Studying gender issues around disaster management labs in Korea

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Abstract
The study aims to provide an atypical alternative in the field of disaster management labs around Korea by examining gender issues. As a methodology, a literature review is used to compare the isolation approach and the inclusion approach in four types of labs, namely public, industrial, college, and joint international labs. The key tenet is that all four lab types must exert effort to transform their current isolation approach into a future-oriented inclusion approach to perform better disaster management research as well as achieve gender equity. This study serves as a pioneering research by providing an analytical framework for gender issues around Korean disaster management labs.

Keywords: Public labs, industrial labs, college labs, gender blindness, gender relation.

Introduction
In disaster management labs around Korea, male researchers greatly outnumber their female counterparts in related research and development work; however, male researchers have not as yet proportionally succeeded in achieving innovative research results. In a similar token, it has hardly been easy for Korean disaster management labs to come up with innovative alternatives in disaster management considering that they continue to rely on male-dominated conventional research.

Further, no distinctive and systematic study has ever been conducted to examine the role of female researchers in Korean disaster management labs despite the fact that these women may do a better job of leading disaster management research compared to male researchers. Therefore, this study studies how to improve gender issues in disaster management labs around Korea as a major research question.

The purpose of the study is to provide an unconventional alternative for disaster management labs around Korea by comparing two approaches to gender issues, namely, gender isolation and gender inclusion. The former isolates gender issues to the edge of lab management affairs, whereas the latter includes gender issues in the central stage of lab management affairs.

With a literature review as major methodology, the isolation approach and the inclusion approach are systematically compared for four types of labs respectively: public, industrial, college, and joint international labs. By outlining related barriers and alternatives, the study will maintain, as a principal theme, that all four lab types must change their current isolation approach into a future-oriented approach to achieve not only gender equity but also innovative disaster management research. In many aspects, the paper will assume that gender equity will ultimately lead to innovative research results in disaster management labs.

Conceptual overview
Importance of gender issues around disaster management labs: There is no single definition for gender or gender issues, but in this study, these terms are more related to sexual roles including women and men and the relationship between them. Disaster includes not only natural disasters but also manmade emergencies; thus, disaster management refers to how to manage any kind of hazards. Accordingly, the scope of disaster management labs in this study is much wider than may be expected including science and technology labs experimental psychology labs, and management labs, to name a few.

Gender issues had a turning point from the late 1960s to the end of the 1970s because related theories and researches had become so well developed during that time. Considering that gender is a main organizing theme in any society and a basis of daily human activity, gender issues continue to be vital in disaster management labs. Thus, if gender issues are not worked out, it would not be easy for disaster management labs to improve productivity in their field.

Given the significance of gender issues, many researchers in the international community have discussed the topic in the context of disaster management labs from different perspectives. In particular, several researchers in advanced nations have approached diverse aspects of gender issues, whereas some researchers in developing nations have studied the issue within a unique cultural context. In general, regardless of national boundaries, there are two distinctive research directions on gender issues in disaster management labs.

One direction, maintained by a few researchers, holds that no gender discrimination exists in disaster management labs. While these researchers confirm that bigger numbers of men work in disaster management labs compared to women, they reason that the bigger numbers are not related to gender discrimination against women.

Rather, there are fewer female workers in disaster management labs because women do not want to major in
engineering or science. As an extreme case, some studies hold that there are innate differences or intrinsic aptitude differences between men and women which thus explain the smaller numbers of women in labs.28,29

The other research direction, which many researchers maintain, holds that gender discrimination clearly exists in disaster management labs. The researchers confirm that the fact that bigger numbers of men are allowed to work in disaster management labs is gender discrimination. In addition, they emphasize that the differences between men and women are related neither to natural nor genetic factors but to the social environment.1,23

In Korea, several researchers have examined the importance of gender issues in the field of science and technology. The majority reported that gender discrimination clearly exists in the field. However, no distinct research has ever attempted to study gender issues in the field of disaster management or its labs15. Considering the poor status of gender issues around Korea, as shown in table 1, it is important for this study to initially delve into the issue in the context of disaster management labs.

Throughout the world, male leadership has many times critically failed during disaster events. Accordingly, many people in the international community do not prefer male leadership in dealing with all kinds of disaster. Similarly, women are preferred to be the future leaders in disaster management labs, given that the context of such labs is closely related to crisis or disaster events. In other words, women may be better able to manage various disasters in the context of disaster management labs compared to men.2,16

Framework of study: Many basic concepts have been suggested regarding gender issues in disaster management labs. Among them, two opposite concepts have been supported, namely, gender blindness and gender relation. The former ignores the role of women; thus, women may not participate in leadership or significant decision making in disaster management labs. In contrast, the latter pays attention to the vulnerable role of women and thus asks for much assistance for them; this is referred to as a more gender-sensitive approach.5,9

By revising the above two concepts, this study will provide two upgraded concepts in the context of Korean disaster management labs: gender isolation and gender inclusion. Gender isolation is not blind to gender issues but moves them toward the edge of management affairs whereas gender inclusion is similar to gender relation but more systematically inclusive of gender issues. In short, the two revised concepts are more advanced or deviant than the two existing concepts.

