Women in Science, Technology, Engineering, and Mathematics (STEM) in the Asia-Pacific

APEC Policy Partnership on Science, Technology and Innovation

May 2025

Asia-Pacific
Economic Cooperation

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EXECUTIVE SUMMARY

In the wave of globalization driven by technological innovation, the Asia-Pacific Economic Cooperation (APEC), as a leading economic cooperation mechanism in the Asia-Pacific region, plays a critical role in promoting science and technology innovation. To further enhance women's participation in STEM and foster innovation in the APEC region, the project titled "Women in STEM: Study and Exchange on Rewards, Incentives and Policies to Promote Innovation Development in the APEC Region (PPSTI 04 2023A)," led by Li Junkai, Director of the International and Regional Cooperation Center at the Beijing Academy of Science and Technology (BJAST), was funded by the ASF Sub-Fund on Innovative Development, Economic Reform and Growth (IERG), and supported by APEC's Policy Partnership on Science, Technology and Innovation (PPSTI). This project, which received endorsements from seven economies—Australia; Chile; Indonesia; Malaysia; Papua New Guinea; Peru; and Russia, and approval from all 21 APEC economies, officially launched in November 2023. The project was scheduled to run from November 2023 to the end of 2024, and its tasks included two seminars and a final project report. The project's primary objective is to identify and implement effective strategies that increase women's participation and success in STEM fields within the APEC region. This involves promoting policy dialogue, sharing best practices, and fostering an inclusive environment that supports women's contributions to innovation.

As of now, the project has completed its tasks within the set timeline, achieving significant progress. On 14 December 2023, with support from various Chinese institutions, the project team organized the "2023 Women in Science and Technology Innovation Pioneers Forum," marking the official launch of the project. The forum, themed "Technology for Good, Humanity for Beauty," attracted over 100 attendees, including three academicians and thirty experts. Through keynote speeches, roundtable dialogues, and women-focused innovation salons, the event not only gathered the pioneering forces of women in science and technology innovation but also laid a solid foundation for the project's subsequent implementation.

Since the forum's launch, the project team has actively carried out research activities. Through APEC Secretariat, online platforms, and professional survey organizations, the team collected 2,629 responses from eight APEC economies over four months regarding the development of women in science and technology innovation. At the same time, a systematic review and in-depth analysis of innovation policies related to women in STEM across the 21 APEC economies were conducted. Based on this research, the project team completed the main part of this report "*Women in Science, Technology, Engineering, and Mathematics (STEM) in the Asia Pacific*," which analyzes the practices and characteristics of policies promoting women's involvement in STEM innovation, assesses the current state of female science and technology innovators, and outlines prospects for advancing women's participation in innovation across the APEC region.

The team continued to refine the report, conducting outreach to relevant local government agencies, such as the Ministry of Science and Technology of the People's Republic of China (MOST) and the All-China Women's Federation (ACWF). Additionally, in August, September, and November 2024, the project team attended the APEC 2024 Third Senior Officials' Meeting (SOM3) in Peru, the APEC-DIWA (Digital Innovation for Women's Advancement) in the Philippines, and the APEC Innovation Exchange: Industry-Academia-Research Collaborations Dialogue in Suzhou, China.

These engagements served to promote the project's interim achievements, solicit feedback, and incorporate expert opinions for further refinement.

On 12 and 13 December 2024, the second event of the project, "APEC Workshop on Women in STEM: Study and Exchange on Rewards, Incentives and Policies to Promote Innovation Development", was held in Beijing. The seminar was attended by member economy government officials, researchers, and young leaders from over ten APEC member economies. Experts presented keynote speeches (see Annex 1) and generated policy recommendations (see Annex 2) at the meeting. We would like to thank the following organizations for their support: Beijing Academy of Science and Technology (BJAST), ZGC Global High-Level Think Tank Alliance (ZGCTA), Network for International Cooperation on Technology Commercialization (NICTC), International and Regional Cooperation Center at the BJAST, International Technology Transfer Network (ITTN), China Women's Association for Science and Technology (CWAST), CAST UN Consultative Committee on Women Scientists and Gender Equality & Solidarity, Beijing Women's Association for Science and Technology, APEC Secretariat, and China Science and Technology Exchange Center (CSTEC).

During the project output-sharing session at the event, the PO Li Junkai presented an update on the project's findings, including policy analysis, survey data, and policy recommendations. The "Development Initiative of Asia-Pacific Women's Science, Technology, Innovation, and Entrepreneurship" (see Annex 3) was then drafted. In the keynote session, experts from multiple economies presented efforts to promote gender equality, while case-sharing sessions allowed representatives from various economies to share their practical experiences. The thematic discussions covered topics, such as "Public and Private Sector Practices in Women's Innovation and Entrepreneurship in STEM" and "Opportunities and Challenges for Outstanding Young Female Innovators."

Based on the research progress, scientific outcomes, and survey analysis, the project team has meticulously compiled the final research report, *Women in Science, Technology, Engineering, and Mathematics (STEM) in the Asia Pacific*. This report aims to present a comprehensive overview of the project's research process and outcomes, providing an in-depth analysis of the current status, challenges, and opportunities for women's involvement in science and technology innovation in the APEC region. It serves as a practical reference and guidance to promote women's participation in innovation and development, contributing to building a more equal, inclusive, and innovative technology ecosystem in the APEC region.

INTRODUCTION

Female scientific and technological workers are a key force in the development of STEM in the Asia-Pacific region and international STEM exchanges and cooperation. According to UNESCO, 33.3% of researchers globally are women, and only 35% of all students in STEM-related fields of study are women[1], so there is a huge potential for women's STEM development. In order to further enhance the participation of women in STEM and socio-economic growth in the Asia-Pacific region, a multi-faceted approach is required. This could include in-depth research, effective communication, discussion of effective policies, and support initiatives to promote the career development of female scientific and technological workers in various economies. This will facilitate the better promotion of women's STEM development in the Asia-Pacific

[1] UNESCO Institute for Statistics 2015–2018

region. Beijing Academy of Science and Technology (BJAST) works with ZGC Global High-Level Think Tank Alliance (ZGCTA), China Women's Association for Science and Technology, CAST UN Consultative Committee on Women Scientists and Gender Equality & Solidarity to release the study *Women in Science, Technology, Engineering, and Mathematics (STEM) in the Asia Pacific* (hereinafter referred to as the "Report").

The Report provides a comprehensive examination of the policy and practice experiences of APEC economies in promoting the development of female scientific and technological workers. It identifies the critical breakthrough points that impede women's participation in STEM fields and explores potential strategies to overcome these barriers. Additionally, the Report seeks to identify entry points that can be leveraged to stimulate the innovation vitality of female scientific and technological workers. Furthermore, it is in accordance with the principles of gender equality and equal opportunities from the perspective of education, the workplace, and society. It calls upon the economies in the APEC region to work together with China in order to establish a fair policy environment, a diversified social environment, and an inclusive and sustainable development environment for female scientific and technological workers.

The Report compiles in detail the policies and practical experiences of 21 APEC economies in promoting women's STEM, and summarizes the policy highlights. In order to gain a comprehensive understanding of the career development status of female scientific and technological workers in the Asia-Pacific region, the Report identifies eight economies as the focus of the study: Brunei Darussalam; China; Indonesia; Korea; Malaysia; Singapore; Thailand; and Viet Nam. The research target group comprises female scientific and technological workers in these economies. In order to gain insight into the career development status of this group, questionnaires were distributed and analyzed. The following dimensions were considered: career development, challenges and expectations, and family-career balance. The Report aimed to analyze the opportunities and challenges in the career development of female scientific and technological workers in the Asia-Pacific region. The survey was conducted over a period of four months, during which 2,800 questionnaires were distributed and 2,629 were collected, representing a recovery rate of 93%.

Combined with the results of the survey, the Report presents an outlook from five perspectives: policy support, platform construction, discourse reinforcement, career development, and humanistic care. It proposes initiatives to promote the development of women in STEM and entrepreneurship within the Asia-Pacific region. These initiatives, supported by APEC economies, focus on the equality of resources, the popularization of education, the expansion of channels, the establishment of role models, and international cooperation, all based on the principles of openness, fairness, impartiality, and non-discrimination.

KEY ISSUES

1 Overview of Policies on Women in STEM in the Asia Pacific

1.1 "Women in STEM" Becomes a Crucial Indicator for Science and Technology Policy Formulation

Numerous economies in the Asia-Pacific region have incorporated the promotion of women's participation in STEM into their long-term macroeconomic policy plans. They

have formulated multi-cycle, multi-dimensional, and multi-field policy framework objectives, with "women in STEM" gradually becoming an independent dimension and evaluation indicator for each economy in policy formulation.

Australia's *Advancing Women in STEM 2020 Action Plan* features the *STEM Equity Monitor*, which publishes an annual domestic data report on girls' and women's participation in STEM education and employment over a 10-year period starting from 2020, enabling the tracking of systemic changes.

In 2007, China revised the Law of the People's Republic of China on the Progress of Science and Technology, which, for the first time, regulated the equal development of female scientific and technological workers. The second revision in 2021 added specific content supporting the development of female STEM professionals, such as "improving the training, evaluation, and incentive mechanisms for female scientists and technicians, caring for pregnant and lactating female scientists and technicians, and encouraging and supporting female scientists and technicians to play a greater role in scientific and technological progress." In 2011, the Ministry of Science and Technology of the People's Republic of China (MOST) and the All-China Women's Federation (ACWF) jointly issued *Opinions on Strengthening the Construction of Female Science and Technology Talent Team*, proposing ten measures to promote the development and growth of the female STEM talent pool. In 2021, seven departments, including the ACWF, the MOST, and the State-owned Assets Supervision and Administration Commission of the State Council (SASAC), jointly issued *Opinions on the Implementation of Women's Action for Sci-tech Innovation*, further improving China's policy on the development of female STEM talents at the macro level from eight aspects. The same year, 12 departments, including the MOST, the ACWF, and the Ministry of Education of the People's Republic of China, jointly issued *Several Measures to Support Female Science and Technology Talents to Play a Greater Role in Scientific and Technological Innovation*, further refining the development policy for female STEM talents in 16 aspects to stimulate their innovative momentum.

Japan's *White Paper on Science, Technology, and Innovation 2023* encompasses policies such as the Sixth STI Plan, Comprehensive Innovation Strategy, and Realization of Society 5.0. Each policy integrates the concept of promoting women's participation in STEM. For instance, the *Sixth Science, Technology, and Innovation Basic Plan 2021-2025* aims to enhance the enthusiasm of female researchers, while the *Integrated Innovation Strategy 2023* seeks to expand educational resources for women.

Since 2004, Korea has been formulating a *Basic Plan for Fostering and Supporting Women in STEM* every five years. Having undergone four rounds of development and refinement, these policies focus on promoting the entire journey of women in STEM, from their entry into the field to their growth and advancement. The plans cover targeted support for various stages, including further education, employment, career retention, and workplace promotion.

1.2 Establishing High-Level Institutions to Promote Women's Equal Development Becomes a Common Practice

Policies promoting women's participation in STEM innovation involve multiple crucial domestic departments, such as education, science and technology, the economy, and human resources. Some economies foster women's equal development by establishing dedicated "women's development departments" or "women's affairs departments" and integrating them into the domestic administrative system.

The Australian Government's Office for Women, Department of the Prime Minister and Cabinet provides high-quality advice and implements effective policies and programs through budgeting and impact analysis with regard to gender inequality. The office has developed the *APS Guide to Gender Analysis and Gender Impact Assessment* to enable government agencies to conduct equality analysis on all new policy proposals and documents submitted to the Cabinet. The Office for Women developed *Working for Women: A Strategy for Gender Equality* and administers the *Working for Women Program,* which supports women's advancement in STEM fields.

Canada has established the Ministry of Women and Gender Equality (WAGE) to advance women's equality in economic, social, and political life. The WAGE develops policies that focus on celebrating "outstanding female scientists" to elevate women's status in the field of science and technology.

Malaysia established the Ministry of Women, Family and Community Development (KPWKM) in response to the practical call made at the 1995 United Nations Fourth World Conference on Women in Beijing, which stated that "the existence of a complete ministry reflects the government's strong commitment to enhancing the dignity of women in the economy."

1.3 International Organizations Become a Significant Driving Force in Promoting Women's Participation in STEM Innovation

Across the Asia-Pacific region, economies exhibit varying levels of economic development, geographical characteristics, populations, and social structures. In promoting women's participation in STEM innovation, international organizations, particularly non-governmental organizations (NGOs), leverage their public welfare status to provide recommendations on framework construction, evaluation indicators, development paths, and funding for economies with less mature policy frameworks and development conditions.

UNESCO's STEM and Gender Advancement (SAGA) is a global project aimed at addressing significant gender inequality in STEM fields at all levels of education and research across different economies. The policy toolkit developed by SAGA can assess and tackle gender inequality issues in STEM. Thailand is the first economy in the Asia-Pacific region to utilize this toolkit, incorporating dimensions into these science, technology, and innovation policy-making process.

The "Women in STEM Workforce Readiness and Development Programme" in Indonesia spearheaded by the International Labour Organization, is committed to enhancing women's acquisition and application of crucial STEM-related soft skills and technical competencies in rapidly expanding sectors, such as automotive and Information and Communications Technology (ICT). The program aims to effectively foster the advancement of Indonesian women in the realm of scientific and technological innovation.

The Malaysian government and the UNESCO International Bureau of Education jointly launched the "IBE-UNESCO Girls in STEM Initiative" to strengthen STEM curriculum for girls. This initiative has united Cambodia, Viet Nam, Kenya, and Nigeria in creating STEM education that promotes gender equality and enhances women's awareness of and participation in STEM.

The Philippine Women's Economic Network (PhilWEN), in collaboration with the Australian government, has launched the "Philippine Business Coalition for Women Empowerment (PBCWE)." This influential alliance, comprised of major employers, strives to enhance gender equality within their own workplaces, thereby directly or

indirectly improving the professional conditions for women across their associated supply chains and other large enterprises.

