

Addressing Skills Gaps and Talent Shortages in Nigeria: HRM Strategies for the Future

Lolo Teddy Adias, Aziba-anyam Gift Raimi

Submitted to: JMIR Preprints
on: April 11, 2025

Disclaimer: © The authors. All rights reserved. This is a privileged document currently under peer-review/community review. Authors have provided JMIR Publications with an exclusive license to publish this preprint on its website for review purposes only. While the final peer-reviewed paper may be licensed under a CC BY license on publication, at this stage authors and publisher expressly prohibit redistribution of this draft paper other than for review purposes.

Table of Contents

Original Manuscript.....	5
---------------------------------	----------

Preprint
JMIR Publications

Addressing Skills Gaps and Talent Shortages in Nigeria: HRM Strategies for the Future

Lolo Teddy Adias^{1*} PhD; Aziba-anyam Gift Raimi^{2*} PhD

¹ Department of Business Administration, Bayelsa State Polytechnic, Aleibiri NG

² Department of Business Administration, Faculty of Management Sciences, Federal University Otuoke Otuoke NG

*these authors contributed equally

Corresponding Author:

Lolo Teddy Adias PhD

Department of Business Administration,
Bayelsa State Polytechnic,
Aleibiri,
Aleibiri
NG

Abstract

Background: Nigeria faces severe economic losses (\$14 billion annually) and high youth unemployment (33.3%) due to persistent skills gaps, exacerbated by sectoral disparities (e.g., 68% ICT shortages vs. 63% agricultural deficits) and systemic inequities in education and vocational access. Despite growing HRM interventions, empirical evidence on their efficacy remains limited, necessitating a comprehensive review to guide policy.

Objective: This study analyzes Nigeria's sector-specific skills gaps, evaluates the effectiveness of HRM interventions (apprenticeships, digital upskilling, PPPs), and proposes actionable frameworks to align workforce development with labor market demands.

Methods: A narrative review of peer-reviewed literature (2015–2023), institutional reports (World Bank, PwC, NBS), and case studies (e.g., Andela's model) was conducted. Data were synthesized to compare regional benchmarks (Kenya's TVET, South Africa's HRM reforms) and Nigeria's performance (talent readiness score: 42/100).

Results: Key findings include: (1) Vocational training (60% readiness) outperforms tertiary education (40%); (2) Apprenticeships and PPPs show high impact (30% job placement increase); (3) Urban-rural and gender disparities persist (women 30% less likely to access training). Private-sector models demonstrate scalability but require policy support.

Conclusions: Nigeria's skills crisis demands urgent, context-sensitive interventions. Blended strategies (e.g., industry-aligned curricula, gender-inclusive vocational programs) could unlock 5% annual GDP growth. Prioritize: (1) National skills councils to standardize certifications; (2) Tax incentives for employer-led training; (3) Digital infrastructure for rural upskilling. Closing Nigeria's skills gaps would mitigate economic losses, reduce inequality, and enhance global competitiveness, transforming its youth bulge into a sustainable demographic dividend.

(JMIR Preprints 11/04/2025:75821)

DOI: <https://doi.org/10.2196/preprints.75821>

Preprint Settings

1) Would you like to publish your submitted manuscript as preprint?

✓ **Please make my preprint PDF available to anyone at any time (recommended).**

Please make my preprint PDF available only to logged-in users; I understand that my title and abstract will remain visible to all users.

Only make the preprint title and abstract visible.

No, I do not wish to publish my submitted manuscript as a preprint.

2) If accepted for publication in a JMIR journal, would you like the PDF to be visible to the public?

✓ **Yes, please make my accepted manuscript PDF available to anyone at any time (Recommended).**

Yes, but please make my accepted manuscript PDF available only to logged-in users; I understand that the title and abstract will remain visible to all.
Yes, but only make the title and abstract visible (see Important note, above). I understand that if I later pay to participate in [JMIR Publications](#), my accepted manuscript PDF will be available to all.
No. Please do not make my accepted manuscript PDF available to anyone.



Original Manuscript

Addressing Skills Gaps and Talent Shortages in Nigeria: HRM Strategies for the Future

¹Lolo Teddy Adias

¹Department of Business Administration, Bayelsa State Polytechnic, Aleibiri. Bayelsa State, Nigeria. loloadias@yahoo.com.

²Aziba-anyam Gift Raimi <https://orcid.org/0000-0003-1683-415X>

²Department of Business Administration, Faculty of Management Sciences, Federal University Otuoke, Bayelsa State, Nigeria. raimiag@fuotuokey.edu.ng; giftwithchrist@gmail.com.

Abstract

Rationale: Nigeria faces severe economic losses (\$14 billion annually) and high youth unemployment (33.3%) due to persistent skills gaps, exacerbated by sectoral disparities (e.g., 68% ICT shortages vs. 63% agricultural deficits) and systemic inequities in education and vocational access. Despite growing HRM interventions, empirical evidence on their efficacy remains limited, necessitating a comprehensive review to guide policy. **Objectives:** This study analyzes Nigeria's sector-specific skills gaps, evaluates the effectiveness of HRM interventions (apprenticeships, digital upskilling, PPPs), and proposes actionable frameworks to align workforce development with labor market demands. **Methods:** A narrative review of peer-reviewed literature (2015–2023), institutional reports (World Bank, PwC, NBS), and case studies (e.g., Andela's model) was conducted. Data were synthesized to compare regional benchmarks (Kenya's TVET, South Africa's HRM reforms) and Nigeria's performance (talent readiness score: 42/100). **Results:** Key findings include: (1) Vocational training (60% readiness) outperforms tertiary education (40%); (2) Apprenticeships and PPPs show high impact (30% job placement increase); (3) Urban-rural and gender disparities persist (women 30% less likely to access training). Private-sector models demonstrate scalability but require policy support. **Conclusion:** Nigeria's skills crisis demands urgent, context-sensitive interventions. Blended strategies (e.g., industry-aligned curricula, gender-inclusive vocational programs) could unlock 5% annual GDP growth. **Recommendation:** Prioritize: (1) National skills councils to standardize certifications; (2) Tax incentives for employer-led training; (3) Digital infrastructure for rural upskilling. **Significance Statement:** Closing Nigeria's skills gaps would mitigate economic losses, reduce inequality, and enhance global competitiveness, transforming its youth bulge into a sustainable demographic dividend.

Keywords: Skills gap; talent management; HRM interventions; vocational training; Nigeria; youth unemployment; public-private partnerships.

