

Internship and Coaching of Fresh Female Engineers in Development Programmes of Nepal: Promoting Gender Inclusion for Achieving Sustainable Development Goals

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ABSTRACT

The Swiss Agency for Development and Cooperation (SDC) is providing Technical Assistance (TA) to the Government of Nepal through the Department of Local Infrastructure (DoLI) under the Ministry of Federal Affairs and Local Development, later restructured into the Ministry of Federal Affairs and General Administration that is responsible for local development in Nepal, in the implementation of Rural Roads, Trail (foot) Bridge, and Motorable Bridge programmes. The DoLI has now been readjusted within the Federal Ministry of Urban Development recently, which is responsible for providing technical support and grants to implement infrastructure programmes for local and provincial governments. While the SDC tries to promote workforce diversity in the programmes, it struggled to bring female engineers into its infrastructure sector technical programmes in early 2009. Only a handful of female engineers were involved in the programmes. Therefore, the internship programme targeted at female engineers was started to train young fresh female civil engineering graduates to work in the rural roads programme initially in 2009. With its success, it continued in the trail and motorable bridge programmes from 2011 onwards to date. So far, over a hundred female civil engineering graduates have been trained in Nepal and are working in different organizations within the country and abroad, the government systems, and the private sector. They contribute their skills and knowledge in project design, implementation, management, and supervision.

Keywords: Internship, fresh female engineers, gender inclusion, roads and bridges

About the Author: Ms. Jun Hada, an architect and an urban planner by academic background, has worked as a development professional, working for almost 20 years in rural and urban development and planning in Nepal. Currently, she is a Senior Programmer Officer at Rural Infrastructure Portfolio, Swiss Agency for Development and Cooperation (SDC) in Nepal, and Chair and Founding Member of the Women in Science and Engineering, Nepal (WISE Nepal) – A voluntary society that works for promoting Science Technology Engineering and Mathematics (STEM) education and career for girls and women in Nepal.

Abbreviations: Swiss Agency for Development and Cooperation, SDC; Technical Assistance, TA; Government of Nepal, GoN; Local Infrastructure, DoLI; Ministry of Federal Affairs and Local Development, MoFALD; Ministry of Federal Affairs and General Administration, MoFAGA; Rural Roads, RR; Trail (foot) Bridge, TB; Motorable Bridge, RB.

Introduction

In Nepal, a huge gender gap in the field of engineering profession exists. There is a limited number of registered female engineers in the engineering council, which is due to the equally limited number of female students taking up engineering studies and, thus, a proportional number of female engineering graduates that the engineering institutes produce each year. As of 2022, only 4,898 or 11% of the 43,018 registered engineers in Nepal are female (Figure 1) (Nepal Engineering Council 2022).

While it is recognized that a lot has to be done to reduce this gap, an important issue to address is encouraging fresh female engineering graduates to prepare themselves for entering the competitive engineering job markets.

This internship programme is designed with a broader objective of transforming fresh female engineering graduates into competent technical professionals in the fields of roads, trail, and motorable bridge building so that they are prepared and available to fulfill the much-needed workforce demand for the economic development of Nepal.

