



CAPACITY BUILDING FOR  
WOMEN IN ENGINEERING BODIES  
**DIGITAL ADVOCACY IN THE  
AGE OF COVID-19**

INSIGHT REPORT

*Wom***ENG**  
WOMEN IN ENGINEERING





## GCRF AFRICA CATALYST



### About GCRF Africa Catalyst

## Capacity Building for Women in Engineering Bodies in West Africa

*Capacity Building for Women in Engineering Bodies in West Africa* builds on *Capacity Building for Women in Engineering Bodies in Sub-Saharan Africa*, a project undertaken between 2018 – 2020, in partnership with professional engineering institutions in eSwatini, Malawi, Tanzania and Zimbabwe. Both project phases were part of the Royal Academy of Engineering GCRF Africa Catalyst Programme. The aim of this project, *Capacity Building for Women in Engineering Bodies in West Africa* was to strengthen the capacity of women in engineering bodies to raise the profile of gender diversity and inclusion in engineering within their region, leveraging WomEng's skills and experience in developing and running women in engineering programmes across 22 countries. *Capacity Building for Women in Engineering Bodies in West Africa* worked in partnership with women in engineering bodies in Ghana, Nigeria and Sierra Leone. The initial project was similarly designed to the previous project phase in East and Southern Africa, then came the onset of the COVID-19 pandemic. Understanding the challenges the pandemic brought to women and the engineering sector, WomEng adapted and redesigned the entire project to meet the adjusted outcomes. WomEng, supported by the Cambridge Institute for Sustainability Leadership provided training and development for women in engineering body members. This included executive leadership, diversity and digital advocacy training and execution of critical outreach programmes within partner countries.

The impact of this project was to improve the capacity of engineering bodies to promote gender diversity and relevance within engineering and among engineering professionals in Africa in a new digital normal where often these institutions lacked capacity, or understanding on the effective use of digital platforms for advocacy and outreach.

Impact was delivered through the following key outcomes:

1. Strengthen and build the institutional capacity of relevant stakeholders by building capacity through women in engineering bodies
2. Increase knowledge among engineering bodies about effective practices for improving gender diversity in engineering
3. Create resilience in advocacy approaches in a digital future
4. Support institutions to showcase the work women in engineering were doing in response to the COVID-19 pandemic

Project locations: Ghana, Nigeria, Sierra Leone

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Organisation: WomEng

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Special Thanks to





## About WomEng

**WomEng is a global, award-winning, values-driven organisation for women in engineering by predominantly women engineers, who have developed programmes to address the barriers facing women in the engineering sector from school level all the way through to industry and ownership.**

Being a dynamic organisation, WomEng has been able to meet the changing demands and needs of the global engineering industry through effective lobbying, advocacy, capacity building and engagement of the sector. WomEng delivers cost effective, impactful programming and has a successful track record, since 2006, in developing programmes that work in supporting diversity and inclusion in the engineering industry. WomEng's unique model ensures lasting impact created by skilled, passionate and committed people through a series of training and development initiatives, experiential learning opportunities and empowerment of local women engineers across the world to support WomEng's vision of a diverse and inclusive engineering industry.

In 2020, as the world changed by the COVID-19 pandemic, WomEng supported partners and grassroots organisations around the world to use digital and hybrid models to support outreach initiatives. As we all spend our time between a physical and virtual world, it becomes critical to engage more women and girls into STEM fields so that they may be the designers of a better virtual world; to move from consumers of technologies to leveraging technology to leapfrog our development challenges. WomEng is at the forefront of building a new gender diverse ecosystem for the engineering sector across Africa.

## ABBREVIATIONS

APWEN	- Association of Professional Women Engineers of Nigeria
CISL	- Cambridge Institute for Sustainability Leadership
ILO	- International Labour Organisation
LMIC	- Low and middle-income country
SDG	- Sustainable Development Goals
SLWE	- Sierra Leone Women Engineers
STEM	- Science, Technology, Engineering and Mathematics
UNDP	- United Nations Development Programme
UK	- United Kingdom
WFEO	- World Federation of Engineering Organisations
WinE Ghana	- Women in Engineering Ghana



## EXECUTIVE SUMMARY

In January 2020, *Capacity Building for Women in Engineering Bodies in West Africa* was initiated as a follow on from *Capacity Building for Women in Engineering Bodies in Sub-Saharan Africa (2018 - 2020)*. The main objective of this project was to build organisational leadership and outreach initiatives for gender diversity and inclusion in engineering in Ghana, Nigeria and Sierra Leone. Just two months after initiating this project, in March 2020, COVID-19 was declared a pandemic by the World Health Organisation. Women in engineering bodies were now tackling three (3) major crises simultaneously, namely:

1. Diversity and inclusion in engineering
2. The COVID-19 pandemic
3. Adapting to an accelerated digital world

This report explores **WomEng's proactive response to building the capacity of women in engineering bodies in Ghana, Nigeria and Sierra Leone during this multi-crisis. Rising to the challenge, WomEng adapted and redesigned capacity building initiatives to deliver relevant impact; ensuring women in engineering bodies transcend the crises to become resilient champions of change. WomEng provided thought leadership; leveraging best practice as well as forging ahead in new territory to support institutions as they navigated a "new normal."**

Partner women in engineering bodies included:

- » Women in Engineering Ghana (WinE Ghana)
- » Association of Professional Women Engineers of Nigeria (APWEN)
- » Sierra Leone Women Engineers (SLWE)

*Capacity Building for Women in Engineering Bodies in West Africa* was implemented between January 2020 - June 2021 building on WomEng's 16 years of experience in fostering and promoting diversity and inclusion in the engineering industry. The key project outcomes, included:

1. Strengthening institutional capacity of relevant stakeholders by building capabilities within women in engineering bodies
2. Increasing knowledge among engineering bodies about effective practices for improving gender diversity and inclusion in engineering

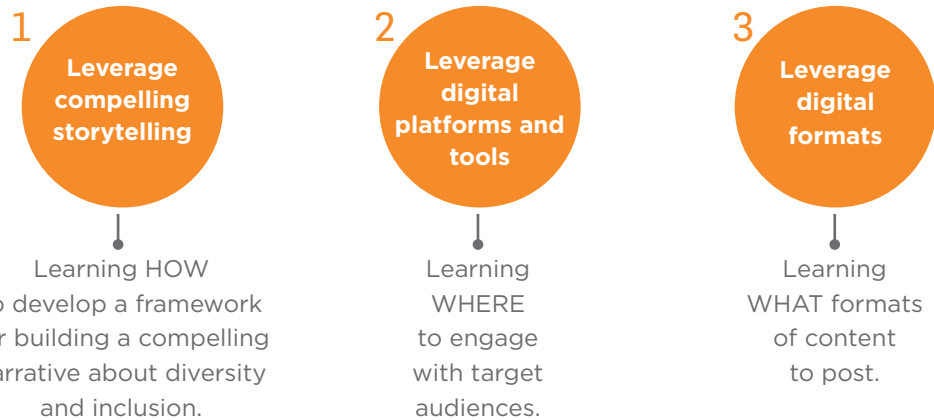
As a response to the COVID-19 pandemic and the commitment to deliver impact, WomEng redesigned *Capacity Building for Women in Engineering Bodies in West Africa* from an in-person intervention to a fully virtual rollout. While the project objectives remained the same, the ability to achieve the objectives, as well as solve new COVID-19 challenges changed the project, our approach and the way WomEng designed, executed and supported organisations through this project. Women in engineering bodies in Ghana, Nigeria and Sierra Leone were:

- engaged in a series of master classes with experts in change management, leadership and digital advocacy;
- provided with resources to develop digital advocacy strategies and;
- piloted outreach initiatives taking into consideration existing organisational strategies, COVID-19 safety regulations and limitations to existing digital connectivity in each project country.

Three (3) strategies WomEng and partner women in engineering bodies identified and implemented during this period included:



WomEng recognized the need and opportunity for capacity building efforts focused on digital advocacy that could be delivered by providing tools for change to women in engineering bodies. These resources aided women in engineering bodies to:



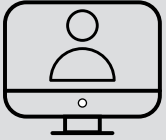
WomEng recognized the need and opportunity for capacity building efforts focused on digital advocacy that could be delivered by providing tools for change to women in engineering bodies.

Each women in engineering body developed individual digital advocacy strategies and aligned outreach initiatives. This resulted in three (3) different frameworks adopted for testing digital advocacy, namely:

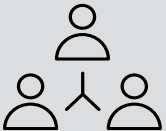
1. **In-person programming supported by digital advocacy:** SLWE initiated a mentorship programme to bridge the gap between generations. This was the first programme of its kind in Sierra Leone. Social media was utilised to create awareness and raise the profile of women in engineering.
2. **Fully digital:** WinE Ghana adopted a fully digital advocacy approach to building new relationships with high school girls, parents and teachers. This included virtual information and mentoring sessions.
3. **Hybrid:** APWEN implemented a multi-level initiative using a balanced combination of in-person programming and digital advocacy; ultimately connecting numerous chapters across Nigeria in an online challenge for high school girls while acknowledging, showcasing and celebrating diversity and inclusion champions.

Women in engineering bodies have successfully shown proof of concepts in terms of integrating digital advocacy into outreach initiatives; increasing drive and momentum to incorporate digital advocacy more proactively in the future. Each outreach initiative implemented had a significant impact in terms of reach as compared to in-person events only. The digital divide within the region i.e. the lack of existing digital infrastructure and high costs of data remains a key barrier to growth. The three (3) different frameworks showcased that a nuanced approach to advocacy is required, tailored to a local context. While the challenges that women in engineering face may be universal, rising to meet those challenges in the age of COVID-19 requires close alignment with local partners, the ability to be adaptable in the face of uncertainty and the ability to provide robust skills training to organisations, which expands beyond the life of this project.

This project, in the age of COVID-19 has showcased the need for engineering institutions to embrace digital in order to remain effective. Closing the digital divide requires macro-economic interventions beyond the scope of women in engineering bodies however, three (3) priority actions have been identified that could sustain growth by women in engineering bodies in building digital advocacy efforts. Recommended priority actions include:



**Adopting a hybrid model (in-person and digital) to events to transition and normalize the use of digital media:** In our rush to embrace technology, we should not exacerbate inequality currently being experienced through the digital divide.

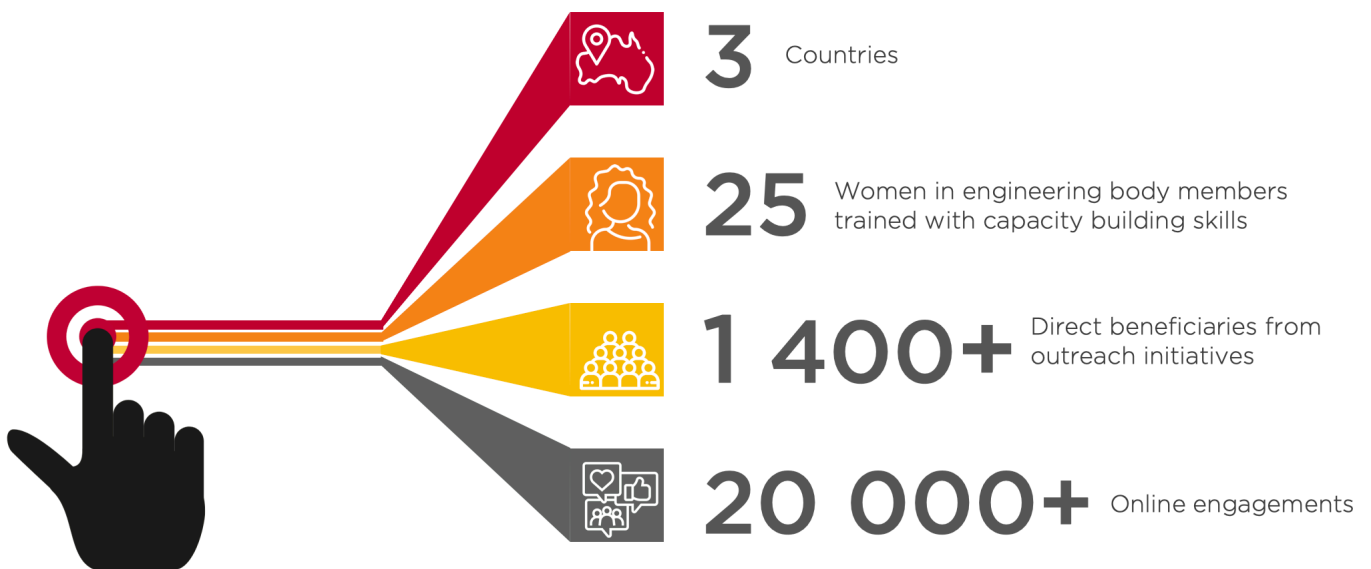


**Building stronger online support communities:** We need to rethink how we support our communities across the continent to share and connect with each other; to find mentors and become mentors; to document experiences and lessons and share these real-life stories.



**Investing in continued digital skills development for women in engineering body leaders:** *Capacity Building for Women in Engineering Bodies in West Africa* was the first project of its kind to support women in engineering bodies on the continent with skills development on accelerating digital advocacy. This should serve as a catalyst for continued growth and development.

## Our Impact in Numbers





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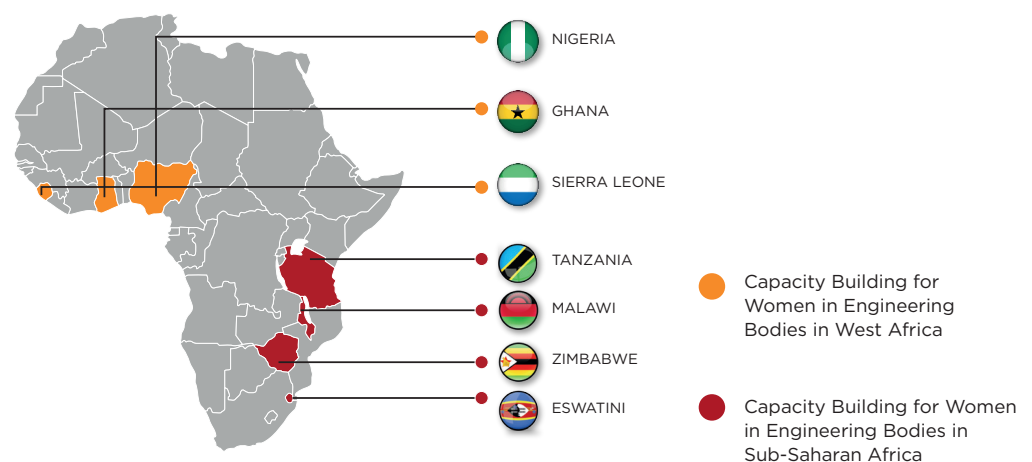


# INTRODUCTION

In January 2020, *Capacity Building for Women in Engineering Bodies in West Africa* was initiated to build organisational leadership and outreach initiatives for gender diversity and inclusion in engineering in Ghana, Nigeria and Sierra Leone. As a follow-on from *Capacity Building for Women in Engineering Bodies in Sub-Saharan Africa* (2018 - 2020), we (WomEng) are on a mission to strengthen the capacity of women in engineering bodies to promote the relevance of gender diversity and inclusion within engineering across the continent. In *Capacity Building for Women in Engineering Bodies in Sub-Saharan Africa*, we worked with four (4) women in engineering bodies from eSwatini, Malawi, Tanzania and Zimbabwe. In this project, *Capacity Building for Women in Engineering Bodies in West Africa*, we grew our footprint across sub-Saharan Africa through partnerships with women in engineering bodies in Ghana, Nigeria and Sierra Leone, namely:

- Women in Engineering, Ghana (WinE Ghana)
- Association of Professional Women Engineers of Nigeria (APWEN)
- Sierra Leone Women Engineers (SLWE)

**Exhibit 1** highlights project countries from both project phases.



**Exhibit 1**, Africa Catalyst Project Countries

## A WORLD IN CRISIS

Just two months after initiating this project, in March 2020, COVID-19 was declared a pandemic by the World Health Organisation (2020). Women in engineering bodies were now tackling with three (3) major crises simultaneously:

1. **Diversity and inclusion in engineering:** It is estimated that women make up less than 10% of the formal engineering workforce in West Africa. Patriarchal culture still maintains a strong hold in society, particularly in West Africa. Shifting mindsets and culture poses the biggest challenge for normalizing the role and participation of women in engineering.
2. **The COVID-19 pandemic:** The COVID-19 pandemic has required women in engineering to play a critical role in responding to the health crisis with a combined engineering and gendered lens. The COVID-19 pandemic has also created an added burden to women in terms of primary care and family responsibility resulting in high levels of economic disproportionality.
3. **Adapting to a digital world:** The COVID-19 pandemic accelerated digital adoption globally while emphasising the challenges of the digital divide. West Africa has one of the lowest levels of digital connectivity in the world. Insufficient infrastructure and high data costs limit West Africa's ability to adapt to a fully digital world coupled with a gendered differential access to technology. This has created a challenge for women in engineering bodies to remain relevant and visible; ensuring the progress made to date for gender parity is not lost or limiting the potential ability to affect change and deliver impacts intended.

## BUILDING CAPACITY FOR WOMEN IN ENGINEERING BODIES IN WEST AFRICA

Understanding the challenges COVID-19 has brought to women and the engineering sector, WomEng adapted and redesigned the entire project to meet the adjusted outcomes. While the objectives of the project remained the same, the ability to achieve the objectives, as well as solve new challenges presented by the COVID-19 pandemic changed the project approach and the way WomEng executed and supported organisations through this project. This project moved from an in-person intervention to a fully virtual rollout with additional support as the pandemic unfolded. Women in engineering bodies in Ghana, Nigeria and Sierra Leone were:

- engaged in a series of master classes with experts in change management, executive leadership and digital advocacy;
- provided with resources to develop digital advocacy strategies and;
- piloted outreach initiatives taking into consideration existing organisational strategies, COVID-19 safety regulations and limitations to existing digital connectivity in each project country.

**WomEng proactively responded to the COVID-19 crisis by strengthening the capacity of women in engineering bodies in West Africa to adapt and thrive in a time of major crisis and in turn creating resilient women in engineering bodies.**

Building resilient women in engineering bodies is critical for providing stronger advocacy and collective action towards increasing the profile of engineering and women in engineering. The key project outcomes for *Capacity Building for Women in Engineering Bodies in West Africa*, included:

1. Strengthening institutional capacity of relevant stakeholders by building capabilities within women in engineering bodies
2. Increasing knowledge among engineering bodies about effective practices for improving gender diversity and inclusion in engineering

These key outcomes further supported:

1. Creating resilience in advocacy approaches in a digital future
2. Supporting institutions to showcase the work women in engineering were doing in response to the COVID-19 pandemic
3. Increasing understanding of and proactive support for the engendered challenges and barriers to entry women face in the engineering sector coupled by the impact of the COVID-19 pandemic
3. Encouraging the development of women in engineering pipelines
4. Advancing executive leadership capacity of women in engineering bodies to attract, develop and retain girls and women in engineering
5. Increasing knowledge among women in engineering bodies about effective practices for improving gender diversity and inclusion in engineering
6. Building on scarce data on women in engineering in sub-Saharan Africa
7. Providing a roadmap to develop and support diversity and inclusion within engineering bodies
8. Providing digital advocacy skills training and virtual outreach support

## REPORT OUTLINE

This report documents key insights developed over eighteen (18) months (January 2020 - June 2021). WomEng has set a precedent for scaling capacity building initiatives for women in engineering bodies across the continent, particularly through digital advocacy while understanding the nuanced challenges for the organisations working on the ground.

### Chapter 1

**Engineering an Equitable Future** draws attention to the importance of gender diversity and inclusion within engineering, innovation and sustainability contexts.

### Chapter 2

**Women in Engineering Bodies** highlights the important role women in engineering bodies play in raising the profile of engineering and women in engineering. This section showcases the women in engineering bodies from Ghana, Nigeria and Sierra Leone in greater detail.

### Chapter 3

**Responding to a Global Crisis** contextualizes the multiple crises women in engineering bodies are currently tackling simultaneously and how embracing disruption could lead to more resilient women in engineering bodies.

### Chapter 4

**Turning Crisis into an Opportunity** outlines WomEng's capacity building strategy and recommendations for women in engineering bodies to actively rise above challenges.

### Chapter 5

**Accelerating Digital Advocacy** presents an assessment of digital communication efforts by women in engineering bodies in West Africa. The COVID-19 pandemic exacerbated the need and use case of digital mediums within Africa requiring organisations globally to accelerate digital strategies. In this chapter, we put forth tools for change to help women in engineering bodies accelerate their digital strategies to stay relevant and connected.

### Chapter 6

**Digital Advocacy in Practice** outlines pilot outreach initiatives implemented by women in engineering bodies to test the impacts of digital advocacy.

### Chapter 7

**Towards a More Diverse, Inclusive and Digital World** summarises the key achievements, barriers to growth and the positive outlook WomEng has for a more diverse, inclusive and digital world.

The report concludes with recommendations for accelerating gender diversity and inclusion across the continent. The steps towards achieving these milestones are detailed in the methodology section.