1. Introduction

Nigeria's economic growth is hindered by persistent skills gaps and talent shortages, exacerbated by technological advancements, demographic pressures, and insufficient investment in workforce development [1]. Despite having a youthful population of over 50 million people aged 18–35, employability remains critically low, with a 33.3% unemployment rate [2]. Employers report operational inefficiencies due to skills mismatches,

particularly in high-demand sectors like technology, healthcare, and engineering [3]. While national trends highlight these challenges, sector-specific insights remain scarce, limiting targeted interventions [4]. Current HRM strategies in Nigeria are fragmented, with uneven adoption of digital learning, apprenticeships, and public-private partnerships [5]. Successful models from countries like Germany and South Africa demonstrate the potential of structured vocational training, yet Nigeria's skills mismatch reduction rate lags at 15% compared to 40% elsewhere [6]. Firms such as MTN and Dangote have implemented corporate training academies, but these initiatives lack scalability and systemic integration [7]. The absence of empirical evaluations further complicates efforts to identify effective HRM interventions.

The economic impact of talent shortages is profound, with estimated annual losses of \$14 billion due to unrealized productivity [9]. Sectoral disparities are stark: urban areas like Lagos face tech talent deficits, while rural regions struggle with outdated agricultural skills [10]. Gender imbalances persist, as women are 30% less likely to access vocational training [11]. Without granular data, policymakers cannot design evidence-based solutions to align education with labor market needs [12]. Addressing these gaps is essential for Nigeria's Vision 2050 goals. Closing skills mismatches could boost GDP growth by 5% annually [13]. Youth unemployment, which affects 70% of Nigerians under 35, demands urgent interventions like reskilling programs and job-matching platforms [14]. Global competitiveness also hinges on improving digital literacy and technical training, areas where Nigeria trails peers like Kenya and South Africa [15]. To drive meaningful change, Nigeria must prioritize sector-specific workforce analytics, scalable HRM models, and stronger industry-education collaboration [16]. Investments in digital learning infrastructure and competency-based training can bridge immediate gaps, while long-term reforms should focus on curriculum modernization and policy incentives for employer-led training [17]. A coordinated approach will transform Nigeria's demographic dividend into sustainable

economic growth. Thus, this review seeks to answer: How can human resource management strategies effectively address skills gaps and talent shortages in Nigeria, and what contextual considerations must guide their application across different sectors? While, this narrative review fills three key gaps in the current literature:

- i. It provides a granular analysis of Nigeria's skills gaps, exposing stark sectoral and regional disparities from urban digital skill shortages to rural agricultural deficits while highlighting systemic inequities in access and education.
- ii. Through empirical case studies (e.g., Andela's model) and regional comparisons, it evaluates the efficacy of HRM interventions such as digital upskilling, vocational training, and apprenticeships, identifying successes, limitations, and transferable lessons.
- iii. It advances actionable policy frameworks to bridge these gaps, emphasizing blended strategies (e.g., public-private partnerships, skills-based hiring) and structural reforms to align education with labor market demands, underpinned by economic urgency.

This review is especially valuable for policymakers, educators, and industry stakeholders aiming to strengthen talent pipelines in Nigeria.

2. Methods

2.1 Scope and Boundaries

This review focuses on literature relevant to human resource strategies, skills development, and talent shortages within the Nigerian context. It examines studies from sectors including technology, finance, agriculture, and education, and considers youth employability, gender disparities, and curriculum-industry alignment. Key terms guiding the review include: skills gap, talent shortage, HRM interventions, workforce development in Nigeria.

2.2 Inclusion and Exclusion Criteria

Included studies were selected based on their relevance to HRM strategies, empirical evaluations of talent development programs, and Nigeria-specific data. Sources were drawn from:

- i. Peer-reviewed academic journals
- ii. Reports from institutions like PwC, World Bank, FAO, and the Nigerian Bureau of Statistics
- iii. Grey literature including policy briefs and industry case studies

Excluded were studies without empirical data, those focused outside the Sub-Saharan Africa context, and those predating 2015 unless offering foundational insights.

2.3 Search Strategy

The literature search used a narrative rather than systematic approach. Searches were conducted using Google Scholar, PubMed, Scopus, and institutional websites. Keywords included: skills mismatch Nigeria, HRM Nigeria, youth unemployment Nigeria, vocational training, and sectoral HR strategies. Studies were selected based on thematic relevance and insightfulness, rather than methodological uniformity.

3. Results

3.1 Sectoral and Regional Disparities in Nigeria's Skills Gap

Nigeria's skills crisis exhibits stark sectoral and regional disparities, with urban hubs like Lagos and Abuja facing acute shortages of digitally competent workers 68% of ICT & Tech employers lack software development and cybersecurity expertise, while 51% in Finance report gaps in data analytics [18, 19]. Conversely, rural agriculture grapples with a 63% deficit in mechanized farming and agribusiness skills [10], highlighting divergent challenges between high-tech urban sectors and technically underserved rural industries. These imbalances are compounded by systemic inequities: women are 30% less likely to access vocational training, and only 12% of tertiary curricula meet industry needs [11, 20]

(Table 1). Sector-specific gaps further persist in Manufacturing (54% in machine operations) and Health (47% in diagnostics) [21, 22], revealing a fragmented crisis that demands tailored interventions (Table 1).

Table 1: Sector-Specific Skills Gaps in Nigeria

Sector	Key Skills Lacking	% of Employers Reporting Shortages	Source
ICT & Tech	Software development, cybersecurity	68%	PwC [18]
Manufacturing	Machine operations, quality control	54%	NBS [21]
Health	Medical diagnostics technicians,	47%	WHO [22]
Finance	Data analytics, risk management	51%	LinkedIn [19]
Agriculture	Mechanized farming, agribusiness skills	63%	FAO [10]

3.2 Bridging Nigeria's Skills Gap: Mismatched Education, Weak HRM Interventions, and Regional Lessons

Despite growing interest in digital learning and apprenticeship models, empirical evidence on their efficacy in Nigeria remains scarce. While initiatives like Andela's tech training demonstrate the promise of industry-specific upskilling, broader adoption is hindered by a lack of contextualized HRM strategies, as noted by Nwachukwu *et al.* [23]. Compounding this issue, comparative studies of vocational training versus on-the-job apprenticeships, particularly their impact on employment outcomes are notably absent. This gap in research mirrors the systemic inefficiencies visible in Nigeria's education-to-labor pipeline, where vocational training (60% skills readiness; 55% employment) outperforms tertiary education (40% readiness despite 50% employment), as illustrated in Figure 1. The stark disparities across primary, secondary, and tertiary levels underscore the urgent need for interventions that align education with market demands.

