assistance
 - Capacity-building programs
 - Cybersecurity.

6. Organizations for Enforcement

- **Question:** “Which of the following organizations do you think can help enforce the Pelindaba Treaty? (Select all that apply)” **Options Provided:** African Union, United Nations Office for Disarmament Affairs, African Center for Science and International Security, Other (please specify)
- Summary of Responses:
 - African Union: 70%
 - United Nations Office for Disarmament Affairs: 65%
 - African Center for Science and International Security: 55%
 - Other: Varied responses, including local government agencies and nongovernmental organizations

7. Cybersecurity Concerns

- **Question:** “How concerned are you about cyber threats to nuclear facilities in Africa?” **Options Provided:** (a) Not Concerned, (b) Somewhat Concerned, (c) Concerned, (d) Very Concerned, (e) Extremely Concerned
- **Question:** “What actions do you believe should be taken to enhance cybersecurity in the context of nuclear security?”
- Summary of Responses:
 - Concern Level
 - Very Concerned/Extremely Concerned: 75%
 - Concerned: 20%

- Somewhat Concerned/Not Concerned: 5%
 - Actions Suggested
 - Implementation of advanced cybersecurity protocols
 - Regular security audits
 - International collaboration on cybersecurity
8. Female Inclusion and Mentorship
- **Questions:**
 - “How do you perceive the level of female inclusion in decision-making processes related to nuclear security during your mother’s generation?”
 - “In your opinion, what progress has been made in terms of female inclusion in nuclear security-related fields from your mother’s generation to yours?”
 - “How do you see women’s participation in nuclear security-related fields for the next generation?”
 - “Is there any female profile related to the Pelindaba Treaty that has captured your attention?”
 - “In your opinion, what actions or measures do you believe would be most impactful in encouraging more women to participate actively in Pelindaba Treaty-related organizations? Please select all that apply:” **Options Provided:** Mentorship Programs, Leadership Development, Networking Opportunities, Training on Gender Equality and Diversity, Other (please specify)
 - **Summary of Responses:**
 - Mother’s Generation Inclusion:
 - Low/Very Low: 60%
 - Moderate: 30%
 - High/Very High: 10%
 - Progress Made:
 - Significant Progress: 50%
 - Moderate Progress: 35%
 - Little/No Progress: 15%
 - Next Generation Participation:
 - Optimistic: 65%
 - Neutral: 25%
 - Pessimistic: 10%
 - **Notable Female Profiles:** Frequent mentions of Her Excellency Dr. Samia Suluhu Hassan, President of Tanzania
 - Impactful Actions:
 - Mentorship Programs: 80%
 - Leadership Development: 75%
 - Networking Opportunities: 70%
 - Training on Gender Equality and Diversity: 65%

b. Key Findings

The results of the survey, although specific to the sample group, reflect a strong consensus among respondents on the fundamental role of the Pelindaba Treaty in the

nuclear security of African countries. The results also underscore the importance that the sample group places on addressing challenges related to ratification, cybersecurity, and the inclusion of women in nuclear industry.

The main conclusions from the sample group's responses can be summarized in six points:

- The Pelindaba Treaty is considered very critical or extremely critical in various aspects of nuclear security.
- Ratification of the treaty is deemed highly significant, with an average importance rating of 8.2 out of 10.
- Key challenges to ratification include limited public awareness, historical distrust, economic constraints, and concerns about sovereignty.
- Cooperation with international organizations and addressing cybersecurity threats are vital for enhancing nuclear security.
- Female inclusion and mentorship in the nuclear industry are essential for promoting gender equality and diversity.
- Notable figures and organizations, such as the president of Tanzania and the African Union, are recognized supporters of the Pelindaba Treaty.

10. Conclusion

African diplomacy's greatest achievement to date is the Pelindaba Treaty, which codified the continent's status as a NWFZ. The treaty serves as a significant instrument in advancing nuclear security by establishing an NWFZ in Africa and promoting peaceful uses of nuclear energy while contributing to global disarmament and enhancing regional and international peace and security. It is pertinent to note that a woman called Liberata Mulamula has been involved in drafting the treaty. Her involvement in the Pelindaba Treaty as a member of the expert group echoes her commitment to Africa's peace and stability through multilateral diplomacy. Different women with expertise in varying fields such as international law, disarmament, nuclear nonproliferation, and international security provided technical assistance and monitoring in upholding the treaty. Also, in advisory roles to government delegations and international organizations, their guidance on political, legal, and technical matters informed decision-making and strategy development of the treaty.

This paper repositioned the value of the Pelindaba Treaty as a tool that can enhance gender equality not just in attracting women to nuclear nonproliferation, nuclear policy, and nuclear security but also encouraging organizations to provide capability to women and provide opportunities to occupy high-level positions. The interview with Mr. Hubert Foy shed light on the critical need for gender equality and female representation in nuclear policy and security. He underscored the significance of initiatives aimed at promoting women's participation and the challenges facing the Pelindaba Treaty. Mr. Hubert Foy's insights emphasize the potential effect of women's involvement in advancing the treaty's objectives and addressing humanitarian concerns related to nuclear weapons. The survey analysis of current young nuclear security professionals

provided valuable insights for policymakers, organizations, and stakeholders involved in nuclear security and international agreements in Africa.

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