Box 1

Key questions we aimed to answer in this report include:

- Why is gender diversity and inclusion in engineering in West Africa challenging?
- How can women in engineering bodies deliver impact more effectively?
- What opportunities exist currently for women in engineering bodies to build their capacity?
- How can women in engineering bodies move towards a more diverse, inclusive and digital future?



# CHAPTER 1

## Engineering an Equitable Future

## WOMEN AT THE DESIGN TABLE

The Sustainable Development Goals are a global commitment to creating a better world. They have been discussed and negotiated in the hallways of the United Nations, and with politicians, civil society, corporations and entities around the world. However, when one breaks down many of these goals, they are fundamentally complex engineering problems. The reason we, as an engineering community haven't yet solved them, is because we require a diverse and inclusive engineering sector to do so and we need more women in the sector to meet the challenge of these goals.

As we work to support more women in engineering, we are starting to see positive strides and transformation.

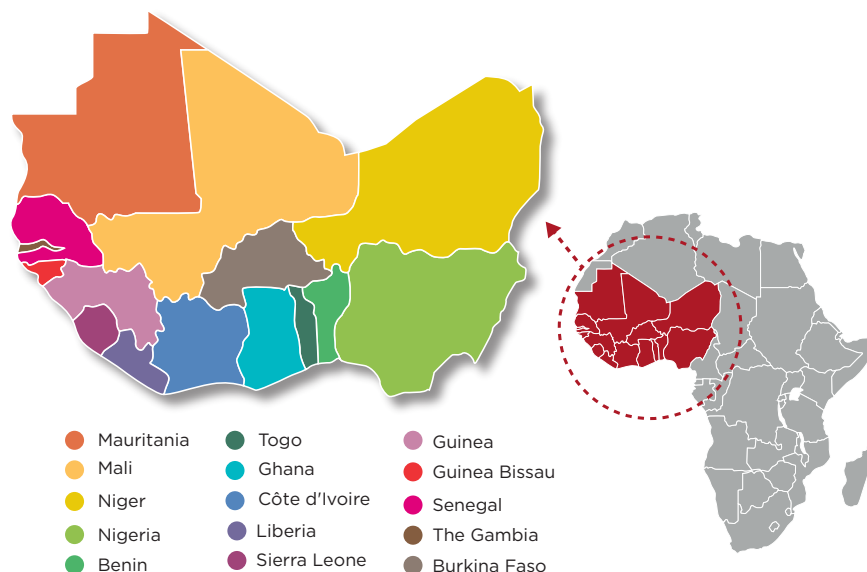
According to UNESCO (2015), women graduating with engineering qualifications are at 28%, however, the number of women in the industry remains low. The challenge is not just attracting girls into the sector, but ensuring that the sector has transformed to retain women. In sub-Saharan Africa, the numbers are still much lower, as girls have few role models and don't have access to a lot of information about engineering careers. The positive effects of an increase in girls in engineering is beyond gender equality in the sector. The diversity of perspectives, different problem solving and solution capabilities is what the world needs right now.

The Global Entrepreneurship Monitor (GEM) Women's Entrepreneurship Report (2017) shows that a country's innovation level increases with its economic development, and "innovation is the indicator with the greatest female-to-male gender ratio; across all 74 economies in their research, women entrepreneurs have a 5% greater likelihood of innovativeness than men."

As we work to support more women in engineering, we are starting to see positive strides and transformation. However, it is not an easy path. Entrenched gender stereotypes and norms still hamper the progress of women. The burden of care, and household responsibilities have been compounded through the COVID-19 pandemic. It is estimated that women could add \$13tn to the global economy; in Africa that is \$316 billion or 10% to the global GDP. In a time where the global economy is attempting to recover from a devastating blow brought about by the COVID-19 pandemic, we cannot afford to not include women, especially as engineering and technology industries are clusters for higher job creation and better salaries.

## A WEST AFRICA PERSPECTIVE

West Africa's opportunities are vast, and its challenges are persistent. **Exhibit 2** highlights the West African sub-region countries. The population in this region is 367 million making almost 35% of sub-Saharan Africa's population and is home to one of the largest economies in the sub-Saharan Africa, Nigeria.



**Exhibit 2:** Map of West Africa

The region has a history of civil wars and large-scale conflicts, however the World Bank Group (2015) notes that there has been growing stabilization giving rise to economic development. The region also of late dealt with the Ebola epidemic offering many lessons in resilience during this COVID-19 pandemic. An added complexity is the split of the region along language lines between English and French. Economic and social development are on the rise with key success indicators including literacy, income levels and girls access to education. However, in order to sustain this growth, a severe lack of engineering capacity in the region needs to be addressed.

The participation of women in engineering in West Africa remains low. Gender diversity and inclusion while increasingly on the agenda, has a long way to go. According to the World Economic Forum's Global Gender Gap Report (2020), gender parity will not be attained for 99.5 years. The report measures economic participation and opportunity, educational attainment, health and survival and political empowerment. 13 out of 15 West African countries were assessed. West Africa has one of the highest gender parity gaps in the world, with countries ranking between 97 and 142 out of 153 countries in terms of attaining gender parity.

It is estimated that women make up less than 10% of the formal engineering workforce in West Africa. Accurate data on the percentage of women participating in engineering sector is very limited as in the case with data challenges across the continent. There are currently no formal studies or census on the number of women in engineering across West Africa. **Exhibit 3** outlines data obtained from UNESCO (2015) and women in engineering bodies in our three (3) partner countries namely Ghana, Nigeria and Sierra Leone, to estimate the capacity of women participating as engineers in industry.

**Exhibit 3:** Data on the Number/Percentage of Women Engineers in Ghana, Nigeria and Sierra Leone

Country	University Graduates (% Women) <sup>1</sup>	Women in Engineering Body Members (No. of Women Members) <sup>2</sup>	Professional Engineering Institution Members (Total No. of Members) <sup>2</sup>	Membership in Professional Engineering Institutions (% of women)
Ghana	18.7%	543	7 310	7.4%
Nigeria	22%	3 000	-	-
Sierra Leone	-	108	1 202	8.5%

1. Source: UNESCO (2015)

2. Sources: APWEN, SLWE, GhIE (2020)

According to UNESCO (2015), “though women are least present in engineering fields, the share of women graduating as engineers has risen in sub-Saharan Africa (between 2006 - 2014)”. This is positive news; however, using the leaky pipeline metaphor in engineering, the progress of women in becoming top leaders in the industry is extremely limited. Data gaps persist on the attrition rates of women in the sector resulting in the underrepresentation in leadership and executive level. Women are failing to reach the top of leadership in the engineering sector which is mirrored across all sectors based on data from McKinsey & Co. (2019) on women in leadership roles. Only about 6% of CEOs, 22% of executive committee members and 25% of board members are women, globally.

The power of women in engineering is clear, a little investment all along the engineering pipeline goes a long way, but we will only truly solve the world's greatest challenges when we have women at the engineering design table and leading the conversations in the boardroom as well.



# CHAPTER 2

Women in Engineering Bodies:  
Champions of Change

## ADVANCING COLLECTIVE ADVOCACY AND ACTION

Advocacy means giving a person support to have their voice heard and understand their rights. Women in engineering bodies have an overarching role to play in supporting the development of engineering capacity by attracting, developing and retaining girls and women into the engineering industry. Women in engineering bodies serve as change agents, providing collective advocacy and action to increase the profile of women in a male-dominated industry. However, change does not happen on its own.

There needs to be a deliberate and structured approach to change including:

- A willingness to change, especially at leadership levels
- Financial resources dedicated to creating a new normal
- Passionate individuals who are supporting the change

Taking collective action across the continent to strengthen the profile of women in the engineering profession can amplify and accelerate the impact of gender diversity and inclusion. In developing a unified voice across the continent, professional engineering institutions have a powerful role to play.

Professional engineering institutions are typically statutory bodies mandated by National Engineering Acts to carry out various activities in upholding and strengthening the practice of engineering within respective countries. The rise of women in engineering bodies within the professional engineering institutions allows for gender diversity and inclusion to become a key growth strategy for the institutions. Each women in engineering body comprises of members from the professional engineering institutions, with a number of specific objectives and activities e.g. outreach

and continuous development programmes for girls and women as well as building advocacy on global platforms like the World Federation of Engineering Organisations (WFEO).

Women in engineering bodies are critical actors in accelerating growth for gender diversity and inclusion in engineering. Women in engineering bodies are typically mandated by national acts and policies, creating far reaching change in their respective countries. Women in engineering bodies have the potential to amplify impact through collective advocacy and action, giving women engineers a unique place and voice within the engineering industry. However, transformation of the sector is not the sole responsibility of women in engineering bodies. There is a requirement for the body to embrace diversity and inclusion, while women in engineering bodies lead the charge.

Our mission at WomEng, is to strengthen these organisations' through capacity building. However, the COVID-19 pandemic changed the world, the way we operate and caused regression on some of the advancements we have made on achieving the SDGs. Women have been more adversely affected. During this time, women within engineering bodies not only had their careers to manage, the engineering response to COVID-19 and the responsibilities of domestic chores, but also a disproportionately sized burden of childcare, education, looking after ill family members and the general mental burden fell squarely on their shoulders. With support from WomEng, women in engineering bodies have risen to leverage the opportunity that COVID-19 provided - to develop more resilient and robust organisations. The disproportionate burden on women is covered further in Chapter 3: Responding to a Global Crisis.

**With support from WomEng, women in engineering bodies have risen to leverage the opportunity that COVID-19 provided - to develop more resilient and robust organisations.**



## WOMEN IN ENGINEERING BODIES IN GHANA, NIGERIA AND SIERRA LEONE

In *Capacity Building for Women in Engineering Bodies in West Africa*, we worked with women in engineering bodies in Ghana, Nigeria and Sierra Leone, namely:

- Women in Engineering, Ghana (WinE Ghana)
- Association of Professional Women Engineers of Nigeria (APWEN)
- Sierra Leone Women Engineers (SLWE)

A key difference between the women in engineering bodies in *Capacity Building for Women in Engineering Bodies in Sub-Saharan Africa* and *Capacity Building for Women in Engineering Bodies in West Africa* is the maturity of the organisations. In *Capacity Building for Women in Engineering Bodies in Sub-Saharan Africa*, we worked with women in engineering bodies in eSwatini, Malawi, Tanzania and Zimbabwe.

These women in engineering bodies are considered relatively young in terms of establishment (10 years old or less). Comparatively, in *Capacity Building for Women in Engineering Bodies in West Africa*, the women in engineering bodies represent some of the longest standing associations on the continent. In Nigeria, APWEN was formally established in 1983 (37 years old). In Ghana, WinE Ghana was established in 1999 (21 years old). In Sierra Leone, SLWE was established in 2015 (5 years old) however Eng. Trudy Morgan, founder and president of SLWE and now also Sierra Leone Institution of Engineers (SLIE), brings more than 30 years of experience in the engineering industry.

**Exhibit 4** provides a high-level organisational profile of the women in engineering bodies in Ghana, Nigeria and Sierra Leone. This information was primarily compiled from existing data and engagement with senior executive members from the respective women in engineering bodies.



**Exhibit 4: Organisational Profile of Women in Engineering Bodies in Ghana, Nigeria and Sierra Leone**

	WinE Ghana	APWEN	SLWE
Objectives	<p>WinE Ghana's vision is "to be the leading female engineering association that encourages females to achieve their fullest potential no matter their ethnic origin or social background." The organisation's key objectives:</p> <ul style="list-style-type: none"> <li>• Promote the study and practice of engineering amongst females</li> <li>• Support and encourage women engaged in the study and practice of the engineering profession</li> <li>• Ensure the provision of equal opportunities for both genders in their pursuit of engineering careers</li> <li>• Contribute to and positively influence policy and decision making at national and international level.</li> <li>• Girl/Female Talk (Yearly WinE Forum on various issues affecting Ghanaian society)</li> <li>• Career Counselling (in Secondary and Tertiary Institutions)</li> <li>• Workplace Visit</li> <li>• Mentoring young female science and engineering students</li> <li>• Awards and Scholarship for studies in science and engineering related fields (in Primary, Secondary and Tertiary Institutions)</li> </ul>	<p>The organisation's vision is "to be the catalyst for advancement of women in the engineering profession towards national and global technological development."</p> <p>The organisation's key objectives:</p> <ul style="list-style-type: none"> <li>• To provide a forum for promoting sorority amongst female engineers</li> <li>• To encourage engineering studies and practice amongst female Nigerians</li> <li>• To create a platform by which women engineers can collaborate with other women in other professions in Nigeria and elsewhere</li> </ul>	<p>The organisation was established in 2014. SLWE's vision is to "strengthen the SLWE and to increase the number of girls studying engineering by 25% across the country in all tertiary institutions by 2025." The objectives set by the organisation for the period 2020 - 2025 include:</p> <ul style="list-style-type: none"> <li>• Create a cadre of Women Engineering Ambassadors who are trained and skilled as mentors to inspire younger girls to develop an interest in engineering as a career (Women Ambassadors)</li> <li>• Provide practical intervention to school girls to enjoy the study and practice of engineering and to see it as a potential future career for themselves (Saturday Club)</li> <li>• Promote the need for diversity and inclusion policies among Sierra Leonean companies starting with engineering companies (Diversity and Inclusion Policy toolkit)</li> <li>• Provide an avenue for girls to meet with female professionals to build their confidence and inspire to be fearless in all they do. (Fearless Girl Campaign)</li> <li>• Introduce engineering as a developmental tool to young girls in rural communities, which can be used to improve and develop communities through specific community led activities (Taking engineering to the rural areas)</li> </ul>
Strategy Plan	<p>In 2019, WinE Ghana re-branded the organisation during the association's 20th anniversary. Since the rebranding, WinE Ghana does not have a formal strategy in place but is in the process of developing one. WinE Ghana's current priority is to complete the strategy and implement the action plan.</p>	<p>APWEN does not have a strategy plan that they are currently working on strengthening.</p>	<p>SLWE developed a high-level document which outlines vision and objectives for next 5 years (2020 - 2025). SLWE is working to strengthen the action plan. Members have volunteered to complete the production of the SLWE updated strategy. Committees have been formed and the next steps will include workshops and meetings to finalise these documents.</p>
Organisational Structure	<p>WinE Ghana has a council made up of four (4) senior members and the seven (7) executives members. There are a total of 543 members from across Ghana. Members include women engineering practitioners and student members.</p>	<p>APWEN has a council made up of twenty (20) executive members. Members form part of 37 chapters across Nigeria. APWEN has a membership base of over 3 000 professional female engineers from all disciplines of engineering.</p>	<p>SLWE has a council of nine (9) executive members. The organisation has a total of 108 members across Sierra Leone.</p>

**Exhibit 4: Organisational Profile of Women in Engineering bodies in Ghana, Nigeria and Sierra Leone**

	WinE Ghana	APWEN	SLWE
Partnerships and Funding	<p>WinE Ghana has established partnerships with private, public and higher education sector institutions. A key partnership is with the Millennium Development Authority (MiDA) through their mentoring and internship programme for female interns attached to organizations in the energy sector. Private sector partnerships include engineering based organisations. Funding is primarily solicited through membership fees and engineering based industries. WinE Ghana receives allocated funding from the parent organisation, Ghana Institution of Engineers.</p>	<p>APWEN works with partners across public, private and higher education institutions. A key partnership for APWEN is working with the Nigerian National Petroleum Corporation (NNPC) on their Build It, Invent It programme. APWEN has also run a number of initiatives with funding from the Royal Academy of Engineering.</p>	<p>SLWE's partnerships are primarily with higher education institutions and other NGOs and civil society organisations. To date, SLWE has not worked directly with government or the public sector. SLWE does not currently have any partnerships with the private sector but intends on developing relationships for the internship programme. Funding is sourced by soliciting membership fees from engineering professionals or grant funding for projects e.g. Royal Academy of Engineering. Fees are waived for young engineers and students who are often unable to afford the monthly fee. Fundraising initiatives have also been carried out e.g. a sponsored walk which covered the costs of the event in 2019.</p>
Activities	<p>Senior executive members are most proud of their continuous mentoring of female engineers. In the last 2 years key initiatives undertaken by WinE Ghana included:</p> <ul style="list-style-type: none"> <li>• Rebranding of WinE Ghana</li> <li>• Inauguration of association's council members,</li> <li>• Capacity building workshops,</li> <li>• Mentoring of female engineering and science students,</li> <li>• COVID-19 Support projects</li> </ul>	<p>Senior executive members are most proud of their continuous mentoring of female engineers. A few of the key initiatives run by APWEN includes:</p> <ul style="list-style-type: none"> <li>• Mentoring programme: Young women exposed to knowledge and valuable skills that they could use in the real world and would make them assets in the job market.</li> <li>• ShEngineer - Invent It, Build It is a programme targeted at 60 female engineers. It is expected to build their capacity on how to effectively train teachers as well. 500 girls in secondary schools will be mentored to take up engineering as a career.</li> <li>• APWEN is also focused on advancing professional technical knowledge of members through facilitation of continuing professional development for the technical industries and organisations with diverse participation.</li> <li>• COVID-19 Support project</li> </ul>	<p>Senior executive members are most proud of drafting a diversity and inclusion policy which has been accepted by Sierra Leone Institution of Engineers. SLWE is working on getting the cooperation of other women organisations to join in the push towards accepting this policy as an industry standard. A few of the key initiatives run include:</p> <ul style="list-style-type: none"> <li>• Saturday Club: Educating young girls about engineering and related skills.</li> <li>• A city-wide awareness campaign and fund-raising walk for the 2019 International Women in Engineering Day</li> <li>• Networking with other sectors</li> <li>• Motivational talks with younger female engineers</li> <li>• COVID-19 Support project</li> </ul>

## STRATEGIC GROWTH CHALLENGES

Based on engagement with senior executive members from the women in engineering bodies in Ghana, Nigeria and Sierra Leone, there are a number of shared strategic growth challenges among the three (3) women in engineering bodies.

A high-level overview of strategic growth challenges identified by the women in engineering bodies include:



### **Updating strategy and action plans in light of the “new normal”:**

All women in engineering bodies have a strategy and action plan, to varying degrees of finalization and implementation. These plans have not considered the “new normal” created by the COVID-19 pandemic.



**Funding:** All women in engineering bodies have been affected in varying degrees from a financial perspective due to the COVID-19 pandemic. With the COVID-19 pandemic putting many projects on hold, funding is limited especially in Sierra Leone and Nigeria which sources most funding based on project specific work.



**Volunteer-based structure:** All women in engineering bodies are fully volunteer based from student members to senior executives. This creates a constraint on capacity and engagement of members. For individual members (all women), participation in the women in engineering bodies’ activities have to be balanced with full-time professional engineering careers and domestic commitments.



**Leadership and talent development:** All women in engineering bodies have expressed need for leadership development of all members in their organisation including executive members. Communication skills and leading teams more effectively was the most common response from executive members.



**Digital transformation:** All women in engineering bodies have a website however use of other digital platforms by the women in engineering bodies for digital advocacy has been limited. Growing reach and impact using digital tools and online programmes while also developing members’ ICT skills has been noted as a need.

**These challenges primarily relate to (1) leadership and culture, (2) partnerships and funding and (3) adapting activities to the new normal presented by the COVID-19 pandemic.**

## BUILDING FOR RESILIENCE

Resilient organisations have the ability to survive a crisis and thrive in uncertain times. The COVID-19 pandemic is proving to be one of the greatest leadership tests of our generation. With the rise of the COVID-19 pandemic, there is a high risk of gender diversity and inclusion in engineering being deprioritized in the industry during this time.

There is a fear that this trend will continue across all sectors, especially as companies downsize. In *Diversity Wins*, McKinsey & Co. (2020) notes, “in this challenging context, the task of fostering diversity and inclusion could easily take a back seat—and the painstaking progress made by many organisations in recent years could be reversed.” Building resilient women in engineering bodies is critical to ensure the traction created by the women in engineering bodies is not lost; but amplified.