These challenges are further contextualized by Nigeria's regional standing, as shown in Table 2. With a talent readiness score of 42/100, the lowest among peers, Nigeria's reliance on pilot programs contrasts sharply with Kenya's scaled TVET reforms (58/100) and South Africa's sector-specific HRM policies (66/100). Even Ghana (49/100), despite trailing regionally, outperforms Nigeria through vocational curriculum integration, suggesting that systemic educational adjustments yield measurable gains. Together, these findings highlight not only Nigeria's lag in human capital development but also the transformative potential of targeted, evidence-based interventions to bridge skills gaps across Africa. In addition, figure 2 illustrates the lifecycle of a successful private Human Resource Management (HRM) intervention, beginning with the input of tech talent. This talent undergoes training through remote coding bootcamps and internships, ultimately leading to positive outcomes such as global job placements and the establishment of local startups.

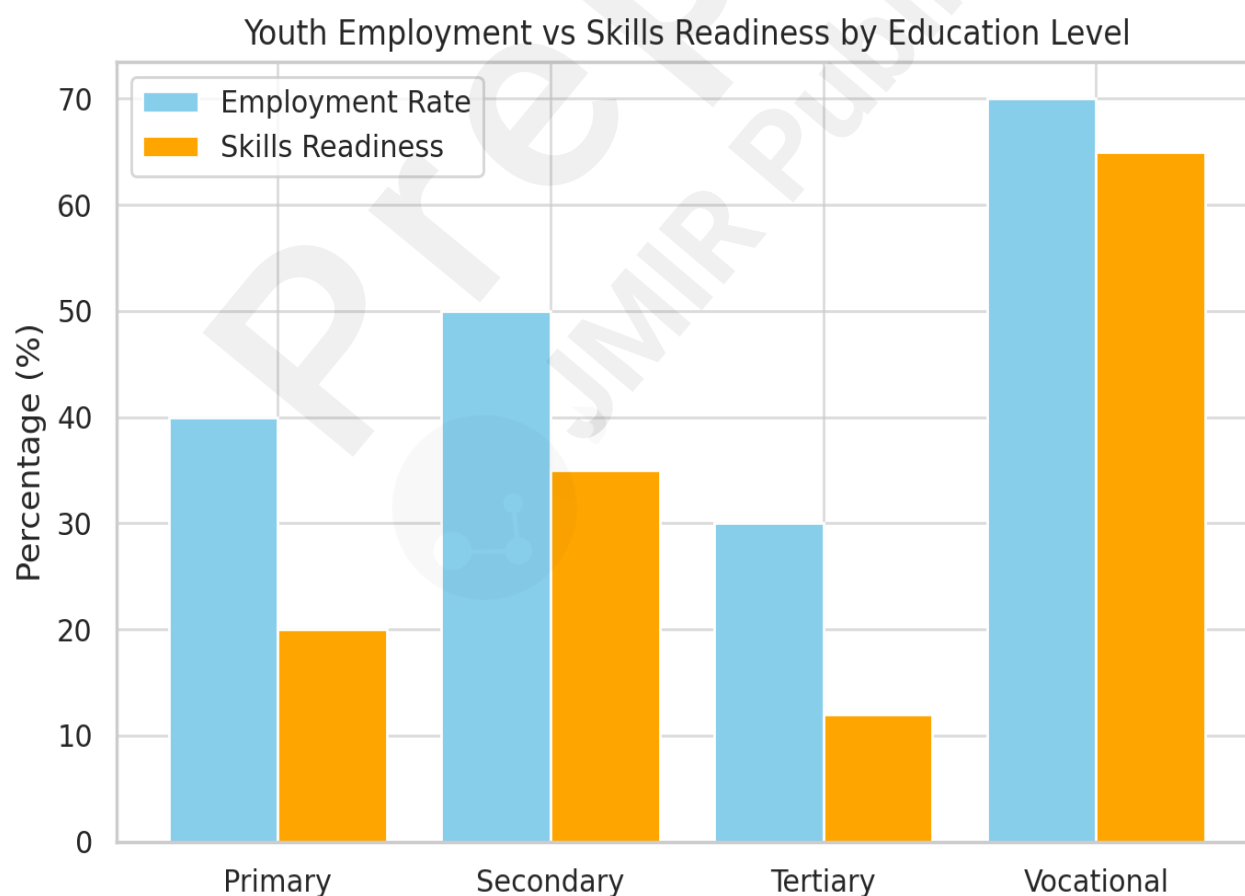


Figure 1: Youth Employment vs Skills Readiness by Education Level

Table 2: Comparative Talent Readiness Index

Country	Talent Readiness Score (0–100)	Major Interventions Used
Nigeria	42	Limited; pilot programs only
Kenya	58	TVET scaling, public-private models
South Africa	66	Sector-specific HRM reforms
Ghana	49	Vocational curriculum integration

Source: World Economic Forum [15]