2 Noteworthy Policies for Women's Participation in STEM Innovation Across the Asia-Pacific Region

2.1 Strengthening STEM Education for Women and Bolstering Their Knowledge Base for Entering the Technology Sector

The Australian Department of Education's "Women in STEM Cadetships and Advanced Apprenticeships" program for an additional two years through 2026-27 to allow more time for women to participate, which provides a cumulative grant of USD25.1 million to eligible higher education institutions. These funds are allocated for developing and offering pre-bachelor qualifications in STEM disciplines, enabling women to pursue part-time studies while maintaining their professional careers.

The Ministry of Education of Singapore and Nanyang Technological University have jointly introduced the "Promotion of Women in Engineering, Research, and Science" (POWERS) initiative. By establishing a robust STEM community, the program aims to create a comprehensive ecosystem for women, spanning from pre-university to post-doctoral levels. This initiative fosters a conducive learning environment, nurturing and empowering young female leaders in STEM fields.

Peru has established a STEM development program specifically designed for indigenous women (Supporting Indigenous Women in Science, Technology, Engineering, and Mathematics in Peru). Initiated by the International Development Research Centre (IDRC) in partnership with Universidad Peruana Cayetano Heredia, the project aims to enhance Peru's domestic scholarship and educational loan programs and strategies. The ultimate goal is to increase opportunities, retention rates, and graduation rates for indigenous Peruvian women pursuing STEM careers.

The US National Science Foundation's STEM program includes the "Rural Girls Engaged in Math and Science Plus Technology Project," which aims to increase rural girls' awareness of and academic preparation for STEM careers. It offers hands-on work experience, experimental or project-based corporate exposure, and mentorship opportunities. Another initiative, "Caminos a la Ciencia" (Pathways to Science), encourages and inspires Latina women to pursue education and careers in STEM fields. The "Black Girls Code" (BGC) project, with 15 chapters across 12 US states, Washington D.C., and Johannesburg, targets girls aged 6-17 from Black, Latinx, and low-income communities. The program, taught by volunteer IT professionals, supports learning in web design, game design, mobile app development, and robotics. Participating girls gain access to technical courses, scholarships, internships, and job opportunities.

2.2 Strengthening STEM Training for Women and Enhancing Their Professional Skills

The Australian Academy of Technology & Engineering (ATSE), as the sole implementing partner of the Australian Government's, AUD41.2 million "Boosting the Next Generation of Women in STEM" fund, has launched the "Elevate: Boosting Diversity in STEM" program. This program awards scholarships to women in STEM fields, fosters more female-led applied research and industry-academia collaborations,

enhances women's skills and entry qualifications in STEM, and promotes women's advancement into senior leadership roles to address gender inequality in STEM.

Engineers Canada's domestic "30 by 30" initiative ensures that women in engineering professions receive the same level of professional development as their male counterparts. By offering training, certification guidance, and other resources, the project aims to increase the proportion of newly licensed female engineers to 30% by 2030. The Society of Canadian Women in Science and Technology's (SCWIST) Immigrating Women in STEM (IWIS) program offers mentoring, skills exchange, and resources to immigrant women. By fostering a supportive community where women can share experiences, seek advice, and expand their networks, IWIS assists internationally trained STEM women in launching and advancing their careers in Canada.

China's leading Internet companies, Alibaba Group and Ant Group, have launched the "Cyber Mulan" initiative, aiming to reach 50 million women globally within five years. Through digital means, the plan seeks to increase women's participation and competitiveness in the digital economy. The initiative will cultivate one million female digital managers in China, supporting Chinese women in enhancing their workplace competitiveness through digital management empowerment. Furthermore, the plan will provide 100 entrepreneurial projects and 100,000 job opportunities for women in impoverished areas.

Indonesia's Ministry of Communications and Information's Digital Entrepreneurship Academy (DEA) program provides access to digital technologies, including specialized technology programs designed for housewives.

The Japan Science and Technology Agency's (JST) Next-Generation Human Resources Development Program offers support for female students in choosing science courses. In collaboration with universities and related institutions, the project conducts talent development activities and hosts seminars featuring female researchers in the science and technology field as role models, encouraging female junior and senior high school students to pursue scientific careers. The project partners with 17 institutions, each receiving an annual subsidy ranging from JPY15 million to 30 million.

The Association of Korean Woman Scientists & Engineers (KWSE) periodically organizes the International Young Woman Scientist Camp (YWS CAMP), designing academic and cultural exchange programs for the next generation of female scientists and engineers.

2.3 Establishing Special Funds and Awards for Women to Promote Technological Innovation and Development

The University of Melbourne in Australia established the Women in Science Emerging Researcher Award (WISER) to address the under-representation of women in senior academic and leadership roles resulting from the excessive attrition of female scholars in the early and mid-career stages. The award annually recognizes two outstanding early or mid-career female scholars, one in the physical sciences and one in the natural sciences and health sciences, providing resources for their research careers and leadership development. Recipients must demonstrate exceptional research achievements and engage in outreach activities that promote science to school, community, or government audiences.

Chile's "50/50 by 2030" Action Plan, part of the National Gender Equality Policy for Science, Technology, Knowledge and Innovation, supports universities in reducing

the gender equality of researchers through a CLP10.5 billion (USD13.822 million) funding project. It also establishes a dedicated leadership program for women in academia, with a budget of CLP2.25 billion (USD2.962 million).

China established the "China Young Women Scientists Award" in 2004 to recognize and reward young female scientists who have made significant scientific and technological achievements, encouraging them to continue their scientific endeavors and attain more fruitful research results. The award includes the "Future Women Scientists Program," which funds doctoral students or postdoctoral fellows with strong research capabilities and development potential to conduct scientific research projects. In 2022, the number of individual award recipients increased from 10 to 20, and a "Team Award" category was added. As of 2023, a total of 184 female science and technology professionals have received the award.

The Association for Women in the Sciences (AWIS) in New Zealand has established the Gatehouse Travel Award to provide women engaged in scientific work or studying science (at the tertiary level or above) with opportunities to attend professional development activities such as seminars and conferences. The award offers support for indirect costs associated with attendance, including childcare, pet care, and other expenses.

2.4 Regulating the Proportion of Female Employees and Senior Management to Enhance Women's Social Influence

The Ministry of State-Owned Enterprises in Indonesia has set a goal of increasing gender equality in the workplace to 25% by expanding opportunities for women to assume leadership roles by 2023.

Thailand's "Women's Empowerment Principles (WEPs)" project, launched in 2010, aims to narrow gender inequality in seven key areas through private sector engagement. The project focuses on three main aspects to empower women in the workplace: first, using gender equality as an indicator of corporate performance; second, incorporating gender equality reporting into business reports; and third, promoting women's representation in leadership positions.

2.5 Formulating Women-Centric Policies to Safeguard Their Career Development

In China, women are encouraged to have relaxed age limits when applying for scientific research projects and technology awards. For example, in the application for the National Natural Science Foundation's "Youth Science Fund," "Excellent Youth Science Fund," "Outstanding Youth Science Fund," and the National Social Science Foundation's "Youth Project," the age limit for women is about two to five years more lenient than for men. When applying for the "China Youth Science and Technology Award" and the "China Youth Women Scientist Award," the age limit for women is relaxed by five years. Starting in 2024, the National Natural Science Foundation of China will allow women to extend the completion time of their projects by 24 months due to childbirth.

Japan's Ministry of Education, Culture, Sports, Science and Technology has established a "Research Fellow Program" under its "Promotion of Active Participation of Female Researchers" plan. This program provides scholarship support of JPY1.05 billion (as of 2020) to enable outstanding researchers to smoothly return to their laboratories after taking leave for childbirth or childcare. To allow women who cannot

work full-time due to childcare or nursing responsibilities to engage in digital work flexibly, the government, in collaboration with relevant ministries, has proposed the "Women's Digital Human Resources Development Plan" to vigorously cultivate women's digital human resources.

The Korea Foundation for Women in Science, Engineering and Technology (WISET) provides education and mentoring support to assist women whose careers have been interrupted due to childbirth and childrearing in finding employment in companies and research institutions. Through job matching programs with universities, public, and private research institutions, WISET promotes women's employment and offers research funding, achieving a three-year job retention rate of 79.2%. For unemployed STEM women or those preparing to change careers, WISET has established the "Academy for Women in STEM" to provide professional skills training in new technologies and industries such as information security, artificial intelligence, and big data.

The United Women Singapore (UWS) "GenSafe Workplaces" program advocates for fostering a safe, supportive, and inclusive work environment. It focuses on the impact of domestic violence and abuse on the workplace, aiming to prevent women from leaving their jobs due to spillover effects. The program offers three key initiatives: 1) Providing support for workplace environment, etiquette, and attitudes; 2) Organizing thematic expert seminars and webinars to explore solutions for preventing workplace harassment and forming an anti-harassment alliance; and 3) Creating an Information Handbook in consultation with government agencies, industry leaders, and legal experts to help establish effective practical measures for addressing Domestic Violence and Abuse (DVA).

The Society of Women Engineers (SWE) in the United States has proposed the "Return to STEM Work Program", which enables employers across various industries to recruit female professionals who have experienced career interruptions. This initiative aims to diversify the mid- and senior-level workforce. The program provides participating employers with a framework, training, and a collaborative environment to create re-entry programs that promote the employment of female talent by offering support and assistance to employers.

3 Survey on the Current Status of Women's Participation in STEM in the Asia-Pacific Region

3.1 Questionnaire Overview

Our team selected female science and technology workers from eight economies in the Asia-Pacific region as research subjects. The team distributed questionnaires based on a comprehensive consideration of factors such as population size, regional distribution, age, educational level, professional and technical titles, institution type, and years of work experience. The four-month survey yielded a total of 2,629 valid questionnaires out of 2,800 distributed, achieving a collection rate of 93.9%.

The survey sample covers eight economies (see Figure 1): Brunei Darussalam; China; Indonesia; Korea; Malaysia; Singapore; Thailand; and Viet Nam.

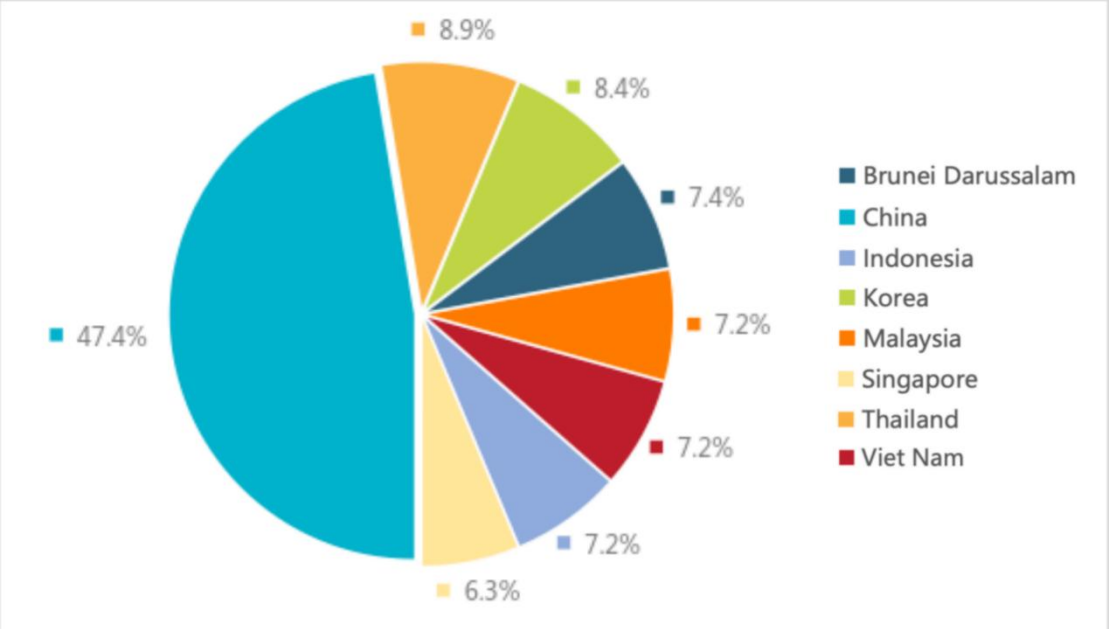

Figure 1Questionnaire Data Distribution by Economy

In terms of age distribution (see Figure 2), the majority of the survey participants were between 36-45 years old (34.6%) and 26-35 years old (34.2%), followed by those aged 46-55 (14.0%).

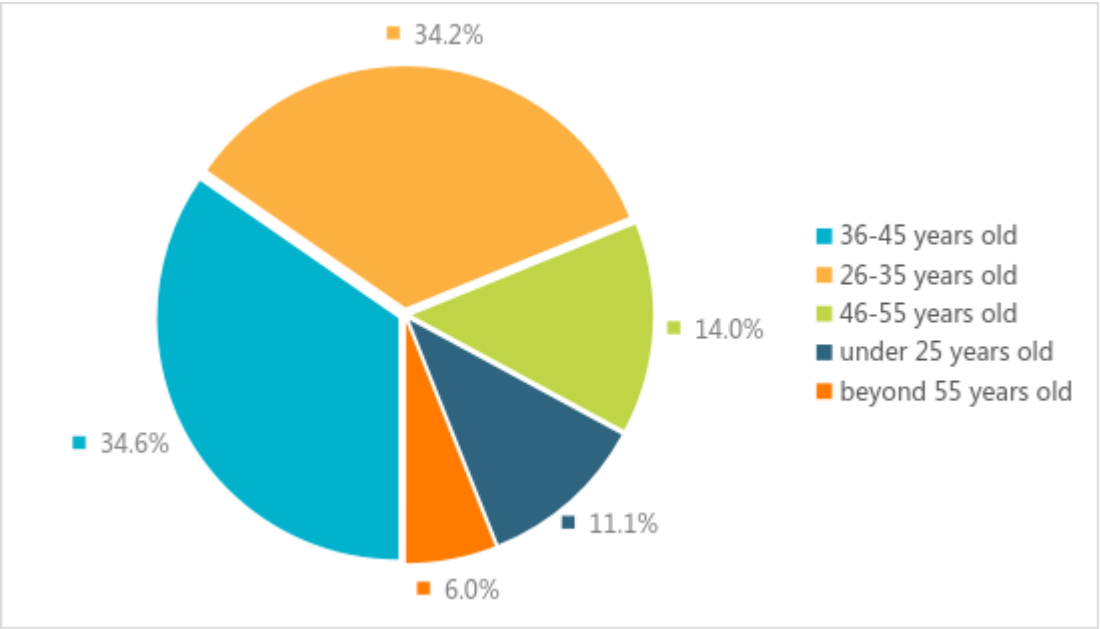

Figure 2Questionnaire Data Distribution by Age Group

In terms of educational levels (see Figure 3), 47.4% of the survey participants held master's degrees, 24.0% held doctoral degrees, and 23.6% had bachelor's degrees.

