



Innovation Policies for Inclusiveness – Policy Cases

Centre for Women in Science, Engineering and Technology

Country: Korea

1. Short Description

The *Centre for Women in Science, Engineering and Technology* (WISET) uses a variety of policy instruments to foster women's participation in science, engineering and technology research and industry. It offers financial support and subsidies for outstanding female students and researchers, and consultation and training service for career development in S&T fields, as well as mentoring support for female scientists.

This policy profile is part of a [policy toolkit on innovation policies for inclusiveness](#). It is relevant for territorial inclusiveness.

2. Policy Characteristics

Basic Information

Country and implementing institution(s):	Timeline:
Republic of Korea Centre for Women in Science, Engineering and Technology (WISET).	September 2001 to the present (as of November 2016). The current form of WISET was established in January 2011.
Target group	Size and budget:
Women at different career stages in S&T fields: school students, university graduates and undergraduates, women at early stages in their research careers and experienced female scientists	<p>WISET Budget: KRW 10.37 billion (2015) (USD 11.6 million, PPP)</p> <p>Budget allocated to each programme and the number of participants:</p> <ul style="list-style-type: none">• Women's return to STEM R&D KRW 2.5 billion (USD 2.8 million), 116 people• Postgraduate-led student research team KRW 1.23 billion (USD 1.4 million), 940 people• Mentoring programme KRW 0.14 billion (USD 157 000), 15 820 people• Employment training KRW 0.58 billion (USD 651 000), 4 945 people• Job matching KRW 0.12 billion (USD 135 000), 1 460 people



	<ul style="list-style-type: none"> • Field study and capacity reinforcement of 16 regional centres • KRW 2.88 billion (USD 3.2 million), 175 891 people • Use of information services KRW 0.3 billion (USD 336 000), 19 062 people
Type of policy instrument(s)	Inclusiveness focus
Direct financial support Government-supported subsidies: grant Non-financial support: counselling, training	Social inclusiveness

Policy objectives

The Korean Centre for Women in Science, Engineering and Technology (“WISET”) uses various policy instruments to foster women’s participation in science, engineering and technology research and industry.

Rationale

As many advanced countries face a decrease in the labour workforce and an aging population, women are becoming increasingly recognised as a key source of national competitiveness. In particular, women’s participation in R&D activities is expected to enhance the diversity and quality of R&D outcomes, accelerating innovation and economic growth. **However, gender inequality problems are severe in Korea, with STEM fields being no exception. Innovative economic activities also show unequal participation of men and women:**

- In 2012, 20.4% of female scientists and engineers held temporary positions, while their male counterparts accounted for 9.5%. In universities and public research centres, 83% of female science researchers held temporary positions compared to 56.8% for men.
- The percentage of female managers in private science and engineering research centres is very low, and decreases the higher the position (6.6% at director level, 3.2% at departmental head level and 2% at executive level for 2012).
- Career breaks for female scientists and engineers are on the rise, from 250 000 in 2011 to 300 000 in 2014. However, fast-changing research trends in S&T make it more difficult for women to return to their careers.

The low representation of female researchers and developers in this area leads to poor gender considerations and innovations, resulting in a negative impact on research quality. Furthermore, women in STEM fields regularly experience conflict in balancing work and family roles. Since innovation policies and business practices largely ignore gender inequality problems in society,



there is a strong need for research on barriers to women's participation in S&T. In this regard, the government's "Basic Plan for Fostering and Supporting Women Scientists and Engineers" and WISET are important policy measures that aim to foster women's participation in STEM fields. Incorporating gender innovation into the national STI system is crucial to promoting national competitiveness.

Policy target recipient and selection mechanism

WISET is aimed at women at different stages of their career in S&T fields: school students, university graduates and undergraduates, women at early stages in their research careers and experienced female scientists experiencing a cut-off later in their career.

Policy instrument(s)

WISET implements a range of policy instruments, three of which are described below:

- Grants to support engineering research projects led by female graduate students.** This programme covers research projects undertaken by teams consisting entirely of women. Each team is made up of graduate engineering students who act as principal investigators, leading undergraduates and middle/high school students. The programme enhances the research and leadership capabilities of graduates, expands the research opportunities of undergraduate students, and helps high-school students become more interested in science and engineering fields. The following table presents the financial support programmes and research opportunities.