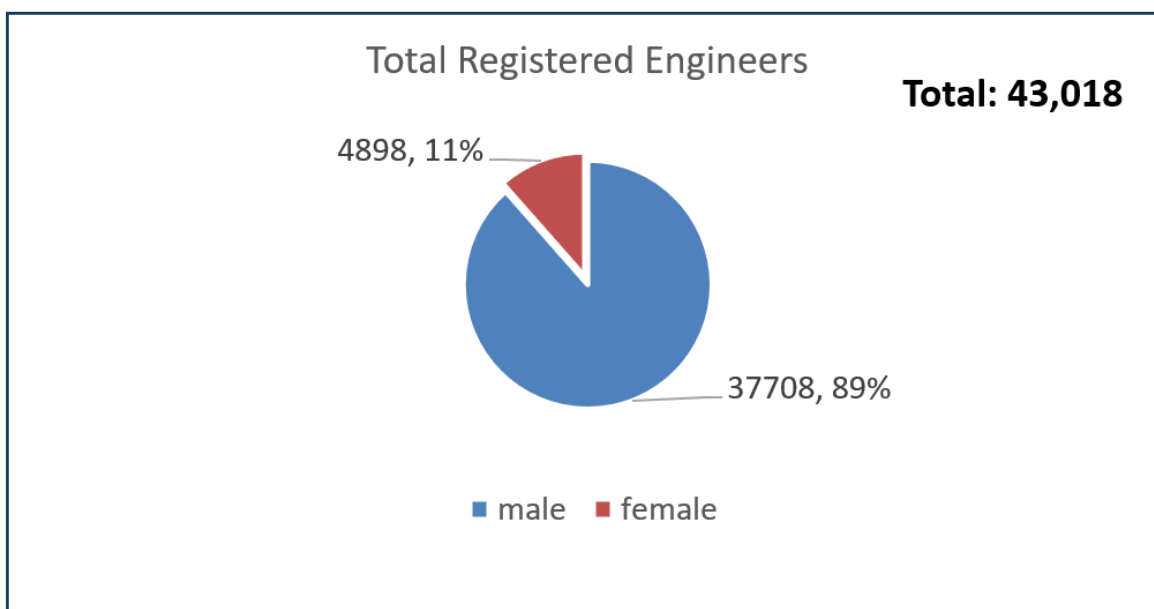


Figure 1. Ratio of male and female registered engineers in Nepal, 2022
Source: Nepal Engineering Council 2022

More concretely, the main objectives are:

- To equip fresh female engineering graduates with the knowledge and the skills required for roads, trail, and motorable bridge designs and construction;
- To mentor and coach them through a team of experienced national professionals;
- To help build their confidence in the sector by exposing them to the real world through working and dealing with the GoN staff, the contractors, consultants, and the local communities; and
- To produce an inclusive human resource in this sector, who are limited but are high in demand in the job market.

The Traineeship Method and Set-up

Every year, all the government and private engineering institutes that produce civil engineering graduates are identified and contacted by the programmes to inform their potential female graduates of the year to apply for the internship programmes. Just before graduation, the internship programme to be offered by these projects in collaboration with the engineering institutes is announced in the engineering institutes for all potential female graduates to apply. The potential graduate

engineers then apply to this internship programme. The applications received for the limited positions (roughly 21 per year) are generally in the hundreds. Therefore, candidates who meet the criteria (fresh graduates with minimum passing marks obtained) are shortlisted based on the inclusion criteria (historically discriminated groups by caste and ethnicity represented from each of the seven provinces) from all over Nepal. In Nepal, certain groups of people have been discriminated and marginalized from mainstream social and economic development, simply because of their caste and ethnicity for centuries for some political reasons. Females from these groups are targeted as a priority. After shortlisting, a written test and a general interview are conducted for the shortlisted candidates. After the written tests and interviews, the cohort of interns is finally selected from the female graduates who pass the tests, and who will undergo a period of ten months to one year of intensive training, coaching, and mentoring sessions in the projects. Each intern is assigned a mentor and a coach to supervise her.

At the very beginning of the program, the interns will be provided with intensive theoretical knowledge training on trail and motorable bridges for 35 days. After the theoretical training, the interns will be divided into small groups of two to three and will be assigned to the respective provincial government offices of their choice or will be assigned to their residential provinces.



Figure 2. Trainees in the classroom: Batch 2024.
Photo Credit: Jun Hada

The interns are assigned to the Trail Bridge programme for five to six months and to the Motorable Bridge programme for another five to six months. In the provincial offices, they learn and experience the real practical works in the trail and motorable bridge-building processes along with the staff and professionals of these programmes. They are trained on how to conduct walk-over surveys, conceptual designing, detail designing, preparing quantities and cost estimates, preparation of contract documents, laying out the foundations for bridge infrastructures, monitoring and supervision of

structures during construction, and quality checking. In these processes, they are supervised and coached by their individual mentors and provided with feedback on their work for improvement every week. They are exposed to the harsh sites, some of which are a few days' walk from their duty stations. The intention is that they learn from the harsh reality and be prepared to survive under any conditions. The interns are provided with a stipend and other benefits as per the policy prescribed by Nepal's Labor law so that they can make their own living.