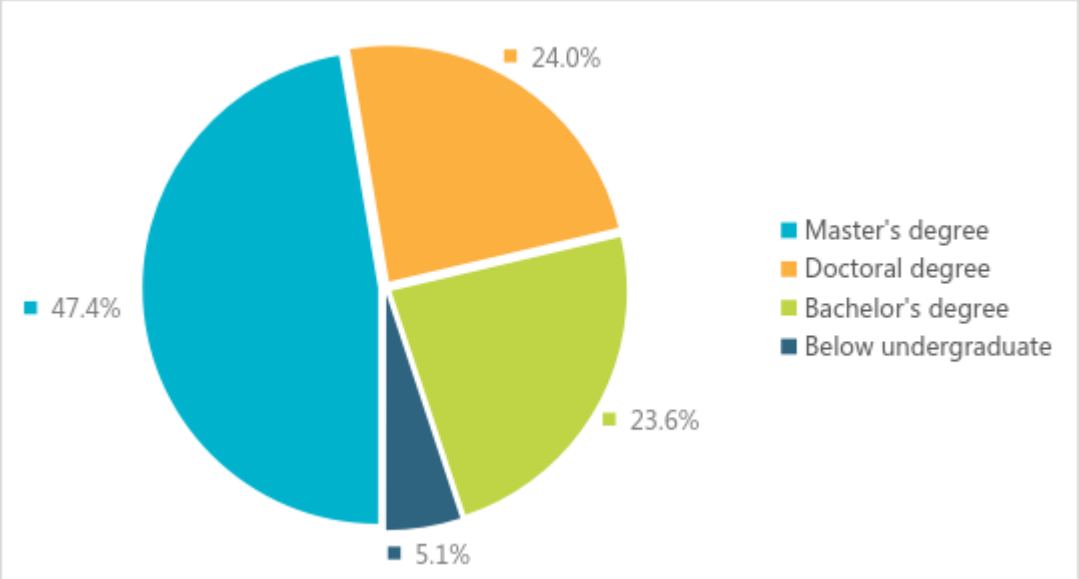

Figure 3Questionnaire Data Distribution by Educational Level

In terms of professional and technical titles (see Figure 4), the majority of the survey participants held intermediate (assistant researcher/assistant professor or equivalent) and associate senior (associate researcher/associate senior or equivalent) titles, accounting for 37.4% and 32.1%, respectively. Those with senior titles (researcher/professor or equivalent) make up 11.2% of the sample.

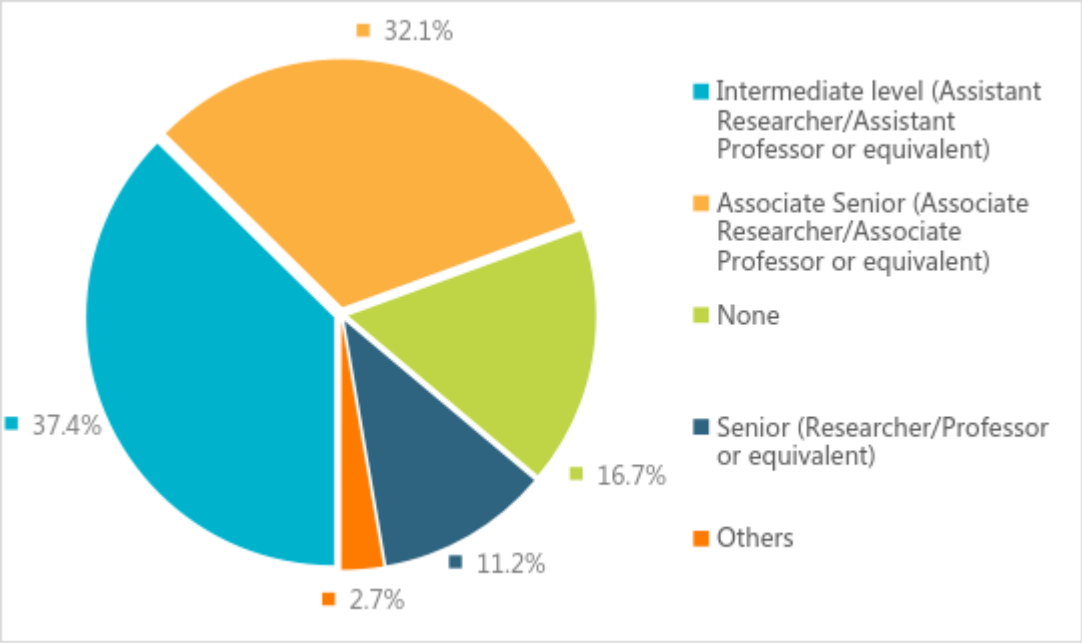

Figure 4Questionnaire Data Distribution by Professional and Technical Title

In terms of work unit types (see Figure 5), a significant proportion of the female science and technology workers surveyed were employed in universities (28.9%), enterprises (28.1%), and research institutes (27.4%). Association organizations accounted for 14.2% of the sample.

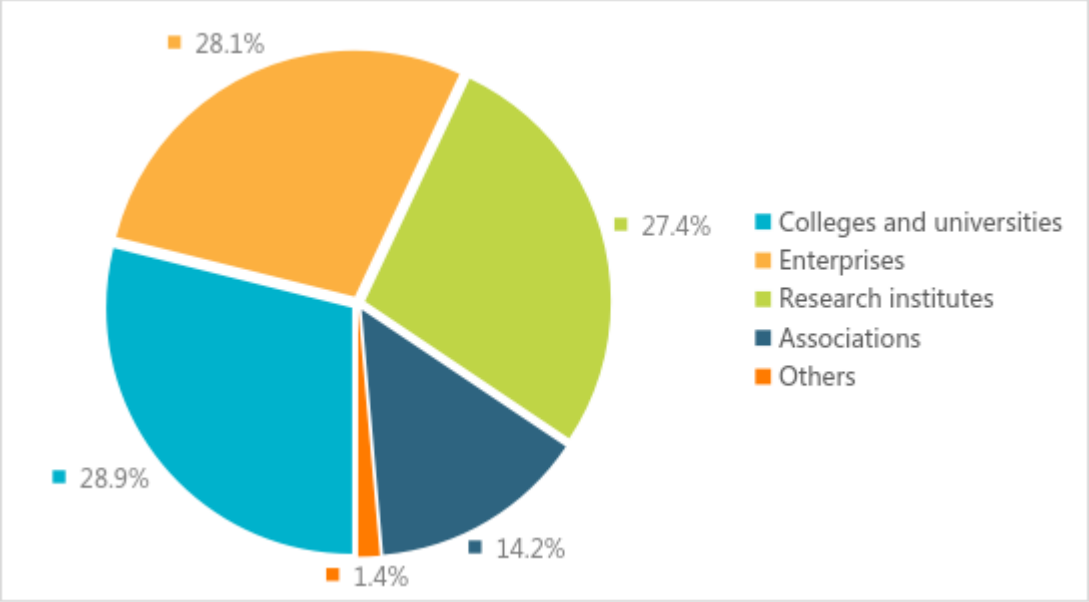

Figure 5Questionnaire Data Distribution by Work Unit Type

In terms of years of work experience (see Figure 6), the majority of the female science and technology workers surveyed had been working for 3-10 years (41.4%) and 10-20 years (29.1%).

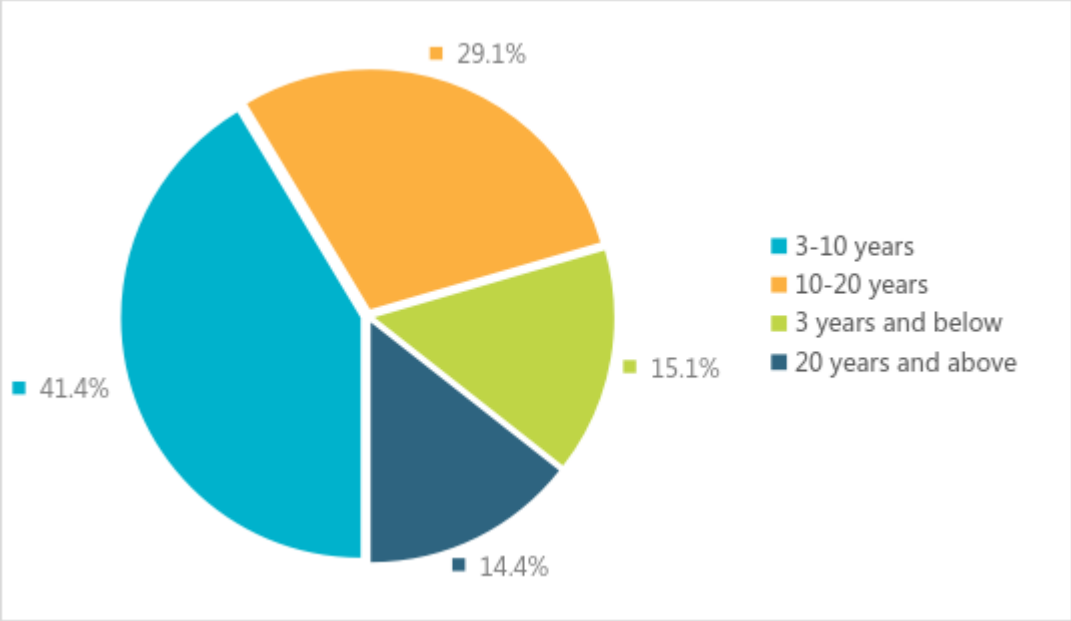

Figure 6Questionnaire Data Distribution by Years of Working

3.2 Career Development

3.2.1 Women's contributions to scientific and technological innovation cannot be overlooked. 33.9% of the women surveyed have received international or domestic awards, and over 30% have made achievements in the fields of patents, standards, and achievement transformation.

The survey results reveal that 32.9% of the female science and technology workers have received international or domestic awards (see Figure 7), demonstrating the significant contributions made by a large number of women to the development of scientific and technological innovation. Female science and technology workers are an essential component of the scientific and technological talent pool. Unleashing their innovative potential and increasing women's labor participation in high-productivity sectors can help boost the gross domestic product (GDP).

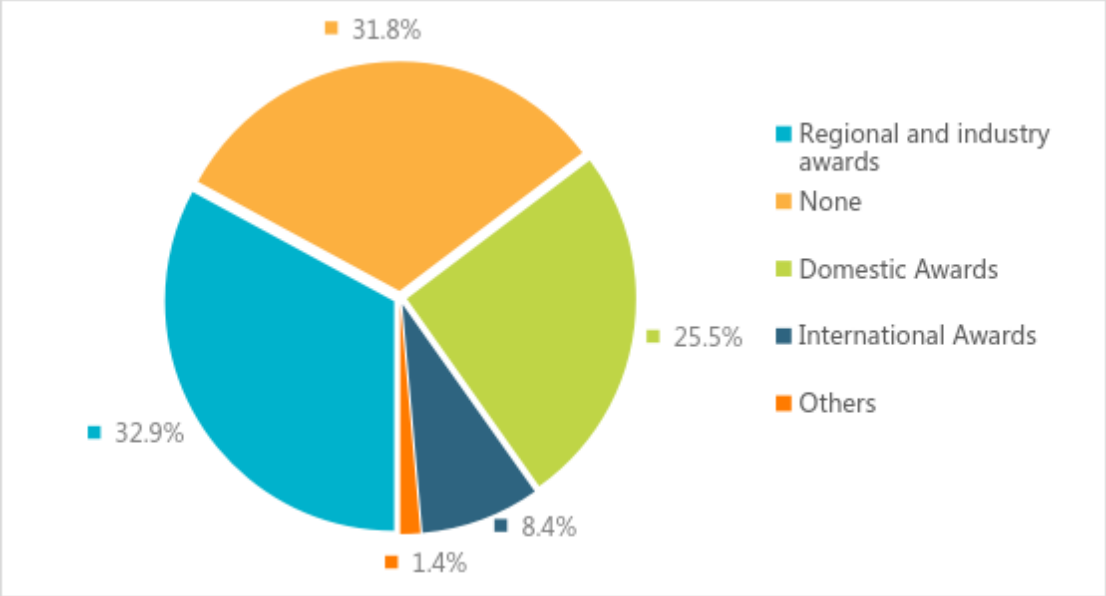

Figure 7Proportion of Female Scientists and Technologists Awarded Scientific Research Prizes by Level

The scientific research outputs of female science and technology workers were diverse. In addition to papers and research reports, 36.4% of the women in the survey sample have obtained patents, 35.9% have successfully transformed scientific and technological achievements, and 33.7% have participated in the formulation of industry standards (see Figure 8).

