

Leveraging Collective Action for Women in Tech

Challenges, Solutions, and the Path Forward



Foreword

Each year, International Women's Day sparks powerful conversations—but too often, they end up as simple hashtags. This year, I wanted to turn dialogue into strategy.

I put together a focus group of Pakistan's leading voices in women-centric tech programs to reflect, connect, and collaborate. What followed was not just a conversation—it was a mirror to our shared challenges and a blueprint for change.

This White Paper captures that collective wisdom. It reveals the invisible barriers faced by women in tech, spotlights the unsung heroes who have built community labs in hard-to-reach regions, and it lays out scalable solutions that can drive lasting impact.

At CodeGirls, we believe transformation doesn't happen in a vacuum. It takes community, context, and courage.

I invite funders, policymakers, educators, and tech leaders to read this not just as a report, but as a call to action: let's move from isolated impact to systemic change.



Founder, CodeGirls

About CodeGirls

With a mission to reduce the gender and skills disparity in tech, CodeGirls was founded by the ConsulNet Corporation with its partners United Global Initiative (UGI) and WomenInTechPK.

CodeGirls provides free, high-quality coding and tech skills training to women, equipping them with industry-relevant skills and employment opportunities.

We are, as such, aligned with the UN Sustainable Development Goals (SDGs):



1 NO POVERTY



4 QUALITY EDUCATION



5 GENDER EQUALITY



8 DECENT WORK & ECONOMIC GROWTH



17 PARTNERSHIP FOR THE GOALS

Working towards these United Nations Sustainable Development Goals (SDGs)

Our Impact

- ➔ **1,400+** Trainings Conducted
- ➔ **900+** Women Empowered Across Karachi, Skardu & Cape Town
- ➔ **18x ROI** – Transforming Lives & Careers
- ➔ Winner of the 2023 Pakistan National ICT Merit Award (CSR Category)
- ➔ Trusted by 110+ National & International Organizations
- ➔ Join us in reshaping the future of tech for women!

About This White Paper

In 107 of 114 economies, there are fewer female than male STEM graduates. For example, women constitute only **21.3%** of computer science graduates globally. (**World Bank, 2019; WomenTech Network, 2024**).

Women-centric tech programs in Pakistan have been pivotal in bridging gender disparities, fostering digital inclusion, and creating economic opportunities.

However, siloed operations, infrastructural gaps, and cultural barriers limit their collective impact.

This white paper synthesizes insights from a focus group discussion (**FGD**) with leaders of key women-focused initiatives in tech and its allies, supported by data from the participating programs to address the recurring challenges and propose actionable solutions.

Acknowledgements

We would like to acknowledge the participation of the following people in the focus group discussion that has helped draw insights for improving the operations and impact of women-focused tech programs. **Azra Maqsood** (Country Director Pakistan, Ascend Athletics), **Bismah Mirza** (Executive Director, R.E.D International), **Faiza Yousuf** (CoFounder and CPO, CaterpillHERS & Founder, WomeninTechPK), **Marvi Soomro** (Project Director, Innovate.Educate.Inspire), **Nida Saif** (Founder, Digital Superwomen), **Sanam Kubra** (Director Grants, Pledges, Inc.), **Syed Azfar Hussain** (Project Director, National Incubation Center Karachi), **Wardah Noor** (CEO, xWave)

Table of Contents

Abbreviations	06
Introduction	07-08
Discussion Themes	09-21
1. Operational Challenges – Infrastructural Gaps Cultural Resistance Lack of Awareness.	
2. Most Transformative High-Impact Aspects of Women-Focused Tech Programs Strategies Contributing to Success	
3. Demographics with Highest Potential & Impact Metrics	
4. Key Impact Metrics	
5. Funding and Sustainability	
6. Collaboration for Collective Impact	
Recommendations for Women-Centered Tech Programs in Pakistan – Call to Action	22-25
Conclusion	26-27
References	28

Abbreviations

CS/IT	Computer Science / Information Technology
R.E.D International	Research. Education. Development International
CPO	Chief Product Officer
ICT	Information and Communication Technology
GB	Gilgit-Baltistan
NIC	National Incubation Center
PKR	Pakistani Rupee
USD	United States Dollar
ROI	Return on Investment
CSR	Corporate Social Responsibility
ESG	Environmental, Social, and Governance
EU	European Union
NUST	National University of Sciences and Technology (Pakistan)



Introduction

In the rapidly evolving global tech landscape, women remain vastly underrepresented — a reality that also holds true in Pakistan. This white paper by CodeGirls, brings together insights from leaders of Pakistan's most impactful women-centric tech programs. Through a focused group discussion and data-backed analysis, it explores recurring challenges, identifies what's working, and lays out a collaborative path forward.