In a similar token, the isolation approach isolates gender issues from the central stage of disaster management labs, although stakeholders are fully or partially aware of the related significance of gender issues. The inclusion approach brings gender issues into the central stage of disaster management labs by openly and significantly addressing them through the goals of disaster management. Thus, the two approaches follow opposite directions in addressing gender issues.

Following figure 1, the study will maintain that Korea has to transform its current isolation approach into an inclusion approach to achieve, in the near future, innovative research results as well as gender equity in disaster management labs. To systematically compare the two approaches, the disaster management labs around Korea have been classified into: ① public labs, ② industrial labs, ③ college labs, and ④ joint international labs. Through these four types of labs, the two approaches will be thoroughly examined.

Table 1

<table>
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<tr>
<th>Units</th>
<th>Ratio of women</th>
<th>Notes</th>
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<tr>
<td>(1) Public labs</td>
<td>About 27%</td>
<td>Women occupied about 1.23% of high-level positions.</td>
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<tr>
<td>(2) Industrial labs</td>
<td>About 23%</td>
<td>In all industrial sectors, women represented about 42% of workers.</td>
</tr>
<tr>
<td>(3) College labs</td>
<td>About 38%</td>
<td>More than half of the 38% held contract-based or temporary positions.</td>
</tr>
<tr>
<td>(4) Joint international labs</td>
<td>Not available</td>
<td>The exact percentages varied depending on the specialization area, nationality, or related definition.</td>
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The wage gap between male and female researchers was 100:65.

Sources: KWDI13; MOIS18; NDMI20; NFSA21; World Economic Forum32.
In terms of the inner part of the analytical framework, the male and female signs are placed within a circle in both the isolation and inclusion approaches. However, the male and female signs are separated by a perpendicular line in the isolation approach, whereas the two signs are juxtaposed within the same circle without any barrier in the inclusion approach. In summary, the presence or absence of a vertical line between the signs signifies respectively the isolation or inclusion of gender issues in disaster management labs.

In the outer part of the analytical framework, each of the four lab types is represented as a quarter of a square surrounding a divided circle in the isolation approach, and as a quarter of a bigger circle surrounding an undivided circle in the inclusion approach. Thus, in the isolation approach, the square and the perpendicular line dividing the circle indicate more challenges to gender issues, whereas in the inclusion approach, the circle and the undivided smaller circle signifies more alternatives to gender issues.

This study mainly uses literature review as a methodology. In the investigation of gender issues around Korean disaster management labs, not only several international reports but also some Korean studies will be appropriately cited. These two sets of literature will be flexibly used to explain all aspects of the challenges and alternatives to gender issues in labs around Korea. The diverse literature will facilitate the exploration of two sub-questions.

The isolation approach to gender issues

Public labs: In Korea, three public labs have played significant roles in disaster management research: the National Fire Service Academy (NFSA), the Korea Fire Institute (KFI) and the National Disaster Management Institute (NDMI). The first two are involved in firefighting, whereas the third addresses other disaster management areas on the ground except firefighting. In all three labs, however, extremely few women have been able to occupy high-level positions.

Although women researchers have several goals for their family, their goals in public disaster management labs are not many. In terms of individual motivation, women have made efforts to pursue diverse important goals within their family, but they have not satisfactorily pursued goals in their research career. That is, female researchers have faced more psychological barriers in public disaster management labs than in their family.

At first glance, it seems that the authorities in all three public labs have tried to address gender issues fairly by emphasizing recruitment and promotion according to individual ability. In doing so, however, these public labs have avoided openly debating gender issues in disaster management research, particularly through their official documents. Thus, although the authorities in the three labs have generally realized the importance of gender issues, they have intentionally pushed gender issues to the edge of management affairs which is a typical example of the isolation approach.

Industrial labs: The composition of workers in industrial labs has been strongly influenced by pressure from the labor market in Korea. When the economy was good, male researchers mostly obtained full-time positions in the labs. When the economy slipped into recession, temporary positions in industrial labs were provided in the labor market which an increasing number of female researchers have seized.

Since the enactment of the Early Childhood Education Promotion Act, the Korean government has incrementally raised the number of childcare centers within all conglomerate corporations, thus contributing to the increase...
of the female workforce in the industry. However, this has not been the case in industrial labs on disaster management because most of these labs do not belong to conglomerate corporations but to small and medium-sized corporations, many of which have failed to provide child care centers for their female workers because of space limitations.