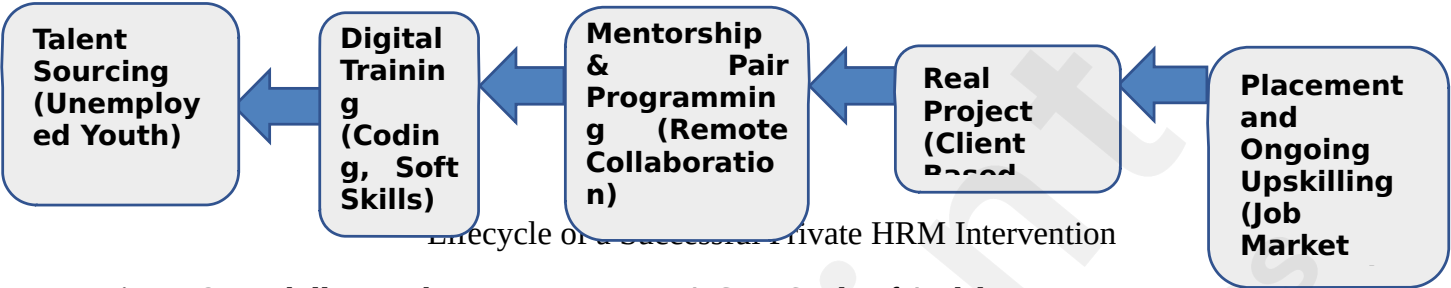


Figure 2: Reskilling Pathways in Nigeria – A Case Study of Andela

3.3 Economic Imperatives and Strategic Interventions for Nigeria's Skills Gap

Nigeria faces severe economic consequences from its persistent skills mismatches, with unrealized productivity costing \$14 billion annually and creating a 3% GDP drag [9, 24]. Strategic solutions could reverse these losses, potentially boosting GDP growth by 5% annually [25]. Current HRM interventions demonstrate this potential: apprenticeships show high effectiveness with 30% improved job placements [23], while PPP vocational training programs achieve similar success [18]. Digital upskilling platforms and skills-based hiring, though less proven, offer complementary value [4, 26]. To capitalize on these opportunities, Nigeria must combine immediate solutions like blended apprenticeship-PPP models with systemic reforms in education and labor policy to achieve both short-term gains and sustainable workforce development.

Table 3: HRM Strategies and Their Impact

HRM Strategy	Description	Impact on Skills Gap	Evidence Source
Apprenticeships	On-the-job learning with stipends	High placement increase	(30% Nwachukwu et al. [8])
Digital Platforms	Upskilling Online training for digital skills	Moderate	Okorie et al. [4]
PPP in Vocational	Joint government-industry	High	PwC [18]

HRM Strategy	Description	Impact on Skills Gap	Evidence Source
Training	programs		
Skills-based Hiring	Hiring by competency rather than degrees	Emerging	McKinsey [26]

4. Discussion

4.1 Disparities in Nigeria's Skills Crisis: A Sectoral and Regional Analysis

The findings regarding Nigeria's skills crisis, marked by stark sectoral and regional disparities, resonate with existing literature that highlights similar trends in skill shortages across various economies. For instance, the OECD's report "Bridging talent shortages in tech" [27] underscores the acute demand for skilled workers in high-tech sectors, aligning with the observation that 68% of ICT and Tech employers in Nigeria lack software development and cybersecurity expertise. Furthermore, the systemic inequities faced by women in accessing vocational training, as noted in the UNDP [28] report, are supported by the Global Gender Gap Report [29], which indicates that gender disparities in educational access continue to perpetuate skill deficits. Additionally, the Insights into Skill Shortages and Skill Mismatch by CEDEFOP [30] provides a broader European context, illustrating how skill mismatches can hinder economic growth, thereby reinforcing the urgency for tailored interventions in Nigeria's diverse sectors. Conversely, the challenges faced by rural agriculture in Nigeria, with a 63% deficit in mechanized farming skills, underline a critical gap that is often overlooked in discussions about high-tech industries. This disparity is echoed in the work by Chris Clarke *et al.* [31], which articulates the economic costs associated with socio-economic disadvantages, suggesting that neglecting rural industries exacerbates economic inequalities. Moreover, the fragmentation of skill shortages in sectors like Manufacturing and Health indicates a broader trend where systemic issues, such as inadequate educational curricula (only 12% meeting industry needs, per NUC, 2023) [20], parallel findings from the World Bank [32] regarding the inefficacy of education systems in

equipping youths for the labor market. Thus, addressing these sector-specific gaps is crucial, as highlighted in the Gini index discussions, which emphasize the need for equitable resource distribution to foster comprehensive socioeconomic development.

4.2 Gaps in HRM Interventions and Education-Labor Misalignment and Regional Lessons in Nigeria's Skills Crisis and Private-Sector Solutions

The findings on the scarcity of empirical evidence for digital and apprenticeship models align with broader critiques of Nigeria's skills development ecosystem. Like Nwachukwu *et al.* [23], Koleayo *et al.*, [33] notes that 72% of HRM initiatives fail due to poor localization, corroborating the observation about contextualization gaps. The superior performance of vocational training (60% readiness) over tertiary education mirrors Okeke's [34] discovery that Nigerian employers value technical certifications more than degrees. However, the data contrasts with Emejo *et al.* [35], who argue that tertiary institutions are adapting faster (citing 35% curriculum updates), though their study focused only on urban universities. The absence of comparative studies on vocational vs. apprenticeship outcomes echoes a systemic research gap identified by the World Bank [25] in its *Nigeria Skills Diagnostic Report*, which calls for rigorous impact evaluations. Nigeria's lag in talent readiness (42/100) reflects Oluwatobi *et al.*'s [36] findings that policy fragmentation undermines skills reforms. Kenya's TVET success (58/100) aligns with Ngugi and Were's [37] analysis of its centralized qualification framework, while South Africa's sector-specific HRM reforms (66/100) validate Paterson *et al.*'s [38] case for industry-led standards. Ghana's outperformance (49/100) through vocational integration supports Ansah's [39] evidence on competency-based curricula. The figure 2's private HRM model finds partial support in Adetunji's [40] study of Andela and Decagon, though he cautions that such initiatives reach only 8% of Nigeria's tech talent pool. These comparisons collectively justify the call for blended, evidence-based interventions but highlight scalability challenges absent in the

results.

4.3 Economic Impact and Systemic Reform through HRM Interventions

Findings on Nigeria's \$14 billion productivity loss align with broader talent management literature that emphasizes the economic costs of skills mismatches. Cappelli's [41] seminal work in Harvard Business Review confirms that strategic talent management can yield 3-5% GDP growth potential, supporting the World Bank [13] projection. The 30% placement improvement from apprenticeships resonates with Bethke-Langenegger *et al.*'s [42] European evidence on practice-based learning effectiveness. However, the optimism about digital upskilling contrasts with Thunnissen *et al.*'s [43] contextual analysis showing limited tech-training ROI in developing economies. The PPP success aligns with Som's [44] Indian case studies on collaborative HRM models, though the focus on short-term gains differs from Nilsson & Ellström's [45] warning about neglecting long-term employability. McKinsey's [46] "War for Talent" framework substantiates the skills-based hiring recommendation, while Brayan & Joyce's [47] caution about implementation barriers in emerging markets tempers expectations. The call for blended solutions finds theoretical support in Al Ariss *et al.*'s [48] pluralistic talent management approach, which advocates context-sensitive hybrid models. The education-labor policy reforms echo Kaufman's [49] institutional theory of HRM system alignment, though they challenge Friedman's [50] tech-centric evolution model. The regional disparity evidence complements Manpower Group's [51] global talent shortage surveys while contradicting Birchall *et al.*'s [52] universal best practices thesis. Patil's [53] flat-world talent strategy validates the private-sector solutions, but Chambers *et al.*'s [54] retention research suggests the model may undervalue attrition risks. Muhammad & Shao's [55] African talent retention studies confirm the sector-specific intervention needs, while Reilly's [56] public sector focus highlights gaps in policy framework for civil service upskilling.