From hybrid learning models and grassroots community building to the role of safe spaces and sustainable funding strategies, this document serves as a call to action for policy-makers, donors, industry stakeholders, and educators: It's time to move from isolated impact to collective transformation.

Participants

- **Azra Maqsood** (Country Director Pakistan, Ascend Athletics)
- **Bismah Mirza** (Executive Director, R.E.D International)
- **Faiza Yousuf** (Co-Founder and CPO, CaterpillHERS & Founder, WomeninTechPK)
- **Marvi Soomro** (Project director, Innovate.Educate.Inspire)
- **Nida Saif** (Founder, Digital Superwomen)
- **Sanam Kubra** (Director Grants, Pledges, Inc.)
- **Syed Azfar Hussain** (Project Director, National Incubation Center Karachi)
- **Wardah Noor** (CEO, xWave)

Moderator – Shamim Rajani (Founder, CodeGirls)

Audiences Targeted by the Participating Programs

- **Female CS/IT graduates struggling with employment,**
(CodeGirls, WomeninTechPK)
- **Women without formal tech education seeking careers in tech,**
(CodeGirls, Digital Superwomen, CaterpillHERS)
- **Youth from underserved regions,**
(Tech Sahelis, xWave, R.E.D International)
- **Young entrepreneurs needing mentorship,**
(NIC Karachi, R.E.D International)
- **Pledges Inc offers grants to fund categories 1-3 of upskilling programs**



Discussion Themes



Operational Challenges – Infrastructural Gaps | Cultural Resistance | Lack of Awareness.

A. Systemic Barriers

Warda Noor shared how tribal conflicts impacted xWave's upskilling efforts in rural Sindh.

"There are life-threatening risks for girls commuting to training centers. In Sindh, we had to increase the timeline of our programme three or four times because girls can't come to the centre on the way. They will be killed. There have been incidents where one community is killing another and the police can't do anything."

B. Societal Resistance

Warda Noor, Azra Maqsood, and Marvi Soomro highlighted the societal barriers encountered by their programs.

Azra Maqsood shared her experiences on parental resistance and societal norms in Skardu,

"It's okay for girls to be educated and literate, but whatever they want to do has to be at home; they don't want to go outside. That's the biggest challenge for my program."

Marvi Soomro shared on deep-rooted gender roles in Hunza,

"The more you work over there, and the more you unpack the layers, you realize that gender norms, gender roles, and these things exist there too, in a very deep-rooted way. Generally, parents say that we support our daughters, but where there is a lack of finances, the education and opportunities for boys take precedence."

Wardah Noor commented,

"One of the biggest challenges is getting access to the right girls who will be motivated enough to join the workforce after they complete the upskilling programmes. Another barrier is parental reluctance to send girls to mixed-gender institutions, even for education."

Sanam Kubra believes that the mindset issue is not limited to participants; it is also deeply rooted within the industry. She explains,

"Employers hesitate to hire women because they worry that 'they'll get married, have kids, and need maternity leave."

C. Challenges in Accessing Online Learning for Women in Pakistan

On the surface, it appears that online learning programs can be a solution to the problems mentioned above.

The remote learning programs are globally acknowledged as a solution to barriers. 45% of women and 60% of women caregivers in developing countries reported that they would have had to postpone or discontinue their studies if online learning were not available" (Vandenbosch, 2022).

45%
Women

60%
Women
Caregivers

*Discontinue learning in
on campus programs.

This, however, is not the same for Pakistan. Socioeconomic disparities and a lack of internet access and ICT tools remain a problem for Pakistan's major population.

"Disparities in internet access and infrastructure are severe between different regions of the country. Many parts of Balochistan lack internet connectivity, and in areas where there was coverage, mobile internet speeds were lower than the national average." (Freedom House, 2023).