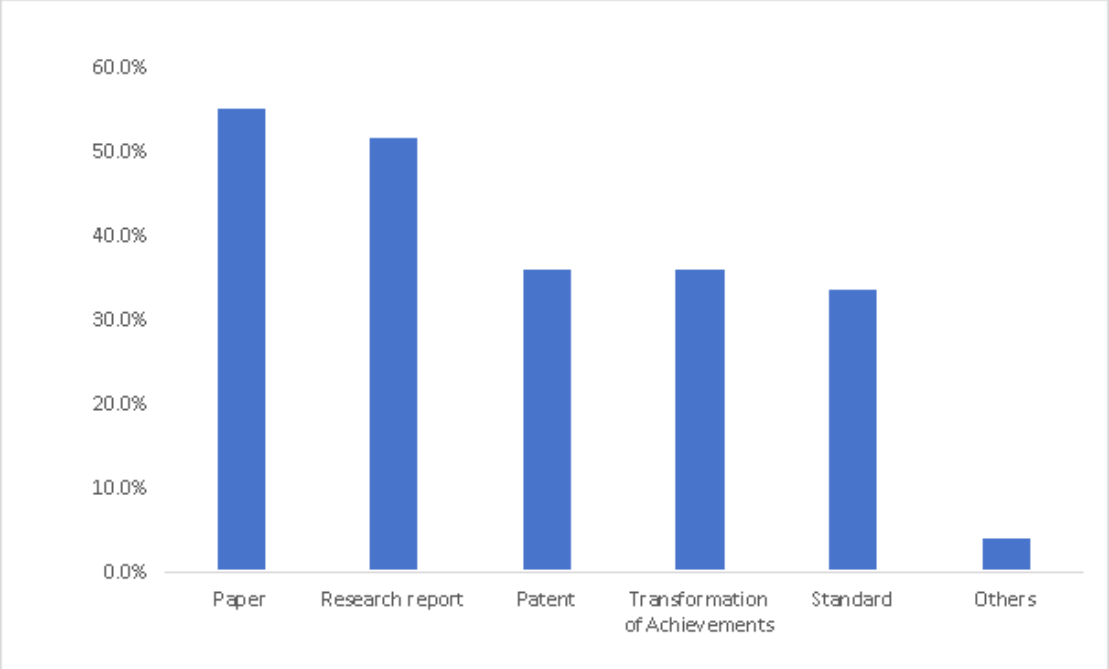

Figure 8Types of Scientific Research Achievements Attained by Female Scientists and Technologists

3.2.2 Female Scientists and Technologists Exhibit Strong Career Continuity, with Career Prospects, Professional Alignment, and Job Stability Being Pivotal Factors Influencing Their Occupational Choices

The survey findings reveal that 83.4% of female scientists and technologists were employed at the same organization for more than three years (see Figure 9). Among them, 24.7% have had their longest continuous tenure spanning 5-10 years, while 26.4% have worked continuously for over a decade. These results underscore the robust career stability and continuity exhibited by female scientists and technologists. Taking into account women-specific needs, job stability proves advantageous for women in striking a work-life balance and mitigating the pressures associated with change. Moreover, the professional attributes of female scientists and technologists, such as their conscientiousness, tenacity, career loyalty, and deep engagement, also exert a certain degree of influence on their career choices. The survey outcomes indicate that the most valued factors for female scientists and technologists when selecting a job are career prospects (17.3%), professional alignment (15.1%), and job stability (12.4%). These elements contribute to elevating social status, bolstering self-confidence and satisfaction, while simultaneously reducing career risks. Furthermore, professional alignment enables them to better leverage their domain expertise.

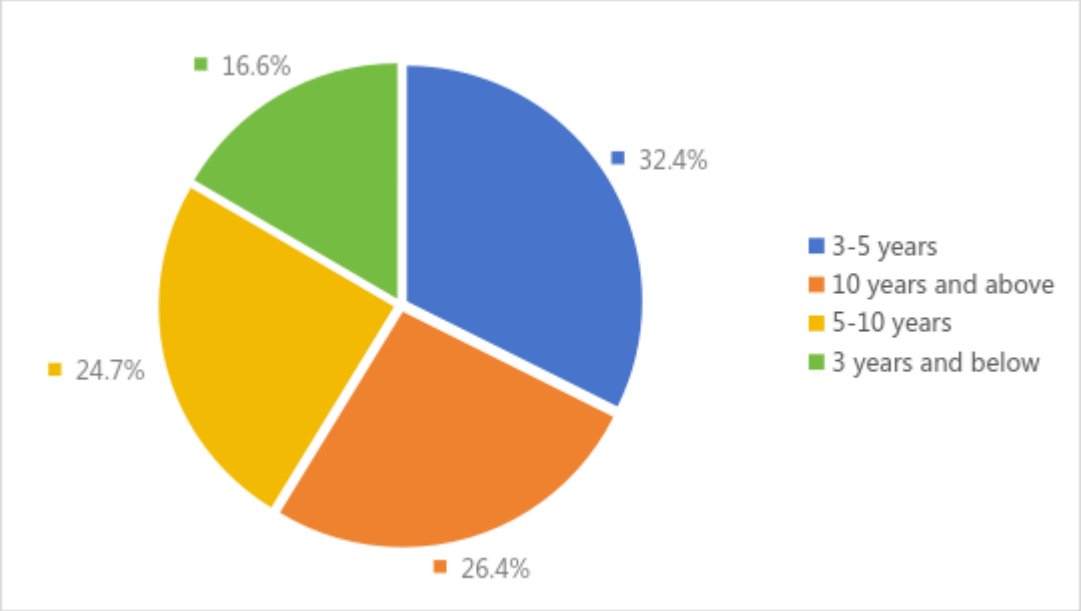

Figure 9Proportion of the Longest Continuous Employment Duration

3.2.3 Women's Overall Voice and Influence in the Realm of Science and Technology Remain Relatively Low, with Overseas Study/Work Experience Exerting a Positive Impact on Enhancing Women's Scientific Research Influence

Currently, women in the science and technology domain still grapple with issues such as low participation in decision-making roles and an overall lower degree of voice and influence. From a work role perspective, over half (52.0%) of female scientists and technologists primarily assumed executive roles in scientific research (see Figure 10). They frequently engaged in and carried out various research tasks, such as experimental design, data collection, and analysis. However, they rarely (33.2%) took on the role of project lead or leader (see Figure 11).

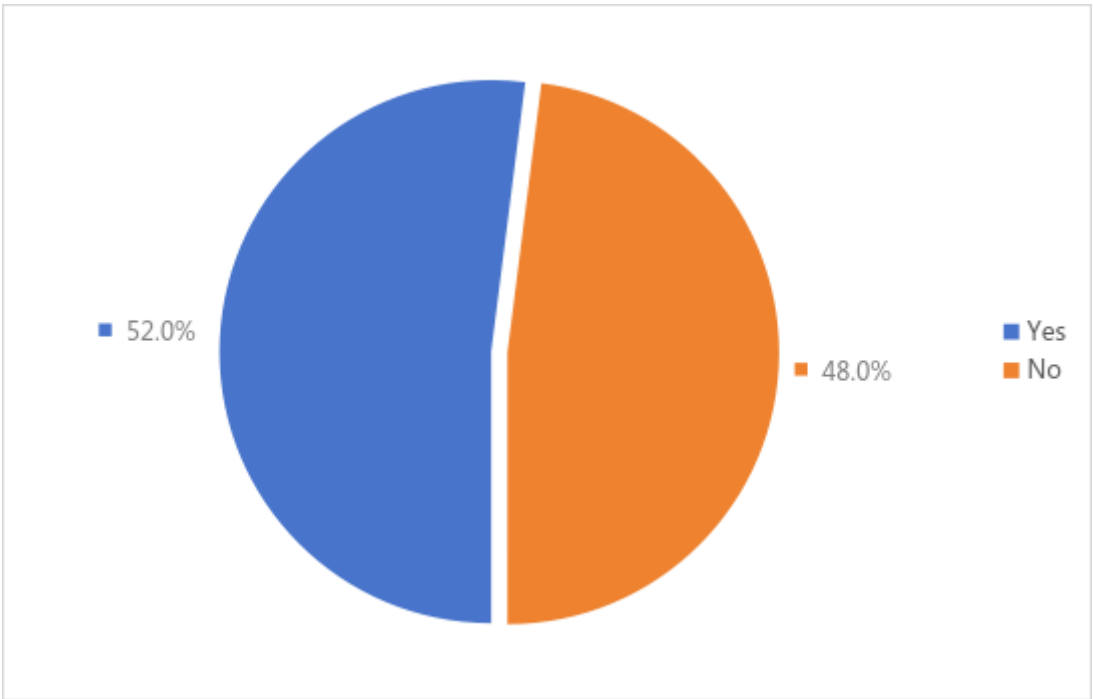

Figure 10Proportion of Women Primarily Undertaking Implementation/Execution Roles in Scientific Research

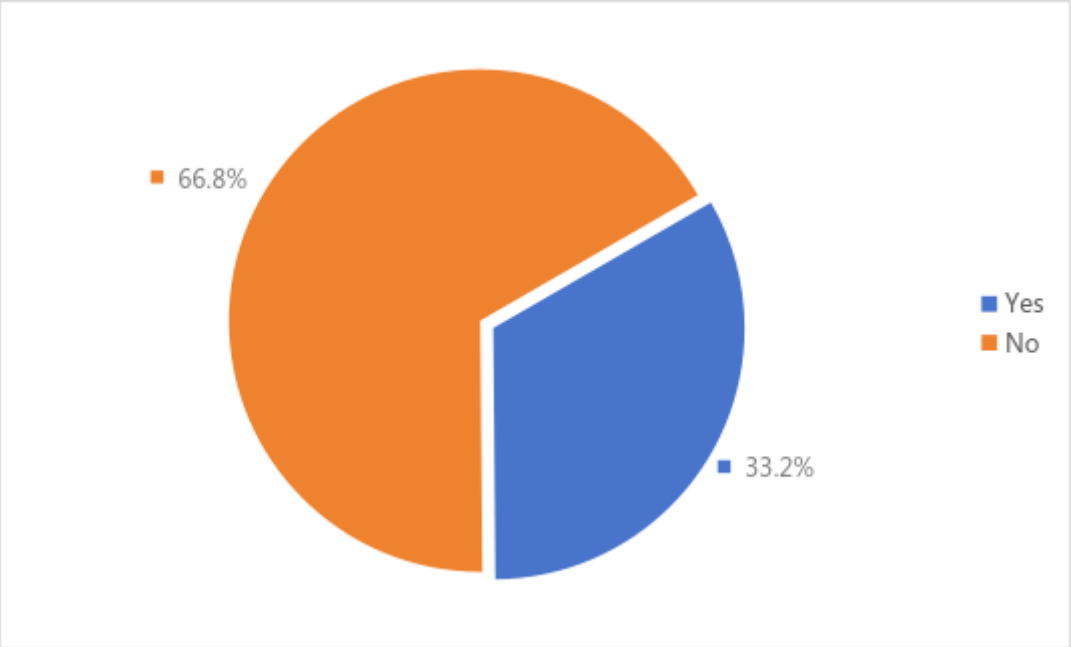

Figure 11Proportion of Women Primarily Undertaking Leadership/Principal Investigator Roles in Scientific Research

In terms of academic influence (see Figure 12), one-fourth (25.1%) of female scientists and technologists have served as reviewers for domestic-level funding projects or high-impact academic journals. A mere 18.3% of women have held significant positions or roles in international organizations or forums. Only 15.2% of female scientists and technologists have assumed leadership positions in institutions, associations, or other entities.

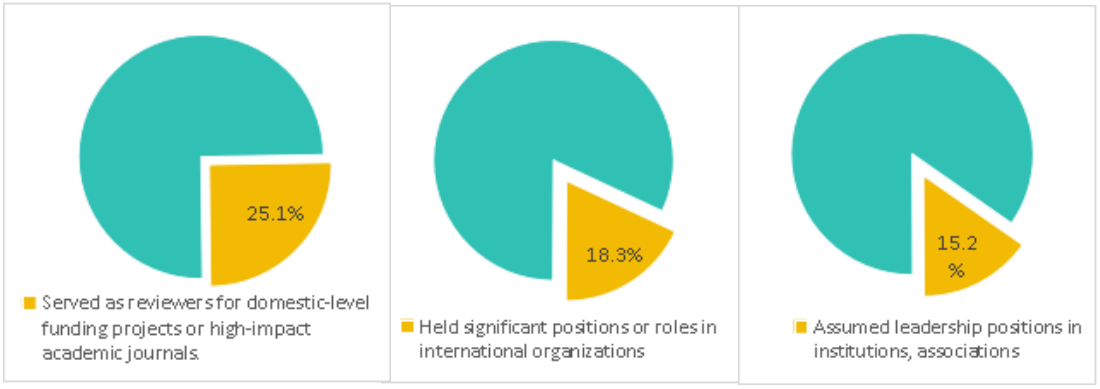

Figure 12Roles Undertaken by Female Scientists and Technologists in Scientific Research

The research findings demonstrate that overseas study/work experience has a positive impact on the influence of female scientists and technologists (see Figure 13). Among the two categories of female scientists and technologists who have served as reviewers for domestic-level funding projects or high-impact academic journals and those who have held important positions or roles in international organizations or

forums, the proportion of women with overseas study/work experience is significantly higher than those without such experience, reaching 88.0% and 90.7%, respectively. Additionally, in terms of having held leadership positions in institutions or associations, the percentage of female scientists and technologists with overseas study/work experience (79.0%) far surpasses those without such experience (21.0%).