In *Capacity Building for Women in Engineering Bodies in Sub-Saharan Africa*, we learnt that the following factors are potent to building thriving women in engineering bodies:



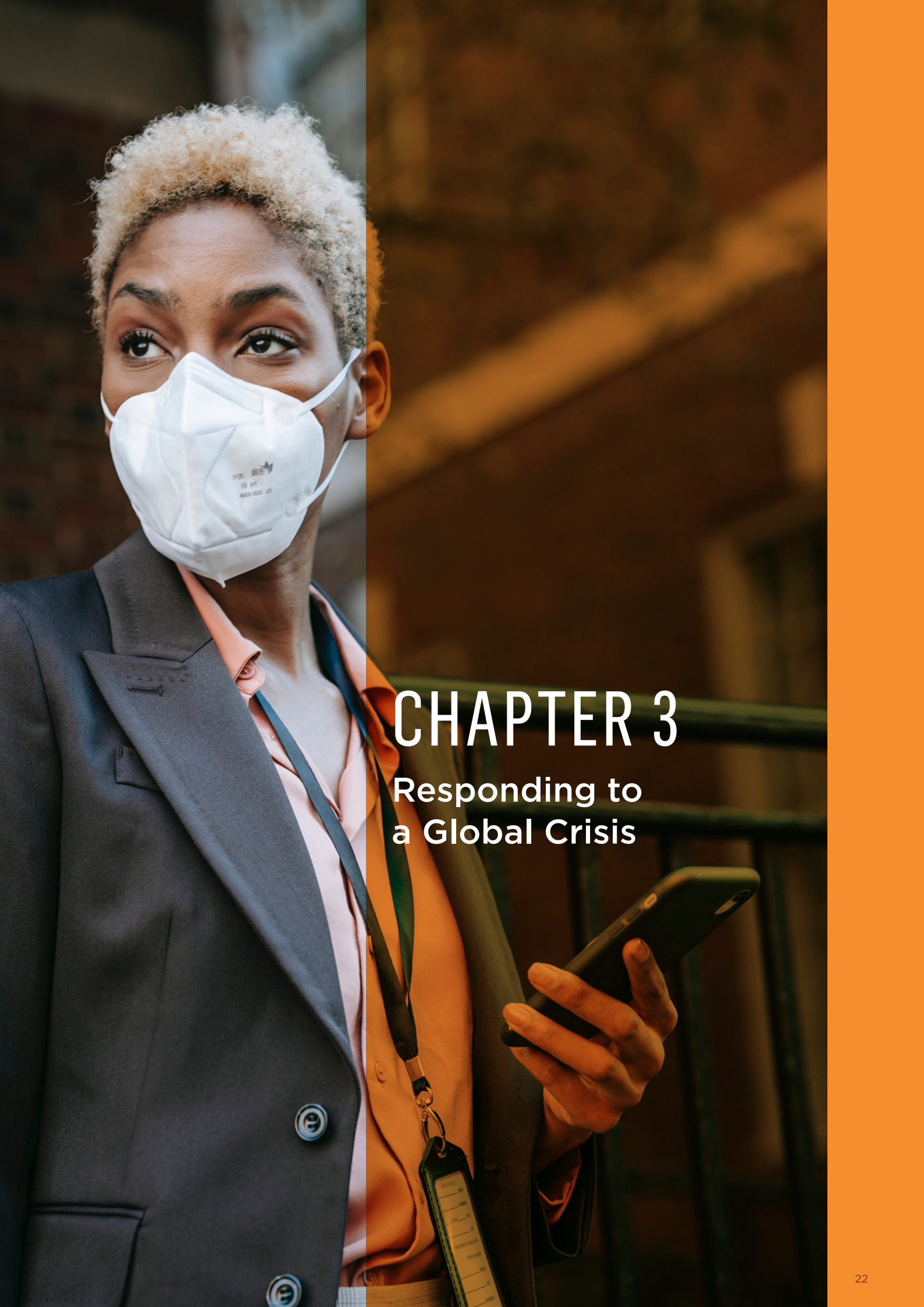
**Leadership and Culture:** Leadership skills are ever evolving, requiring leaders at all levels to often self-evaluate and actively improve personal leadership skills. Members from all levels of leadership ranging from executive members to student members participated together in the leadership development and training workshops hosted for the various women in engineering bodies during *Capacity Building for Women in Engineering Bodies in Sub-Saharan Africa*. This was purposeful to create a culture of visibility and accessibility of leaders while collectively developing organisation roadmaps; preparing leaders at all levels in the organisation to understand the challenges, seek opportunities and make decisions.



**Network and Relationships:** Internal (member engagement) and external relationships (partnerships) are critical to ensuring sustainability. In Zimbabwe, the women in engineering body frequently engaged with members using instant messaging services like Telegram and WhatsApp, for sharing news updates and opportunities. In Malawi, *Capacity Building for Women in Engineering Bodies in Sub-Saharan Africa* built gravitas and paved the way for the team to build partnerships with other institutions e.g. Rice University, expanding outreach programmes in Malawi. The way an organisation operates day-to-day influences the extent to which people and organisations will be prepared to help you during times of adversity.



**Adaptability:** The COVID-19 pandemic is only one of several crises women in engineering bodies will have to endure. Many other obstacles have come before COVID-19; many are yet to arrive. Organisations taking a proactive approach in seeking new opportunities (adopting a learning mindset) to fulfil their vision and mission are more likely to thrive in the long run. Since April 2020, WomEng eSwatini as example has been hosting Facebook Live sessions with leaders in the eSwatini engineering sector. This has kept the community engaged during the lockdown, while raising the profile of the engineering sector in eSwatini.



# CHAPTER 3

## Responding to a Global Crisis

To date, the key mandates for women in engineering bodies have been to attract, develop and retain more girls and women in engineering. Ultimately, women in engineering bodies have been working towards developing a diverse and inclusive engineering sector capable of solving problems representative of all factions of society as well as provide a support mechanism for women in engineering. It has not been an easy path for these women in engineering bodies, with challenges around funding, support, and energy to carry on activities on top of work and home time constraints.

In this section, we map out the multi-crisis women in engineering bodies are now tackling and the principles that are helping us rise in times of challenge.

## DEALING WITH MULTIPLE CRISES

In the current state of the world, women in engineering bodies are dealing with three (3) major crises, simultaneously:



**Diversity and Inclusion in engineering:** In Chapter 1, we estimated that women make up less than 10% of the formal engineering workforce in West Africa. Patriarchal culture still maintains a stronghold in society, particularly in West Africa. Shifting mindsets and culture poses the biggest challenge for normalizing the role and participation of women in engineering in West Africa.



**The COVID-19 pandemic:** Women in engineering play a critical role in responding to the COVID-19 crisis with a combined engineering and gender lens. According to research, the burden of care, and household responsibilities for women during this period have been compounded through the COVID-19 pandemic resulting in high levels of economic disproportionality.



**Adapting to a digital world:** The COVID-19 pandemic accelerated digital adoption across the world and in turn emphasising the challenges of the digital gender divide. West Africa has one of the lowest levels of digital connectivity in the world. Insufficient infrastructure and high data costs limit West Africa's ability to adapt to a fully digital world coupled with a gendered differential access to technology. This has created a challenge for women in engineering bodies to remain relevant and visible; ensuring the progress made to date for gender parity is not lost or limiting the potential ability to affect change and deliver impacts intended.

## CRISIS 1: DIVERSITY AND INCLUSION IN ENGINEERING

In Chapter 1, we estimated that women make up less than 10% of the formal engineering workforce in West Africa. Patriarchal culture still maintains a stronghold in society, particularly in West Africa. Shifting mindsets and culture poses the biggest challenge for normalizing the role and participation of women in engineering.

Patriarchy is defined as a system of society in which the father or eldest male is head of the family and descent is reckoned through the male line. As such, patriarchal culture has a stronghold in West Africa. According to the United Nations Development Programme (UNDP) (2016), “perceptions, attitudes, and historic gender roles” limit women's access to health care and education, and lead to disproportionate levels of family responsibility, job segregation, and sexual violence. Senior executive members from women in engineering bodies in Ghana, Nigeria and Sierra Leone, noted a number of factors influenced by patriarchal culture over generations as some of the barriers we need to overcome. **Exhibit 5**, highlights the most common barriers noted.

## Barriers to Gender Equality in Engineering in West Africa



Societal and cultural expectations of engineering and traditional roles for men and women



Majority of women in West Africa work in the informal sector



Girls' education is valued less than boys' education



Workplaces that are designed by men for men



Limiting mindset among women

### Box 2



#### SOCIETAL AND CULTURAL EXPECTATIONS OF ENGINEERING AND TRADITIONAL ROLES FOR MEN AND WOMEN

Research has shown that social beliefs about men and women influence a lot more of their decisions and career choices than their biological features. Engineering has historically been perceived by society as a masculine domain. This could be based on ancient understanding of traditional engineering disciplines like civil engineering where there was a lack of understanding around what civil engineers did, and rather the applications in the building and construction industries specifically required excessive physical strength. With the rise of the new technology, this is no longer applicable however the stereotype has remained around physical strength. Furthermore higher aptitudes in mathematics were attributed to boys rather than girls, and this stereotype has persisted in marginalised women from STEM fields.

Men have also traditionally been seen as the breadwinners, labourers, “hunters” in society while women have been conditioned to be responsible for domestic duties in the household and chief nurturers of offspring. An article by BCG (2019), notes that “the home management load is constant, underrecognized, unpaid—and it falls disproportionately on women, limiting their ability to focus on their careers and rise into leadership roles.” Women are still 1.9 times more likely than men, on average, to have primary responsibility for household chores. In African societies, more women are now entering the formal workplace however this most often comes with still having to shoulder the burden of maintaining society’s expectation of women as primary care givers in the household.

Over the last year, this has been exacerbated by the COVID-19 pandemic. According to statistics by the International Labour Organisation (2021), there were unprecedented global employment losses in 2020 of 114 million jobs relative to 2019. In relative terms, employment losses were higher for women (5%) than for men (3.9%), and for young workers (8.7%) than for older workers. Decomposing the 5% employment loss for women showed that, women have been more likely than men to become economically inactive, that is to drop out of the labour force, during this crisis (4,3%) compared to being unemployed (0.7%).



#### GIRLS' EDUCATION IS VALUED LESS THAN BOYS' EDUCATION IN MANY REGIONS

A report by Global Partnership for Education and the World Bank (2017), show that girls still have on average lower levels of educational attainment than boys in West Africa. Child marriage is common in this region, requiring many girls to stop their formal education by primary school. In Sierra Leone, although the legal age for marriage is 18 years old, the United Nations Girls' Education Initiative (2006) reported that 56% of girls were still getting married below this age.



In Nigeria, an estimated 44% of girls are married before their 18th birthday (World Bank, 2020). Poverty is also a major barrier for education in countries in West Africa. In families that cannot afford education for all their children, boys are often prioritised over girls to receive formal education as this is connected to the patriarchal ideology of men being the heirs to their family legacy. We do acknowledge that generalising about the status of girls' education in even a single country is often misleading. Variations within each individual country are substantial and the variance is exacerbated in urban vs rural communities or linked to socio-economic status. Estimates by UN Women (2020) show that an additional 11 million girls may leave school by the end of the COVID-19 crisis; evidence from previous crises suggests that many will not return.



### LIMITING MINDSET AMONG WOMEN

According to McKinsey & Co. (2019), some women limit their own prospects, being reluctant to take risks, network with colleagues, and advocate for their own advancement, often times caused by the pressure to not break societal norms. Eng. Trudy Morgan, founder of SLWE notes, "In Sierra Leone, it is still common practice to pressure women into marrying and starting a family as early as possible. This is often looked at as a mark of womanhood by society. Those who stray from this convention are often called out on it; often by other women." Additionally, Eng. Trudy Morgan notes based on first-hand observations, "Women are still having to navigate traditional roles and socio-cultural norms while observing what the world is giving in terms of women's rights and empowerment. There are many women in our current generation that are the first woman or person in their family to earn a degree. Being the first often shoulders a financial responsibility to the family who would have collected savings to send their daughter to institutions of higher learning. However, the trend to limit a career in favour of traditional family life and responsibilities for women still persists."



### MAJORITY OF WOMEN IN WEST AFRICA WORK IN THE INFORMAL SECTOR

According to McKinsey & Co. (2019), 90% of women in Africa work in the informal sector with just 10% receiving a tertiary education. This translates into "a story of low wages, insecurity, and limited opportunities to progress into professional and technical roles". Working in the informal sector leaves many women vulnerable because they are poorly compensated; many work with no compensation at all. Most women are still financially dependent on the men in their family; fueling patriarchal ideologies and creating a virtuous cycle for generations to come. When women are not economically empowered, they tend to have lesser decision-making power in their household on matters such as the education of their daughters. This has a ripple effect on the access and attainment of STEM careers. Research through *Capacity Building for Women in Engineering Bodies in Sub-Saharan Africa* showcased the need to improve role models for girls under the theory of "you can't be what you can't see." The lack of role models in STEM, coupled with the majority of women in the informal economy creates a cycle of low STEM attainment.



### WORKPLACES THAT ARE DESIGNED BY MEN FOR MEN

"We don't have policies that encourage women to stay in engineering. Policies that are guiding engineering practices are not friendly to women. An example is on many engineering sites there are no private change rooms or spaces for women", notes Eng. Enyonam Kpekpena, President of WinE Ghana. In West Africa, women have only been in the formal engineering workplace over the last one (1) - two (2) generations. The workplace culture and policies in place have been in existence for much longer. Over the last two (2) generations, little accommodation has been made for women. This ranges from the availability of bathrooms and changerooms, to the temperature control which is usually set at the optimal working temperature for men. Women's optimal temperature is 2 degrees celcius higher. This is just the physical space. Hostile work cultures have been pushing women out of the industry. This ranges from the type of work assignments given to women in engineering vs. men to inappropriate comments and unwanted advancements in the workplace.



## CRISIS 2: THE COVID-19 PANDEMIC

The COVID-19 pandemic has required women in engineering to play a critical role in responding to the COVID-19 crisis with a combined engineering and gender lens. The COVID-19 pandemic has also created an added burden to women in terms of primary care and family responsibility. While the world focussed on the unfolding health crisis, the engineering industry responded to the engineering crisis brought on by COVID-19. The lack of clean water, the need for sanitation stations, the production of sanitizers where supply chains were compromised and a delay in service delivery due to the raging pandemic. The lack of hospitals, ventilators and personal protective equipment (PPE) in hospitals became an engineering challenge. However, West African countries are more resilient, having successfully emerged from the Ebola pandemic, and declared Ebola-free, and the women in engineering chapters leveraged on their expertise in dealing with uncertainty in a pandemic.

### SERVING SOCIETY WITH AN ENGINEERING AND GENDERED LENS

In early 2020, women in engineering bodies responded swiftly to the health crisis focussing on community outreach. Each of the women in engineering bodies adopted different approaches.

In Sierra Leone, SLWE responded by raising funds to assist community members, targeting areas in need. The funds raised were used to donate water, food and other essential items to an orphanage and an old age home. SLWE also commissioned a hand washing station that was installed at a minibus station near the SLWE offices.

In Ghana, WinE Ghana carried out targeted interventions, initially at the nearby market which is typically congested and where it is difficult to implement social distancing. Food markets in Ghana are predominantly operated and frequented by women. WinE Ghana focused on food safety and upgrading infrastructure that was not adequate for safety regulations. The team developed a proposal and shared with government. WinE Ghana team also bought sanitation products. They have now created safer work environments for people selling in the markets which are predominantly women.

In Nigeria, APWEN took action in two significant ways. Firstly, in the early days of COVID-19 lockdown, the team was able to raise funds personally and through external donors to provide community members with essential goods during this time. APWEN has a number of chapters across various regions of Nigeria. Each chapter adopted different approaches. Many of the chapters carried out awareness campaigns on safety and hygiene. Secondly, APWEN launched an e-learning platform and YouTube channel as part of their digital transformation plans to continue creating awareness and providing learning mechanisms during this time with the support of WomEng to create larger following and impact.

The type of leadership shown by executive members showcased frugal innovation borne out of necessity and the importance of being agile and improvising during uncertain times. The institutions also leveraged their engineering skills to support the local COVID-19 response.

### THE ADDED BURDEN ON WOMEN AS PRIMARY CAREGIVERS

The COVID-19 pandemic, and the economic downturn it has caused, has affected women disproportionately. A report by UN Women (2020) found clear evidence that, although both genders have seen their unpaid workloads increase, women are bearing more of the burden than men. "Prior to COVID-19, data on how much time women and men spent on unpaid care and domestic work was scarce. On an average pre-COVID-19 day, women already spent about three times as many hours on unpaid domestic work and care work as men" (UN Women,2020).

Available data from 38 countries overwhelmingly confirm that both women and men have increased their unpaid workloads, but women are still doing the lion's share. Women are also taking on a greater intensity of care-related tasks than men. This includes the responsibility of household tasks, including cooking and cleaning. With the COVID-19 pandemic limiting domestic help support, women took on the full burden. As schools closed, and teaching went online, women took the role of educators on top of their workload, and when members of the family became sick, women took the role of a caretaker. Meanwhile, parents are getting more help from daughters than sons. Worryingly, more women than men are leaving the workforce, perhaps as a result of these increased workloads. **Exhibit 5** highlights the estimated disproportionate workload balance between women and men in a shared household.

**Caring for children, including cleaning, feeding & physical care**

Women		Men
36%	Increased by	30%
36%	I don't usually do it	48%

**Teaching**

Women		Men
32%	Increased by	29%
40%	I don't usually do it	44%

**Playing with, talking to & reading to children**

Women		Men
34%	Increased by	31%
27%	I don't usually do it	35%

**Affective/emotional support for adult family members**

Women		Men
34%	Increased by	31%
27%	I don't usually do it	35%

**Assisting older/sick/disabled adults with care, feeding, cleaning**

Women		Men
20%	Increased by	21%
52%	I don't usually do it	54%

**Cooking & serving meals**

Women		Men
32%	Increased by	18%
17%	I don't usually do it	48%

**Cleaning eg. Clothes, household**

Women		Men
45%	Increased by	35%
13%	I don't usually do it	33%

**Shopping for the family**

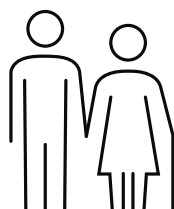
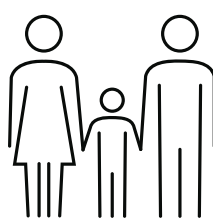
Women		Men
25%	Increased by	22%
23%	I don't usually do it	29%

**Decoration, repairs, household management**

Women		Men
29%	Increased by	24%
29%	I don't usually do it	33%

**Pet care**

Women		Men
13%	Increased by	14%
60%	I don't usually do it	61%



**Exhibit 5:** Share of workload between women and men in a shared household  
Source: UN Women, 2021

According to World Economic Forum (2020a), already more than 28 million women over the age of 25 are estimated to have left the labour market altogether in 55 high- and middle-income countries over the last year, compared to 24 million men. Given that women were already less likely to be in the workforce, this represents a serious threat to the economic status of huge numbers of women. On a global scale, it's thought the pandemic will push a further 47 million women and girls into extreme poverty by 2021. This is also driven by the nature of work, where women have been in industries such as the service industries which have been hardest hit, with a very slow recovery. This is not to mention the increase mental health strain the pandemic has had on women.



### CRISIS 3: ADAPTING TO A DIGITAL WORLD

The COVID-19 pandemic accelerated digital adoption globally while emphasising the challenge of the digital divide. West Africa has one of the lowest levels of digital connectivity in the world. Insufficient infrastructure and high data costs limit West Africa’s ability to adapt to a fully digital world coupled with a gendered differential access to technology. This has created a challenge for women in engineering bodies to remain relevant and visible; ensuring the progress made to date for gender parity is not lost or limiting the potential ability to affect change and deliver impacts intended.

According to the World Bank (2020), “Digital technologies can be game changers in the crisis, and we are encouraging more investment not just in digital infrastructure and platforms, but also in skill and in creating an enabling regulatory environment.” However, the digital divide is a multifaceted issue. The digital divide, or technology gap, is the difference between groups with access to technology and the internet and those without (Plan International, 2020). Three (3) main characteristics define this gap, namely:

1. access to high-speed internet;
2. access to reliable devices and;
3. high data costs.

**Exhibit 6** details the penetration rates (percentage users/mobile devices vs. population) for internet, mobile and social media usage in Ghana, Nigeria and Sierra Leone.

**Exhibit 6,** Internet, Mobile and Social Media Penetration Rates (% Users/Mobile Devices vs. Population) in West Africa (Hootsuite, 2020)

Penetration Rate	West Africa	Ghana	Nigeria	Sierra Leone
Internet	41%	48%	42%	12%
Mobile Use	92%	130%	83%	79%
Social Media	12%	20%	13%	8.1%

Data from Hootsuite (2020), shows that 41% of West Africa’s population has some form of internet access. Currently, only 12% of West Africa’s population engages regularly on social media however exponential growth looks promising. Facebook, YouTube and WhatsApp are the top 3 most common forms of social media. Mobile phones however have been game changers across the continent with higher adoption rates and greater access to opportunity. In West Africa, mobile subscriptions equate to 92% of the total population. According to data from Hootsuite, approximately three-quarters of the population in sub-Saharan Africa (747 million people) have a mobile connection but only a third of these – 250 million – use a smartphone. In 2019, only 10 out of 45 African countries tracked by the Alliance for Affordable Internet were able to afford internet connectivity (defined as 1GB of mobile prepaid data costing 2% or less of the average monthly income).

The digital divide additionally affects women disproportionately. The Mobile Gender Gap Report (GSMA, 2020) examines how the mobile gender gap is changing quickly in low and middle-income countries (LMICs), revealing how the main factors preventing women’s equal mobile ownership and internet use are evolving over time, and demonstrating how mobile usage is quickly expanding as smartphone ownership rises. There remains a substantial mobile gender gap across LMICs. Over 300 million fewer women than men access the internet on a mobile, and women are 8% less likely than men to own a mobile phone. But the mobile internet gender gap is narrowing in LMICs. Although women remain 20% less likely than men to use mobile internet, this represents a reduction from 27% in 2017, and 54% of women now use mobile internet. **Exhibit 7** provides an overview of the key gender gaps that exist within the digital divide.