Marvi Soomro shared,

"90% of the girls who come to our program don't have access to digital tools outside our lab. They don't have laptops. They don't have computers in their homes. They have issues with electricity and the internet. For 3–4 months in winter, electricity is severely disrupted. You never know if you can schedule a Zoom call in GB."

90%

**Girls don't have access to digital tools.*

Whereas, Nida Saif, added another perspective on the challenges of online learning. She shared,

"51.9% of women respondents in a survey told us they're unable to finish online trainings, and 84% of women told us that they struggle to keep up with online learning programs due to a lack of accountability and community."

84%

**Women in Pakistan struggle even in online learning.*

D. Shortage of Professional Trainers in Tier 2/ Tier 3 Regions

Warda Noor shared,

"It's very difficult to find quality instructors in rural areas."

xWave has addressed all of the above problems through smart interventions. Wardah added,

"We shifted to a hybrid model: we set up labs there, and people come to the lab, but we conduct remote training programs. This ensures the same curriculum runs across all labs, with instructors teaching remotely. This model helped us maintain quality."

E. Data Collection

Alongside the execution barriers, it is often very difficult to measure the program's impact. Bisma Mirza highlighted the challenges in measuring the impact of R.E.D International's initiatives:

"Participants don't fill out pre/post-tests properly. They rush through them. They do it as if it is a test. It's very difficult to evaluate the training impact. We can see how their presentation has improved, but knowledge assessment is hard."

F. Funding Bottlenecks

The bottom line for effective operations remains the availability of funds. Sanam Kubra added the donor perspective to the conversation. Workplace biases and funding dependencies often negatively impact the growth and results of non-profit programs. She stressed,

"Donors love funding kidney transplants, not women's empowerment. Financial sustainability is the bane of nonprofits."

Most Transformative High-Impact Aspects of Women-Focused Tech Programs | Strategies Contributing to Success

A. Providing Safe Spaces

Marvi Soomro shared in the focus group discussion,

“Our girls-only lab in Hunza provides electricity, internet, and mentorship. Girls progress from digital literacy to freelancing, gaining confidence.”

Tech Sahelis has reportedly trained over 70 girls in their first year in the Gilgit Baltistan region, where such opportunities often fall through. After which, 8 of these girls launched their freelancing careers. **(Tech Sahelis Report, 2022).**

Pakistan’s grassroots initiatives, like Tech Sahelis’ girls-only labs in Gilgit-Baltistan, mirror global models such as India’s Girl Script **(GirlScript Foundation, n.d.)** and Kenya’s AkiraChix **(AkiraChix, n.d.)**, both of which prioritize safe spaces for women in tech. Similar labs such as Rwanda’s “Girls in ICT” program **(Girls in ICT Rwanda, n.d.)** have trained 5,000+ women since 2020, with 65% of them securing tech jobs post-training.

B. Creating Role Models

Azra Maqsood shared,

"When women mountaineers trained by Ascend in Skardu earn 50,000+ PKR monthly, they become role models." By certifying women as instructors and leaders in male-dominated fields, Ascend enables them to emerge as visible role models and financial equalizers for their families. This economic empowerment not only challenges societal norms but also inspires younger girls in their communities to pursue opportunities historically reserved for men."

C. Accountability Partners | Building a Community Around the Program

Faiza Yousuf highlighted the importance of having a community around the program:

"The most impactful intervention has been the community aspect of the program... we want to make sure that whoever comes to the program goes out of the program with a bunch of accountability partners and friends. We have incorporated it into the program's curriculum in a way that ensures students stay in touch and work in groups. After having run 7-8 cohorts of CaterpillHERs' Freelance Accelerator program, graduates from older cohorts are still working together."

D. For the Industry by the Industry

Shamim discussed how involving industry stakeholders in curriculum design has been monumental in CodeGirls' success:

"One of the early successes that we had in Code Girls... was to ensure that we involved the stakeholders in the program development from the beginning. So, the end part of this training was to get the girls jobs and put them into the industry. So, the people at the end, we brought them to the front, right in the beginning. So, we had them train and define the learning outlines. So that when it is time for graduation and finding jobs, we have them on our side. And that helped. I think that is one of the most powerful strategies that has led to the success of the program."