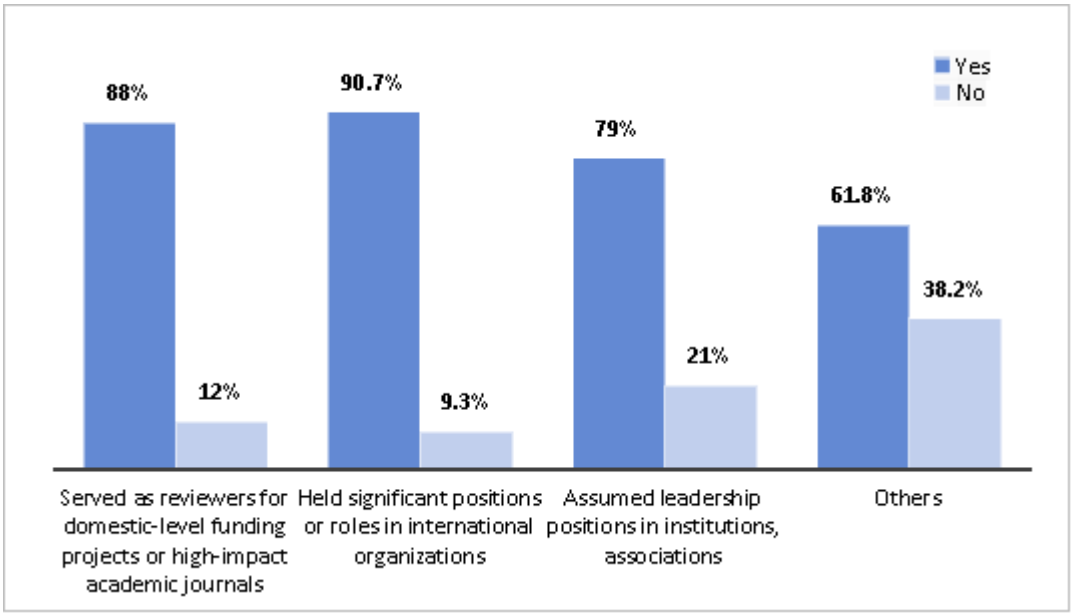

Figure 13Impact of Overseas Experience on Women's Scientific Research Roles

3.2.4 Female Scientists and Technologists Express Low Overall Job Satisfaction, with Career Advancement Opportunities, Work Environment Atmosphere, and Salary Satisfaction Receiving the Lowest Ratings

The survey results reveal that female scientists and technologists have a relatively low overall evaluation of their job satisfaction, scoring only 71.5 points out of 100. In their self-assessment of career development, the three aspects with the lowest scores are career advancement opportunities (70.7 points), work environment atmosphere (72.5 points), and salary satisfaction (73.1 points). An unfavorable work environment, insufficient room for career advancement, and the under-representation of women in high-level positions can impact their salaries and satisfaction, undermining the support and recognition that female scientists and technologists receive.

3.3 Challenges and Difficulties

3.3.1 Overwhelming administrative tasks diverting focus from research, heavy research assessment responsibilities, and a lack of research teams are the primary sources of work-related stress for female scientists and technologists.

The survey results reveal that 37.6% of respondents indicated that cumbersome administrative affairs distract them from their scientific research work. As female science and technology professionals often take on more executive roles in their field, their work tends to be more fragmented and trivial, negatively impacting their work efficiency and innovative capacity.

Furthermore, 34.0% of respondents believed that the demanding nature of research assessments and the fierce competition in scientific research pose significant challenges.

The limited opportunities for advancement available to female scientists and technologists have intensified competition, and they must also contend with onerous research evaluation tasks. These pressures can potentially stifle the innovative potential and research enthusiasm of female professionals in science and technology.

Additionally, 33.2% of respondents felt that they lacked access to research teams or that their own team's research capabilities were insufficient. Female science and technology workers often struggle with limited influence and a lack of voice, putting them at a disadvantage when it comes to securing research resources and trust. They face obstacles in team building, scarcity of financial resources, and difficulty attracting talent, which restricts their ability to collaborate on projects, share resources, and engage in knowledge exchange, ultimately hindering the production of high-quality research outcomes. Gender stereotypes can further exacerbate this situation to a certain degree.

3.3.2 The burden of family responsibilities and the disadvantage in accumulating scientific research resources are the main challenges confronting female science and technology professionals.

In the survey, 46.2% of respondents indicated that "compared to men, women bear a heavier family burden," which is one of the primary difficulties and challenges they face. In the traditional social value systems of the Asia-Pacific region, gender norms, and societal expectations often pressure women to prioritize family responsibilities over career and educational pursuits. Given that STEM careers are typically demanding, female science and technology workers must shoulder heavier family burdens while simultaneously coping with work-related stress. Moreover, physiological factors such as pregnancy and breastfeeding bring additional pressure and challenges.

Concurrently, 38.3% of female science and technology workers believed that "women are still at a disadvantage in terms of accumulating scientific research resources," which has a certain impact and creates difficulties for their career development. As women often find themselves in a disadvantaged position in existing social relationships and interactions, they may face higher costs in terms of time, energy, and finances when engaging in social activities. This also affects the cost for women to establish research networks and acquire resources, resulting in a need for them to exert more effort in workplace competition.

3.3.3 Insufficient Support for Women's Career Development: Female STEM Professionals Need More Targeted Assistance

Women in STEM fields face numerous obstacles in their professional journeys, including unequal access to resources, networking opportunities, and career advancement. Our survey reveals that 35.0% of respondents believed a dedicated "communication and service platform for female STEM professionals" should be established, while 29.8% advocated for the formation of "specialized organizations for female STEM talents." These platforms and organizations can bring greater attention to the challenges faced by women in STEM, accurately identify the thorny issues hindering their career growth, and provide targeted support to comprehensively assist their professional development.

When asked about the most critical areas of support and assistance (see Figure 14), nearly 40% (35.0%) of respondents indicated that "providing women with more opportunities for exchange and showcase" is essential. Close to 30% (28.9%) believed "offering more training and development opportunities for female STEM talents" and "implementing more flexible and autonomous work schedules for women" are crucial.

During interviews, some women expressed that "a distracted work environment leaves them lacking sufficient opportunities for academic exchange and collaboration, limiting their ability to update their knowledge and expand their horizons." They hoped that "through organizing activities and conferences, women will have more chances to voice their opinions in relevant fields, amplifying their influence in scientific and technological innovation." Additionally, they "need more opportunities to participate in advanced training courses, professional seminars, and short-term programs to update their knowledge and master the latest research methods and techniques." Diverse platforms for showcasing their work, balanced allocation of research resources, equal reward and selection mechanisms, fair career advancement paths, and a flexible, open research environment have become the collective call of the vast majority of female STEM professionals.

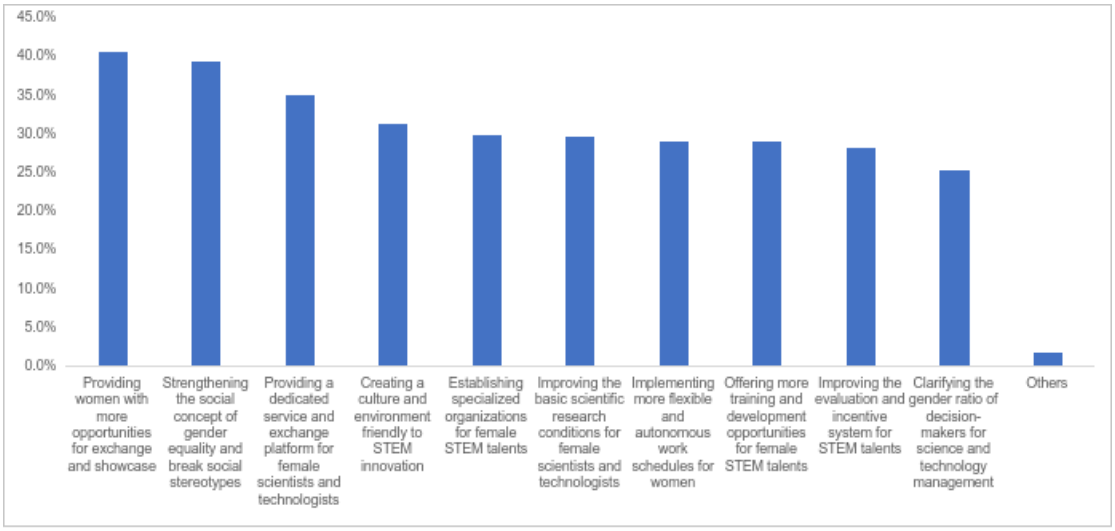

Figure 14 Areas of Support and Assistance Most Needed by Women in Scientific and Technological Innovation Work

3.3.4 40% of Female STEM Professionals Believe Societal Notions of Gender Equality Need Strengthening: Creating a Female-Friendly STEM Innovation Culture Remains a Daunting Task

Social stereotypes are a significant factor constraining the career development of women in STEM. Our survey found that nearly 39.4% of female STEM professionals believed that societal concepts of gender equality still need to be reinforced. Ingrained social biases in the Asia-Pacific region pose additional challenges and difficulties for women in STEM as they navigate their careers. These biases include the belief that men are better suited for leadership roles and STEM-related work, as well as prejudice against the capabilities and contributions of female STEM professionals. A Thai female scientist shared in an interview, "There is no physiological difference between men and women in intellectual work, so opportunities should be equal to reduce stereotypes." A Chinese female scientist also noted, "True equality is the equality of consciousness. It's not about giving more to one group, but about changing societal perceptions. It requires the attention of the entire society."

In our survey, 31.2% of respondents believed that a cultural atmosphere and environment friendly to female scientific and technological innovation should be further cultivated. This indicates that the current research environment still needs

improvement to better support the career development of female STEM professionals. A Malaysian female STEM worker stated, "The existing evaluation system for scientific research may not fully consider the unique contributions and needs of female STEM professionals, making it difficult for them to focus on their research and innovation work." Women in STEM still face social prejudice and low societal recognition, leading to an imbalance in the distribution of research funds, experimental equipment, human resources, research project applications, and academic resources between men and women.

3.4 Special Attention

3.4.1 77.1% of Female STEM Professionals Face Challenges Balancing Career and Family, with Women Aged 26-35 in Their Childbearing Years Facing the Most Severe Conflicts

Among all respondents, only 22.9% of women were able to effectively balance family and career, while 77.1% of female STEM professionals struggled with this issue (see Figure 15). 29.3% of women have foregone important work or promotion opportunities due to family reasons, and 6.2% have experienced family discord because of work demands. Moreover, some research institutions lacked flexible work arrangements, such as adjustable working hours or remote work options, making it difficult for female STEM professionals to adapt their work schedules to accommodate family needs.

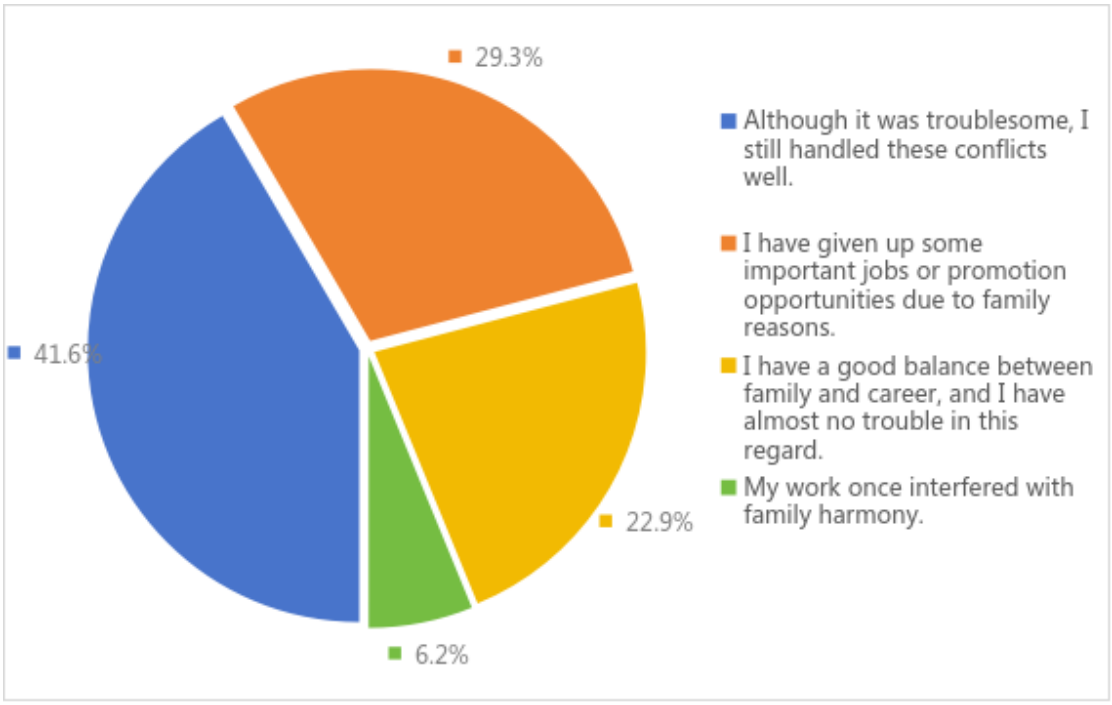

Figure 15 Challenges faced by female STEM professionals in achieving work-life balance

The survey results reveal that nearly half (45.7%) of female STEM professionals aged 26-35 have sacrificed job opportunities or career advancement due to family obligations. Women in this age bracket faced the dual pressures of marriage, childbearing, and societal expectations. Simultaneously, the STEM research field is characterized by the pervasive "publish or perish" competitive mentality. Certain economies have implemented "up or out" policies, mandating that researchers can only

secure long-term positions after successfully passing an evaluation during their probationary period. As this critical assessment phase coincides with the peak childbearing years for women, it exacerbates the conflict between professional and personal life.

3.4.2 Policy Inclinations Should Avoid Overemphasizing Differences between Men and Women; Family Responsibilities Should Be Shared Equally by Both Men And Women

Currently, support policies aimed at women focus more on assisting career women in balancing family responsibilities, such as extending maternity leave, offering flexible work arrangements for breastfeeding mothers, providing maternity benefits for women during the childcare period, and allowing women to bring their children to work. While the original intention of these policies is to demonstrate support and care for female STEM professionals, the implementation may inadvertently push women further away from social and professional activities and towards increased family obligations, hindering their ability to successfully return to work. Therefore, policy inclinations should refrain from deliberately accentuating differences and instead genuinely consider the impact of childbirth and child-rearing on women's career development. Equal family support policies should be provided to both men and women, rather than solely encouraging women to return to domestic roles. A Chinese female STEM professional stated, "The primary issue lies in reducing the burden placed solely on women in terms of family-related responsibilities, which stems from traditional social roles and societal norms. This encompasses improvements in social and cultural attitudes, the widespread adoption of mandatory paternity leave of equal duration, and the provision of flexible working hours not only for female researchers but also for their male counterparts in the scientific research field. Failure to do so may result in flexible work arrangements being used as a justification for discriminating against female candidates during the recruitment and promotion processes."