## KEY MOBILE GENDER GAP STATISTICS FOR SUB-SAHARAN AFRICA

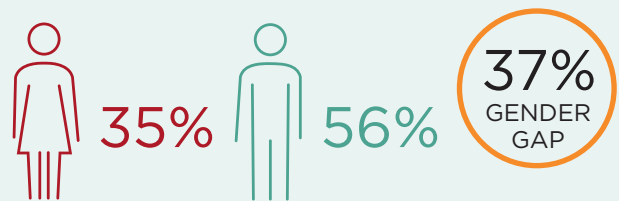
### Mobile Ownership

% of adult population in Sub-Saharan Africa



### Mobile Internet Use

% of adult population in Sub-Saharan Africa



Gender gap in ownership /use (%)

$$= \frac{\text{Male owners/users (\% of male population)} - \text{Female owners/users (\% of male population)}}{\text{Male owners/users (\% of male population)}}$$

## TOP BARRIERS TO MOBILE OWNERSHIP FOR MEN AND WOMEN IN AFRICA



- Affordability
- Literacy & Skills
- Family does not approve
- Safety and security



- Affordability
- Literacy & Skills
- Safety and security
- Network coverage

**Exhibit 7:** Gender gaps that exist within the digital divide  
Source: Mobile Gender Gap Report, 2020

## PRINCIPLES FOR EMBRACING THE DISRUPTION

Crises such as the COVID-19 pandemic can be pivotal in ultimately moving our societies to their next levels of economic development, promoting social and environmental movements and opening the way to innovation.

With each crisis comes disruption. In a Director's Alert Report, *Courage Under Fire*, Deloitte (2017) succinctly noted, "Organizations that choose to embrace this disruption rather than taking a strictly defensive posture are those best positioned to generate long-term value for their stakeholders. This requires the ability to anticipate disruptive events and a willingness to respond to them courageously while focusing on long-term success. Leaders will need to find ways to seize the initiative and leverage disruption to their advantage."

In December 2019, WomEng initiated a GoDigital Strategy to support the transition of our capacity building programmes into virtual mediums. It gave us the advantage when the COVID-19 pandemic changed the way the world travelled and engaged just three months later. WomEng has used its foresight ability along with its unique toolbox of support to build capacity for organisations leveraging change management as a leadership development tool. Below are guiding principles explained as the foundations for adapting an initial in-person programme to support the transition to a virtual programme with better outcomes. These three (3) principles included:

1. **Navigating change:** The world is in a constant state of change and in this period, accelerated by a pandemic requiring leaders to move from change management to change leadership.
2. **Building diverse and inclusive talent pipelines:** Research by multiple leading consulting firms have shown that diversity and inclusion leads to a stronger more resilient economy, company and organisation. Proactive promotion of the relevance between (1) diversity and inclusion and (2) innovation needs and implementation needs to be prioritised.
3. **Leading in an uncertain world:** During a crisis which is ruled by unfamiliarity and uncertainty, effective responses are largely improvised. Thriving in the face of disruption starts with leadership.

In May 2020, WomEng embarked on imparting these key principles to the women in engineering bodies, as part of the stakeholder commencement meeting for *Capacity Building for Women in Engineering Bodies in West Africa*. Through a three (3) part master class series, senior executive leaders engaged on each principle that is further outlined in the sub-sections below.

### Navigating Change

*"How do we think about change as a constant in our world? How are we going to manage constant and consistent change?"*

Anjani Harjeven, an organisational transformation specialist, led a discussion on change management with the women in engineering bodies. The most immediate change that all the women in engineering bodies were dealing with during this period was digital transformation; adapting organisational activities from predominantly in-person to fully virtual. The COVID-19 global crisis accelerated the need for organisations to operate more digitally. In April 2020, Microsoft's CEO, Satya Nadella, noted that the software giant had seen "two years' worth of digital transformation in two months" due to the COVID-19 pandemic shifting our lives abruptly online (The Guardian, 2020). The women in engineering bodies were responding to the call for digital transformation by initiating mechanisms such as virtual calls with members however the consensus among all the women in engineering bodies was that the change brought about by the pandemic was one that they were not fully prepared for.

**"How do we think about change as a constant in our world? How are we going to manage constant and consistent change?"**

Actively leading and managing change is no longer an optional strategy but an essential leadership trait required to thrive in the current environment. Building change management capability is especially topical given the uncertainty following the impacts of the COVID-19 pandemic. Leaders are being sought to provide direction and are needing to dig deep for the skills required to respond along with managing their own personal leadership journeys. This is compounded in engineering, where the profession has always been “part science, part art, part crystal ball gazing.” The ability to build and sustain infrastructure and take a long term perspective is paramount.

At WomEng, we have supported capacity building around change leadership for organisations, understanding the critical need to create change management processes moving forward. Included in development, change leadership is a core leadership trait, supported through robust but practical training approaches.

## QUESTIONS FOR LEADERS TO ASK

- How do we think about change as a constant in our world?
- How are we going to manage constant and consistent change?
- What are we working to deliver? How do we think about that differently?
- How do we manage the user journey for our team members?

Box 3

“A winning formula for diversity and inclusion in organisations includes long term vision, commitment, resources and a good plan.”

### Building Diverse and Inclusive Talent Pipelines

*“A winning formula for diversity and inclusion in organisations includes long term vision, commitment, resources and a good plan.”*

Naadiya Moosajee, co-founder of WomEng led a discussion on promoting and implementing diversity and inclusion strategies. Diversity and inclusion is a term that is typically used together however the two (2) words differ in meaning. Diversity focuses on identity and cognitive ability of a person while inclusion relates to empowered, engaged and enabled people in a workforce. During the engagement, women in engineering body members were asked “Do you think your organisation is diverse?” 78% of women in engineering body members responded “Yes”. Women in engineering body members were then asked “Do you think your organisation is inclusive?” 50% of respondents said “Yes”. The disparity in the numbers is representative of the global outlook; while we might be making great progress with diversity, we are not doing so well on inclusivity.

While the COVID-19 pandemic has a lot of airtime, it will not be the last global shock. While economies are taking a beating, diverse leadership is shown to have the most effective approach. This is evidenced by how countries led by women are doing better in terms of developing virus response. Reports by leading consulting firms have shown that companies with women in leadership and diverse boards outperform those who don't. The data is clear, that diversity and inclusion leads to a stronger more resilient economy, company and organisation.

Leveraging diversity and inclusion can create a better world. We can think about the supply challenge of women in engineering as a unique opportunity by changing the narrative to “How can we make it such that women become the solution makers?”

Historically, the rationale for gender diversity and inclusion in engineering has been thought of as important for fairness and equality. There is growing evidence of the importance of gender parity from a business perspective. This includes:

- Enhancing innovation
- Reflecting gender composition of customer base
- Enhancing decision making
- Reflecting the consumer base
- Reducing costs on research and development and providing a quicker access to market

WomEng has worked with the engineering industry to switch the narratives around diversity and inclusion, leveraging it as a key success driver, rather than a rights based issue. While equally important, organisations have responded more positively to understanding the key value add women add to organisation development and growth. In recessions, and downturns, companies and organisations with women in leadership outperformed homogenous teams.

## 7 WAYS WOMENG TACKLES DIVERSITY AND INCLUSION



**BOTTOM UP AND TOP DOWN APPROACH:** Bottom-up approach relates to feeding the funnel of women in engineering by empowering girls from an early age about opportunities in engineering. A top-down approach relates to involving top leaders in organisations which are typically males to create the change required.



**VISIBILITY IS KEY:** Research shows a tipping point is created when organisations have more than 20% female representation. Women are heard better and able to speak up more.



**POWER OF STORYTELLING:** Greater exposure to role models in industry is important for young girls and women. Sharing engineering stories and showcasing role models can make engineering more relatable to girls and women.



**MENTORSHIP AND REVERSE MENTORSHIP:** Understanding that leaders might not know everything, reverse mentorship by younger people with senior leaders is important.



**CHAMPIONSHIP:** A champion is an active and vocal supporter of your career. S/He should work within your organisation, be a step or two above you in the career ladder, and have a keen understanding of you as a professional. Particularly if you're facing institutional or cultural barriers of advancement, a champion can help overcome obstacles and fight for your promotion.



**TRIPLE BOTTOM LINE:** Organisations that are serious about diversity and inclusion should allocate funding to it.



**TACKLING BIAS:** Everyone has unconscious bias within them. A key component is to make people conscious of the biases.

Box 4



“A leader within this crisis is someone that enables others to contribute to the solution. Improvisation from leaders is key during uncertain times.”

## LEADING IN AN UNCERTAIN WORLD

*“A leader within this crisis is someone that enables others to contribute to the solution. Improvisation from leaders is key during uncertain times.”*

Dr. Nicola Dee and Dr. Lisa Smith from our UK partner, the Cambridge Institute for Sustainability Leadership, provoked women in engineering body members to reflect on how their organisations responded to the current COVID-19 global crisis and what can be learnt from it. The type of leadership shown by executive members in early response initiatives briefly outlined in the outline of Chapter 2 was frugal innovation borne out of necessity. It showed the importance of being agile and improvising during uncertain times.

During a crisis which has been ruled by unfamiliarity and uncertainty, effective responses were largely improvised. Thriving in the face of disruption starts with leadership. Leaders will increasingly face challenges that have no solutions. They will have to make decisions though. This pandemic has shown that the female leadership traits have been successful in dealing with uncertainty and crisis. Empathy coupled with a pragmatic approach has provided results at a national level. A good case study is New Zealand's Prime Minister Jacinda Ardern. From the early days of the COVID-19 pandemic, Jacinda Ardern captured headlines for the swift and comprehensive actions she undertook to prevent the spread of COVID in her island country. Her success and the resultant popular support were noteworthy, but so too were the displays of raw emotion uncommon among leaders of nations. In showing her own vulnerability and concern for others, she demonstrated a keen emotional intelligence and dispelled the myth that compassion and humanity are shortcomings in a leader.

Key lessons being learned for the next crisis:

1. We have leapfrogged our entry into a digital world catalysed by COVID-19. Learning to adapt to online mechanisms for productivity has been accelerated.
2. Being aware that we have other global crises on the horizon e.g. dealing with inequality (social and economic) which has been exposed even more due to COVID-19 and climate change.
3. Technology will accelerate and create new business models, opportunities and the way we live creating a hyperconnected world. The technology divide will exacerbate inequality.

Volatility, uncertainty, complexity, and ambiguity (VUCA) are the realities of today and won't be getting easier (CCL, 2020). Bob Johansen, author of *Leaders Make the Future* (2012) notes that the VUCA acronym can be turned around to a more positive framing of effective leadership:

- Volatility leads to *Vision*.
- Uncertainty yields to *Understanding*.
- Complexity yields to *Clarity*.
- Ambiguity yields to *Agility*.

It is tricky to think about how one can move from addressing the needs of the now while preparing for what comes next, however, leaders in the future will need to have vision, understanding, clarity, and agility.

### QUESTIONS FOR LEADERS TO ASK

- How do we as a leaders respond to disruption?
- How were we able to engage our network to respond quickly?
- Can we build in these platforms and systems to continue post-COVID-19?



# CHAPTER 4

Turning Crisis  
into Opportunity

The COVID-19 pandemic created a number of challenges for the traditional ways in which capacity building was executed e.g. in-person gatherings halted, universities and schools closed and business as usual was disrupted while budgets were diverted to focus on COVID-19 relief. WomEng chose to view these challenges as opportunities to disrupt systems and develop innovative and creative solutions to long-standing issues.

In the previous chapter we outlined the three (3) global crises women in engineering bodies are tackling and foundational principles adopted by WomEng and the women in engineering bodies to thrive in the age of COVID-19 and beyond. This chapter outlines WomEng's capacity building strategy and recommendations for women in engineering bodies to actively rise above challenges. This includes:

- Promoting diversity and inclusion as a response to the COVID-19 pandemic
- Enhancing skills development through online learning
- Raising the profile of engineering and women in engineering through digital advocacy

## PROMOTING DIVERSITY AND INCLUSION AS A RESPONSE TO COVID-19 PANDEMIC

The COVID-19 pandemic demanded innovation and creativity from the global engineering workforce. Engineers are critically needed during this pandemic; providing solutions for ventilators, protective equipment, disinfecting environments and many more areas in which we now live and work. While this has been a healthcare emergency, it was an engineering emergency as well. COVID-19 has been shining a light on some of the inequalities we see in society from the lack of medical infrastructure to the instability and lack of IT infrastructure to enable equitable virtual education opportunities. Having a diverse and inclusive engineering workforce can reduce inequalities as problems would be tackled from multiple perspectives.

This period has been an opportune time to showcase how women in engineering can contribute to health and safety efforts and in doing so, showcase the value that women bring to communities. In recognition of African women in STEM and their COVID-19 emergency response, the UNDP (2020) noted, "Women's contributions have resulted in increased skills with several spill over effects, such as training, capacitation, and experience gathering for younger scientists and other frontline workers; jobs in the (potential) manufacturing sites; as well as the availability and/or creation of role models and mentors and their abilities to inspire a whole generation of African women and girls."

Across the continent, women in engineering are being showcased for noteworthy innovations e.g. locally produced emergency ventilators in the Democratic Republic of Congo led by Dr. Ngalula Mubenga and Sibongile Mongadi from South Africa, who designed a robotic contraption that used hand sanitizers and interactive software to track body temperatures in public places (UN Women,2020). Likewise, the women in engineering bodies in Ghana, Nigeria and Sierra Leone promptly responded to the health crisis in their communities. **Box 6** showcases how WinE Ghana was able to respond to the health crisis swiftly with a technical engineering and gendered lens on their community's challenges.

**Recommendation: Identify problems within communities where women are the key customers or users. Women in engineering members can use their technical knowledge and gendered perspective to understand the context in more detail and provide engineering solutions.**

## WinE GHANA RE-ENGINEER MARKETS IN GHANA

As a COVID-19 response, WinE Ghana carried out targeted interventions focusing on re-engineering markets around Accra, Ghana which are typically congested and difficult to implement social distancing. Food markets in Ghana are traditionally associated with female entrepreneurship and frequented mostly by women to purchase food.

WinE Ghana immediately identified a need to improve the health and safety standards of markets in surrounding areas in light of the COVID-19 pandemic. WinE Ghana initially developed a proposal on re-engineering markets around the WinE Ghana head office. The proposal details how the current situation at the markets could be improved in terms of sanitation, infrastructure, food hygiene and places of convenience. In April 2020, the proposal was presented to the Ministry of Sanitation and Water Resources, Ministry for Local Government and the Ministry for Gender and Children Affairs. The Minister of Sanitation and Water Resources, Hon. Cecilia Dapaah, welcomed the proposal and responded positively.

WinE Ghana distributed baskets, masks, hand sanitizers and buckets and educated the women working in the market on COVID-19 preventive measures and food hygiene. WinE Ghana also distributed locally made palm baskets, especially to traders to use to display food items instead of the bare floor. According to WinE Ghana President, Eng. Enyonam Kpekpena, the palm baskets

provided by WinE Ghana improved visual appeal while increasing health and safety for food items that WinE Ghana members noticed laid out on the bare floor. WinE Ghana also used their engineering knowledge to help redesign the layout of stalls to ensure social distancing measures were met. The initiative by WinE Ghana, started in one market and scaled to several other markets.

The initiative developed by WinE Ghana is evidence that gender diversity in the engineering industry is crucial because it enables a diverse group of people to ideate and create initiatives that will be beneficial for various groups. Members from WinE Ghana were better able to understand the challenges faced by the women in these markets as they were frequent customers in the markets. This initiative was designed by women for women, providing resources needed to ensure that the local markets continue operating. Initiatives such as these also showcase to communities, the value women bring to engineering. WinE Ghana have now created safer work environments for people selling in the markets which are predominantly women. The efforts of WinE Ghana received media exposure on national television and online.



## ENHANCING SKILLS DEVELOPMENT THROUGH ONLINE LEARNING

Women in engineering bodies have historically worked on improving skills development for members, predominantly through in-person programming. Reach during this project period, however, was limited primarily due to COVID-19 safety restrictions limiting in-person engagement. Through research at WomEng across our Africa programmes, and in consultation with the women in engineering bodies in Ghana, Nigeria and Sierra Leone we identified the need for leadership and talent development programmes for members. These core skills included:

- Communication skills
- ICT Skills
- Leading teams effectively
- Entrepreneurship
- Personal branding
- Time management skills
- Team building
- Strategic planning for executive members

We also identified the needs of secondary school girls during this time around STEM awareness, additional mentoring and support with career awareness and opportunities. As we moved towards digital transformation, WomEng and the women in engineering bodies understood that the use of online learning could mean that we reach more people while breaking down physical barriers such as distance and infrastructure. However, a major challenge in West Africa is access to internet and high data costs.

Understanding both the need to support virtual learning, and the barriers around data, WomEng explored a number of low-data options e.g. use of WhatsApp or other instant messaging tools. As part of leapfrogging the challenges on cost, WomEng provided data stipends to participants on the learning programmes, and redirected funding to support digital inclusion. We also successfully held executive leadership training for the members of the women in engineering bodies through online sessions.

**Recommendation: Enhance skills development through online learning. This is an opportune time to test a number of options, develop and adapt programmes faster with engagement from beneficiaries in real time.**

## RAISING THE PROFILE OF ENGINEERING AND WOMEN IN ENGINEERING THROUGH DIGITAL ADVOCACY

Digital transformation for organisations was particularly critical in the early days of the COVID-19 pandemic to keep communities engaged. Social media has become a primary source of information for people. Though the use of social media networks is still relatively low in West Africa (12% penetration rate), the positive news is that it is growing exponentially. This is a key opportunity to build reach and digital advocacy for women in engineering bodies.

Digital tools can be part of the solution and may offer “leapfrog” opportunities for women’s economic empowerment. The use of digital platforms is providing women with greater access to markets, knowledge and more flexible working arrangements. Women in engineering bodies have the potential to drive the digital transformation for girls and women in rural and urban areas across West Africa and the rest of the continent by setting a precedent on digital advocacy.

A core adaption to Capacity Building for Women in Engineering Bodies in West Africa was to support the digital advocacy training for women in engineering bodies. The WomEng training focussed both on leveraging social media to build the positive profile for women as role models, as well as opinion piece writing, to leverage traditional media and provide thought leadership in the industry.

**Recommendation: Women in engineering bodies can build a stronger digital presence to increase the voices on women in engineering and showcase the engineering sector as an opportunity for girls. Posting content consistently on the organisations' website and select social media platforms in the following ways is recommended but not limited to:**

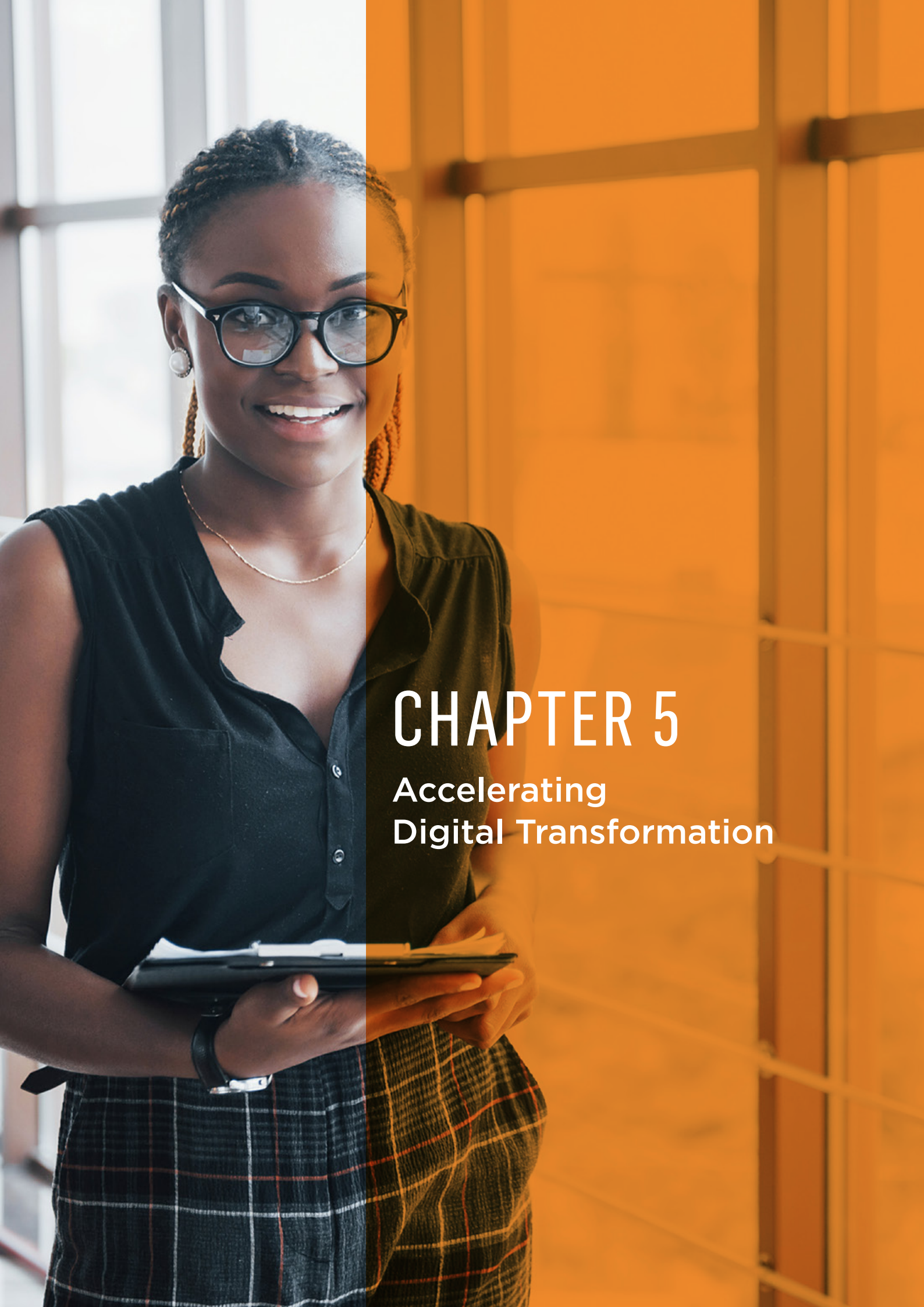
- o Showcasing women in engineering as change agents and role models.
- o Publishing opinion articles and technical papers from women in engineering.
- o Creating compelling change stories e.g. videos of girls and women in engineering to support policy, process and programmes during this time.