CodeGirls boasts a 70% placement rate among its program graduates. (CodeGirls Impact Report, 2025)

E. Offering Stipends and Transport

Wardah Noor added,

"We provide transport assistance to the girls. We have talked to the rickshaws and carry-tables for them, and they pick them up, so they don't have to commute from far-off areas alone, with the security threats. Secondly, we introduced performance-based stipends to incentivize continued participation, ensuring girls saw immediate value in the program."

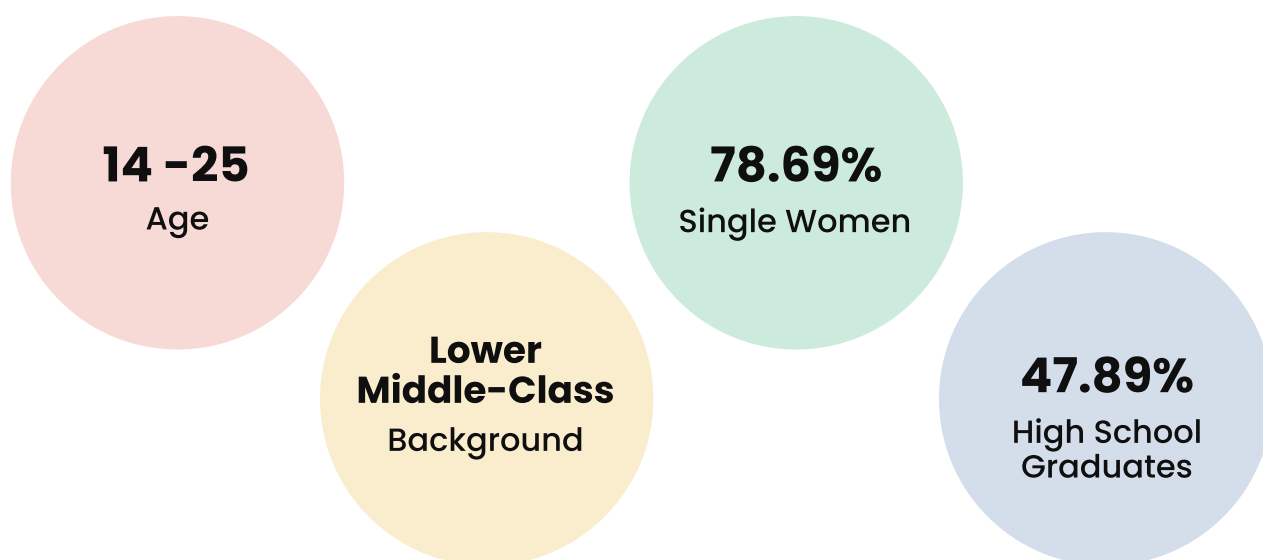
Demographics with Highest Potential & Impact Metrics

Nida Saif said,

"Women aged 25–35, balancing 9–5 jobs, show the highest commitment to upskilling."

The following insights are drawn from the data gathered from reports shared by the participating programs:

- ➔ Tech Sahelis focuses on girls **aged 14–25** in Gilgit-Baltistan.
- ➔ CodeGirls and xWave train participants who are at least **18+**.
- ➔ 76.69% of CodeGirls participants are **single**.
- ➔ 47.89% of CodeGirls participants are **high school graduates**, and the majority of them belong to **lower middle-class socio-economic** strata (their monthly income being less than 300 USD).



Key Impact Metrics

CodeGirls conducts annual longitudinal surveys with its alumni to track career progression, skill utilization, and socioeconomic outcomes. This data-driven approach maps their average professional trajectories, measures the actual impact of the program, and identifies systemic barriers to their progress, which, in turn, enables subsequent improvements to their women-in-tech initiatives while creating compelling impact narratives for stakeholders.

- ➔ **ROI:** CodeGirls invests an average of **392 USD** per participant. Boasting a 70% job placement rate so far, participants have earned over **7088 USD**, i.e, over 18 times the initial investment.
- ➔ Over **70%** of Participants who got jobs after CodeGirls reported that they did not have employment before joining CodeGirls.
- ➔ Of those already working, **60% reported** that their pay increased due to improved skills after CodeGirls (CodeGirls Impact Report, 2025)

"These rates are comparable to results found in the survey conducted by Course Report. In over 3,000 bootcamp graduates from more than 100 bootcamps, it was found that 79% of students were employed after completing a coding bootcamp." (Eggleston, 2021)

79%

*Average global success rate of boot camps.

