Supplementary File S2

Questionnaire on Occupational Safety and the Work Environment of Women Engineers in Construction Projects in Iraq

Dear Engineer,

This questionnaire aims to examine the occupational safety situation and work environment of women engineers working in Iraq's construction sector, whether their work is performed in government departments and engineering offices or through field visits and follow-up at project sites. It focuses on the nature of work, level of site exposure, safety risks, personal protective equipment, suitable facilities, the ability to report hazards or inappropriate conduct, and the professional and social barriers that women engineers may face in a male-dominated work environment. It also addresses the potential use of digital tools and artificial intelligence to support women engineers' safety and improve reporting mechanisms.

Important note: Participation is entirely voluntary. The questionnaire does not require you to provide your name or directly identify your workplace. Responses will be used only for scientific research and results will be reported in aggregate form without identifying any individual participant. By continuing to complete the questionnaire, you confirm that you have read the information above and voluntarily agree to participate in the study.

Section S1. General Information and Nature of Work

1) Age:

☐ Under 25 years
☐ 25 to under 35 years
☐ 35 to under 45 years
☐ 45 years or older

2) Engineering discipline:

☐ Civil engineering
☐ Architectural engineering
☐ Electrical engineering
☐ Mechanical engineering
☐ Environmental engineering
☐ Materials / laboratory
☐ Other: ……

3) Highest academic qualification:

☐ Bachelor's degree
☐ Higher diploma
☐ Master's degree
☐ PhD

4) Years of professional experience:

☐ Less than 3 years
☐ 3 to under 6 years
☐ 6 to under 10 years
☐ 10 to under 15 years
☐ 15 years or more

5) Organization / workplace:

☐ Government department / institution
☐ Contracting company
☐ Consulting office / company
☐ Design / supervision company
☐ Laboratory
☐ University / educational institution
☐ Freelance work / private office
☐ Other: ……

6) Current work role:

☐ Design
☐ Supervision / field follow-up
☐ Project management
☐ Quantities / payment certificates
☐ Laboratory / quality control
☐ Engineering administrative work
☐ Consulting
☐ Government follow-up / inspection and acceptance
☐ Other: ……

7) Current work-setting pattern:

☐ I work only in the department / office and do not visit project sites
☐ I work in the department / office, with irregular field visits to project sites
☐ I work in the department / office, with regular field visits to project sites
☐ I work mainly at project sites
☐ Other, please specify: ……

8) Frequency of field visits to project sites:

☐ I do not visit project sites
☐ Rarely, only when needed
☐ Once or twice per month
☐ Once or twice per week
☐ Three or more times per week
☐ I work on site almost daily

9) Nature of participation on site: *(More than one answer may be selected)*

☐ Engineering follow-up or supervision
☐ Inspection of completed works
☐ Quantity measurement or review of payment certificates
☐ Attendance at site meetings
☐ Laboratory follow-up or materials testing
☐ Administrative or government follow-up
☐ Coordination between design and construction
☐ Inspection visits or acceptance of works
☐ Not applicable; I do not visit project sites
☐ Other: ……..

10) Governorate / primary work region: ……

Section S2. Occupational Safety and Exposure to Site Risks

Please indicate your response to each statement using the following scale: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree.

No.	Statement	1	2	3	4	5
1	The nature of my work brings me into direct or indirect contact with project sites.	☐	☐	☐	☐	☐
2	I am exposed to occupational safety risks during site visits or field follow-up.	☐	☐	☐	☐	☐
3	Entrances and walkways at project sites are usually safe and suitable for women engineers.	☐	☐	☐	☐	☐
4	Safety instructions are explained before or during a site visit.	☐	☐	☐	☐	☐
5	Poor housekeeping and site order affect my sense of safety during a visit.	☐	☐	☐	☐	☐
6	The movement of machinery, vehicles, and materials within the site is a source of safety concern.	☐	☐	☐	☐	☐
7	I sometimes avoid entering certain areas of a site because they appear unsafe.	☐	☐	☐	☐	☐

Section S3. Personal Protective Equipment (PPE)

Please indicate your response to each statement using the following scale: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree.

No.	Statement	1	2	3	4	5
1	Suitable personal protective equipment is available when visiting project sites.	☐	☐	☐	☐	☐
2	The sizes and designs of the available personal protective equipment are generally suitable for women engineers.	☐	☐	☐	☐	☐
3	Unsuitable personal protective equipment may reduce a woman engineer's ability to work safely on site.	☐	☐	☐	☐	☐
4	I have experienced difficulty obtaining suitable personal protective equipment during field visits.	☐	☐	☐	☐	☐
5	Some women engineers may avoid certain field tasks because suitable personal protective equipment is not available.	☐	☐	☐	☐	☐

Section S4. Facilities, Privacy, and Mobility

Please indicate your response to each statement using the following scale: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree.