#### **APWEN UTILIZING YOUTUBE TO PROMOTE TECHNICAL EXCELLENCE OF WOMEN IN ENGINEERING**

APWEN launched a YouTube channel in January 2020. As of 31 May 2021, APWEN has 131 subscribers and has published 43 videos showcasing the work done by APWEN and more so the technical expertise of women in engineering in Nigeria. APWEN understands that video is becoming the fastest growing form of communication and is a highly effective form of content and its popularity has gone hand-in-hand with the rise of social media.

Box 7



# CHAPTER 5

## Accelerating Digital Transformation

The COVID-19 pandemic accelerated digital transformation globally as people were forced to connect virtually. Digital advocacy is defined as the use of digital tools and methods to support the practice of public affairs; in our case this can be to raise the profile of engineering and women in engineering in a country using digital platforms for communication. In the case of this project, we leveraged the opportunity to raise the profile of engineering and women in engineering in the catalyst countries using digital platforms for communication. In this section, we firstly analyse digital advocacy efforts of our women in engineering bodies based on a baseline survey conducted with women in engineering members in December 2020. We then outline three (3) key aspects for developing a digital advocacy strategy.

## STATUS QUO: DIGITAL ADVOCACY FOR WOMEN IN ENGINEERING BODIES IN WEST AFRICA

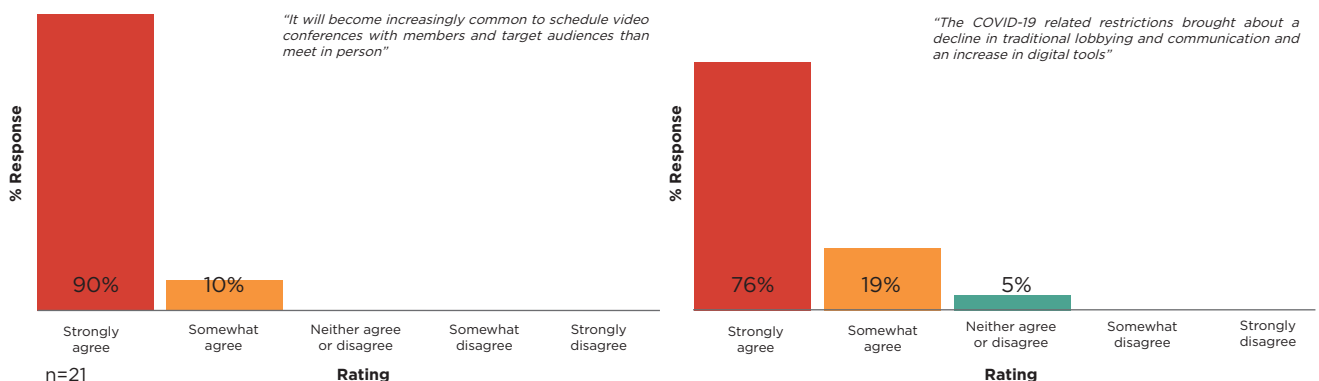
In December 2020, women in engineering body members from our three (3) project countries were surveyed to understand the scope and perception of digital advocacy within their countries. A total of 21 responses were received from women in engineering body members. Responses were received from senior leaders including the presidents and vice presidents of each women in engineering body.

Sub-sections to follow provide insights on:

1. Perceptions of the Effect of COVID-19 on Digital Communication
2. Importance Rating of Digital Communication Objectives
3. Value Rating of Digital Communication Tools Used
4. Target Audience Reach
5. Challenges with Implementing Digital Communication Strategies
6. Preferred Use of Social Platforms
7. Preferred Use of Social Formats

### PERCEPTIONS OF THE EFFECT OF COVID-19 ON DIGITAL COMMUNICATION

Women in engineering body members were asked, to what extent do they agree with the following statement: (1) "It will become increasingly common to schedule video conferences with members and target audiences than meet in person" and (2) "The COVID-19 related restrictions brought about a decline in traditional lobbying and communication and an increase in digital tools". Respondents provided a rating out of 5 where 5 = strongly agree and 1 - strongly disagree. **Exhibit 8** provides a breakdown of responses. 90% of respondents strongly agree with statement 1 while 76% of respondents strongly agree with statement 2.



**Exhibit 8:** Perceptions of the Effect of COVID-19 on Digital Communication

There was an alignment on the effects of COVID-19, however, understanding the problem is only half the challenge, what to do next was critical to better support organisations going forward.



**IMPORTANCE RATING OF DIGITAL COMMUNICATION OBJECTIVES**

Women in engineering body members were asked “Why do you think it is important for your women in engineering body to use digital communications tools? How relevant to you are the following reasons?” Based on a rating of 5 where 5 = Most Relevant to 1 = Not relevant, respondents provided a rating for each of the communication objectives listed in **Exhibit 9**. Ratings from respondents were analysed based on weighted averages of the responses provided by members in each country. This provides a fair outlook for each country.

**Exhibit 9:** Importance Rating of Digital Communication Tools by Women in Engineering Bodies in West Africa

Importance of Digital Communication	Weighted Average Value Rating			
	Ghana	Nigeria	Sierra Leone	Total
To promote our events	89%	100%	93%	94%
To showcase our organization’s personality (our human side)	89%	80%	93%	87%
To log and share information about meetings, issues, developments	85%	80%	93%	86%
To drive visitors to our website	80%	90%	87%	86%
To raise awareness and improve visibility around issues	89%	80%	87%	85%
To engage and build relationships with stakeholders+B33	84%	70%	73%	76%
To gather information and monitor stakeholders and events	84%	70%	73%	76%
We must: our audiences are present there	79%	60%	87%	75%
To build reputation	86%	50%	73%	70%
To rebut inaccuracies	64%	50%	73%	62%
To reach specific policy outcomes	81%	30%	67%	59%

n = 16 (Ghana); 2 (Nigeria); 3 (Sierra Leone)  
 Weighted Average = Grade (5 = Most Relevant and 1 = Not Relevant) multiplied by % response per rating

The top three (3) objectives for use of digital communication tools seen as most important included:

- To promote events by the women in engineering body
- The showcase the organisation’s personality/brand
- To log and share information about meetings, issues and developments,

WomEng used this data to support a wider use case for social media to support greater digital outreach and advocacy.

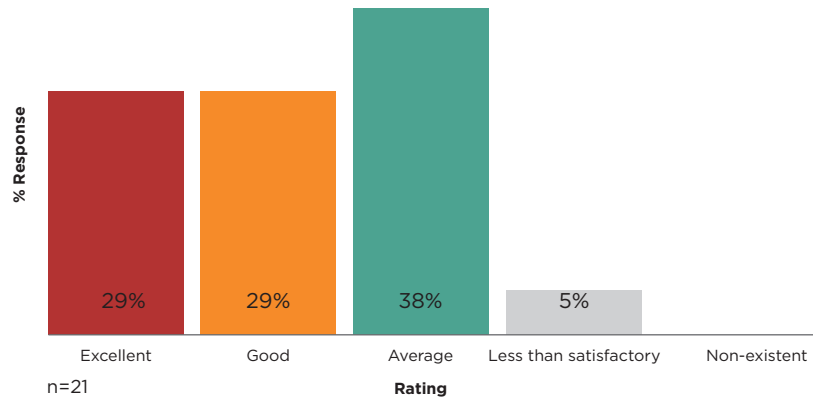
**VALUE RATING OF DIGITAL COMMUNICATION TOOLS USED BY WOMEN IN ENGINEERING BODIES IN WEST AFRICA**

Women in engineering body members were asked, “How would you rate your women in engineering body’s use of digital tools and media?” on a rating scale of 5 where 5 = excellent and 1 = non-existent. **Exhibit 10**, shows that the majority of respondents rated their women in engineering body’s use of digital tools and media as average.

Country specific responses ranged from:

- Ghana: Average to excellent
- Nigeria: Good to excellent
- Sierra Leone: Average to less than satisfactory

"How do you rate women in engineering body's use of digital tools?"



**Exhibit 10:** General Rating of Digital Communication

WomEng used this insight to build out programme content to better support organisations and the appropriate platforms organisations could use for advocacy.

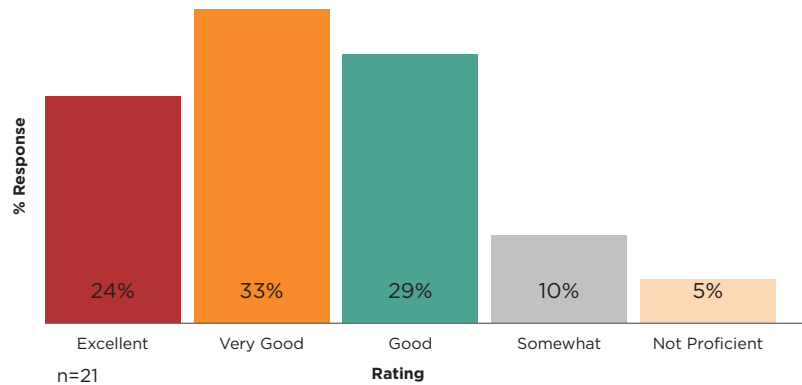
### PROFICIENCY RATING OF TARGET AUDIENCE REACH

Women in engineering body members were asked, "How proficient do you believe your women in engineering body is, at reaching your target audiences through digital communication tools and social media?" on a rating scale of 5 where 5 = excellent and 1 = Not proficient. **Exhibit 11** shows that the majority of respondents rated proficiency of digitally reaching target audiences, as good to very good.

Country specific responses ranged from:

- Ghana: *Somewhat Good to Excellent*
- Nigeria: *Good to Not Proficient*
- Sierra Leone: *Average to Less Than Satisfactory*

"How proficient do you rate women in engineering body's is at reaching your target audience?"



**Exhibit 11:** Proficiency Rating of Target Audience Reach

Social media is constantly evolving, with new platforms gaining popularity as well as new mediums. In this context, WomEng used data analytics to understand which platforms would be better suited and targeted based on popularity and messaging to support the women in engineering bodies with digital advocacy strategies.

## CHALLENGES IMPLEMENTING DIGITAL COMMUNICATIONS EFFORTS

Women in engineering body members were asked, “What do you think are the challenges for your women in engineering body’s digital communications efforts?” Respondents provided a rating out of 5 where 5 = Most Challenging to 1 = Not challenging for each of the challenges listed in Figure 6. Responses were analysed to provide a weighted average rating in terms of highest to lowest challenge.

**Exhibit 12** highlights the key challenges as rated per women in engineering body. The severity of perceived challenges identified per country varied. In Ghana, WinE Ghana perceived the biggest challenge for their women in engineering body was understanding how to reach/influence audiences. In Nigeria, APWEN members perceived the large variety of channels and platforms available to share news and insights as challenging. In Sierra Leone, SLWE members perceived the effort required by SLWE members to implement various digital communication efforts as time-consuming.

**Exhibit 12:** Top Rated Challenges for Implementing Digital Communication Strategies

Top Challenges for Digital Communication Implementation	Weighted Average Value Rating			
	Ghana	Nigeria	Sierra Leone	Total
Too many channels and platforms	63%	90%	53%	69%
Digital communications expertise available to us	56%	60%	87%	68%
It is time consuming	61%	40%	93%	65%
Reaching/influencing audiences	69%	70%	53%	64%
Measuring success	56%	30%	80%	55%

n = 16 (Ghana); 2 (Nigeria); 3 (Sierra Leone)

Weighted Average = Grade (5 = Most Challenging and 1 = Not Challenging) multiplied by % response per rating

Respondents also had the opportunity to share other challenges not stated above. Additional potential challenges noted by women in engineering members included:






- Willingness of women engineers to engage in digital communications
- Affordability of data
- Network connectivity issue
- Lack of technical know-how for some participants

WomEng used this data to support the training programmes and brought in experts to provide insights on leveraging social media in efficient ways.

## PREFERRED SOCIAL PLATFORMS

In August 2020, a snapshot assessment was conducted of existing social media platforms that our three (3) women in engineering bodies are active on. **Exhibit 13** shows that APWEN has the most number of active platforms compared to WinE Ghana and SLWE.

**Exhibit 13:** Existing Social Media Presence (August 2020)

Digital Platforms		APWEN	WINE Ghana	SLWE
World Wide Web		apwen.org	www.winegh.com	slwe.org.sl
Facebook		535 Followers	133 Followers	976 Followers
Instagram		237 Followers	-	-
Twitter		331 Followers	46 Followers	19 Followers
LinkedIn		34 Followers	-	-
YouTube		101 Subscribers	-	-

Women in engineering body members were asked to rate the value each digital communications platform listed in **Exhibit 14** brings you, personally. Correlating to the low social media penetration rates noted in Chapter 3, the top three (3) platforms preferred by women in engineering members are:

- WhatsApp
- Email/Newsletter
- Website

**Exhibit 14:** Top Rated Digital Communication Platforms

Top Digital Communication Platforms	Weighted Average Value Rating			
	Ghana	Nigeria	Sierra Leone	Total
WhatsApp (or other instant messaging apps)	93%	100%	100%	98%
Email/Newsletter	91%	90%	93%	92%
Website	93%	90%	73%	85%
LinkedIn	75%	80%	93%	83%
Youtube	89%	90%	60%	80%
Facebook	75%	70%	87%	77%
Blog	60%	70%	67%	66%
Twitter	50%	60%	80%	63%
Instagram	53%	60%	73%	62%

n = 16 (Ghana); 2 (Nigeria); 3 (Sierra Leone)

Weighted Average = Grade (5 = Most Valuable and 1 = Not Valuable) multiplied by % response per rating

#### PREFERRED SOCIAL MEDIA FORMATS

Women in engineering body members were asked to rate the value each digital communications format or tool listed in **Exhibit 15** brings you, personally. The top three (3) preferred formats for engagement by women in engineering body members are:

- Photos
- Webinars
- Videos

These results align with the digital divide challenges noted in Chapter 3: Responding to a Global Crisis, where platforms like WhatsApp, which require lower data and offer smaller engagement opportunities were more popular than other platforms.

**Exhibit 15:** Top Rated Digital Communication Formats

Preferred Communication Formats	Weighted Average Value Rating			
	Ghana	Nigeria	Sierra Leone	Total
Photos	84%	90%	93%	89%
Webinars	84%	90%	93%	89%
Video	85%	90%	87%	87%
Short-form text (e.g. one-page summaries)	83%	90%	73%	82%
Online advertising (banner ads, social ads or search engine marketing)	74%	90%	67%	77%
Infographics	71%	80%	73%	75%
Micro-form text (e.g. tweets, status updates)	65%	70%	73%	69%
Podcasts	73%	50%	80%	68%
Online monitoring tools	69%	60%	67%	65%
Long-form text (e.g. long-reads, reports, position papers online)	63%	50%	60%	58%
More advanced online data tools e.g. network analysis	68%	40%	60%	56%
Petitions	60%	50%	47%	52%

n = 16 (Ghana); 2 (Nigeria); 3 (Sierra Leone)

Weighted Average = Grade (5 = Most Valuable and 1 = Not Valuable) multiplied by % response per rating

In summary, the digital impact survey and assessment of existing platforms by women in engineering body members highlighted that:

- Majority of women in engineering bodies believe that the COVID-19 pandemic has ushered in an accelerated digital age in West Africa that is here to stay.
- Women in engineering bodies primarily perceive using social media platforms as important to promote events, showcase the brand's personality by profiling women in engineering or share updates from meetings/events/key activities.
- The main challenges that women in engineering body members are faced with include:
  - o Feeling overwhelmed with the number of social media platforms available.
  - o Learning how to effectively reach and influence their target audiences online.
  - o Making effective use of social media in a limited amount of time due to volunteer-based structures.
- Women in engineering body members prefer utilising WhatsApp, direct emails and their website for communication compared to social media platforms.
- Photos, webinars and videos are considered the highest value format for online content.

Considering these insights, the next sub-section outlines three (3) key aspects identified by WomEng to equip women in engineering with resources to improve digital advocacy effort.



## TOOLS FOR CHANGE: AMPLIFYING DIGITAL ADVOCACY WITHIN WOMEN IN ENGINEERING BODIES

The COVID-19 pandemic has required organisations, globally, to turn to digital tools and methods of communication in order to stay relevant, visible and impactful. The power of digital and social has allowed our society to rally around, accelerate and impact international conversations and change via movements such as #MeToo, Black Lives Matter and climate change. There's no question: Digital is rooted in the way we shape and voice opinions, seek out and socialize with others and create change (Forbes.com, 2020).

Women in engineering bodies are at the helm of the gender diversity and inclusion movement in engineering and require strong digital advocacy strategies and action plans to change mindsets, feelings and actions. Through proactive thought leadership sessions with our women in engineering bodies and capacity building redesign considerations, WomEng recognized the need and opportunity during this COVID-19 period for capacity building efforts focused on digital advocacy.

According to the UN (2021), "a lever of change can be understood as an area of work that has the potential to deliver wide-ranging positive change beyond its immediate focus.", WomEng identified three (3) key levers of change to amplify digital advocacy efforts, namely:

1. **Leverage compelling storytelling:** Learning HOW to develop a framework for building a compelling narrative about diversity and inclusion.
2. **Leverage digital platforms and tools:** Learning WHERE to engage with target audiences.
3. **Leverage digital formats:** Learning WHAT formats of content to post.

Each of these levers target critical levels of planning and implementation in terms of delivering impactful digital advocacy initiatives, namely:

- **Strategic:** Building an effective narrative that simply and clearly illustrates long-term aims, interests and means of achieving them.
- **Tactical:** Developing systems and processes for the approach e.g. which platforms best which platforms best serve the desired results; considerations for meeting the target audiences on platforms they utilise most.
- **Operational:** On a day-to-day basis, how to best disseminate information and educate target audiences on the issues related to diversity and inclusion.

**Exhibit 16** illustrates the model adopted by WomEng to build digital advocacy.



**Exhibit 16:** Key Considerations for Planning and Implementing Digital Advocacy Efforts

Through a three (3) part master class series, Leading in A Digital Age, experts in digital media provided insights and guidelines to our partner women in engineering bodies for leveraging each of the changes noted above.

Key considerations for leveraging each of these digital advocacy aspects is detailed in the sub-sections to follow.

“No one ever made a decision because of a fact. They need a story”  
- Daniel Kahneman

## LEVERAGING COMPELLING STORYTELLING: UNDERSTANDING YOUR WHY

“No one ever made a decision because of a fact. They need a story”, states Daniel Kahneman a Nobel Prize winner, notable for his work in behavioural economics. In Chapter 3, we noted that shifting mindsets and culture poses the biggest challenge for normalizing the role and participation of women in engineering. People need to make sense of the change before they change. According to McKinsey and Co (2011), telling the compelling story of change is essential to the success of any transformation effort. Stories reflect our values and our actions and have been critical to the passing down of traditions between generations. If we want to change traditions, we need to change our stories. What we tell ourselves over time is what we begin to believe. In the digital landscape, stories can be far reaching, requiring impact at various levels of society.

Knowing why we need to manage change helps define what we need to do.

Learning how to develop a framework for effective storytelling can enable women in engineering bodies to build a compelling narrative about diversity and inclusion that connects with stakeholders and promotes participation.

## HARNESSING THE POWER OF STORYTELLING - MOKENA MAKEKA

“Make it personal but not about the person” – Mokena Makeka

Mokena Makeka, an accomplished architect, artist, creative, curator, designer, global leader, scholar, speaker, urbanist led a master class for our women in engineering bodies on harnessing the power of storytelling to shift mindsets and engage target audiences in gender diversity and inclusion initiatives. This master class required our women in engineering bodies to think about their organisation’s strategic vision, mission and objectives; assessing how effective they were in connecting with stakeholders and promoting participation to change the status quo on gender diversity and inclusion in engineering.