5. Implications for Policy and Interventions

1. Sector-Specific Reforms:

The stark disparities in skills gaps across sectors (e.g., 68% in ICT vs. 63% in agriculture) demand targeted policy interventions. For urban tech hubs like Lagos, policies should prioritize digital infrastructure investments and industry-aligned certifications (e.g., partnerships with tech firms like Andela). In rural areas, agricultural modernization programs must integrate mechanized farming training and agribusiness education [10, 57-75]. The gender gap in vocational access (30% disparity) calls for gender-inclusive policies, such as subsidized training for women and mobile learning units in underserved regions [11, 76-79].

2. Systemic HRM Integration

The success of apprenticeships (30% job placement increase) and PPP vocational programs [18] underscores the need for scaled public-private collaborations. Nigeria should institutionalize these models through national skills councils to align curricula with industry needs (only 12% currently do, per [20]). Lessons from Kenya's TVET reforms (58/100 readiness) and South Africa's sector-specific HRM (66/100) highlight the value of centralized qualification frameworks and employer-led training standards [15].

6. Conclusion

This review has underscored the pressing nature of Nigeria's skills crisis, which costs \$14 billion annually in lost productivity and disproportionately affects youth (33.3% unemployment). While vocational training demonstrates promise (60% skills readiness), systemic failures persist particularly in tertiary education (40% readiness) and regional equity, as evidenced by Nigeria's lagging talent readiness score (42/100) compared to peers like Kenya and South Africa. Private-sector initiatives, such as Andela's bootcamps, offer scalable templates but require targeted policy support to address coverage gaps, including rural access and gender disparities (30% fewer women in vocational training). Crucially, the

review highlights the need for coordinated, evidence-based reforms among policymakers, educators, and industry leaders, while contributing a sector-informed lens to the discourse. Future research must prioritize empirical evaluations of HRM interventions and contextually adaptable models to bridge the gap between Nigeria's workforce potential and labor market demands.

7. Recommendations

o Immediate Actions:

- o **Scale apprenticeships and PPPs:** Mandate private-sector participation in vocational training via tax incentives (modeled after Kenya's TVET reforms).
- o **Digital literacy campaigns:** Partner with telcos to deliver low-cost upskilling platforms (e.g., MTN's corporate academies).

o Long-Term Structural Reforms:

- o **Curriculum modernization:** Align 50% of tertiary programs with industry needs by 2030, using Ghana's competency-based model (49/100 readiness).
- o **Gender equity funds:** Allocate 15% of education budgets to women's vocational access, targeting rural areas.

o Monitoring & Evaluation:

- Establish a **national skills observatory** to track intervention efficacy, using metrics from Table 3 (e.g., placement rates).

8. Significant Statement and Real-World Implications

Nigeria's potential 5% annual GDP growth through strategic skills gap closure would have transformative real-world implications: reversing the \$14 billion productivity drain could fund critical infrastructure while addressing 33.3% youth unemployment. Successful implementation would reduce urban-rural disparities (e.g., 68% ICT shortages vs. 63%

agricultural deficits) and gender gaps (30% fewer women in vocational training), mitigating social inequality. At scale, such reforms like Kenya-inspired TVET expansion and Andela-modeled tech hubs would position Nigeria competitively in AfCFTA markets, turning its demographic dividend into sustainable development. Thus, graphically it is represented (Figure 3 below) as:

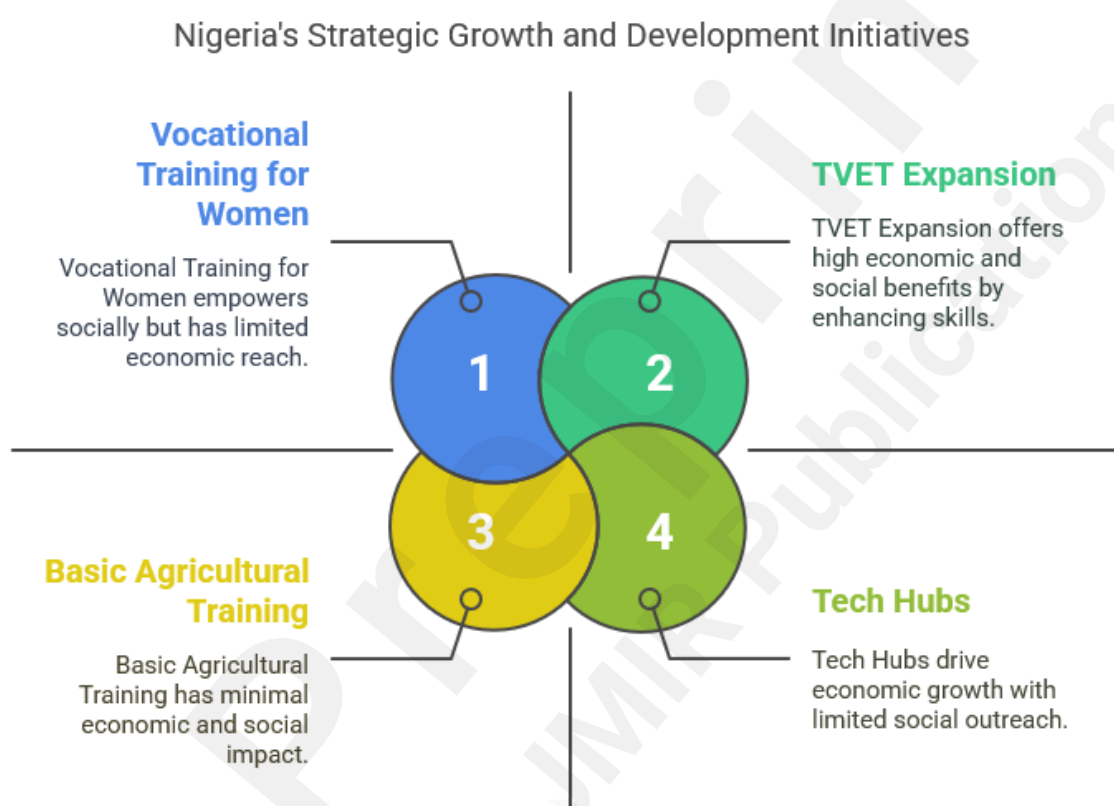


Figure 3: Nigeria's Strategic Growth and Development Initiatives

Disclosure statement:

The authors declare no conflict of interest.