Pledges Inc.:

- ➔ **\$1,200:** Average cost per student to secure an entry-level tech job,
- ➔ **7,000+ students:** Currently enrolled in Pledges-supported bootcamps,
- ➔ **\$14,400:** Average annual salary for graduates within the first year of employment,

R.E.D International:

- ➔ **380+** direct beneficiaries,
- ➔ **3** female-led startups,
- ➔ **Over 50%** female participation in most districts,

In 2023, global funding for women-led tech startups fell by 27%, highlighting systemic barriers (Crunchbase).

27%

**Drop in funding globally for women businesses.*

Donor priorities and financial sustainability are major defining factors for the future of development programs. Sanam Kubra commented,

"Financial sustainability is the bane of nonprofits. Donor agendas limit flexibility. We need to focus on ESG-focused grants (e.g., €500,000–€1 million EU grants), which are critical for survival."

Warda Noor shared how xWave has shifted to commercial avenues for funds:

"We shifted from a nonprofit model to paid online boot camps for sustainability. Middle-class participants pay, while rural labs stay free."

Bisma Mirza has experienced funding bottlenecks even under partnerships with CSR programs:

"Corporate CSR teams want 'quick wins'—they fund a 3-day workshop but ignore long-term mentorship. We partnered with a private bank to adopt their cohort, but they pulled out when the 'impact report' didn't look flashy. Donors care more about photos than real change. CSR budgets in Pakistan are shrinking—companies prefer 'trendy' causes."

Shamim Rajani shared her experience regarding involving the private sector,

"Funding dries up when programs are tied to competitions or grants. We partner with companies and ask them to get involved in the execution. We let them shape curricula, provide experts as trainers, and hire graduates. This builds trust and long-term revenue. No one funds hand-holding, but it's what women need most."

Marvi Soomro had an innovative take on the funding problem:

"We charge only 1,500 PKR, but even that's too much for rural families. Scholarships drain our budget. We're exploring partnerships with tourism companies. However, donors don't typically fund 'niche' ideas like this."

In her closing remarks, Azra Maqsood emphasized the critical role of ESG (Environmental, Social, and Governance) frameworks in ensuring long-term sustainability and donor appeal for women-led programs.

"If I had one ask: Align with global sustainability goals. The EU's €33 trillion green transition fund includes gender equity—Pakistan's programs must tap into this or starve."

Collaboration for Collective Impact

Faiza Yousuf champions building transparent, long-term partnerships through her initiatives.

"At Women in Tech PK, we do more than others ask—we help them reach people, but we want them invested in our results. Relationships must be transparent and long-term. We partner with everyone who aligns with our values, and we believe that trust is non-negotiable."

Azra Maqsood believes the same, for her partnership with industry is immensely important for sustainability.

"Collaboration isn't charity; it's strategic. Let's co-opt, not compete."

Warda Noor shared how her program uses volunteerism and resources from academia:

"We use remote trainers and student volunteers from universities like NUST."

CodeGirls' 2024 Impact Report covers over 110 friends of CodeGirls. These friend organizations contribute by supporting training, recruitment, sponsorship, and outreach efforts. Change spreads through collaboration, creating a ripple effect.