Strategic level considerations relate to developing impactful stories of change. Key considerations towards building strong stories of change include:

1. Understanding what makes a good story: Mokena outlined seven (7) characteristics of great stories that should be considered when communicating theories of change. These characteristics as outlined by ABC Copywriting (2013) include:
  - a. **Trust in the teller:** Our feelings about a storyteller influences our reaction to their story.
  - b. **Drama:** Stories need dramatic development and emotional dynamics.
  - c. **Relatability:** The more people identify with a story, the more likely they are to be persuaded.
  - d. **Immersion:** The more readers put themselves into a story, the more likely they are to change their opinions.
  - e. **Simplicity:** Simple stories are strong stories. Take out everything that doesn’t serve the narrative.
  - f. **Agency:** Stories are most persuasive when readers work out their meaning for themselves.
  - g. **Familiarity:** The more familiar a story feels, the more powerful it is.

2. Mastering story making: When communicating stories of change about gender diversity and inclusion, consider the seven (7) key skills of story making outlined by Matthew Bird, a media and strategic communications executive (2011):
  - a. **Concept:** Be able to communicate your big idea, simply. Be able to describe your visions, mission and objectives in 1 – 2 sentences.
  - b. **Character:** Understand the roleplayers within the gender diversity and inclusion in engineering space and how to make it easy for them to participate.
  - c. **Structure:** Highlight high points and low points in shifting the needle on gender diversity and inclusion in engineering.
  - d. **Scene work:** Consider the necessary elements required to make your story of change relatable to your target audiences. An effective story of change typically has 3-parts namely (1) the set-up (context), (2) the conflict (challenge/opposing agendas) and (3) the outcome (the change going forward).
  - e. **Dialogue:** Be able to match the dialogue to the intended type of audience.
  - f. **Tone:** Clarify what type of story you are telling e.g. a story of hope, happiness or failure.
  - g. **Theme:** Outline the bigger objectives that a single story ties to.

## Reflections from Women in Engineering Body Members

On reflection of her highlights about harnessing the power of storytelling, Rugiatu Koroma, Vice President of SLWE noted “The world is presently revolving around technology. Any organisation with big dreams must adjust to this phenomenon. Digital communication is faster and can reach many at the same time. The medium of communication must be customized in a way that is appropriate for the desired audience in order for one to achieve its desired objective.”

Box 8

## LEVERAGING PLATFORMS AND TOOLS: UNDERSTANDING WHERE TO ENGAGE

Digital communities and platforms are getting bigger in West Africa. In Sierra Leone, active social media users grew by 15% (+92 000 users) between April 2019 and January 2020. Similarly, active social media users in Nigeria grew 22.2% (+6 million people) and Ghana, 36.7% (+2.2 million people) during this same time period. Comparatively, the global digital growth was 13.2% during this same time period.

Leveraging digital and social media platforms and tools to meet people where they are can help women in engineering bodies:

1. **Shorten the distance between change-agents and society:** Few things are more important during a change event than communication from leaders who can paint a clear and confidence-inspiring vision of the future. Social media has been able to flatten the hierarchy of leaders vs. civilians.
2. **Give society a role in shaping the future:** Many say the most difficult part of change at work is feeling powerless over the future.
3. **Build community:** To offer camaraderie and space to process uncertainty. It's a space where people go to discuss, collaborate, and create shared.



“You need to speak to what matters to them” - Mimi Kalinda

Mimi Kalinda, Group CEO and Co-founder of Africa Communications Media Group, a pan African public relations and communications agency led a master class for our women in engineering bodies on leveraging communication platforms and public relations in a digital age.

Tactical level considerations relate to systems and processes required to deliver impactful messaging about the change required for gender diversity and inclusion in engineering. Key tactical level considerations towards shifting mindsets and promoting participation include:

1. **Positioning:** Building key messages for different target audiences
2. **Approach:** Meeting target audiences where they are on social media platforms
3. **Playbooks:** Delivering consistent impactful communication.

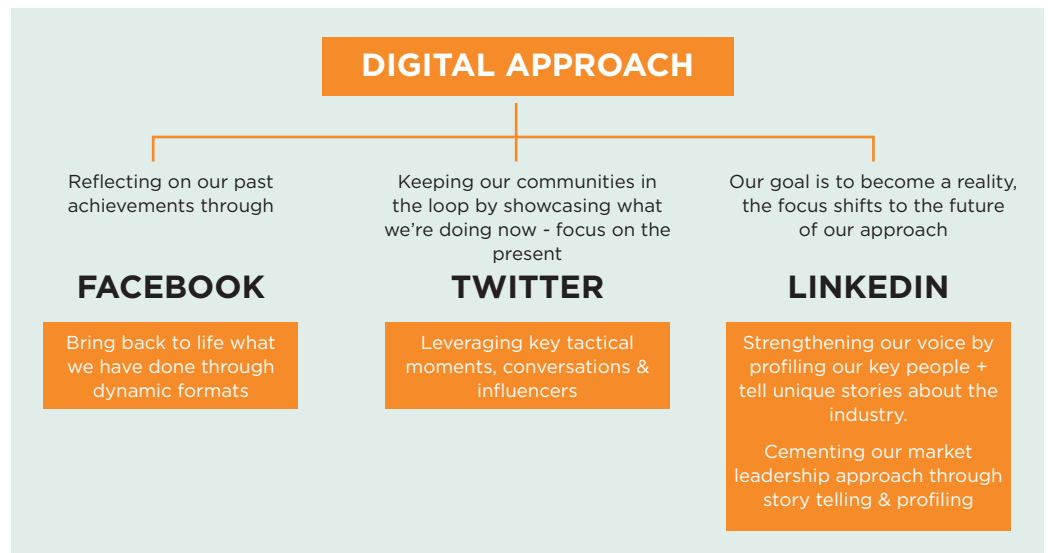
### POSITIONING

- Adapt your narrative to content that will contribute significantly to your audience
- Your audience needs to feel like they have walked away with something; that you have contributed to their knowledge as well.
- Step away from jargon – if we are talking about engineering, you have to spend time to distil your message to remain simple and clear. The responsibility of the communicator to be understood.
- Inspirational leaders are able to connect what they do to the overall contexts of the environments in which they work. Communication does not happen in a vacuum. As such, linking gender diversity and inclusion to current affairs can compound interest and participation from target audiences.
- Having a clear call for action.

### APPROACH

Not all social and communication platforms are built the same. Women in engineering bodies need to adopt social media platforms specific to the type of content it best delivers. Based on the digital impact survey results from women in engineering bodies and market trends, use of visual content-driven platforms are growing exponentially. The pandemic has overwhelmingly increased the amount of online video people watch (Hubspot, 2021). In terms of social media, **Exhibit 16**, outlines a suggested digital approach to utilising three (3) common social media platforms to deliver messaging in different ways based on the type of user. Suggested use for the top three (3) most common social media platforms in West Africa includes:

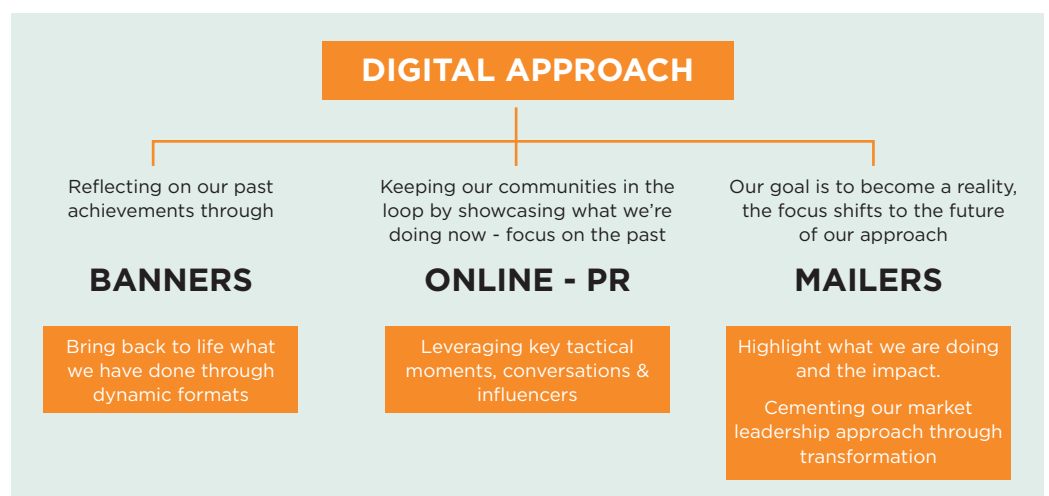
- a. **Facebook** – Past - Bring to life what we have done through dynamic formats. Share updates of events that have already happened and profile stories of people.
- b. **Twitter** – Present – Focus on what is currently happening. Twitter is quick and short form to keep communities in the loop by showcasing is happening now.
- c. **LinkedIn** – Future - Profile key people and stories about the industry. Thought leadership articles are also suggested.



**Exhibit 17:** Suggested Digital Approach to Social Media

Alternative digital media other than social media also provides impact in delivering stories of change. Three (3) of the most common alternative digital mediums to social media are outlined in **Exhibit 18** and include:

- **Banners** – website has a clear call to action
- **Online PR/Influencers** – leveraging your community to share opinions and content in the spaces they have created
- **Mailers** – engaging through email



**Exhibit 18:** Suggested Digital Approach to Alternative Media

**PLAYBOOKS:**

Community strategies or playbooks help deliver more consistent and impactful messaging. When developing guidelines for an organisation, recommended aspects to include:

- **Platform approach:** Which platforms will be used and who will be the key target audience?
- **Social tone and voice:** If you had to describe your organisation as a person, what kind of person will they be? Will the tone of your messaging be conversational or formal?
- **Content guidelines:** How is content created? What type of content will be communicated?

## Reflections from Women in Engineering Body Members

“How you tell a story is important to how the information is interpreted.”

- Ametorxe Asamoah-Okyere, WinE Ghana

“(You) must have your audience in mind, Ability to communicate with pictures, communications on all forms of social media is necessary.” - Engr. Dr. Elizabeth Eterigho, APWEN

“(With digital communication), more people are able to be connected or communicated than physically.”

- Patricia Pokua Sasu, SLWE

Box 9

## LEVERAGING FORMATS: UNDERSTANDING WHAT TO POST

“Certain types of content lend themselves better to particular industries than others. Some segments of your audience may also be easier to reach with one content format over another.” - Kenichi Serino

### SHARING IMPACTFUL OPINIONS - KENICHI SERINO

Kenichi Serino, an international journalist, media trainer and researcher led a master class for our women in engineering bodies on sharing impactful opinions.

Having an opinion is important. Opinions bring new ideas. Opinions bring about change. That is why it is not just important to have an opinion but to share it as well. Globally, diversity and inclusion is increasingly gaining traction requiring confident change-agents to push forward new opinions.

Operational level considerations relate to day-to-day communications that shape the strategic level story. Key operational level considerations towards shifting mindsets and promoting participation include:

- Considering several different content formats – not just blog posts and written content. Consider traditional vs social media format e.g. news coverage on television and radio vs. videos on YouTube.
- Researching your audience to get a better idea of the types of content they engage with and share. In the digital impact survey of women in engineering body members, the top three (3) preferred formats were photos, webinars and videos.
- Re-purposing one piece of content into several different formats

## Reflections from Women in Engineering Body Members

“Communicating effectively, using traditional media or social media to practically support organisational and personal stories of women engineers in developing impactful opinions in society.” - Annabel Mawuena Buabasa, WinE Ghana

Box 10



# CHAPTER 6

## Digital Advocacy in Practice

Following capacity building initiatives run by WomEng as detailed in the previous chapter, the women in engineering bodies were tasked with piloting outreach initiatives within their countries incorporating a digital advocacy component. The objective of this outreach was three-fold:

1. Increase awareness of engineering and technology skills and opportunities for girls and women
2. Raise the profile of women in engineering
3. Test digital advocacy strategies for longer term development

The outreach initiatives in Ghana, Nigeria and Sierra Leone were planned and implemented between January 2021 – May 2021 by the respective women in the engineering bodies. Outreach initiatives hosted in each country aimed to maximize impact while considering:

- Alignment with existing organisational objectives and strategies of the women in the respective engineering bodies
- COVID-19 safety regulations within respective countries
- Assumptions by the women in the respective engineering bodies on internet access and connectivity by primary beneficiaries

Each women in engineering body developed individual digital advocacy strategies and aligned outreach initiatives based on the considerations noted above. This resulted in three (3) different frameworks adopted for testing digital advocacy in outreach initiatives, namely:

**IN-PERSON PROGRAMMING SUPPORTED BY DIGITAL ADVOCACY:** SLWE, Sierra Leone initiated a mentorship programme to bridge the gap between generations. Social media was utilised to create awareness and raise the profile of women in engineering.

**FULLY DIGITAL:** WinE Ghana, adopted a fully digital advocacy approach to building new relationships with parents and teachers.

**HYBRID:** APWEN Nigeria, implemented a multi-level initiative using a balanced combination of in-person programming and digital advocacy; ultimately connecting its' 37 chapters across Nigeria in an online challenge for high school girls while acknowledging and showcasing and celebrating diversity and inclusion champions.

Each of these initiatives are detailed in the sub-sections below providing an overview of:

- **BACKGROUND, AIMS AND OBJECTIVES:** An assessment of the considerations noted above
- **SPECIFIC INITIATIVES:** Details about the implementation of the outreach initiatives and how digital advocacy was incorporated
- **IMPACT:** Measuring success in relation to the outreach objectives
- **CHALLENGES:** Highlighting any key challenges from which lessons could be derived.
- **HINTS AND TIPS:** Considerations for future development
- **NEXT ACTIONS:** Intentions for the continued growth of digital advocacy

## CASE STUDY: SLWE BRIDGING THE GAP BETWEEN GENERATIONS

### BACKGROUND, AIMS AND OBJECTIVES

Sierra Leone Women Engineers Vision 2025 strategy is to strengthen the organisation and increase the number of girls studying engineering by 25% across the country in all tertiary institutions. Key objectives of this strategy include:

**Women Ambassadors:** Create a cadre of Women Engineering Ambassadors who are trained and skilled as mentors to inspire younger girls to develop an interest in engineering as a career.

**Saturday Club:** Provide practical intervention to secondary school girls to enjoy the study and practice of engineering and to see it as a potential future career for themselves.

**Develop and promote a diversity and inclusion toolkit and policy:** Promote the need for diversity and inclusion policies among Sierra Leonean companies starting with engineering companies.

**Fearless Girl Campaign:** Provide an avenue for girls to meet with professionals to build their confidence and inspire to be fearless in all they do.

**Taking engineering to rural areas:** Introduce engineering as a developmental tool to young girls in rural communities, which can be used to improve and develop communities through specific community led activities.

This outreach initiative provided an opportunity for Sierra Leone to pilot their mentorship programme aligned to their Women Ambassadors strategic objective. Corresponding outcomes to this objective included:

- Providing training to women in engineering to enable them to act as mentors
- Providing career guidance and support to enable women in engineering to grow, improve their productivity, build networks and improve their career progression
- Encouraging women in engineering to take up more responsible positions in professional bodies and the workforce
- Advocating and lobbying for women in engineering and students who face sexual harassment, or any form of discrimination

The aim of this mentorship programme was to encourage young women and girls to challenge the status quo that women too can be engineers, inspire young girls in secondary schools to develop an interest in the world of science and to encourage women studying towards engineering qualifications to work hard and achieve their goals.

In terms of digital advocacy, Sierra Leone has one of the lowest digital penetration rates in the world. Only 12% of the population (7.8 million) has access to the internet, the number of mobile phones in use equates to 79% of the population and only 8.1% of the population utilise social media. SLWE took this into consideration when assessing where impact could be made during this period, thus adopting a heavier weighted in-person component to the outreach initiative while utilising social media platforms to promote the initiative and educate others in parallel with direct beneficiaries. The COVID-19 regulations in Sierra Leone during this period allowed for small group in-person events allowing Sierra Leone Women Engineers to launch a 5-week in-person mentorship programme.

## SPECIFIC INITIATIVES

The Sierra Leone Women Ambassadors Mentorship programme followed five (5) senior women in engineering as they mentored and inspired young women in engineering, who have been through the SLWE Saturday Club programme and are now studying engineering at the University of Sierra Leone.

Pairings between mentors and mentees were tailor-made e.g. each of the mentees were paired with mentors that worked in the mentee's current field of study. This gave the mentees an opportunity to see women thriving in their fields of study.

The five (5) mentor-mentee pairs underwent a 5-week programme outlined as follows:

- Week 1 - Introduction meeting
- Week 2 - First 1-on-1 meeting
- Week 3 - Second 1-on-1 meeting
- Week 4 - Third 1-on-1 meeting
- Week 5 - Wrap up meeting

During the Introduction meeting in Week 1, mentors and mentees were provided with a master class on mentorship, understanding expectations and breaking the ice between mentors and mentees. Between weeks 2 and 4, mentoring pairs met on a 1-1 basis sharing career advice, personal experience, technical training and connections to new networks. In Week 5, the wrap up meeting brought all mentoring pairs together to reflect on their experiences. Presentations of experiences concluded the pilot phase of the Women Ambassadors Mentorship programme. The mentees gave individual presentations of the meeting sessions they had with their mentors and expressed what their experiences had been like. They also included several recommendations which they believed would make the project even more unique.



## A Mentor Mentee Experience



Eng. Trudy Morgan and Alice Conteh, a mentor-mentee pairing



Eng. Trudy Morgan and Alice Conteh (**Box 11**) were one (1) of the five (5) mentoring pairs. Eng. Trudy Morgan is the President of the Sierra Leone Institution of Engineers and Co-Founder of Sierra Leone Women Engineers. Alice Conteh is an engineering student at the University of Sierra Leone. In one of the early 1-on-1 meetings, Eng. Trudy Morgan and her mentee Alice spent a day together to provide Alice with insight to Eng. Trudy's every day work life, serving multiple professional roles.

On this experience, Eng. Trudy Morgan noted, "This will help her time management skills and also her ability to multi-task but most importantly, it builds the foundation of our conversations because every time I took her to an event or a meeting I ask her questions on what her comments, questions or concerns may be based on the activities that had happened there. This always sparked a long conversation... until the next meeting, event of course".

Part of their time together included visiting the Architecture Department where Alice joined a class of other students who were part of a workshop on "Upgrading Engineering Education and Practice in Sierra Leone" organized by The Sierra Leone Institute of Engineers and The Professional Engineers Registration Council in conjunction with The Royal Academy of Engineering. Eng. Trudy and Alice also went on to Parliament where Eng. Trudy Morgan is the Project Manager of the refurbishing of Parliament. Alice is now an intern there and working on site, collecting data and doing daily reports. Working with her mentor is also an opportunity for Alice to learn the ropes of the profession she loves.

Eng. Trudy Morgan noted, "This will help her time management skills and also her ability to multi-task but most importantly, it builds the foundation of our conversations because every time I take her to an event or a meeting I try to ask her questions on what her comments, questions or concerns may be based on the activities that had happened there and that always sparks a long conversation... until the next meeting or event of course".



## IMPACT

Bridging the gap between generations: Ten (10) women undertook intensive knowledge and skills sharing over a 5-week period. Mentees benefitted from expert career advice, learnt from the personal experiences of their mentors and had the opportunity to explore the practical side of their studies. The mentees also gained a new platform to network with other engineers and build their connections. As they continue with their studies, the mentees now have a firm sense of what the engineering industry is beyond their classroom. Mentors also noted significant benefit from the programme. Prior to the engagements, senior women in engineering had misconceptions about the younger generation such as the partying culture and believing that the younger generation do not take studies seriously. These misconceptions were cleared as they learnt more about their mentees and the challenges they face now.

- Virtuous cycle of mentoring: The young women mentored on this programme intend on mentoring high school girls on Sierra Leone Women Engineers Saturday Club School which they were once beneficiaries of. This creates a virtuous cycle of confident and engaged girls and women in engineering.
- Increased visibility for the organisation and women in engineering through digital advocacy:
  - o Awareness of the programme and individual experiences of mentors and mentees were shared on SLWE's social media platforms. More than nineteen (19) posts were made on the Sierra Leone Women Engineers Facebook page, Twitter and LinkedIn accounts as well as through WhatsApp via statuses by SLWE members.
  - o Facebook is the most used and engaging platform by SLWE. Posts about the mentorship programme launched on the 13th of March 2021 correlated with an increase in followers. SLWE's Facebook page grew by 49% from 973 followers (16 March 2021) to 1 451 followers (26 April 2021).
  - o During 16 March 2021 and 26 April 2021, Sierra Leone Women Engineers Facebook posts had a reach of 62 619 and 13 062 engagements.
  - o More engineers are now also more aware of the programme and interested in becoming mentors.