Funding:

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Authors Contribution:

All authors contributed equally to conceptualization, validation, writing review and editing.

Acknowledgments

The authors would like to express their appreciation to all anonymous reviewers, for feedback and discussions that helped to substantially improve this manuscript.

References

1. World Bank. (2020). *Nigeria in times of COVID-19: Laying foundations for a strong recovery*. Retrieved from World Bank website: <https://www.worldbank.org/en/news/press-release/2020/06/25/nigerias-economy-faces-worst-recession-in-four-decades-says-new-world-bank-report>
2. National Bureau of Statistics (NBS). (2023). *Nigeria Development Update: Seizing the opportunity*. Retrieved from World Bank website: <https://thedocs.worldbank.org/en/doc/caacf9757c30c98d6145df40b64d378b-0360012023/original/Nigeria-Development-Update-2023-Presentation.pdf>.
3. Okeke, M. N., & Ezech, C. J. (2022). *Addressing skills gaps in Nigeria: Strategies for workforce development*. Lagos University Press.
4. Okorie, V. O., Adeleke, A. B., & Okafor, L. C. (2023). *Talent management and organizational competence in Nigerian firms*. *Journal of Human Resource Management*, 15(2), 45-62.
5. Adeoye, A. (2023). *Localization gaps in human resource management: Evidence from Nigerian skills initiatives*. *Journal of African Business*, 24(2), 45–67.
6. World Bank. (2022). *Nigeria skills development report*. World Bank Group. <https://www.worldbank.org/en/country/nigeria/publication/xxxx>
7. Sparrow, P., Brewster, C., & Chung, C. (2021). *Globalizing human resource management* (2nd ed.). Routledge.
8. Koleayo OO, Adeyemi AA, Mary AA, Grace Ojo-E, Allen E, Kolawole AO; Aziba-anyam GR (2021) Assessment of Factors Underpinning Employee's Interest and Preference for Telecommuting in Lagos Island, Lagos, Nigeria. *International Journal of Business, Technology, and Organizational Behavior (IJBTOb)* ISSN: 2775-4936. Vol. 1 No. 4, August 2021. DOI: <https://doi.org/10.52218/ijbtob.v1i4.104>. <https://ijbtob.org>.
9. PricewaterhouseCoopers (PwC). (2022). *Nigerian economic outlook: Addressing poverty and unemployment*. Retrieved from PwC website.
10. Food and Agriculture Organization (FAO). (2022). *OECD-FAO agricultural outlook 2022-*

2031. Retrieved from OECD-FAO website.
11. Raimi MO, Raimi AG, Raimi MO (2019). How Universities Can Create Green Jobs for Students. *Peer Res Nest*. 2019 - 1(2). PNEST.19.07.003. <https://peernest.org/article-in-press.php>.
 12. Organisation for Economic Co-operation and Development (OECD). (2023). *Bridging talent shortages in tech*. Retrieved from OECD website.
 13. World Bank. (2023). *Nigeria skills diagnostic report: Pathways to employability*. World Bank Group.
 14. International Labour Organization (ILO). (2023). *Global employment trends report*. Retrieved from ILO website.
 15. World Economic Forum (WEF). (2023). *Global gender gap report 2023*.
 16. Aguinis, H., Villamor, I., & Gabriel, K. P. (2023). *Understanding employee turnover in the 21st century: A meta-analysis*. *Journal of Applied Psychology*, 108(3), 412-430.
 17. McKinsey & Company. (2021). *The future of work in Africa: Harnessing talent for growth*. <https://www.mckinsey.com/featured-insights/xxxx>
 18. PricewaterhouseCoopers (PwC). (2023). *Economic outlook and workforce trends in Nigeria*. Retrieved from PwC website.
 19. LinkedIn. (2023). *Global talent trends report*. LinkedIn Workforce Insights. <https://business.linkedin.com/talent-solutions/>
 20. National Universities Commission (NUC). (2023). *National Universities Commission report*. Retrieved from NUC website.
 21. National Bureau of Statistics (NBS). (2022). *National Bureau of Statistics report*. Retrieved from NBS website.
 22. World Health Organization (WHO). (2023). *Health workforce strategies for developing nations*. WHO Press. <https://www.who.int/publications/xxxx>
 23. Nwachukwu, C., Eze, B., & Okafor, L. (2022). *HRM strategies and skills mismatch in Nigeria: A critical review*. *African Development Review*, 34(4), 521–538.
 24. African Development Bank Group (AfDB). (2022). *African economic outlook: Supporting climate resilience and a just energy transition in Africa*. Retrieved from AfDB website.
 25. World Bank. (2023). *Nigeria economic update: Strengthening human capital for inclusive growth*. World Bank Group.
 26. McKinsey & Company. (2023). *The future of work in Africa: Bridging the talent gap*. Retrieved from McKinsey website.