Although the number of female researchers in industrial labs has increased considerably due to pressure from the labor market, the positions held by these women are temporary. Similarly, although the number of childcare centers in the industry has increased, many women researchers in small and medium-sized corporations are yet to benefit from such facilities. In short, although industrial labs have seemingly addressed the needs of women researchers, they have not sincerely dealt with gender issues at all. Rather, they have treated gender issues as a secondary matter which falls under the isolation approach.

**College labs:** The ratio of women researchers in disaster management labs in colleges is bigger than that in public or industrial labs. Women’s achievement in college labs has partially been facilitated by family support. Families used to prefer sons as successors to bloodlines. However, daughter preference has revolutionarily prevailed because of negative traits associated with sons such as greed for family heritage and unfilial behavior. As a result, many families have equally educated their daughters in colleges and thus have helped them to become researchers in labs.

Despite their achievement in college labs, however, the ratio of women in such labs is still way below 50%. One reason for this is that traditional Confucianism, as a national ethic and philosophy, has limited women’s roles to caregivers in the home. Because of this Confucian principle, women have been slow in acquiring the appropriate status in college labs. In short, Confucianism has contributed to the slowness in addressing women’s achievement even in educational institutions.

Despite the presence of family support, Confucianism still plays a role in framing what the majority of Koreans think of gender issues in the society, whether knowingly or unknowingly. On one hand, the Confucian view on gender issues has been considerably diluted because of the introduction of Western culture. On the other hand, college labs are located within the center of conservative Confucianism; thus, influenced by the Confucian principle, gender issues have been isolated from key management affairs in college labs.

**Joint international labs:** Clearly, globalization has played more positive than negative roles in improving the international economy. In so doing, globalization, including the exchange of labor, capital, trade, and technology, has opened employment opportunities in many international labs on disaster management. In short, because of globalization, not only men but also women in Korea have obtained the rare opportunity to work in joint international labs.

Despite the difficulty in obtaining statistical data, it is confirmed that the number of Korean female researchers in joint international labs on disaster management is increasing. Compared to domestic labs, many joint international labs have begun to pursue diversity in terms of gender. In addition, when gender issues have been raised between different countries, the disputes between them have caused more international interests or more display effect than domestic ones have. All national and many international media have focused on international conflicts in particular through the Internet.

Due to the lack of information, it would be hard to judge whether the isolation approach is applicable to Korean female researchers in international labs. However, the authorities in joint international labs are certain to pay increasing attention to gender issues so as not to become the targets of international media, as well as to pursue gender diversity in advance. Thus, the status of joint international labs is at the boundary between gender isolation and gender inclusion, or more toward gender relation.

**The inclusion approach to gender issues**

**Public labs:** Psychological barriers have contributed to women’s poor promotion to high-level positions in disaster management labs in Germany, the United Kingdom, India, China, and Japan. When people think of the top managers in labs, they immediately consider males and not females. This has fostered bias against female researchers in the selection of high-level positions in labs. In the inclusion approach, Korean female researchers in labs need to have confidence in their equal ability to their male counterparts.

Although some public institutions have appointed their own officials to deal with gender issues in their areas, no public labs in the field of disaster management have ever attempted such appointment. Considering that the three public labs are under the authority of the Ministry of the Interior and Safety (MOIS), the Minister of MOIS therefore has to appoint an official for each of these labs. With such official in charge of gender issues, female researchers may initiate improving their psychological confidence.

In a similar token, it is necessary for the Minister of MOIS to allocate recruitment and promotion quota to women in public labs. Without the enactment of a legal quota, the male researchers who dominate public labs would not easily give up what they consider to be their vested rights. The increase in the amount of gender quota has to be decided not by the administration behind closed doors but in open debates. By pushing gender issues to the center of affairs in public labs, the ministry may continue to promote women’s motivation.

**Industrial labs:** To achieve gender equity, Australia began to expand gender mainstreaming to its industrial labs on disaster management. Gender mainstreaming put not only all
men’s but also all women’s concerns and experiences into an integral dimension. However, the industrial labs faced excessive political activism during the related implementation. Nevertheless, they made continuous efforts to get rid of political activism based on legitimate political processes. To promote the inclusion approach, Korean industrial labs have to abolish political activism not for the purpose of gender isolation but to achieve gender mainstreaming.

To elaborate, it is inevitable for the authorities in industrial labs to utilize gender mainstreaming for their economic benefits. In doing so, they have to sincerely consider gender issues as a primary concern in industrial labs. As long as male researchers do not succeed in coming up with innovative research results, the authorities in industrial labs have to turn their attention to equally hiring and promoting women researchers, both for their corporate benefit as well as the attainment of their disaster management goals.