4 Policy Recommendations for Advancing Women's Participation in STEM in the Asia-Pacific Region

4.1 Providing more platforms and opportunities for women to engage in scientific innovation

1) **Specialized Training Initiatives**: it is crucial to organize specialized training for female STEM professionals to enhance their vocational skills and career planning capabilities. A wide range of educational and training opportunities should be offered, including short courses, workshops, and online education. The training content must encompass the latest research methodologies, utilization of technical tools, scientific project management, and team collaboration skills development. These initiatives aim to keep female researchers updated with current knowledge, equip them with new skills, and provide essential guidance and support for their career advancement.
2) **Communication Platforms and Visibility**: providing more platforms for communication and opportunities for women to showcase their work is essential. Female STEM professionals should be encouraged to participate in international forums, academic conferences, seminars, and exhibitions through policy inclinations, talent evaluation guidance, financial support, and other measures.

This will allow their research achievements to gain broader recognition and dissemination. Additionally, establishing online forums for female scientists, talent service organizations for female STEM professionals, and talent exchange platforms will foster communication and collaboration among women in STEM fields, enabling them to collectively address challenges encountered in their career development.

3) **Research Participation and Policy Adjustments**: increasing the proportion of women participating in scientific research project applications is necessary. Relaxing age restrictions for women applying for projects and implementing relevant systems to impose certain percentage limitations on the application, approval, and participation of female STEM professionals in research projects will help create a more supportive and friendly environment. These measures aim to develop a more diverse, equal, and inclusive research ecosystem

4.2 Enhancing Women's Influence and Voice in Scientific Innovation Activities

1) **International Journal Involvement and Leadership in Sci-Tech Organizations**: it is imperative to encourage women to actively participate in the international journal peer review processes and to assume roles within global science and technology organizations. A comprehensive database of exceptional female talents across the Asia-Pacific region should be established, collecting and recommending these accomplished women as potential reviewers for prestigious journals and as decision-makers in influential sci-tech institutions. Additionally, targeted training should be provided to hone their international skills, thereby amplifying their global influence in the scientific community.
2) **Engagement in International Collaborative Research**: guidance and support should be extended to female researchers to engage with international collaborative research projects. A dedicated fund specifically for women's participation in global scientific cooperation initiatives should be created. Female sci-tech professionals should be encouraged and empowered to apply for these collaborative opportunities, fostering their involvement in cross-border scientific exchanges. Through these international interactions, women can broaden their perspectives, enhance their capabilities, and strengthen their voice in worldwide innovation endeavors.
3) **Promotion of Role Models and Recognition of Achievements**: it is essential to establish and promote inspiring role models of women excelling in scientific research. Awards tailored to recognize the outstanding contributions of female researchers, such as the "Global Women's Prize for Exceptional Achievement in Science and Technology," should be instituted. Media platforms and public forums should be utilized to widely publicize the groundbreaking accomplishments of these award-winning women, elevating their visibility and cementing their esteemed status within the scientific world.

4.3 Expanding Advancement Pathways for Women in the Scientific and Technological Innovation Ecosystem

1) **Institutional Policies for Gender Equality in Leadership**: it is crucial to institutionalize clear guidelines specifying the proportion of female representation in decision-making roles. Legislation should be enacted, or

policies formulated, mandating that research institutions prioritize gender equality in their decision-making processes. Specialized training programs and selection mechanisms should be established to cultivate and promote female scientific leaders. For example, it should be stipulated that women comprise at least 20% of decision-making positions, with regular reviews and disclosures of gender equality at this level to ensure transparency and drive continuous improvement. This initiative should also aim to integrate more female leaders into science advisory boards, review panels, and the management echelons of research organizations.

2) **Gender Equality in Recruitment and Advancement**: we recommend that we need to guarantee gender equality in recruitment and advancement practices within the scientific domain, and implement anonymized hiring and promotion evaluation procedures to mitigate social biases. We need to ensure that assessment committees feature a substantial proportion of female members, fostering diverse perspectives in the selection process.
3) **Mentorship Assistance for Female Sci-Tech Professionals**: we recommend introducing a mentorship assistance initiative tailored for female sci-tech professionals, and matching these women with seasoned mentors who can provide personalized guidance for their career development. Through this program, female scientists and technologists can enhance their leadership abilities, project management skills, and other crucial competencies. By offering targeted support, this initiative aims to empower women to thrive and ascend to higher echelons within the scientific research field.

4.4 Amplify Support for Young and Middle-Aged Female Scientific and Technological Professionals

1) **Funding and Resource Allocation**: we need to bolster funding and resource allocation specifically tailored for young and middle-aged female researchers. We should also stablish initiatives such as a development fund for female STEM professionals, outstanding achievement awards for young and middle-aged scientific talents, and a "Sprout" program for nurturing early-career female scientists. These initiatives should provide targeted support for their research projects, facilitating significant advances in their respective fields.
2) **International Exchange Opportunities:** we recommend creating overseas exchange opportunities specifically designed for young and middle-aged female STEM professionals. We also suggest that we need to offer them a wider array of international collaboration and networking opportunities, including visiting scholar programs, participation in international forums, and advanced studies abroad. These opportunities are intended to broaden their professional networks and enhance their global perspectives, thereby enriching their scientific endeavors.
3) **Talent Evaluation and Administrative Support**: we would like to refine the talent evaluation system for young and middle-aged female STEM professionals, and focus on alleviating their administrative burdens and work pressure not directly related to scientific and technological innovation. Instead, guide them to make greater contributions in areas such as research output, the transformation of scientific achievements, and participation in international scientific exchanges. This approach aims to optimize their productivity and impact in the scientific community.

4.5 Extend More Humanistic Care to Female STEM Professionals

1) **Cultivating a Female-Friendly Work Environment**: it is essential to cultivate a female-friendly work environment within scientific research institutions. This can be achieved by conducting awareness training to enhance all researchers' understanding of the importance of gender equality. Such training fosters a more inclusive and respectful workplace, crucial for promoting diversity and cooperation.
2) **Implementing Family-Friendly Policies**: we suggest implementing family-friendly policies that promote the concept of shared family responsibilities between men and women, thus reducing social bias, and advocate for the adoption of measures such as popularizing paternity leave, providing childcare support, maternity leave, and parental leave, and offering convenient facilities for female STEM professionals with children. Collaboration with community resources to provide childcare information and support is also vital, ensuring that these professionals receive the necessary backing to balance family and work commitments effectively.
3) **Enhancing Mental Health Support**: we suggest to offer enhanced mental health support for women, and establish a mental health support system to provide psychological counseling services specifically for female STEM professionals. We should regularly organize mental health lectures and workshops to improve women's self-regulation abilities and coping strategies. We also need to provide targeted mental health guidance for pregnant and breastfeeding women returning to the workplace, assisting them in managing work pressure and challenges during their reintegration. This comprehensive support is aimed at ensuring their well-being and productivity in the scientific field.

CONCLUSION

Establishing a gender-equal social paradigm and promoting women's participation in STEM is a long-term, systematic undertaking. While current research on women's involvement in STEM reflects, to a certain extent, the difficulties and challenges faced by female scientific and technological professionals, there remains a large number of unsung heroines toiling in grassroots STEM fields, such as private enterprises and small and micro businesses, who are often overlooked in our surveys and studies. Although they may not have received various scientific and technological awards, published significant academic papers or research reports, or had opportunities to participate in major forums and conferences, they are a crucial force in advancing women's scientific innovation and form an integral part of the vast community of female STEM professionals. The hardships and issues they encounter may be far more severe and pronounced than what our research has uncovered.

Concurrently, elevating gender equality awareness throughout society still confronts complex social environments and cultural barriers. Gender equality in STEM should not be merely a "rallying cry" confined to a small circle of women. Policymakers must treat it as a long-term development strategy, continuously deepening their focus on and investigation of female STEM professionals, dismantling the barriers that hinder their work, and collaboratively striving to promote genuine equality and inclusivity in the realm of science and technology.

Annex 1: Compilation of Views from Speakers and Participants at the Second Event of the Project

1. Zhang Jingjie

Title: *Distinguished Core Researcher and Doctoral Supervisor, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences (CAS)*

Topic: *Women are Playing a Very Important Role in the Field of Marine Technology*

- Women's scientific and technological innovation and entrepreneurship have received increasing attention and support from society. Events such as the "Cutting-Edge Technology: Her Power" session at the 2023 Zhongguancun Forum and the "Global Women in Technology Innovation Forum" in 2024 have showcased the positive influence of "her power." Differences between men and women are not barriers to success; instead, women's unique characteristics can solve certain problems more efficiently.
- The ocean covers more than 70% of the Earth's surface, which is more than twice the area of land. It holds a large amount of untapped resources and numerous scientific puzzles remain unsolved. However, due to the extremely complex ocean environment with darkness, high pressure, and low temperature, our understanding of the ocean is even less than that of the moon. Internationally, advanced manned submersibles such as the American "Deepsea Challenger" and "Alvin", Japan's "Shinkai 6500", China's "Fendouzhe", France's "Nautilus", and Russia's "Mir-2" have been developed. China has also achieved remarkable results, with submersibles like the "Shenhai Yongshi" (4,500-meter manned), "Haidou-1" (10,000-meter), and "Fendouzhe" (full-ocean-depth manned). The "Fendouzhe" took five years to develop and conduct sea trials with the efforts of nearly a hundred units across the economy, achieving the goals of "going down, coming up, operating well, and detecting accurately".
- The success of this achievement is attributed to the efforts of many women. For example, Wang Yongmei from Baoji Titanium Industry Co., Ltd. led her team to improve the manufacturing process of the manned sphere of the "Fendouzhe", ensuring the independent control of key technologies. When the "Fendouzhe" faced a shortage of buoyancy materials, her team developed high-safety-factor materials with independent intellectual property rights. He Lisheng, a researcher at the Institute of Deep-Sea Science and Engineering, Chinese Academy of Sciences, was the first Chinese female scientist to reach the 10,000-meter-deep seabed and carried out in-cabin operations.
- On the path of scientific research, women should not be afraid of difficulties. Instead, they should be passionate and face challenges head-on. Accumulation is the foundation, innovation is the way out, and perseverance is the key. We should pay tribute to female scientists like Marie Curie, He Zehui, Huang Lingyi, Tu Youyou, and Wang Chengshu for their outstanding contributions to the development of human science and technology.

2. He Yihua

Title: *Chief Physician, Professor and Ph.D. Supervisor, Beijing Anzhen Hospital, Capital Medical University*

Topic: *Exploration of Women's Innovation in the Prevention and Control of Birth Defects*

- Dr. He Yihua shared her insights in "Exploring Women's Innovations in the

Prevention and Control of Birth Defects". She began by highlighting the significant role of female workers and researchers in birth defect prevention and control. In her 70-member team, the majority are female doctors, whose empathy and meticulousness are crucial in this field. She also emphasized the importance of the organization in promoting their work and ideas.

- Birth defects are a vital part of the domestic population strategy, with congenital heart disease ranking first. The disease burden is shifting from lethal to non-lethal, and issues like reducing birth complications and managing the entire life cycle of patients have become crucial. To address these challenges, her team has been innovating. They have developed new prenatal diagnostic techniques for fetal hearts, such as using CT to create 3D digital heart models and establishing a unique fetal heart growth curve theory, which has been cited in international guidelines. They also actively promote medical-engineering cross-cooperation and apply AI technology. Despite the low fetal heart screening rate in China compared to Europe and the United States, they developed AI-based screening models, achieving remarkable results and publishing in top international journals. With the emergence of large-scale models like ChatGPT, they are building imaging and language models to provide more comprehensive medical services, from prenatal diagnosis to post-natal consultations. Moreover, her team has developed an integrated clinical management plan, including a remote consultation system for multi-disciplinary cooperation, to predict disease risks. They have also expanded into genetic research. By studying the relationship between fetal structural abnormalities and genetic factors, they discovered a new pathogenic gene related to fetal energy metabolism. Through cooperation with other teams, they helped a family with a history of birth defects have a healthy child after ten years. Dr. He emphasized that female scientists' dedication and exploration are key to promoting progress in birth defect prevention and control, aiming to bring more happiness to families and society.

3. Wu Yi

Title: *Host of HICOOL Global Entrepreneurs Summit and Entrepreneurship Competition, Vice Chairman and Secretary General of Beijing Overseas Talents Association, General Manager of Beijing Hycore Innovation Technology Service Co., Ltd.*

Topic: *Breaking Boundaries and Undefinable-Observing the "Power of Women" in the HICOOL Global Entrepreneurship Competition*

- Overview of HICOOL Global Entrepreneurship Competition: HICOOL is a significant global entrepreneurship competition and ecosystem. It offers a comprehensive range of services, including a competition, business college, fund, and industrial park, aiming to support global entrepreneurs and attract high-quality innovation resources.
- Women's Participation in HICOOL: The number of female participants and award-winners in HICOOL has been increasing. Female participants are often young and well-educated. The cultural creativity track attracts the most female entrepreneurs, with many projects being innovative, some empowered by AI or featuring new business models.
- HICOOL's Supportive Ecosystem: HICOOL provides a one-stop entrepreneurial ecosystem service platform. It offers policy support, capital connection, industry matching, and comprehensive services to help startups and entrepreneurs solve various problems and promote their development.

- Conclusion: The presentation likely concludes by encouraging more female entrepreneurs to join HICOOL's ecosystem, highlighting its potential to support women in achieving entrepreneurial success.

4. Li Chunmei

Title: *Vice President, AISPEECH Technologies Co., Ltd., China*

Topic: *Future Female Power: Pioneering in Technology and Innovation*

- Status of Women in Suzhou's AI Industry: In Suzhou, the AI industry is large-scale with 2000 + companies and 2 economy-wide platforms, and 20% of the over 10,000 practitioners are women. The local women's federations and alliances support female tech workers through various activities like cooperation exchanges and talent-related events.
- AI Applications for Women's Well-being: AI is applied in "Smart Homes", "Smart Education", "Smart Health", and "Smart Driving" to improve women's lives. For example, in smart homes, AI applications reduce women's household burdens; in smart education, they help with parenting; in smart health, they focus on women's and the elderly's well-being; and in smart driving, they ensure women's travel safety.
- Future Vision: The future lies in cooperation, sharing, and dialogue. There are plans to build an "AI-enabled Future Digital Family" innovation consortium through cross-border integration to support women in both family life and scientific innovation.