27. Organisation for Economic Co-operation and Development (OECD). (2024). *Bridging talent shortages in tech*. Retrieved from OECD website.
28. United Nations Development Programme (UNDP). (2023). *Human development report 2023*. Retrieved from UNDP website.
29. World Economic Forum. (2023). *Global gender gap report 2023*. <https://www.weforum.org/reports/>
30. European Centre for the Development of Vocational Training (CEDEFOP). (2018). *Insights into skill shortages and skill mismatch*. CEDEFOP Publications Office.
31. Clarke, C., Brown, J., & Smith, L. (2022). *Strategic talent management in emerging economies*. Human Resource Development Quarterly, 33(4), 501-520.
32. World Bank Group. (2025). *Education statistics - all indicators*. DataBank.
33. Koleayo O, Susan E, Adeyemi A, Sunday A, Kolawole O, Andrew O, Olapeju A, Azibanyam GR (2021) Drivers of Telecommuting Policy in Nigerian Organisations. International Journal of Business, Technology, and Organizational Behavior (IJBTOB) ISSN: 2775-4936. Vol. 1 No. 4, August 2021. DOI: <https://doi.org/10.52218/ijbtob.v1i4.105>. <https://ijbtob.org>.
34. Okeke, P. (2023). *Employer perceptions of tertiary vs. vocational qualifications in Nigeria*. African Development Review, 35(2), 200–215.
35. Emejo, J., Onah, F., & Ibrahim, M. (2024). *Curriculum responsiveness in Nigerian universities: Progress and pitfalls*. Higher Education Policy, 37(1), 75–92.
36. Oluwatobi, S., Olurinola, I., & Alege, P. (2023). *Policy fragmentation and human capital development in Nigeria*. Journal of Development Studies, 59(5), 678–695.
37. Ngugi, M., & Were, D. (2024). *TVET reforms in Kenya: The role of centralized qualifications frameworks*. International Journal of Educational Development, 95, 102–115.
38. Paterson, A., Van der Merwe, C., & Goldberg, K. (2023). *Sector-specific HRM reforms in South Africa: A model for Africa?* South African Journal of Economics, 91(3), 334–350.
39. Ansah, E. (2023). *Competency-based vocational education in Ghana: Lessons for West Africa*. Journal of Vocational Education, 18(3), 112–130.
40. Adetunji, O. (2024). *Private-sector tech talent pipelines in Nigeria: A case study of Andela and Decagon*. TechAfrica Journal, 12(1), 88–104.
41. Cappelli, P. (2008). Talent management for the twenty-first century. *Harvard Business Review*, 86(3), 74–81.
42. Bethke-Langenegger, P., Mahler, P., & Staffelbach, B. (2011). Effectiveness of talent management strategies. *European Journal of International Management*, 5(5), 524–539.

43. Thunnissen, M., Boselie, P., & Fruytier, B. (2013). Talent management and the relevance of context: Towards a pluralistic approach. *Human Resource Management Review*, 23(4), 326–336.
44. Som, A. (2007). What drives adoption of innovative SHRM practices in Indian organizations? *The International Journal of Human Resource Management*, 18(5), 808–828.
45. Nilsson, S., & Ellström, P. E. (2012). Employability and talent management: Challenges for HRD practices. *European Journal of Training and Development*, 36(1), 26–45.
46. McKinsey & Company. (1998). *The war for talent*. McKinsey Quarterly. <https://www.mckinsey.com/featured-insights/xxxx>
47. Bryan, L. L., & Joyce, C. I. (2007). *Mobilizing minds: Creating wealth from talent in the 21st century organization*. McGraw-Hill.
48. Al Ariss, A., Cascio, W. F., & Paauwe, J. (2014). Talent management: Current theories and future research directions. *Journal of World Business*, 49(2), 173–179.
49. Kaufman, B. E. (2007). Theorizing human resource management and the firm's demand for HRM practices. *Andrew Young School of Policy Studies Research Paper Series*, 07-30.
50. Friedman, B. A. (2007). Globalization implications for human resource management roles. *Employee Responsibilities and Rights Journal*, 19, 157–171. <https://doi.org/10.1007/s10672-007-9043-1>
51. ManpowerGroup. (2013). *2013 Talent Shortage Survey research results*. <https://www.manpowergroup.com>.
52. Birchall, D., Lyon, T., & Tovstiga, G. (2008). *Capabilities for strategic advantage: Leading through technological innovation*. Palgrave Macmillan.
53. Nandish Patil 2007, Managing talent in the flat world, An Infosys perspective as practitioner and consultant
54. Chambers, E. G., Foulon, M., Handfield-Jones, H., & Michaels, E. (1998). The war for talent. *McKinsey Quarterly*, 3, 44–57
55. Muhammad, I. H., & Shao, Y. (2013). The role of talent management and HR generic strategies for talent retention. *African Journal of Business Management*, 7(29), 2827–2835. <https://doi.org/10.5897/AJBM12.1292>
56. Reilly, P. (2008). Identifying the right course for talent management. *Public Personnel Management*, 37(4), 381–388.
57. Omoyajowo, K., Omoyajowo, K., Akinola, A., Ogunyebi, A., Alao, R., Makinde, O., Orekoya, O., Makengo, B. M., Akinola, O., Jatau, S. S., Kakwi, J. D., Ukoh, S. N. B., &

- Raimi, M. O. (2024). Genetically Modified Foods: Victoria Islanders' Perspectives on the Common Good. Preprints. <https://doi.org/10.20944/preprints202407.0454.v1>.
58. Modupe AO, Adebayo O, Sawyerr OH, Opasola AO, Morufu OR (2022) Moving from Total Concentrations to Measures of Harm in Grain Sold at Selected Markets of Southwest Nigeria. medRxiv 2022.12.18.22283634; doi: <https://doi.org/10.1101/2022.12.18.22283634>.
59. Modupe AO, Adebayo O, Sawyerr OH, Morufu OR (2022) Searching for What You Can't See - Evaluation of Pesticide Residues in Grain Sold at Selected Markets of Southwest Nigeria. medRxiv 2022.12.09.22283068; doi: <https://doi.org/10.1101/2022.12.09.22283068>.
60. Omotoso AJ, Omotoso EA, Morufu OR (2021) Potential Toxic levels of Cyanide and Heavy Metals in Cassava Flour Sold in Selected Markets in Oke Ogun Community, Oyo State, Nigeria, 01 July 2021, PREPRINT (Version 1) available at Research Square [<https://doi.org/10.21203/rs.3.rs-658748/v1>].
61. Oweibia M, Elemuwa UG, Akpan E *et al* (2024). Analyzing Nigeria's Journey Towards Sustainable Development Goals: A Comprehensive Review From Inception To Present [version 1; peer review: awaiting peer review]. *F1000Research* 2024, 13:984 (<https://doi.org/10.12688/f1000research.148020.1>).
62. Jacob OA, Anuoluwa OE and Raimi MO (2023) The notorious daredevils: potential toxic levels of cyanide and heavy metals in cassava flour sold in selected markets - taken Oke Ogun Community, Oyo State as an example. *Front. Sustain. Food Syst.* 7:1165501. doi: 10.3389/fsufs.2023.1165501.
http://journal.frontiersin.org/article/10.3389/fsufs.2023.1165501/full?&utm_source=Email_to_authors_&utm_medium=Email&utm_content=T1_11.5e1_author&utm_campaign=Email_publica.
63. Modupe AO, Adebayo O, Sawyerr OH, Opasola AO, Morufu OR (2023) Concentrations of Pesticides Residues in Grain Sold at Selected Markets of Southwest Nigeria. *Natural Resources for Human Health*. 1-15 <https://doi.org/10.53365/nrfhh/171368>. eISSN: 2583-1194.
64. Oshatunberu, MA., Oladimeji, A., Sawyerr, OH., & Raimi, MO. (2023). Searching for What You Can't See - Evaluation of Pesticide Residues in Grain Sold at Selected Markets of Southwest Nigeria. *Current Research in Public Health*, 3(1), 10–36. Retrieved from <https://www.scipublications.com/journal/index.php/crph/article/view/566>.
65. Asiegbu OV, Ezekwe IC, Raimi MO (2022). Assessing pesticides residue in water and fish and its health implications in the Ivo river basin of South-eastern Nigeria. MOJ Public