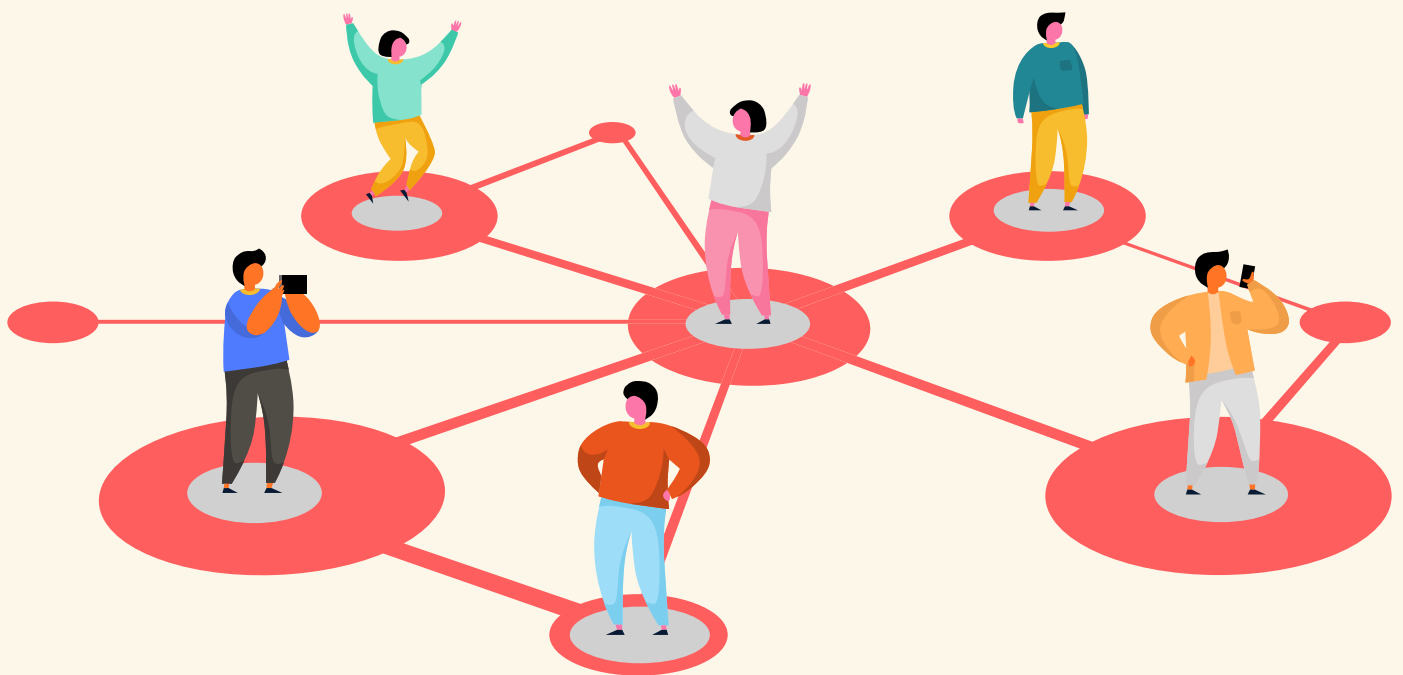
Communities can help create a much more profound impact than we can imagine. Nida Saif said,

"Our Facebook group crowdsources solutions—how to find couriers, pitch investors, etc. Collaboration isn't formal; it's 70,000 women sharing struggles and hacks daily."

Key Themes Identified from the Discussion on Collaborations:

- ➡ Trust Over Transactions: Long-term, transparent partnerships.
- ➡ Shared Resources: Borrowing curricula and industry tie-ups.
- ➡ Grassroots Networks: Informal collaboration works.

Recommendations



Recommendations

To drive meaningful and sustained progress for women, Pakistan urgently needs a dedicated **Center of Excellence focused on advancing women-centric upskilling initiatives**. This center should serve as a national backbone for collaboration, innovation, and policy influence, aiming to work actively across key areas.

Key areas include curriculum standardization, hybrid training models for promoting gender equality in the professional world, cross-program mentorship, and scalable funding mechanisms to prevent hindrances to future progress.

By centralizing knowledge and consequently enabling coordinated action, the Center can amplify the collective impact of existing programs and create a unified voice for gender equity in tech. Below is a detailed 5-year plan for the recommended Center of Excellence for Upskilling of Women.

1. Build a National Collaboration Network for Women in Tech

- ➡ Form a coalition of women-centric tech programs to reduce duplication, foster knowledge-sharing, and amplify collective advocacy.
- ➡ Establish a central “Women in Tech Pakistan” repository to share.
 - Training Curricula,
 - Reporting structures,
 - Checklists for setting up hybrid labs and community engagement plans,
 - Partnership and MoU templates for working with universities or funders,

2. Standardize Hybrid Models with Local Customization

- ➔ Set up physical, community labs with centralized remote instruction from expert trainers,
- ➔ Pair this with local customization, like how Tech Sahelis is tailoring skills for the tourism economy in Gilgit-Baltistan,

3. Design for Motivation & Retention

- ➔ Combine performance-based stipends with structured accountability systems like CaterpillHERs' peer cohorts and Digital Superwomen's community-driven check-ins,
- ➔ Offer a shared, cross-program mentor pool by leveraging alumni as paid mentors or accountability partners, allowing us to track participation and impact via open dashboards.