## CHALLENGES

- Managing demand: SLWE experienced a high demand and interest from young engineers to be mentees on this programme. The number of interested mentees outweighed the number of mentors that were allocated for this pilot initiative.
- Platform administration and management: The SLWE team struggled in the initial days to obtain the login details for their Twitter and LinkedIn accounts created. Management of such admin was not prioritised prior to this project leading to delays in tracing the required login details.
- Cost of data: SLWE noted that data is relatively expensive in Sierra and is most often a limiting factor for even basic access to social media platforms by the majority of citizens.
- Content development: SLWE members perform their organisational duties in a volunteer capacity on top of their regular engineering day jobs and domestic and family responsibilities. The organisation is still in a learning phase thus content development requires much effort from team members which can be a challenge in terms of consistent dedication from the team.

## HINTS AND TIPS

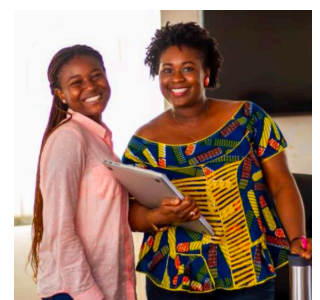
- Ensure record management systems are in place for the organisation's digital platforms. Within the organisation, loss of login details could result in challenges with accessing networks developed already. It also has high cyber-security risks and implications.
- Invest in social media training for key personnel within the organisation. Eng. Trudy Morgan in her role as President of Sierra Leone Institution of Engineers has mandated social media training for their administration assistant. This will continue in-house skills development towards ensuring sustainability of digital advocacy initiatives.

## NEXT STEPS

SLWE noted that this mentorship programme is the first of its kind in Sierra Leone. The impact of this project went beyond their direct beneficiaries. The project impacted other young people as well as their friends and families. It forms an indisputable bond between mentors and mentees whilst also acting as a form of solidarity to other female engineering students who are not fortunate to participate, reminding them to be studious and showing them that their dreams really could become a reality by showing women who continue to excel in the same field as they hope to excel themselves. It is prudent that this project is sustainable. It is definitely a step in the right direction to encourage more young women and girls to enter and thrive in the world of engineering.

Next steps noted by SLWE included:

- Developing a short film that follows the engineering mentors and their mentees as they meet (in groups and individually) to discuss their challenges, hopes and dreams, aspirations and how they can overcome some of these issues faced. This will be hosted on their website and clips posted on social media.
- Posting social media updates about the programme and stories of successfully paired mentors and mentees once every month, with the aim of reaching 10,000 younger girls through targeted social ads.
- SLWE Hour to be a partnership with AfriRadio. The talk show format will be two panellists and a moderator conversing on a selected topic or theme of the month.



## CASE STUDY: WINE GHANA BUILDING NEW RELATIONSHIPS ON SOCIAL MEDIA

### BACKGROUND, AIMS AND OBJECTIVES

WinE Ghana's vision is "to be the leading female engineering association that encourages females to achieve their fullest potential no matter their ethnic origin or social background." Some of the organisation's key strategic objectives related to this case study include:

- Promoting the study and practice of engineering amongst females
- Supporting and encourage women engaged in the study and practice of the engineering profession
- Ensure the provision of equal opportunities for both genders in their pursuit of engineering careers
- Career Counselling (in Secondary and Tertiary Institutions)
- Mentoring young female science and engineering students

With this outreach initiative, WinE Ghana intended to make strong use of its digital platforms to reach out to its target audience, namely:

1. Parents/Guardians/Adults - These groups of people have a high influence on their children and can encourage them to study engineering.
2. Teachers - the modern-day child spends 6-8 hours at school with teachers. Teachers are the childrens' second parents. Thus, targeting teachers of some selected schools will also be our primary focus.
3. Children (5-12 years)
4. Students (13 years upwards)

The key objectives set by WinE Ghana for this outreach initiative included:

1. Reaching out to a minimum of one-hundred (100) children
2. Reaching out to a minimum of fifty (50) parents and adults
3. Reaching out to a minimum of fifty (50) teachers
4. Mentoring a minimum of fifty (50) students using digital channels for communication (WhatsApp, feedback forms, etc)

### SPECIFIC INITIATIVES

WinE Ghana established an 8-point plan to implement outreach initiatives in Ghana, namely:

1. Prepare and implement a digital advocacy plan
2. Set up an editorial board comprising of five (5) persons to be responsible for posting on pages bi-weekly
3. Get a consultant to assist WinE Ghana in implementing the advocacy plan
4. Establish target groups and commence stakeholder engagements
5. Create all the digital channels for adults and kids
6. Prepare content
7. Post content on digital channels
8. Monitor, record KPIs and measure impact of digital advocacy activities

WinE Ghana's outreach initiative brought together students, parents, teachers and professional engineers under one umbrella to offer career guidance for young girls and to encourage parents to guide their children to pursue an engineering career. This was done through a number of online engagements which is outlined on the next page.

### WINE GHANA FORUM – THE ROLE OF THE FEMALE ENGINEER IN ACHIEVING THE SDGS

WinE Ghana successfully organised a forum for members. The forum focused on SDG 4 through to SDG 9. Women in engineering working in these fields gave presentations on achieving the SDGs in their fields of work. WinE Ghana members gained a better understanding of the SDGs. A total of 101 WinE Ghana members attended this forum.

### WINE GHANA INFORMATION SESSION 1

The purpose of this session was to engage teachers at Oyster International School about the importance of engineering education and career opportunities. WinE Ghana formed a partnership with Oyster School based in Accra, by adopting them as their model school to monitor the impact of outreach initiatives over a number of years. Post this pilot, WinE Ghana will periodically organise outreach initiatives with the high school girls and do follow ups to identify the number of girls that have gone to pursue engineering studies. The school was excited with WinE Ghana's proposal and informed them that this was in line with their intention of ensuring that more girls study mathematics and science related subjects. A total of 27 teachers and guardians engaged with WinE Ghana on this call.

### WINE GHANA INFORMATION SESSION 2

WinE Ghana successfully held one outreach programme through virtually reaching out to over two hundred (200) high school girls from different schools. Digital tools made it possible for WinE Ghana to have international speakers share their work experiences. Ghanaian engineers were also able to share their experiences and make engineering attractive to girls. Schools gathered students and connected to Zoom in order to participate in the outreach programme. WinE Ghana utilised many platforms including WhatsApp, Facebook, YouTube and Twitter to promote the event along with consultations with school authorities. Science tool kits were also distributed to the students in the participating schools.

### WINE GHANA MENTOR-MENTEE ONLINE

WinE Ghana engaged online with women currently studying towards an engineering qualification to in relation to their on-going mentoring programme. Both mentors (senior engineers) and mentees (engineering students) were given guidelines for effective mentoring. The mentor-mentee virtual session brought together six (6) mentors and seventeen (17) mentees during which the existing mentorship programme was evaluated to discuss the challenges that had been identified so far and come up with possible solutions towards a better engagement between mentors and mentees. There are currently 150 mentors and 153 mentees whose data was documented by WinE Ghana.

In addition to the above, the following activities were carried out on the following channels:

- **WinE Ghana website** – The WinE Ghana website boasts of an array of publications and posts, namely opinion articles, videos and thought-provoking phrases on pursuing engineering by females.
- **Facebook** – An opinion article was written concerning female engineers whose activities have greatly impacted the milestones attained by WinE Ghana. These articles were posted on WinE Ghana's Facebook page.
- **LinkedIn/Twitter/Instagram** – The team has been exploring optimum ways to use of these platforms in terms of digital advocacy.



## IMPACT

Based on the objectives outlined by WinE Ghana, progress on success metrics included:

- Reach out to a minimum of one-hundred (100) children: 100% completed
- Reach out to a minimum of fifty (50) parents and adults: 100% completed. Two different programmes were organised through zoom to meet the set target. The WinE online forum and the WinE Outreach programme were activities that WinE Ghana used to reach out to parents who were very optimistic. They indicated from the poll results that similar WinE activities held would better help them in guiding and assisting their wards in choosing courses of study.
- Reach out to a minimum of fifty (50) teachers: This objective was successfully accomplished through two different outreach activities via zoom. An online meeting with the teachers and the WinE Outreach programme provided an avenue for WinE to engage with teachers from a model school who embraced the programme, decided to work in partnership with WinE Ghana and encouraged the association to continue with such activities.
- Mentor a minimum of fifty (50) students using digital channels for communication (WhatsApp, feedback forms, etc): WinE's ongoing mentoring programme continued with the establishment of WhatsApp mentor and mentee platforms to increase collaboration and improve communication. Additionally, an online Zoom meeting was held between mentors and mentees to evaluate and ensure better engagement between mentors and mentees.

In addition to the impact noted above, the project impact was measured by taking note of the increase in engagement (views and likes) on the WinE Ghana YouTube and Facebook channel per video upload, as well as the number of subscribers on the YouTube channel over the period of the project. The impact on the Facebook channel was measured by recording the number of members in the Facebook group and the number of likes per issue or video posted. In the case of programmes held via Zoom video conferencing, the number of people who joined each programme was noted. These statistics are highlighted in **Exhibit 19** and **Exhibit 20**.

**Exhibit 19:** WinE Ghana Success Metrics - Direct Participants

Key indicators	Baseline value	Target value	Current value
Number of zoom participants (meeting with teachers of Oyster School)	0	20	27
Number of zoom participants (WinE Ghana outreach and advocacy programme)	0	100	220
Number of zoom participants (WinE Ghana Forum)	50	100	101
Number of zoom participants (mentor-mentee interaction)	15	20	23

**Exhibit 20:** WinE Ghana Success Metrics – Social Media Platforms

Key indicators	Baseline value	Target value	Current value
Facebook page members	102	1000	206
Facebook group likes	90	50	164
YouTube kids subscribers	2	100	22
YouTube kids WinE Forum views	7	1000	35
YouTube kids WinE Forum likes	5	1000	4
YouTube kids meeting with Oyster school views	5	1000	23
YouTube kids meeting with Oyster school likes	2	50	3

## CHALLENGES

- Steep learning curve: Digital advocacy was new to the team and learning how to use the tools was challenging and a great learning curve. Members of the project team continuously educated themselves using online tutorials for the digital tools used.
- Content development: Difficulty in preparing content, posting and monitoring requires dedicated hands. WinE Ghana needs to have people dedicated to this cause. The project team decided to settle on organising four (4) major online programmes to reach out. These programmes were recorded and published on two of our platforms for the project.
- Organising outreach events while maintaining COVID-19 regulations: Difficulty in organising the target groups especially the students (school children) in the midst of COVID-19 pandemic. The project team worked with the schools to organise the students to meet in separate halls and connect to the online programme from the school premises.
- Internet connectivity: Internet technology in rural communities is a major challenge (nationwide coverage is a problem; students from there may not have access to information). The recorded programmes would be played directly to students in rural communities to overcome the issues related to connecting online directly during the programme.

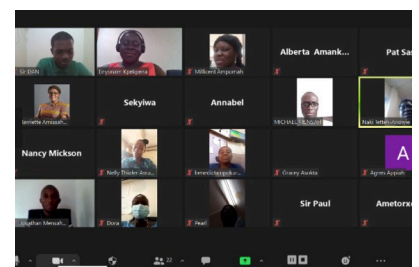
## HINTS AND TIPS

- Establishment of a dedicated digital advocacy/editorial team: WinE Ghana members that participated in the series of master classes hosted by WomEng, established a dedicated editorial team consisting of 20 members directed by an 8-member Digital Advocacy Board.
- WinE Ghana worked with schools as central points to engage virtually with girls, reducing ratio of data connectivity points to girls. This model reduced the logistics for WinE Ghana while increasing the number of girls reached.

## NEXT STEPS

WinE Ghana intends to continue with the momentum gathered during this engagement. Post funding, Wine Ghana intends to continue with the following activities:

- Continuous engagement with the Oyster school which it has adopted to use as a model school in order to mentor and counsel students to pursue engineering. As well as to encourage female students that they too can excel in engineering.
- Continual use of online tools to reach out and mentor young girls and females as they pursue engineering education and enter the work force to reduce the number of females who change engineering careers after entering the workforce.
- Development of new partnerships with other educational institutions to promote the study of engineering amongst females using online tools.
- Engagement with science and engineering clubs to promote the practice of engineering through hands on projects and activities using online tools.
- Growth of social media subscribers and viewership. Wine Ghana intends to engage a dedicated team to help use these tools, monitor and measure progress and success.
- WinE Ghana intends to use TV, radio and print media engagements to increase awareness and reach areas where internet connectivity is a challenge.
- WinE Ghana intends to establish all the remaining online platforms including LinkedIn, Instagram in the short-term and post its programmes and articles in order to reach a larger audience.
- WinE Ghana will ensure that the digital advocacy board ensures the continuous implementation of its strategy.



## CASE STUDY: APWEN CONNECTING ACROSS REGIONS

### BACKGROUND, AIMS AND OBJECTIVES

APWEN's vision is "to be the catalyst for advancement of women in the engineering profession towards national and global technological development." The organisation's key strategic objectives include:

- To provide a forum for promoting sorority amongst female engineers.
- To encourage engineering studies and practice amongst female Nigerians.
- To create a platform by which women engineers can collaborate with other women in other professions in Nigeria and elsewhere.

Utilising their network of 37 chapters across six geopolitical zones in Nigeria, APWEN implemented a multi-level initiative using a balanced combination of in-person programming and digital advocacy; ultimately connecting high school girls through an online competition culminating in a grand finale event which acknowledged, showcased and celebrated gender diversity and inclusion champions at a national awards event in Lagos, Nigeria and virtually on Zoom. Building on APWEN's organisational strategic objectives, APWEN's objectives for this outreach initiative included:

- Increasing public acceptance that engineering is a career for girls too
- Mobilize others to "recruit engineering girls"
- Inspire more than 100 girls to study engineering

Digital advocacy tools were utilised to promote the competition and grand finale/ awards event. Schools with primary participants and related stakeholders connected to events hosted at zonal and national levels using virtual platforms like Zoom. Social media platforms were utilised to market the competition to girls and the awards event to various target audiences. Planned social media targeting included:

- Instagram - targeted the girls
- Facebook - targeted parents and guardians
- Twitter - targeted parents, guardians, public
- LinkedIn - targeted professionals
- YouTube - targeted all

The COVID-19 regulations in Nigeria during this period allowed for small group in-person events allowing APWEN to host in-person events in larger cities while connecting schools from outer lying areas via virtual platforms like Zoom.

### SPECIFIC INITIATIVES

APWEN's outreach initiative incorporated two (2) key components, namely:

- Who Wants to Be an Engineer? - an engineering competition for high school girls across Nigeria
- International Women's Day Event and Awards - an in-person event hosted on 09 March 2021 to honour and celebrate diversity and inclusion champions and the finale for the Who Wants to Be an Engineer? competition for high school girls.

These initiatives are further outlined on the next page.

### WHO WANTS TO BE AN ENGINEER?

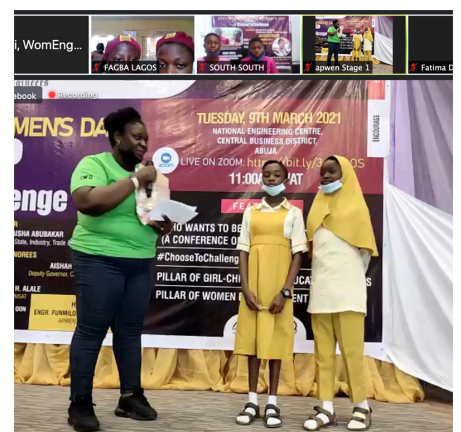
Who Wants to Be an Engineer? was an activity-based competition designed by APWEN for girls aged 10 – 14 years old in junior secondary school. The activity required girls to design and construct engineering related mechanisms using materials provided e.g. a cardboard hydraulic jack.

The competition was implemented in two (2) phases:

- A preliminary competition for high school girls was hosted in each of the six geopolitical zones of Nigeria by APWEN chapters within each zone. An in-person event was hosted in the main city, Abuja with outer lying schools connecting virtually on Zoom.
- Finalists i.e. 2 girls from each zone were selected to participate in the grand finale which was hosted alongside APWEN's 2021 International Women's Day celebration and awards event on 09 March 2021.

### INTERNATIONAL WOMEN'S DAY EVENT AND AWARDS

APWEN's 2021 International Women's Day Celebration and Awards Event was hosted in a hybrid format; the main event was in-person with participants from across regions joining virtually on Zoom. The event was also streamed live on APWEN's Facebook page.





## IMPACT

- Connecting chapters and girls from across various regions simultaneously: Raising awareness about engineering was created by chapters at zonal and national level. 20 out of 37 APWEN chapters across Nigeriaparticipated in the Who Wants to Be An Engineer? programme, with reach out to schools in-person and virtually. In total, more than 1 000 girls have engaged through the various levels with APWEN during this initiative.
- Scholarships: Through additional partnerships with external stakeholders, APWEN was able to provide scholarships for up to three (3) years for the top three (3) winners of the “Who Wants to Be An Engineer?” competition.
- Enabled public schools to adopt the use of technology: APWEN were insistent with schools that they adopt a virtual approach vs the traditional approach of travelling to in-person events.

## CHALLENGES

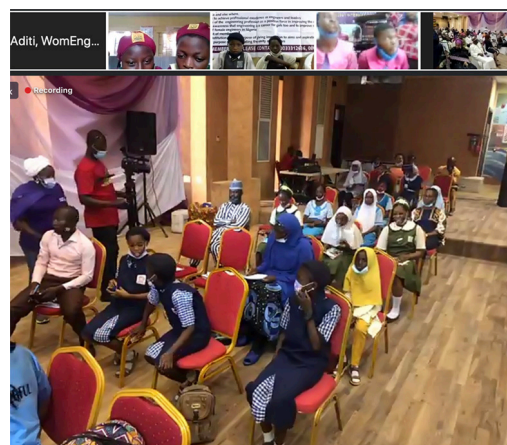
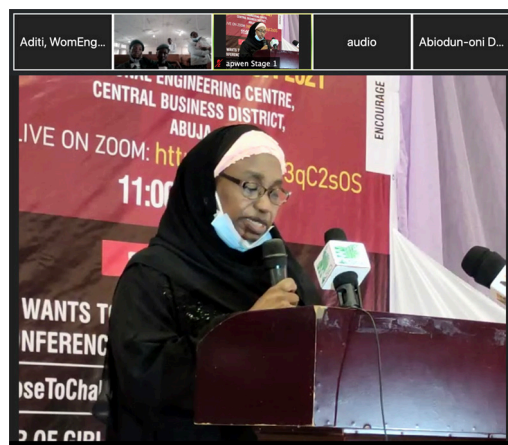
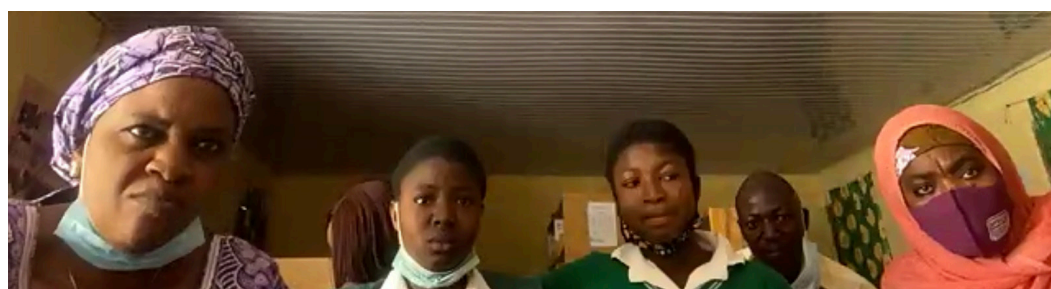
- Internet connectivity: Some schools in outer lying areas experience intermittent disruptions resulting in a break in connection.
- Marketing events for high school girls on social media platforms: Instagram, Facebook and Twitter did not provide the reach required for marketing the events to the targeted audience as per initial plans. The three platforms for communication most utilised included:
  - o WhatsApp for direct engagement with the network of APWEN chapters.
  - o LinkedIn to reach out to professional and volunteer networks.
  - o In-person events to connect to parents required initial engagement with school principals who later engaged directly with parents.