En route to gender mainstreaming, the authorities in industrial labs have to stop playing excessive political activism against gender issues. Offering temporary positions to women researchers under the pretext of gender equity but without providing childcare centers is a typical kind of excessive political activism, considering that women researchers urgently need full-time positions with child care center provision even in small and medium-sized corporations. In other words, the authorities in industrial labs must provide legitimate political alternatives.

**College labs:** A proportional relationship was found between women’s achievement in college labs and the family policy in the United States, Finland, and Sweden. The family policy included paid maternity leave, parental benefits, and childcare support among others. The better the family policy was formed and implemented, the higher are the number of women with tenure-track positions in college labs in both the United States and Nordic countries. On this point, Korean college labs have to make use of the family policy to successfully adopt the inclusion approach.

Thanks to their family’s educational support, women researchers have made great achievements in college labs. However, this does not mean that they have benefited from the family policy. Although the extent of the family policy has been incrementally improved, many women researchers, including those holding temporary positions, have no choice but to embrace an unsubstantial family policy including a short period of maternity leave, few childcare centers etc. Hence, stakeholders need to substantially enhance the family policy for women in college labs.

For women researchers in college labs, it is extremely difficult to reverse the Confucian view on gender issues within a short period, mainly because Confucianism has long been part of the Korean culture. However, college labs may supplement the negative role of Confucianism by encouraging multidisciplinary research. By fully utilizing the knowledge from different fields of studies, men and women will be able to work together to achieve the goal of innovation in the same labs. That is, the Confucian concept in college labs may be overcome by involving more women in interdisciplinary research.

**Joint international labs:** Regarding the extent of work-family conflicts in joint international labs on disaster management in the United States, Ukraine, and Iran, various workforces have shown unique results. In general, it was proven that women researchers’ work-family conflicts are more strongly influenced by cultural ideologies such as individualism or collectivism than by gender issues. To adopt a future-oriented inclusion approach, Korean stakeholders have to learn an important lesson from the international case.

In addressing gender issues in joint international labs, Korean labs should incorporate diverse factors such as cultural context. Not many Korean women have worked in joint international labs, but their number is increasing due to globalization. Similarly, the number of foreign female researchers will increase in domestic labs. At this point, Korean stakeholders must adjust their inclusion approach for women researchers by expanding genders issues into cultural ideologies, particularly by seeing the whole picture surrounding gender issues.

Korean female researchers in joint international labs need to more actively participate in diversity programs in the international community especially by expressing their diverse opinions to achieve the ultimate goal of disaster management. Through such diversity, labs may come up with unique solutions to save human lives.

Also, by taking advantage of the display effect on gender issues in joint international labs, female coworkers may set up a networking system between or among themselves and other women researchers in other Korean labs. By doing so, the inclusion approach will be enhanced regardless of national boundaries.

**Conclusion**

This study compared the isolation approach and the inclusion approach to gender issues in disaster management labs around Korea for the ultimate goal of providing an idiosyncratic alternative. In so doing, many challenges and alternative were suggested, in particular by systematically examining four types of labs, namely, public, industrial, college, and joint international labs. The first three types showed diverse aspects of the isolation approach whereas the last type was found to be at the boundary between the isolation and inclusion approaches. Appropriate alternatives for all four types of labs were examined in terms of the inclusion approach. With these in mind, it is urgent for disaster management labs to thoroughly transform their current isolation approach into an inclusion approach to
achieve both gender equity and innovative research results.

To implement the inclusion approach in disaster management labs around Korea, all four types of labs need to implement related alternatives. By comprehensively implementing all aspects of the inclusion approach within a global context as well as under the unique Korean environment, the goal of the inclusion approach may be achieved. Particularly, all stakeholders have to realize that women researchers may better play the leading role in providing better solutions in the field of disaster management research compared to their male counterparts.

The main contribution of this study is that it provides an analytical framework for gender issues in disaster management labs around Korea, considering that no distinctive study has ever attempted to study the subject before. In addition, the study may contribute to the exploration of gender issues in international disaster management labs by referring to the above-mentioned two upgraded approaches.

Given that an analytical framework for disaster management labs around Korea has been successfully provided, Korean researchers should study how each of the four lab types might more effectively adapt the inclusion approach. In addition, diverse international cases have been directly or indirectly cited in this study such as Germany, United Kingdom, China, Japan, Australia, the United States, Finland, Sweden, Ukraine, Iran, and others. Thus, international scholars may focus on studying their labs from the Korean perspective or vice versa.

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(Received 06th January 2020, accepted 19th March 2020)