5. Zhao Jie

Title: *President of BabyTree Group, Vice President of Outstanding Women Branch of United World Chinese Association*

Topic: *AI Technology Leads New Development of Maternal and Child Care*

Optimized Content:

- BabyTree's Influence and AI Innovations: BabyTree, a renowned brand in maternal and infant care, is at the forefront of leveraging AI technology to enhance user experiences. Its innovations include a cry translator, AI-powered storytelling, and an AI-based Q&A service for pregnancy and parenting. Furthermore, BabyTree has introduced Mika-Brain, a specialized AI model for the maternal and childcare domain, to bolster its business capabilities.
- User-Centric Services and Data-Driven Insights: BabyTree has crafted an all-encompassing community platform for learning, communication, and consumption. By utilizing user-authorized data, it creates precise user profiles, gains insights into user needs, and offers tailored services. This approach has significantly elevated its brand recognition and fostered user loyalty.
- AI-Powered Product Ecosystem: BabyTree boasts a diverse portfolio of AI-enabled products and services spanning various application scenarios like knowledge acquisition, communication, and consumption. These offerings are designed to revolutionize the parenting experience and cater to the multifaceted needs of families at different stages of their maternal and infant journey.

6. Yanuar Farida WISMAYANTI

Title: *Head of Research Center for Public Policy and Senior Researcher, National Research and Innovation Agency (BRIN), Indonesia*

Topic: *Strengthening Women's Role to Support the Green Economy and Climate Change Adaptation Policy*

- International Commitment and the Significance of Women's Empowerment: Indonesia is committed to the Sustainable Development Goals (SDGs) and the Paris Agreement. Climate change disproportionately affects women, exacerbating poverty among them. The green economy, aiming for sustainable growth and social equality while reducing environmental damage, is crucial. Women's empowerment is significant as it contributes to economic growth, social equality, and environmental protection. However, Indonesia has a relatively high Gender Inequality Index (GII), indicating gender inequality in education, employment, and political representation.
- Women's Economic Participation and the Green Economy: The female labor force participation rate in Indonesia has increased slightly. Women are active in various sectors, and microfinance and small enterprise opportunities have a positive impact on them. In the green economy, women play important roles in sustainable farming and agroforestry, renewable energy, and waste management. For example, the "Kartini Tani" program empowers women in agriculture. However, women face barriers such as cultural and societal norms, and limited access to finance and digital literacy.
- Government Policies and Initiatives: The Indonesian government has implemented policies and programs to support women's empowerment, sustainable development, and gender equality. Public-private partnerships also play a role. The National Research and Innovation Agency (BRIN) focuses on research and innovation in areas like biodiversity, renewable energy, etc. However, current policies may be too general and lack specific support for women in the digital business ecosystem.
- Future Directions and Recommendations: Future efforts should focus on women-responsive policy design and implementation, empowering women in decision-making, and ensuring policy sustainability. Strengthening policy implementation requires increasing public awareness, improving infrastructure, and simplifying regulations. Enhancing access to finance and promoting evidence-based research are also important strategic priorities.

7. Sri Hartini RACHMAD

Title: *Researcher, National Research and Innovation Agency (BRIN), Indonesia*

Topic: *Tech-Driven Empowerment: Boosting Indonesian Women Entrepreneurs in the Digital Era*

- Background: Digital technologies have revolutionized industries and enabled digital entrepreneurship, which offers opportunities for women entrepreneurs to overcome certain barriers. However, women face unique challenges in entrepreneurship ecosystems, such as limited access to capital, customers, and support. Skills, entrepreneurial framework conditions, and the digital divide also impact their success.
- Literature Review: Digital entrepreneurship can drive growth for women-owned businesses. For example, in India, digital platforms have empowered women to start e-commerce businesses. In Indonesia, FinTech and e-commerce startups support women micro-entrepreneurs. But globally, women have lower digital inclusion due to factors like affordability, lack of skills, and cultural norms. Digital platforms present both opportunities and challenges, and overcoming barriers can maximize their potential for female entrepreneurship.
- Method and Result: In 2023, most e-commerce business owners in Indonesia

had a high school or vocational high school education or below, and men dominated the e-commerce workforce. Transaction security and accountability were issues, with multi-mode sales, cash payments, and lack of financial reports being common.

- Conclusion and Policy Recommendations: Indonesian women face challenges in digital business, despite the opportunities offered by technology. To address these, stakeholders should invest in programs supporting women entrepreneurs and promoting gender equality, leveraging technology, and supporting research. This can create an inclusive digital economy beneficial to all, especially women entrepreneurs in Viet Nam.

8. Anugerah Yuka A.

Title: *Senior Researcher, National Research and Innovation Agency (BRIN), Indonesia*
Topic: *Women's Successful Practice in Science and Technology Innovation and Entrepreneurship (Public Sector): Experiences from Indonesia*

- Introduction to STI, Entrepreneurship, and Digital Business Ecosystem: Defines science and technology characteristics, entrepreneurship types, and the digital business ecosystem (DBE). DBE combines business and innovation ecosystems and is crucial for female entrepreneurship, with digital technology playing a significant role.
- Indonesia's Situation: Indonesia ranked 54th in the 2024 Global Innovation Index. SMEs are vital to the economy, and a large number of them are managed by women. The government promotes women entrepreneurs' use of digital platforms, but they face challenges like access to finance, infrastructure, and digital literacy.
- Case Studies: Presents three cases of Indonesian women in digital business entrepreneurship. In each case, women in SMEs utilized digital technology, and local governments provided support, such as information-sharing platforms, digital marketing training, etc.
- Challenges and Government Support: Challenges for women entrepreneurs include general government DBE policies and sector-specific support. The government should collaborate with industries to maximize the role of women in SMEs. However, the government also supports women through various policies and initiatives, such as digitalization training.
- Conclusion: The presentation likely concludes by emphasizing the importance of addressing challenges and leveraging government support to promote women's entrepreneurship in the digital era.

9. Rio Alyssa Yoshika

Title: *Founder and CEO of Golden Jubilee, Chairwoman of Asia Medical Innovation Center, Japan*
Topic: *Fostering Innovation in STEM: The Role of Women Scientists in Medical Advancements*

- Company Vision and Philosophy: The Golden Jubilee Inc. focuses on early-stage medical technology investment in the APEC region and supports the commercialization of innovative technologies. It adheres to a technology-first philosophy, evaluating based on technical merit regardless of sex to ensure fairness and maximize innovation potential.
- Unique Contributions of Women Scientists in Medicine: Women scientists in medicine have a unique perspective, focusing on quality of life and usability in

addition to treatment efficacy. They are strong in women's disease research and can better empathize with female patients. Case studies, like the breast cancer screening innovation and chemotherapy hair loss treatment, demonstrate their contributions.

- Call for an Inclusive Future: To create a more inclusive and innovative future in STEM, it is essential to ensure fairness, support women scientists with resources, and foster diversity.

10. Maizatul Nasyira MOHD SURATIN

Title: *Principal Assistant Secretary, Ministry of Science, Technology and Innovation, Malaysia*

Topic: *Building an Inclusive and Supportive System for Women in STEM in Malaysia*

- Maizatul Nasyira binti Mohd Suratin shared Malaysia's strategies. In the labor force, women face challenges, with many out of work due to family responsibilities. Malaysia has a comprehensive set of STI policies under the *NSTIP 2021-2030*, aiming to increase women's participation and re-entry into the STEM workforce. There are numerous female leaders in R&D and STI-related institutions, serving as role models. STEM outreach events like Malaysia Tech Olympics and STEM Camp, as well as scientist-school visits, stimulate students' interest in STEM. International and domestic collaborations, such as the Malaysia-China International Brand Conference, offer platforms for knowledge exchange. Diverse funds support STEM research, and awards such as the MBOT Woman Leadership Award recognize women's contributions. Data collection and continuous monitoring through platforms like the Malaysian Science and Technology Information Centre enable evidence-based policy-making to better support women in STEM.

11. María José Morales García

Title: *Director General for Gender Equality, Diversity and Inclusion, Federal Institute of Telecommunications (IFT), Mexico*

- María José Morales García introduced a key project on professional and technological transformation to boost female leadership, with female experts as role models and involving many women in inter-agency collaboration. Surveys are carried out to understand women and girls' use of communication technologies and their role in e-commerce for insights into economic contributions. She emphasized that his team collaborates with schools on systematic programs for girls and focuses on eliminating social stereotypes, a task that requires joint efforts from parents, schools, and policy-making to change the traditional view that women should only focus on the family. Additionally, they cooperate with institutions to offer free digital courses to enhance women and girls' digital skills for better digital integration and are committed to improving digital space safety to ensure a secure environment for them, believing these efforts are crucial for promoting gender equality and women's greater participation in science and technology development in Mexico.

12. Rocio Asuncion CABRERA Gomez

Title: *Technology Transfer Specialist, National Council for Science, Technology and Innovation (CONCYTEC), Peru*

Topic: *Opportunities and Challenges of Practice of Outstanding Young Women STEM Workers*

- Mentoring Program: Rocío Cabrera Gomez introduced a mentoring program in alliance with the British Council in 2020. The program aims to develop intellectual property management skills among female STEM graduates in Latin American economies, including Brazil; Chile; the Dominican Republic; and Peru. These women are engaged in innovation initiatives, and the program helps them create value through the use of intellectual property.
- Support from CONCYTEC: CONCYTEC, through technical and financial means, supports the capacity-building of women in STEM. It offers training, personalized advisory meetings, and specialized tools on the Vinculate Platform. The overall goal is to ensure the long-term presence and promotion of women to leadership positions in the STEM sector in Latin America.

13. Myra Evelyn FLORES Flores

Title: *Technical Secretary, Committee for Women STI of National Council for Science, Technology and Innovation (CONCYTEC), Peru*

Topic: *Peru's Policies and Programs for Promoting Women's Participation in the Development of STI*

- Dr. Myra E. Flores introduced Peru's efforts. The "Committee for Women in STI" was established in 2019. It has 12 female advisors and focuses on reducing the gender inequality in STI by designing relevant mechanisms. Regulatory changes ensure that pregnancy or maternity leave doesn't affect researchers' active status in the registry, safeguarding their access to funding. A mentorship program with over 300 trained mentors and a MOOC for continuous training nurtures female talent. Scholarships like "María Reiche" and internship programs support young women. In research funding, projects led by women or with female researchers get extra scores, and pregnancy-related deadlines can be extended. Universities with CONCYTEC-funded doctoral programs must allocate 40% of scholarships to women. Science outreach activities like "Scientist for a Day" and "Women of Science" workshops in schools, along with the "Scientists of Peru" book, raise awareness about women in science.

14. Jocelle Batapa-Sigue

Title: *Undersecretary for ICT Industry Development, Department of Information and Communications Technology (DICT), the Philippines*

Topic: *Digital Innovation for Women Advancement (DIWA): The Philippines Strategy for Women's Digital Inclusion*

- The Digital Innovation for Women Advancement (DIWA) in the Philippines is a significant initiative that focuses on leveraging the power of ICT to promote gender equality and empower women. Globally, there are concerning realities such as a low number of women enrolled in ICT courses compared to men, a low level of digital competence among college graduates, and a significant gap in workforce participation in the ICT sector.
- DIWA aims to address these issues through several strategies. It focuses on ensuring women and girls have access to the Internet to enhance their participation in decision-making, economic development, innovation, and entrepreneurship. Additionally, it encourages the use of ICTs for promoting gender equality and empowers women and girls by promoting their involvement in digital technologies, education, certifications, and skills training. The key findings of the *DIWA Survey 2024* show strong support for the initiative. Respondents recognize its alignment with gender equality and ICT goals,

especially in line with Sustainable Development Goals (SDG) 5 of the *2030 Agenda for Sustainable Development.* There is also a strong advocacy for inclusive opportunities, including equal access to ICT tools and skills development for women, and increased participation in ICT industries, entrepreneurship, and policy-making. Stakeholders view DIWA as an initiative that empowers women by encouraging their participation and leadership in ICT fields, spreads awareness about the role of women in digital transformation, and builds a community by strengthening networks among advocates and participants.

- DIWA's advocacy framework emphasizes gender equality mainstreaming in ICT policies, collaboration among stakeholders to create inclusive digital ecosystems, and empowering women and girls through targeted initiatives and capacity-building. This initiative was also discussed in the APEC Workshop on Women in STEM held in Manila, the Philippines in September 2024, which further highlights its importance in the Asia-Pacific region's efforts to promote women in STEM and drive innovation development.

15. Mary Joie Cruz

Title: *Founder and CEO, Limitless Lab, the Philippines*

Topic: *Innovating for Inclusion: Design and Technology for Social Good*

- Limitless Lab and Services: Limitless Lab is a global social innovation company using creativity, design, and technology to drive positive change. It offers digital products, training programs, co-design services, and an innovation management platform. Since 2018, it has trained over 10,000 people in design thinking.
- Women's Strengths and Challenges in Innovation: Women possess unique strengths in innovation such as empathy, collaboration, creativity, flexibility, multitasking, and the ability to detect nuances. However, they face challenges like not being taken seriously, limited access to funding, and social bias. Recognizing and leveraging these strengths can lead to a more inclusive approach to innovation.
- Call to Action: To support women in innovation, individuals should find women mentors, take credit for their work, and support other women innovators. The "SHE DESIGNS PHILIPPINES" UX Certification Program for Young Filipino Women is an example of an initiative to empower women in the field.

16. Katherine Dillena

Title: *Head of Operations & Project Manager, Extempo, the Philippines*

Topic: *The Role of Women in Driving Innovation in Philippine Tech Start-ups*

- Current Situation in the Philippines' Tech Start-ups: In the Philippines' tech start-ups, men still dominate the ecosystem. Only 31% of startups have at least one female founder, and the average number of female founders is low. Women face challenges such as workplace harassment, social bias, limited leadership opportunities, work-life balance issues, and difficulty accessing funding.
- Importance of Women in Innovation: Women are key drivers of innovation globally. In the Philippines, female-led startups create innovative solutions in fintech, healthtech, and sustainability, and women-owned tech companies have high return on investment and innovation rates.
- Solutions and Call to Action: To empower women in the Philippines' tech start-ups, it is necessary to leverage programs like QBO Innovation Hub and SheLovesTech, promote government initiatives, and build inclusive workplaces

with mentorship opportunities. Startups should invest in women-led ideas, women in tech should utilize networks and mentorship, and policymakers should enhance funding access and education for women in STEM.