No.	Statement	1	2	3	4	5
1	Project sites usually provide suitable sanitary facilities for women engineers.	☐	☐	☐	☐	☐
2	The lack of suitable sanitary facilities affects women engineers' willingness to visit project sites.	☐	☐	☐	☐	☐
3	Safe waiting or rest areas are available during field visits.	☐	☐	☐	☐	☐
4	Site arrangements take account of women engineers' privacy and comfort.	☐	☐	☐	☐	☐
5	Remote or distant sites create additional concerns for women engineers.	☐	☐	☐	☐	☐
6	Transportation to and from project sites affects women engineers' sense of safety.	☐	☐	☐	☐	☐

Section S5. Reporting Climate and Organizational Response

Please indicate your response to each statement using the following scale: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree.

No.	Statement	1	2	3	4	5
1	I feel comfortable reporting unsafe conditions at the workplace.	☐	☐	☐	☐	☐
2	Women engineers can report inappropriate conduct without fear of negative consequences.	☐	☐	☐	☐	☐
3	Management takes women engineers' safety concerns seriously.	☐	☐	☐	☐	☐
4	Clear channels are available for reporting harassment, inappropriate conduct, or unsafe working conditions.	☐	☐	☐	☐	☐
5	I would feel supported if I refused to enter an unsafe area on site.	☐	☐	☐	☐	☐
6	Reporting safety problems may expose a woman engineer to embarrassment or blame.	☐	☐	☐	☐	☐

Section S6. Gender-Related Professional Barriers

Please indicate your response to each statement using the following scale: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree.

No.	Statement	1	2	3	4	5
1	Women engineers may sometimes be excluded from certain field activities because they are women.	☐	☐	☐	☐	☐
2	The male-dominated nature of the site affects a woman engineer's sense of safety or comfort.	☐	☐	☐	☐	☐
3	Women engineers may be excluded from some informal discussions or communications on site.	☐	☐	☐	☐	☐
4	Some workers or supervisors question the technical authority of a woman engineer on site.	☐	☐	☐	☐	☐
5	Inappropriate comments or conduct may affect a woman engineer's comfort during field work.	☐	☐	☐	☐	☐
6	Social expectations affect the types of tasks assigned to women engineers in the construction sector.	☐	☐	☐	☐	☐
7	Gender-related barriers may reduce women engineers' opportunities to gain field experience.	☐	☐	☐	☐	☐

Section S7. Digital and AI-Enabled Tools for Safety and Reporting

Please indicate your response to each statement using the following scale: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree.

No.	Statement	1	2	3	4	5
1	Anonymous digital reporting systems could help report safety risks.	☐	☐	☐	☐	☐
2	Mobile safety applications could improve communication during field visits.	☐	☐	☐	☐	☐
3	AI-based complaint analysis could help organizations detect recurring problems.	☐	☐	☐	☐	☐
4	Digital dashboards could help management prioritize improvements in women engineers' safety and the work environment.	☐	☐	☐	☐	☐
5	I would use a digital reporting system if privacy were guaranteed.	☐	☐	☐	☐	☐
6	Women engineers may hesitate to use digital reporting systems if they fear that their identity could be disclosed.	☐	☐	☐	☐	☐

Section S8. Priorities for Improving Women Engineers' Safety and Work Environment

Please indicate the importance of each item using the following scale: 1 = Not important at all, 2 = Slightly important, 3 = Moderately important, 4 = Important, 5 = Very important.

No.	Statement	1	2	3	4	5
1	Provide suitable personal protective equipment for women engineers.	☐	☐	☐	☐	☐
2	Provide suitable sanitary facilities at project sites.	☐	☐	☐	☐	☐
3	Provide safe waiting or rest areas during field visits.	☐	☐	☐	☐	☐
4	Establish clear protocols for women engineers' visits to project sites.	☐	☐	☐	☐	☐
5	Provide safe transportation to remote or distant sites.	☐	☐	☐	☐	☐
6	Establish confidential channels for reporting safety problems or inappropriate conduct.	☐	☐	☐	☐	☐
7	Train site managers and supervisors to address women engineers' safety issues professionally.	☐	☐	☐	☐	☐
8	Increase women engineers' participation in safety committees or project safety decisions.	☐	☐	☐	☐	☐
9	Use anonymous digital reporting systems to enhance women engineers' safety.	☐	☐	☐	☐	☐
10	Require contractors and consultants to provide suitable conditions for women engineers working on site.	☐	☐	☐	☐	☐

Section S9. Open-Ended Questions (Optional)

1) What is the most important safety or work-environment-related challenge you have faced as a woman engineer in the construction sector?

2) What factors most often make project sites uncomfortable or unsafe for women engineers?

3) In your opinion, what is the single most important action for improving women engineers' safety and comfort at project sites?

Thank you for your time and cooperation.