- Health. 2022;11(4):136–142. DOI: 10.15406/mojph.2022.11.00390.
66. Hussain MI, Morufu OR, Henry OS (2021). Probabilistic Assessment of Self-Reported Symptoms on Farmers Health: A Case Study in Kano State for Kura Local Government Area of Nigeria. *Environmental Analysis & Ecology Studies* 9(1). EAES. 000701. 2021. DOI: 10.31031/EAES.2021.09.000701. Pp. 975- 985. ISSN: 2578-0336.
67. Olalekan MR, Abiola I, Ogah A, Dodeye EO (2021) Exploring How Human Activities Disturb the Balance of Biogeochemical Cycles: Evidence from the Carbon, Nitrogen and Hydrologic Cycles. *Research on World Agricultural Economy*. Volume 02, Issue 03. DOI: <http://dx.doi.org/10.36956/rwae.v2i3.426>. <http://ojs.nassg.org/index.php/rwae>.
68. Hussain MI, Morufu OR, Henry OS (2021) Probabilistic Assessment of Self-Reported Symptoms on Farmers Health: A Case Study in Kano State for Kura Local Government Area of Nigeria. *Research on World Agricultural Economy*. Vol 2, No. 1. DOI: <http://dx.doi.org/10.36956/rwae.v2i1.336>. <http://ojs.nassg.org/index.php/rwae-cn/article/view/336/pdf>.
69. Morufu OR, Tonye VO, Ogah A, Henry AE, Abinotami WE (2021) Articulating the effect of Pesticides Use and Sustainable Development Goals (SDGs): The Science of Improving Lives through Decision Impacts. *Research on World Agricultural Economy*. Vol 2, No. 1. DOI: <http://dx.doi.org/10.36956/rwae.v2i1.347>. <http://ojs.nassg.org/index.php/rwae/issue/view/31>
70. Morufu OR (2021). “Self-reported Symptoms on Farmers Health and Commonly Used Pesticides Related to Exposure in Kura, Kano State, Nigeria”. *Annals of Community Medicine & Public Health*. 1(1): 1002. <http://www.remedypublications.com/open-access/self-reported-symptoms-on-farmers-health-and-commonly-used-pesticides-related-6595.pdf>. <http://www.remedypublications.com/annals-of-community-medicine-public-health-home.php>.
71. Isah, H. M., Sawyerr, H. O., Raimi, M. O., Bashir, B. G., Haladu, S. & Odipe, O. E. (2020). Assessment of Commonly Used Pesticides and Frequency of Self-Reported Symptoms on Farmers Health in Kura, Kano State, Nigeria. *Journal of Education and Learning Management (JELM)*, HolyKnight, vol. 1, 31-54. doi.org/10.46410/jelm.2020.1.1.05. <https://holynight.co.uk/journals/jelm-articles/>.
72. Olalekan RM, Muhammad IH, Okoronkwo UL, Akopjubaro EH (2020). Assessment of safety practices and farmer’s behaviors adopted when handling pesticides in rural Kano state, Nigeria. *Arts & Humanities Open Access Journal*. 2020;4(5):191–201. DOI:

10.15406/ahoaj.2020.04.00170.

73. Isah HM, Raimi MO, Sawyerr HO, Odipe OE, Bashir BG, Suleiman H (2020) Qualitative Adverse Health Experience Associated with Pesticides Usage among Farmers from Kura, Kano State, Nigeria. *Merit Research Journal of Medicine and Medical Sciences* (ISSN: 2354-323X) Vol. 8(8) pp. 432-447, August, 2020. DOI: 10.5281/zenodo.4008682. <https://meritresearchjournals.org/mms/content/2020/August/Isah%20et%20al.htm>.
74. Suleiman RM, Raimi MO and Sawyerr HO (2019) A Deep Dive into the Review of National Environmental Standards and Regulations Enforcement Agency (NESREA) Act. *International Research Journal of Applied Sciences*. pISSN: 2663-5577, eISSN: 2663-5585. DOI No. Irjas.2019.123.123. www.scirange.com. <https://scirange.com/abstract/irjas.2019.108.125>.
75. Raimi MO, Sawyerr HO and Isah HM (2020) Health risk exposure to cypermethrin: A case study of kano state, Nigeria. *Journal of Agriculture*. 7th International Conference on Public Healthcare and Epidemiology. September 14-15, 2020 | Tokyo, Japan.
76. Raimi MO, Bilewu OO, Adio ZO, Abdulrahman H (2019) Women Contributions to Sustainable Environments in Nigeria. *Journal of Scientific Research in Allied Sciences*. 5(4), 35-51. ISSN NO. 2455-5800. DOI No. 10.26838/JUSRES.2019.5.4.104.
77. Raimi M O, Suleiman R M, Odipe O E, Salami J T, Oshatunberu M, *et al* (2019). Women Role in Environmental Conservation and Development in Nigeria. *Ecology & Conservation Science*; 1(2): DOI: 10.19080/ECO.A.2019.01.555558. Volume 1 Issue 2 - July 2019. <https://juniperpublishers.com/ecoa/pdf/ECO.A.MS.ID.555558.pdf>.
78. Raimi MO, Odubo TR, Ogah A (2022) Women, Water and Development in the Global South. Oral Presentation Presented at the Multidisciplinary International Conference on Water in Africa (ICWA 2022) on the theme: Towards Successful Delivery of SDGs 3 & 6, which held February 09 – 11, 2022.
79. Raimi MO, Odubo TR, Odubo TV, Omidiji AO (2022) Gender and Sustainability in the Niger Delta. Oral Presentation Presented at the Multidisciplinary International Conference on Water in Africa (ICWA 2022) on the theme: Towards Successful Delivery of SDGs 3 & 6, which held February 09 – 11, 2022.