17. Kris R. Villanueva Libunao

Title: *Executive Director and Chief Sustainability Officer, SmartCT, the Philippines*

- Current Landscape and Key Findings: APEC economies have made progress in addressing the digital gender inequality, but challenges remain. Key findings include the importance of education in bridging the gap, cultural norms as a major barrier to women's participation in ICT, limited data on women's digital entrepreneurship, the need for specific women-inclusive ICT policies, and infrastructure access as a significant hurdle.
- Action Strategies: Five action strategies are proposed: education and early engagement, workplace policies and culture, entrepreneurship and leadership, integrated women-inclusive ICT policy and legislation, and technology access and digital literacy. A holistic approach is needed to create a more inclusive digital future.

18. Suthida PIRIYAKARNSAKUL

Title: *Policy Specialist, Office of National Higher Education Science Research and Innovation Policy Council (NXPO), Thailand*

Topic: *Women in STEM: Empowering the Future*

- Challenges in Empowering Women in STEM: Suthida Piriyakarnsakul from the Office of the National Higher Education Science Research and Innovation Policy Council in Thailand presented on empowering women in STEM. The challenges include addressing educational gaps among groups with untapped economic potential, encouraging girls to pursue STEM education and careers, establishing networks, mentorship, and role models in STEM, and promoting inclusivity and equality in STEM learning and employment opportunities.
- Initiatives and Activities: Thailand has launched several initiatives. "Women Made: Girl in STEM" includes panel talks, inspiration from successful STEM professionals, human library events, and workshops for teachers to make STEM education more accessible to female students. "Girls In ICT 2024: Leadership" is a webinar co-hosted by the Digital Council of Thailand and the International Telecommunication Union to enhance gender equality in digital leadership and skill development. The Ministry of Higher Education, Science, Research and Innovation, through the National Science Museum Organization, has launched a set of science media activities, such as science experiment kits and IT skills learning kits, to promote scientific learning.
- Scholarships and Career Examples: There are various scholarships for women in STEM, like the ASEAN-UK SAGE scholarship and L'Oréal Thailand "For Women in Science" Fellowship Program. In the electronics and energy sectors, women play significant roles. For example, in Delta Electronics Thailand, women make up over 70% of the workforce. In the energy field, Thai women are involved in research and policy-making, with some receiving awards for their contributions.

19. Panisa HARNPATHANANUN

Title: *Division Director, Division of Higher Education Innovation and Future Skills Development, Office of National*

Higher Education Science Research and Innovation Policy Council (NXPO), Thailand
Topic: *Incentives for Women in STEM Workforces in a Case of Thailand*

- Incentives for Women Workers: On International Women's Day, Thailand's Social Security provides various benefits for women workers, including increased maternity and child allowances, higher prenatal care fees, free health checks, and access to social security. These measures aim to support women in the workforce and improve their well-being.
- Incentive Packages for High-Skilled Workforce Development: Thailand offers comprehensive incentive packages for high-skilled workforce development in STEM. In employment, there are tax incentives for hiring STEM personnel. For human resource development within organizations, tax incentives for workforce training and funding for personnel training costs are provided. Additionally, incentives are given for admitting internships and establishing specialized training centers. These incentives are designed to promote the development of a high-skilled STEM workforce.
- Manpower Development Platform and Strategic Industries: Thailand has a Manpower Development Platform focusing on upskilling, reskilling, co-creation, and employment and career development. It aims to support targeted industries such as BCG and the 12-S-Curve, and has had a positive impact, including producing a large number of high-performance manpower and attracting significant investments. The platform also helps increase the productivity of the higher education workforce.

20. Duong Thi PHUONG
Title: *Officer, National Agency for Science and Technology Information (NASATI), Ministry of Science and Technology, Viet Nam*
Topic: *Viet Nam's Policies and Awards Supporting for Women in STEM*

- Overview: STEM is fundamental to innovation, sustainable development, and economic growth. Viet Nam is committed to the United Nations Sustainable Development Goals, especially gender equality and innovation. The government has introduced numerous policies to promote women's participation in STEM, although women still face barriers in leadership and high-level positions in STEM fields.
- Government Policies Promoting Women in STEM: Viet Nam's National Gender Equality Strategy (2011-2020) focuses on reducing gender inequality in STEM-related education, employment, and economic participation. The education system has implemented gender equality mainstreaming, with initiatives like STEM scholarships for female students, STEM clubs and workshops for girls, and efforts to encourage female STEM teachers. The legal framework, including the Labor Code (2019) and Women's Rights Law, ensures gender equality in the workplace. The Viet Nam National Innovation Center (VNIC) promotes women-led startups and women in tech. Project 939 supports women in STEM-related businesses, and the NAFOSTED funding program prioritizes female-led research projects.
- Awards and Initiatives to Support Female Scientists: Viet Nam has a range of domestic awards for female scientists, such as the Viet Nam Women's Award and the Viet Nam's Female Innovator Award, which recognize their contributions and raise awareness of women in STEM. Internationally, Vietnamese female scientists have received awards like the Kovalevskaia Award. There are also international awards for organizations promoting gender

equality. Additionally, initiatives like She Is STEM (Viet Nam) and the application of the Athena SWAN model aim to promote gender equality in STEM.

- Achievements and Challenges: Viet Nam has achieved some success in promoting gender equality in STEM, with high female participation in scientific research and improvements in the gender equality index. However, challenges remain, including social bias, lack of specific support programs for women in STEM, underrepresentation of women in high-tech and engineering sectors, and workplace discrimination.
- Proposed Solutions: To address these challenges, Viet Nam should improve policies by creating separate policies for women in STEM and setting specific targets for their participation. Developing a support ecosystem, promoting awareness and education, and supporting better working conditions, such as providing flexible work mechanisms and childcare services, are also crucial steps.

21. Vu Quynh ANH

Title: *Official of Secretariat Division, Office of Ministry of Science and Technology, Viet Nam*

Topic: *Viet Nam's Policies on Innovative Entrepreneurship*

- Overview of Viet Nam's Innovative Entrepreneurship Ecosystem: Viet Nam's innovative entrepreneurship ecosystem has developed significantly. It ranked 56th in the *2024 Global Startup Ecosystem Index Report*, and its *Global Innovation Index (GII)* has been rising. There are numerous startups, support organizations, and investment funds, along with economy-wide and local innovation centers.
- Assistance Policies: Viet Nam has introduced several laws and strategies, including the Law on Science and Technology (2013), the Law on Support for Small and Medium Enterprises, Law on Investment (2020), and the 2030 Science Technology and Innovation Development Strategy. These aim to foster a favorable environment for entrepreneurship.
- Program to support Women entrepreneurship (project 939): Implemented from 2017-2025, its goals include raising awareness among Women's Union members, supporting women in starting businesses, establishing women-managed cooperatives, and providing consultation for women-owned enterprises. It has organized many events, competitions, and training courses, and achieved remarkable results, such as guiding millions of women in startup and business development and helping thousands of women start businesses.
- Women-Innovative Entrepreneurship: Advantages and Disadvantages: The presentation briefly mentions the need to explore the advantages and disadvantages of women in innovative entrepreneurship, although specific details are not fully elaborated.

Annex 2: Policy Recommendations from Speakers and Participants

1. We recommend institutionalizing a mentoring system for women and girls in Information and Communication Technology (ICT); and we suggest creating strong innovation ecosystems, removing barriers, and bridging the digital divide for women and girls in ICT.

2. We recommend adopting regulations in science and technology for women's absences while pregnant and raising children.

3. We would like to recommend data-driven entrepreneurship support for women in ICT, we propose to integrate gender equality and ICT policy in the APEC region, and we support digital space as a safe place for girls and women.

4. We suggest developing funding and mentorship programs for women tech designers, we propose reversing social stereotypes (working with families and teachers), and we need tech access and digital literacy.

5. We urge strengthening policy specific to science, technology, and innovation (STI) to be more women-responsive and inclusive; we believe that it is necessary to increase public awareness of the importance of gender equality and financial access to women; and promoting research on evidence-based is urgent to integrate into policy development and evaluation.

6. We would like to recommend strengthening mentorship and networking opportunities: developing a regional mentorship network linking female STEM professionals with students, and partnering with industries to create mentorship programs and internships designed for women entering STEM fields.

7. We should support flexible arrangements for women and others in the ICT workplace, we propose visualizing female role models in STEM and ICT, and we support education and early engagement in STEM.

8. We recommend promoting gender equality and challenging social stereotypes, leveraging technology to empower women, and supporting research and data collection.

9. We suggest establishing mentorship programs as a talent development strategy for women and experienced scientists (women or men) paired with less experienced girls/scientists.

10. We need to ensure equal representation of women in leadership roles within STEM organizations, providing enough time for maternity leave and flexible working arrangements to retain women in the workforce, enhance programs that promote STEM education for girls in rural areas to reduce the gender equality gap from an early age (including scholarship) and increase public awareness campaigns that highlight successful female STEM role models to inspire young women.

11. We urge looking at building the future talent of women in STEM, especially science and technology leaders, through exploring possible grants/scholarships for micro-credentials/professional certifications on international platforms.

12. We recommend: continuing to issue mechanisms and policies to create a more favorable environment for women to start businesses (e.g., capital support, legal advice, and training centers); organizing training programs of advanced and specialized knowledge about creative innovation startups; and expanding the scope of activities and beneficiaries by startup investment guide at all levels so that more and more women will have the opportunity to access funds.

13. We propose:
    - improving supporting policies: issuing separate policies for women participating in STEM, such as scholarships or priority research grants;
    - developing a supportive ecosystem to establish a network of mentors for female scientists and promote international cooperation, and organizing forums and seminars to honor female scientists to connect with international experts;
    - promoting awareness and education to eliminate social stereotypes through communication and education campaigns at schools, and include successful female scientist role models in inspirational programs;
    - and supporting working conditions to enhance flexible working mechanisms for women, especially researchers with families, and building supporting infrastructure, such as childcare services at the workplaces.

14. We would like to recommend:
    - accessibility to education: to provide financial incentives to encourage women to pursue STEM fields;
    - workplace policies: to provide family-friendly policies to assist women in achieving work-life balance. For example, Malaysia's career comeback program is to help women return to the workforce, which provides policies protecting women from discrimination and maternity allowance and social security;
    - recognition for women in science, e.g., the AASSA Prof. Yoo Hang Kim Young Women Scientists Award, and the L'Oréal Women in Science (APEC might also have a similar award);
    - leadership roles for women, e.g., in Malaysia, there is a 30% decision-makers to ensure at least 30% of top management should be women;
    - global coalition that breaks barriers and enables girls and women to develop STEM skills and knowledge to become problem-solvers, shapers, and creators of tomorrow;
    - and work with existing initiatives, e.g., the Beijing Declaration and Platform for Action, and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) to promote women in STEM. (not to reinvent the wheel but to build upon existing work for a more targeted and efficient work).

Annex 3: Development Initiative of Asia-Pacific Women's Science, Technology, Innovation, and Entrepreneurship

Scientific and technological innovation serves as a crucial engine driving economic and social progress. Women, as pioneers of human civilization and catalysts of social advancement, play an indispensable role in the comprehensive development of science and technology innovation, which is vital for the prosperity of the Asia-Pacific region. Currently, efforts to elevate societal awareness of gender equality face complex social and cultural barriers. To advocate for and implement an open, equal, just, and non-discriminatory environment for scientific and technological innovation, unleash the wisdom and power of Asia-Pacific women in this field, and collectively build an Asia-Pacific community with a shared future, we hereby propose the Development Initiative of Asia-Pacific Women's Science, Technology, Innovation, and Entrepreneurship:

1. Upholding the Reverence of Science. Science stands as a formidable force propelling social progress and development. We encourage Asia-Pacific women to immerse themselves in scientific research and technological innovation, pursuing truth and exploring the unknown while leveraging scientific principles and methodologies to drive societal advancement. We urge female scientists, researchers, and technologists to fearlessly scale the heights of scientific achievement, harnessing their unique strengths and untapped potential in the realm of science and technology. By doing so, they will make significant contributions to technological innovation, prosperity, and development across the Asia-Pacific region.

2. Embracing Equality and Inclusivity. Gender equality forms the bedrock of scientific and technological innovation and social development. We vehemently call for the eradication of all forms of discrimination and bias, ensuring that women are afforded equal rights and opportunities in the spheres of scientific and technological innovation and entrepreneurship. Our initiative champions the creation of an inclusive ecosystem for technological innovation, fostering mutual learning, exchange, and collaboration among women from diverse backgrounds and fields. This collective effort will serve as a powerful catalyst for the advancement of scientific and technological innovation.

3. Prioritizing Humanistic Care. Scientific and technological innovation should be people-centric, emphasizing the holistic development and well-being of women. It is crucial to address the physical and mental health, work-life balance, and personal growth of women engaged in scientific and technological innovation. We implore governments, society, and families to provide essential support and safeguards for female scientists, researchers, and technologists. This includes creating more flexible and supportive work environments that nurture their innovative potential and creativity, thereby infusing the Asia-Pacific region's scientific, technological, and social development with renewed vitality and wisdom.

4. Fostering Openness and Cooperation. Open collaboration is a cornerstone for advancing scientific and technological innovation and entrepreneurship. We advocate for Asia-Pacific women in science and technology to engage in

extensive cooperation and exchange across economics' boundaries, fields, and disciplines, jointly exploring new frontiers and directions in scientific and technological innovation. We call upon governments and all sectors of society to strengthen cooperation, collectively promoting the development of women's scientific and technological innovation and entrepreneurship in the Asia-Pacific region. By building an open, collaborative, and mutually beneficial scientific and technological innovation ecosystem, we can harness the power of "she-innovation" to contribute significantly to the region's prosperity and development.

It is a long-term systematic project to elevate social perceptions of gender equality and promote women's participation in scientific and technological innovation. Let us join hands and strive together to forge a more prosperous future for women's scientific and technological innovation and entrepreneurship in the Asia-Pacific region.