Category	Regular courses	Intensive courses
Targets	<ul style="list-style-type: none"> Lead researcher: Master's or doctoral engineering candidate Co-researchers: two female undergraduates and four female students from middle/high school One professor and one female mentor working in the field 	<ul style="list-style-type: none"> Lead researcher: Master's or doctoral engineering candidate Co-researchers: four female undergraduate students One professor and one female mentor working in the field
Support	KRW 5.5 million per team (USD 6 200)	KRW 6.5 million per team (USD 7 300)
Research areas	Construction/civil engineering, machinery/materials/marine engineering, biotechnology/food engineering, electrical engineering/electronics/semi-conductor, computation and computer engineering, chemical engineering/environmental engineering	
Benefits	<ul style="list-style-type: none"> Opportunity to receive a Minister's Award from the MSIP and have research papers published in WISET's <i>Journal of Junior Science and Engineering</i> Financial support for patent lawyers and patent application fees when applying for patents for outstanding research papers Undergraduate and graduate scholarships MSIP Award for best research team 	

- Support for female returners to R&D.** The WISET "Return-to-R&D Programme for Women in STEM" aims to motivate and support qualified STEM women who have experienced obstacles returning to their work in the R&D field, due to childcare or



household work. A pilot project was established in 2012 and the programme has been operational since 2013. It consists of two main activities:

1. **Career cut-off women in STEM.** This programme targets women who have experienced career cut-off or unemployment due to pregnancy, childbirth, childcare or care for family members. The applicants must have a Master's degree or above (or equivalent degree) in STEM. For women accepted to this programme, WISET:
 - Supports matching and grants to participate in R&D projects in STEM fields;
 - Provides education and training programmes to reinforce R&D competency. The education programmes involve specific skill-related courses (e.g. "SW professional manpower fostering course", "IP R&D sector support training", "Patent engineers", etc.). WISET also includes occupational training course (e.g. for those who majored in Physics, courses include "Pharmaceutical bio quality/molecular diagnosis professional manpower fostering course" and "R&D task managing administrator fostering course", etc.);
 - Assists with job matching to provide actual employment opportunities. This includes access to: (i) a Job Portal for talented women in the STEM field, which provides education and employment information; (ii) a Job Matching Programme, which consists of a database of employing institutions and a job fair; and (iii) an Employment Consultation to overcome difficulties following career return (work-life balance, career development, etc.);
 - Provides a mentoring network to share experiences and know-how between senior and junior researchers.
2. **Research institutes.** This programme targets research institutions in STEM fields (including government research centres, research centres in universities and private research centres, etc.). Through the programme, WISET provides grants of up to KRW 20 million (approx. USD 18 200) per person for a maximum of three years. Specific programmes are also provided to target research institutes on how to utilise female labour power. Women who participate in this programme receive education and mentoring services for research capacity improvement and career development through a one-year course at the WISET Academy. After the first year, continuous assistance is determined based on evaluation results.

WISET mentoring programmes. The WISET "Women into Science and Engineering" programme was initiated by the Ministry of Science and Technology in 2001, to promote a female-friendly science environment by providing a mentoring system run by female scientists. WISET's "Girls Mentoring Programme" aims to help high school girls develop their college study plans, with female professors and college students as their mentors. WISET's online mentoring system and cyber community allow mentees to communicate and conduct online activities with other members. Participants can share their experiences, encouragement and information via small group communities. Private websites and email, messenger and SMS services are provided to each mentor and mentee.



Policy challenges

Korean women still face many difficulties in pursuing research careers in STEM fields. This is due to the surrounding socio-cultural environment, which lacks the requisite institutional and social measures for women to maintain a work-life balance.

Actions undertaken to address challenges

WISSET has over 20 support programmes grouped under the following three categories: “Establishment of Infrastructure”, “Nurturing Female Scientists and Engineers” or “Supporting the Career”. This classification approach helps the programmes target specific groups and needs, and operate in a co-ordinated manner.