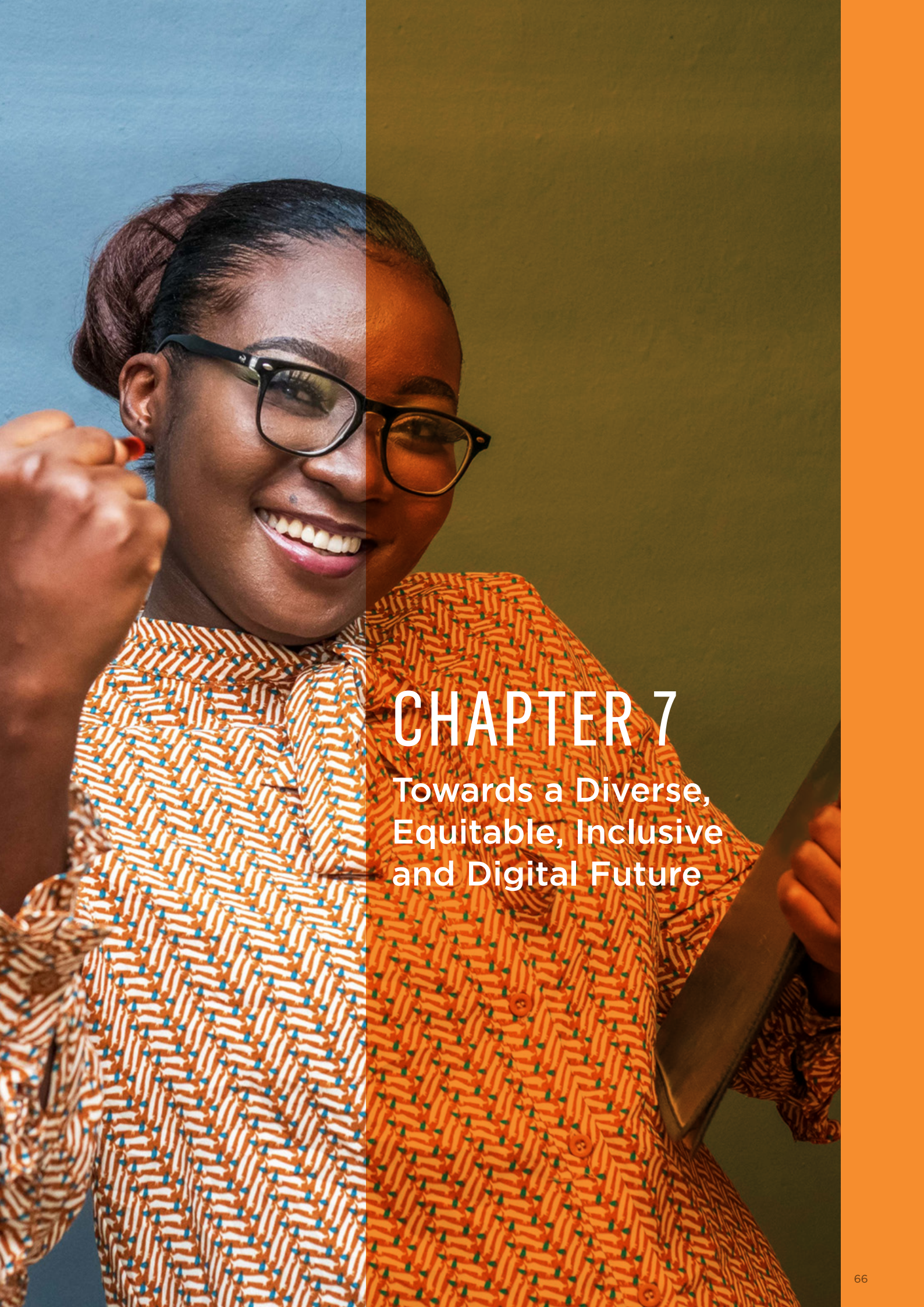
## HINTS AND TIPS

- Hybrid events can be hosted with a main in-person event in one major city and then connection with outer lying areas through virtual platforms where available.
- APWEN provided data through chapters to schools for girls to connect via Zoom to zonal and national events.
- Making the virtual events a competition provided an additional drive for schools to participate, understanding that scholarships were prizes. This drove motivation by girls and schools to participate.

## NEXT STEPS

- Girls that participated in the Who Wants to Be an Engineer? programme have been awarded academic scholarships for up to three (3) years of schooling.
- APWEN will continue pursuing hybrid models of hosting events, reaching more people virtually.





# CHAPTER 7

Towards a Diverse,  
Equitable, Inclusive  
and Digital Future

In May 2021, *Capacity Building for Women in Engineering Bodies in West Africa* drew to a close with our Africa Catalyst Festival of Learning, a stakeholder meeting that served as an opportunity for project stakeholders to collectively share insights and reflect on the impact of this project in terms of building capacity for digital advocacy in the age of COVID-19. Some of the key takeaways noted by partner champions included:

“This project was great in building our capacity. We were good at doing some things and now we understand how to do them better. One of the aspects I appreciated the most was learning from the case studies of Ghana and Nigeria as well. It has given us inspiration and ideas for future initiatives in Sierra Leone. This project has been an amazing opportunity to share ideas. Take them. Use them. Adopt them. Adapt them.” - *Trudy Morgan, Founder, Sierra Leone Women Engineers and President, Sierra Leone Institution of Engineers*

“This project required us to be more deliberate about our digital presence. The training on this project challenged our thinking and actions to date. A key takeaway from the digital advocacy master class that we now implement regularly includes being more deliberate about adding call to actions on all our media posts.” - *Eng. Funlola Ojelade, President, Association of Professional Women Engineers of Nigeria*

“One key aspect that benefitted us as an association was that this project not only included training and tools for digital advocacy but funding as well for us to apply the knowledge we gained immediately through implementation of outreach initiatives. We were able to apply the knowledge we gained by executing a project that was beneficial to the WinE Ghana’s existing strategy. We were able to reach more beneficiaries in terms of number and type e.g. students, teachers and parents using digital means. If we pursued only in-person methods, we would not have been able to achieve the reach we did in the same period of time. The project helped us improve governance, ensure that we have been able to meet our targets and helped us establish a digital advocacy board and team that is in place to sure that we continue with the digital advocacy plan, post this project.” - *Eng. Enyonam Epekpena, President, Women in Engineering Ghana*

## WOMEN IN ENGINEERING BODIES RISING ABOVE THE CRISES

WomEng will continue playing the role of mentor, and support for our Africa Catalyst women in engineering bodies as part of our global mandate to ensure sustainability and development of women and girls in the engineering and technology industry. This project has produced some notable key outcomes which include:

- In Sierra Leone, SLWE created a virtuous cycle of mentoring relationships that has inspired many more engineers to join the programme as mentors and inspired mentees in turn become mentors to young girls in high school. Utilising social media to promote the programme and the stories of mentors and mentees has increased awareness and interest in the programme globally.
- In Ghana, WinE Ghana established an editorial/digital advocacy team that is dedicated to increasing WinE Ghana’s digital advocacy efforts beyond this project.
- In Nigeria, APWEN has been effectively adopting a hybrid model of engaging beneficiaries with far reaching impact.
- Regional: The digital advocacy efforts by all three women in engineering bodies has set a precedent for raising the profile of women in engineering across West Africa and globally.

## BARRIERS THAT PERSIST

Through the work conducted on this project, we understand that the biggest barrier that persists is the digital divide that exists within West Africa which has been exacerbated by the COVID-19 pandemic. Digital tools are accelerating change however lack of infrastructure and high data costs remain the largest challenge for advancing West Africa as the world moves towards a digital future.

As noted by the Close The Gap Foundation (2021), closing the digital divide is important for:

1. **Equal learning opportunity:** Education is an important foundation for the rest of our lives and by limiting the opportunities in early life, the playing field will never be truly even in higher education, the workplace, or our communities as a whole.
2. **Wider career opportunities:** As we've seen in recent years, remote work is a crucial part of a competitive economy. Giving professionals the opportunity to work remotely regardless of where they live is just one of the ways to help bridge the gap between competitive professional opportunities in urban and rural areas.
3. **Access to community:** Digital spaces are a crucial part of modern communities and have become a foundation for social, professional, and academic networks. Excluding individuals from these spaces means widening the network gap while leaving out important perspectives and cultures.

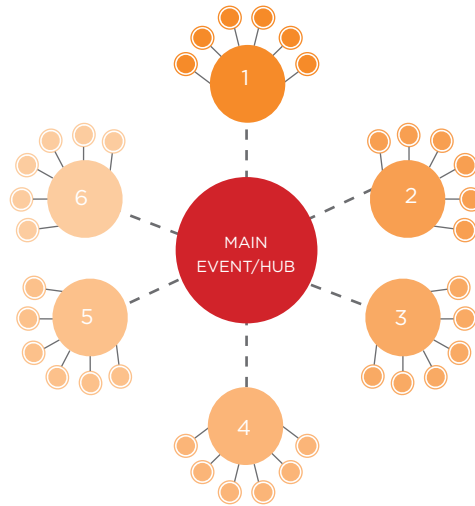
Unfortunately, very little can be done about this in the short-medium term. This is a multi-faceted governance issue, requiring the adoption of macro-economic policies which would result in improving the livelihoods of citizens, so that they are able to afford the necessary technology. The digital divide however does not mean that we need to remain stagnant. In the meantime, we understand that it is imperative to continue capacity building efforts of women in engineering bodies by leveraging existing tools in innovative ways to reach those that can be reached.

Advancing digital advocacy is imperative to increase relevance and reach of the issues that women in engineering bodies aim to tackle. This is just the start as we have far to go...

## ADVANCING DIGITAL ADVOCACY

Advancing digital advocacy is imperative to increase relevance and reach of the issues that women in engineering bodies aim to tackle. Based on research and insights gained from outreach initiatives run by WomEng and the women in engineering bodies over the last eighteen (18) months, we identified three (3) key ways organisations can catalyse digital advocacy efforts in the short-medium term, namely:

1. **Provide data for beneficiaries:** As part of leapfrogging the challenges on cost, WomEng provided data stipends to participants on the learning programmes, and redirected funding traditionally budgeted for travel and event planning to support digital inclusion.
2. **Communicate on multiple platforms:** Meet target audiences where they are to maximise engagement. Through the various outreach initiatives, multiple platforms including WhatsApp, Zoom and social media platforms for streaming events were utilised to maximise reach and awareness.
3. **Adopt a hub and spoke model for virtual events:** WomEng has found that adopting a hub and spoke model to hosting events i.e. establishing mini- hubs for smaller groups to connect to the main event. Hub and spoke hybrid live events can combine some of the most valuable aspects of live events while minimising the number of people in the same room and amount of travel needed. **Exhibit 21** illustrates the hub and spoke model.



**Exhibit 21:** Hub and Spoke Hybrid Event Model

“The most important thing we have learnt is that we must find what works best for our country. In Sierra Leone, most people have access to Facebook and WhatsApp. We use WhatsApp a lot and so that is sustainable for us.” – Eng. Trudy Morgan, Founder, Sierra Leone Women Engineers and President, Sierra Leone Institution of Engineers

The sentiment shared by Eng. Trudy Morgan during our Africa Catalyst Festival of Learning aligns to the key learning noted under *Capacity Building for Women in Engineering Bodies in Sub-Saharan Africa* in terms of moving towards a diverse, inclusive and digital future, namely “... that there are no blanket solutions that exist for sub-Saharan Africa. Each country has a unique mix of challenges and opportunities that require customised solutions. However, it does show that we can change the status quo for women and girls in Africa through proactive support, mentoring and funding innovative models to create awareness, develop capacity and showcase opportunity. WomEng has shown that these models can be effectively scaled and that there is power in building a community for women in STEM in Africa.”



## RECOMMENDATIONS

*Capacity Building for Women in Engineering Bodies in West Africa* has set a precedent for increasing knowledge on the successes, challenges and lessons learned by women in engineering bodies on developing digital advocacy driven strategies. These strategies have been able to increase relevance and reach of the women in engineering bodies' primary mandate; developing a gender diverse, equitable and inclusive workforce.

Based on the findings in this report, we believe there are three (3) priority actions that if tackled by women in engineering bodies, will achieve sustained growth in building digital advocacy efforts:



**Adopt a hybrid model (in-person and digital) to events to transition and normalize the use of digital media:** In our rush to embrace technology, we should not exacerbate inequality. The majority of West African's still do not have access to high speed internet connectivity. The largest barriers identified to developing a stronger digital future in West Africa are the necessary physical infrastructure required for internet connectivity and the high costs of data when available. Impact has to be hybrid on the continent until such time that political and economic interventions allow for such barriers to be overcome.



**Build stronger online support communities:** We need to rethink how we support our communities across the continent to share and connect with each other; to find mentors and become mentors; to document experiences and lessons and share these real-life stories. The development of virtual groups on social media is one such example of breaking through the limitations of geography and access to leaders. WhatsApp or similar instant messaging apps have been found to be one of the most effective digital communication tools as identified in the digital impact survey carried out on women in engineering members and through lived experiences by women in engineering bodies during the implementation of outreach initiatives. Instant messaging apps typically require low data and are mobile driven. This correlates with existing research showing the exponential growth of mobile usage on the continent while navigating high data costs.



**Invest in continued digital skills development for women in engineering body leaders:** *Capacity Building for Women in Engineering Bodies in West Africa* was the first project of its kind to support women in engineering bodies on the continent with skills development on accelerating digital advocacy. The learning curve for women in engineering body members remains steep while the thirst for more knowledge remains high. It is undeniable that the future is digital. This should serve as a catalyst for continued growth and development.

Driving long-term prosperity for a gender diverse and inclusive engineering industry requires champions at local, national, regional and global levels. This project, *Capacity Building for Women in Engineering Bodies in West Africa*, has successfully highlighted the positive impact created when champions choose to navigate change, commit to building diverse and inclusive talent pipelines and confidently lead in an uncertain world.

**WomEng continues to drive global advocacy and support for a diverse and inclusive engineering industry, while empowering local women in engineering bodies on the ground to develop the next generation of women engineers and truly transform the sector.**

## CONCLUSION

WomEng's Africa Catalyst projects has improved the capacity of engineering bodies to promote gender diversity and relevance within engineering and engineering professionals in Africa.

In our previous report, *Capacity Building for Women in Engineering Bodies in Sub-Saharan Africa* we laid the foundations for building resilient women in engineering; equipping relatively young (<10 years old) or newly established women in engineering bodies with leadership and outreach skills development. In this report, we laid out a path for women in engineering bodies, particularly matured women in engineering bodies to adapt to a faster-paced and constantly changing world in order to remain relevant; visible and to achieve mandates in new and engaging ways. This was successfully achieved through out two (2) key outcomes established at the beginning of this project, namely:

- **Strengthening the institutional capacity of relevant stakeholders through training and leadership development:** *Capacity Building for Women in Engineering Bodies in West Africa* was the first project of its kind to support women in engineering bodies on the continent with skills development on accelerating digital advocacy. WomEng undertook a series of virtual training and development sessions, engaging senior executive leaders including the Presidents and Vice-Presidents of women in engineering bodies. Collectively, 25 women in engineering body members directly participated in these sessions. The sessions were recorded and shared with our women in engineering body members to further distribute within their organisations and to use for continued future reference and learning.
- **Increasing knowledge among engineering bodies about effective practices for improving gender diversity in engineering:** Based on the skills development provided, women in engineering bodies designed and piloted outreach initiatives that proactively considered digital advocacy tools. The outreach initiatives implemented by the women in engineering bodies during this project have directly impacted more than 1 250 girls and women in-person and many thousands more through increased engagement on the women in engineering bodies social media platforms. This provided first-hand experience for women in engineering bodies to learn from through knowledge sharing and women in engineering bodies have also been able to learn from fellow women in engineering bodies.

This project has resulted in impact across three (3) countries, with twenty-five (25) senior women in engineering bodies having received training in capacity building. These women in engineering bodies in turn, delivered outreach initiatives reached more than 1 400 beneficiaries directly and create awareness through social media contributing to more than 20 000 engagements on social media.

We have shown that there are no blanket solutions that exist for the continent. Each country has a unique mix of challenges and opportunities that require customised solutions. As this report makes clear, WomEng's mission of developing a gender diverse, equitable and inclusive engineering workforce continues by serving as a beacon of excellence and common platform for women in engineering bodies on the continent.

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## METHODOLOGY

*Capacity Building for Women in Engineering Bodies in West Africa* was a 18-month project implemented between January 2020 - June 2021. This project was funded by the Royal Academy of Engineering under the GCRF Africa Catalyst Phase 3 Grant. Following *Capacity Building for Women in Engineering Bodies in Sub-Saharan Africa* which was funded under GCRF Africa Catalyst Phase 2 Grant, this project was designed and implemented as a capacity building initiative and qualitative research study.

### Stakeholders

*Capacity Building for Women in Engineering Bodies in West Africa* was made possible through partnerships with a number of organisations. The key stakeholders included:

- **WOMENG:** responsible for project delivery and management. WomEng developed the outreach curriculum and assisted professional engineering institutions to develop strong Women in Engineering bodies.
- **CAMBRIDGE INSTITUTE FOR SUSTAINABILITY LEADERSHIP** our UK partner, provided leadership development and training for engineering bodies.
- **BENEFICIARY PARTNERS:** These bodies institutionalised and supported the Women in Engineering chapters in project countries:
  - Ghana - Women in Engineering Ghana
  - Nigeria - Association of Professional Women Engineers Nigeria
  - Sierra Leone - Sierra Leone Women Engineers

Beneficiary partners were selected based on demand expressed to WomEng by stakeholders in the noted project countries. Each beneficiary partner also has different maturity levels and structural dynamics, allowing for testing of programmes over a wider range of institutional types.

### Project Delivery

The project was implemented in a 6-step process formulated by WomEng and implemented through formal interaction, observation, surveys, informal discussion, document review and with senior executive women in engineering body members. Initially formulated for in-person engagement, WomEng adapted and redesigned each step to a fully virtual roll-out. Insights gathered from each of these steps culminated in the development of this insight report.

The 6-step process for implementing *Capacity Building for Women in Engineering Bodies in West Africa* included:

#### **STEP 1: STAKEHOLDER COMMENCEMENT MEETING**

Initially planned as a 2-day in-person meeting for all project stakeholders in Accra, Ghana, the stakeholder commencement meeting was redesigned (in light of COVID-19) to be hosted virtually in a 4-part virtual series between 16 April 2020 - 07 May 2020. The first session hosted on 16 April 2021 was a one and a half (1.5) hour call with at least two (2) executive members from each women in engineering body including the President and Vice-President from each women in engineering body. The purpose of this call was to ensure alignment between stakeholders on roles and responsibilities, project objectives and deliverables. This call was followed with three (3) hour-long leadership development master classes for senior executive leaders covering principles outlined in Chapter 2 of this report and providing support to women in engineering bodies as the COVID-19 pandemic spread across West Africa. Master classes were hosted by senior leaders from WomEng, namely Naadiya Moosajee and Anjani Harjeven and champions from our UK partner, Cambridge Institute for Sustainability Leadership namely, Dr. Lisa Smith and Dr. Nicola Dee.

## **STEP 2: MAP ENGINEERING CAPACITY, DIVERSITY AND INCLUSIVITY IN WEST AFRICA**

Between May 2020 – July 2020, a needs assessment was conducted based on direct engagement with women in engineering bodies, review of existing desktop research and assessment of the COVID-19 pandemic trends. The outcome of this process was a needs analysis report from which key findings have been incorporated into this insight report.

## **STEP 3: ONLINE LEADERSHIP DEVELOPMENT TRAINING FOR WOMEN IN ENGINEERING (WIE) BODY MEMBERS**

A three (3) part virtual master class series, Leading in a Digital Age was hosted for women in engineering members to equip leaders with knowledge and resources on accelerating digital advocacy efforts. This was hosted virtually with three (3) experts in digital media. Each session was two (2) hours in duration and outlined as follows:

- The Power of Digital Storytelling hosted by Mokena Makeka
- Digital Communications and PR hosted by Mimi Kalinda
- Developing and Sharing Impactful Opinion Articles hosted by Kenichi Serino.

## **STEP 4: DIGITAL ADVOCACY TOOLKIT**

WomEng conducted a high-level assessment of current online platforms and tools used by each women in engineering body along with a digital impact survey completed by twenty-two (22) women in engineering body members. WomEng provided women in engineering bodies with a guideline to developing a digital advocacy strategy based on the master classes hosted in Step 3. Each women in engineering body was tasked to develop individualised strategies together with incorporating an outreach component to test digital advocacy tools and resources.

## **STEP 5: STRENGTHENING STRATEGIC AND ACTION PLANS**

Upon review from WomEng, the women in engineering bodies hosted one outreach activity identified in line with their existing organisational and digital advocacy strategies. These outreach activities impacted girls and women directly in-person or virtually using digital communication and social media tools. WomEng provided support to women in engineering bodies in developing content and awareness initiatives through social media channels. Feedback reports and a knowledge sharing meeting with women in engineering bodies provided insights from outreach initiatives.

## **STEP 6: AGGREGATION OF RESULTS AND DEVELOPMENT OF INSIGHT REPORT**

WomEng aggregated learnings from Steps 1 – 5, culminating in this insight report. A Festival of Learning hosted on 31 May 2021 served as the launch for this report and stakeholder closeout meeting.

## **Data Collection and Analysis**

Quantitative and qualitative methods were utilised during the data collection and analysis. While we work with macro markers for change, we tailor local metrics based on each country's needs and projected outcomes. Data was collected through the following means:

- **SURVEYS:** Feedback surveys were conducted after training and development sessions and a digital impact survey to assess local
- **EXISTING DATA:** Women in engineering bodies shared existing data on their respective bodies. This was incorporated into this insight report together with desktop research; analysing trends and reports from sources such as UNESCO, World Economic Forum, BCG and McKinsey and Co.
- **OBSERVATIONS:** Data was collected through participatory action activities conducted during the leadership development and training sessions and ongoing engagement with each woman in engineering body.

## **Limitations**

- In-person engagement: International travel was restricted due to COVID-19 travel bans. This resulted in a redesign of the project from in-person to virtual.
- Data consistency across project countries: Due to the virtual nature of this project, WomEng was limited to data provided by women in engineering bodies in each of the three (3) project countries for their various outreach initiatives. Data provided could be open to interpretation and specific to local contexts in each country.

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