Figure 3. Trainees in the field.
Photo Credit: T. Gregoire

The Results of Traineeship

The internship programme has coached more than 100 female civil engineering graduates since 2009. Most of them are working with various agencies of the Government of Nepal and contributing their learning in the fields of engineering. This is a major success story of the internship programme. While some left the country to pursue higher studies or got better job opportunities abroad, a number have returned with higher qualifications and greater experience and have continued working in Nepal in the areas of project management, implementation, and supervision.

A participatory review of the programme by the intern graduates showed that this internship is the best launching pad for them, which is exceptional due to the high standard of work values and ethics taught by

embracing diversity and inclusion in such a traditionally male-dominated profession (<https://www.rvwrmp.org.np/single-post/2017/09/01/Choosing-to-Thrive-in-a-Male-Dominated-Profession>). Figure 4 shows the Internship Graduation of 2023 at the Swiss Agency for Development and Cooperation in Nepal.

Relating to the food systems and sustainable development goals (SDGs), (Figure 5)— this program promotes gender equality (SDG 4 and 5) and empowering women and girls. These young female engineers build bridges in Nepal. These bridges are the future backbones of the country for enhanced physical connectivity, mobility, and accessibility, that directly and indirectly contribute to the backward and forward linkages of the whole of the sustainable agricultural sector transforming the food systems (SDGs 2, 3, 4 and 8).



Figure 4. Internship Graduation of 2023 at the Swiss Agency for Development and Cooperation in Nepal. Graduate interns with the Ambassadors of Switzerland to Nepal and the Director General (Mr. Bharat Aryal) of the Department of Local Infrastructure. Photo Credit: SDC



Figure 5. Sustainable Development Goals (SDGs).
(<https://iucn.org/our-work/informing-policy/international-policy/un-sustainable-development-goals>)

Major Learnings from the Programme

At the start of the programme, we would take the best graduates, who, most often, have also applied in other places for different positions. Some of the interns left the internship programme even without completing it. Thus, later for the new cohorts, the programme has strictly applied the rule that one has to complete it and if she fails to do so, she will have to pay back the stipends she has received. Moreover, the interns should follow the guidance provided by the mentor and supervisor, carry out all assignments given to them, and get feedback regularly. All assignments must be completed in time and these are all strictly monitored.

There were also challenges for the interns during the monsoon period. For about three months, when the construction stops at sites, they cannot learn the construction supervision works. Thus, the projects ensure that the interns learn the practical site layouts, construction work, and supervision during the construction seasons, while during monsoons, they will stay in the offices for desk work to primarily review the designs and cost estimates, as well as study the contract documents, etc. When in the fields, these young female interns are exposed to harsh climates and external environments. To protect them and ensure that they are safe from any potential physical and mental harassment,

the projects require that they work in buddies to enable them to protect each other, with the assurance that any act of violence is intolerable and is reported to the programme for proper actions.

Because of the programme's experience and important outputs, engineering institutes have also asked that the internship be diversified to include other fields of engineering disciplines and not only civil engineering. However, because of the present programme's objective of building bridges, the internship was focused on civil engineers.

At the SDC and the Department of GoN, on various occasions, it was recommended that this female internship approach be promoted in other disciplines of engineering, for example, environmental engineering, information and communication technology, etc.

Ways Forward and Recommendations

The two SDC-supported programmes on trail bridges and motorable bridges are unfortunately coming to an end in November 2023 and June 2025 respectively and thus, the internship programme will also end. However, the learnings from this internship have been shared with other programmes of the SDC to replicate this initiative

so that we continue to promote equality and empower women and girls.

The other SDC-funded programmes have also started working together with the relevant private sector industries. For example, technical and vocational education sector support programmes have started working with private industries and educational institutes to design course curriculum and practicum for apprenticeships for graduating students as required by the private sector. The private industries then recruit fresh academic interns as apprentices, to coach them in order to fulfill their practical academic credits while also giving them opportunities to learn life skills. At the same time, the private sector industries also benefit from the new ideas and innovations brought about by the academic interns through their respective educational institute's contributions.

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None.

Disclosure of conflict of or competing interest:

The author declares no conflict of or competing interest.

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