“Gender diversity” policy measures are being implemented in specific programmes to encourage female students to continuously develop their careers in STEM fields. For example, the government has encouraged specialised high schools to revise their admissions process, by taking a new approach that takes into account gender, with the aim of boosting the confidence of female students in STEM fields.

The government is advancing a comprehensive policy mix for career development each year, targeting female scientists and engineers in temporary positions. Measures now aim to nurture female scientists in response to the diversified demands of science. This long-term and multidimensional approach also aims to promote other policy measures related to the labour and business market, so as to ensure stable employment mechanisms.

Similarly, the policy mix for gender equality in the STEM field now involves the pursuit of gender inclusive innovation. Its scope has enlarged to involve excluded economic players due to social and cultural barriers. This new measure aims to achieve the responsible and inclusive (for both woman and man) development of science and technology.

Evaluation and outcomes of the scheme

- Recent years have seen some progress and improvement in the engineering environment for women. Between 2004 and 2014, the ratio of female students majoring in engineering at university rose from 17.6% to 20.5%, while the female faculty in engineering majors increased from 3.7% to 5.3%, and the ratio of female engineers with Master’s or doctoral degrees rose from 12.9% to 16.2%.
- Evaluation in 2012 showed that the job satisfaction rate among female returners in R&D fields was 7.9 out of 10. Female returners produced an average of 2.18 research outcomes out of a total of 177 articles published in foreign/domestic journals. In 2015, they presented 443 domestic or foreign presentations, and received 56 patent awards (9 registered). In 2013, the starting fund for the programme was USD1.4 million rising to USD 2.5 million. The number of participating institutes grew from 13 (five government-funded research institutes, six universities and one private company) in 2013 to 82 institutes (7 public institutes, 45 universities and 30 private companies) in 2015. As of February 2016, 72.2% of participating returners were working in their career fields.



- Participants in WISSET mentoring programmes delivered positive feedback on the evaluations of the Mentoring Fellow Programme, which has created a female-friendly culture in the organisations involved. Mentors track their alumni's career paths and help them widen their network by forming another mentor groups. In addition, mentees develop good relationship with their mentors by encouraging them to pursue advanced studies in their majors. When participants were asked if the mentoring fellow programme was helpful for their developing careers, 31% strongly agreed and 61% agreed. Moreover, 46% of participants strongly agreed and 54% agreed that the programme had helped them build and extend their networks. Furthermore, 38% of participants strongly agreed and 62% agreed that the programme had improved their own social attitudes with regard to nurturing the next generation of female scientists.

Sources

Lee, H. (2011), Performances and Future Prospect of Policies for the Support and Cultivation of Women Scientists and Engineers, Ministry of Education, Science and Technology Performances, Seoul.

Ministry of Science, Information and Communications Technology (ICT) and Future Planning (MSIP) (2011), *Act on Fostering and Supporting Women Scientists and Technicians*, MISP, Seoul, https://elaw.klri.re.kr/eng_service/lawView.do?hseq=27224&lang=ENG (accessed 18 November 2016).

WISSET (2015), *2014 Report on Korean Women in Science, Engineering and Technology*, Centre for Women in Science, Engineering and Technology, Seoul.

WISSET (2014), *2013 Report on Statistic re-analysis of use and nurturing of female scientists and engineers*, Centre for Women in Science, Engineering and Technology, Seoul.

Background

*This document is part of a repository of examples of **innovation policies that have for explicit aim to contribute to territorial, industrial and social inclusiveness**. The repository is part of an innovation policy toolkit developed for the **Innovation for Inclusive Growth** project and gathers national innovation policy programmes that:*

- A.** Explicitly target **lagging and less innovative regions** (outside of regions that are highly innovative) or by design are more likely to support these lagging / less innovative regions.
- B.** Explicitly aim to include in innovation activities **individuals and groups that are not usually participating** in those activities and in support of broadening the group of innovators.
- C.** Explicitly aim to foster innovation activities in non-innovative firms, in particular by targeting **non-innovative sectors and non-innovative Small and Medium-sized Enterprises (SMEs)**.

Policies are searchable by inclusiveness type, objective and implementation challenge on:
<https://innovationpolicyplatform.org/inclusivetoolkit>