4. Activate Funding Pathways

- ➔ Develop impact reports for donors featuring impact metrics,
- ➔ Pursue ESG-aligned funding as a collective pitch for large sustainability grants (Consider the EU's €33 trillion green transition fund)
- ➔ Co-develop a "Sustainability Toolkit" for smaller programs to transition into hybrid funding models (paid + free tiers)

5. Reporting & Measurement Across Programs

- ➔ Create a lightweight shared dashboard to track longitudinal data,

6. Foster Cross-Sector Partnerships with Clear Roles

- ➔ Establish joint industry advisory councils, including partners such as incubators, Startup Accelerators, CSR leaders, and hiring managers, to identify skill gaps, align training with market needs, and co-create strategies for workforce integration.

7. Champion Context-Specific Policy Advocacy

- ➔ Use joint data and stories to advocate for policies including:
 - Connectivity subsidies for rural regions,
 - Maternity leave protection and remote work incentives,
 - Provincial budgets for women-focused digital hubs,

Conclusion



Conclusion

The challenges facing Pakistan's women-centric tech programs—such as infrastructure gaps, cultural resistance, and reliance on funding—mirror challenges in similar initiatives like Bangladesh's "Women in Digital" and Egypt's "STEM Egypt." While these hurdles are considerable, they are not insurmountable.

As Shamim Rajani emphasized, "This collective wisdom underscores the power of collaboration, context-specific solutions, and resilient community-building to drive systemic change."

By implementing the recommendations outlined, stakeholders can;

- **Break Silos:** A national coalition will unify efforts, reduce duplication, and amplify advocacy for change,
- **Leverage Local Context:** Hybrid models and open curriculums will ensure that programs are relevant across diverse and disconnected regions,
- **Secure Futures:** Sustainable funding through ESG grants and alumni networks will reduce the programs' dependency on donors,
- **Involve Tech Giants:** Engaging industry leaders in execution can yield impactful results without requiring substantial funding,

With the right policy alignment, stable community trust, and innovative funding models, Pakistan's women-centric tech programs can evolve from isolated efforts, restricted to their own cities, into a nationwide movement for inclusive growth.

By adopting globally informed, locally tailored strategies, we can contribute to achieving the UN's SDG 5 (Gender Equality) and SDG 8 (Decent Work), driving forward a future of equal opportunity and inclusive development.

References

World Bank. (2019). There are fewer female than male STEM graduates in 107 of 114 economies. Retrieved from

<https://blogs.worldbank.org/en/opendata/there-are-fewer-female-male-stem-graduates-107-114-economies>

WomenTech Network. (2024). Women in Tech Stats 2024.

<https://www.womentech.net/en-pk/women-in-tech-stats>

Vandenbosch, B. (2022, July 20). Here's how online learning can help narrow global gender gap. World Economic Forum.

<https://www.weforum.org/stories/2022/07/online-learning-workforce-gender-gap/>

Freedom House. (2023). Pakistan: Freedom on the Net 2023. Retrieved from

<https://freedomhouse.org/country/pakistan/freedom-net/2023>

Soomro, M. (2022). Tech Sahelis Empowering girls with digital skills. Innovate. Educate & Inspire Pakistan

[GirlScript Foundation. http://girlscript.tech/](http://girlscript.tech/)

AkiraChix. <https://akirachix.com/>

Girls in ICT Rwanda. (n.d.). About us. <https://www.girlsinict.rw/about>

CodeGirls. (2025). Impact report. ConsulNet Corporation.

<https://codegirls.consulnet.net/images/uploads/2025/2/c3542c6b4e8f28c149dfbc29d380c084.pdf>

Eggleston, L. (2021, May 5). 2020 Coding Bootcamp Alumni Outcomes & Demographics Report. Course Report.

<https://www.coursereport.com/reports/2020-coding-bootcamp-alumni-outcomes-demographics-report-during-covid-19>



in partnership with  & **WomenInTech**PK



1 NO POVERTY



4 QUALITY EDUCATION



5 GENDER EQUALITY



8 DECENT WORK & ECONOMIC GROWTH



17 PARTNERSHIP FOR THE GOALS

Working towards these United Nations Sustainable Development Goals (SDGs)