# Capacity building in EO and GIT - bridging the gender and capacity gap in the HKH region

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**Abstract**

Earth observation (EO) and geographic information technology (GIT) offer a wide range of data and tools to aid in data management, research, decision-making, and tracking, as well as the ability to test and assess options by providing high-resolution and spatially explicit information in both temporal and spatial domains. However, capacity and gender gap at individual and institutional levels in the HKH region has limited the adoption and operational use of EO data and GIT in various applications as was evident by SERVIR phase I and phase II analysis. In this regard, as part of our capacity-building processes in the HKH region, we held a series of "Empowering women in GIT" events in 2021 to promote and support young women to become aware of and pursue careers in EO and GIT. Virtual trainings were delivered to the young women of five countries i.e. Nepal, Pakistan, Afghanistan, Bhutan and Bangladesh of the HKH region building the capacity of ˜235 individuals from ˜166 institutes accommodating many professionals from the academic institutes as well. The trainings were given on various aspects of EO and GIT from basic to advanced level including the use of open-source EO data and tools for terrestrial applications along with a focus on the SERVIR services, and applications on drought monitoring, forest cover analysis, HiWAT streamflow prediction, stream water delineation etc. Analysis from the training assessment showed an enhancement (>50%) in the knowledge and skills from low to higher levels. The effectiveness of the training judged by relevancy and quality surveys demonstrated that the trainings were of significant high quality, with >85 percent of the participants responding positively. Our efforts to close the gender gap in EO and GIT had a positive outcome, with most participants expressing confidence in using the information in their respective professional domains and research areas. Academic institutions have been the key in spreading knowledge on EO and GIT, thus, building the capacity of academic professionals would help in the foundation of institutional and individual capacity to transfer knowledge. Focused capacity development can contribute to bridge the gender and capacity gap, and underpin the achievement of best practices and innovations that might guide towards better adoption of EOand GIT in the HKH region.

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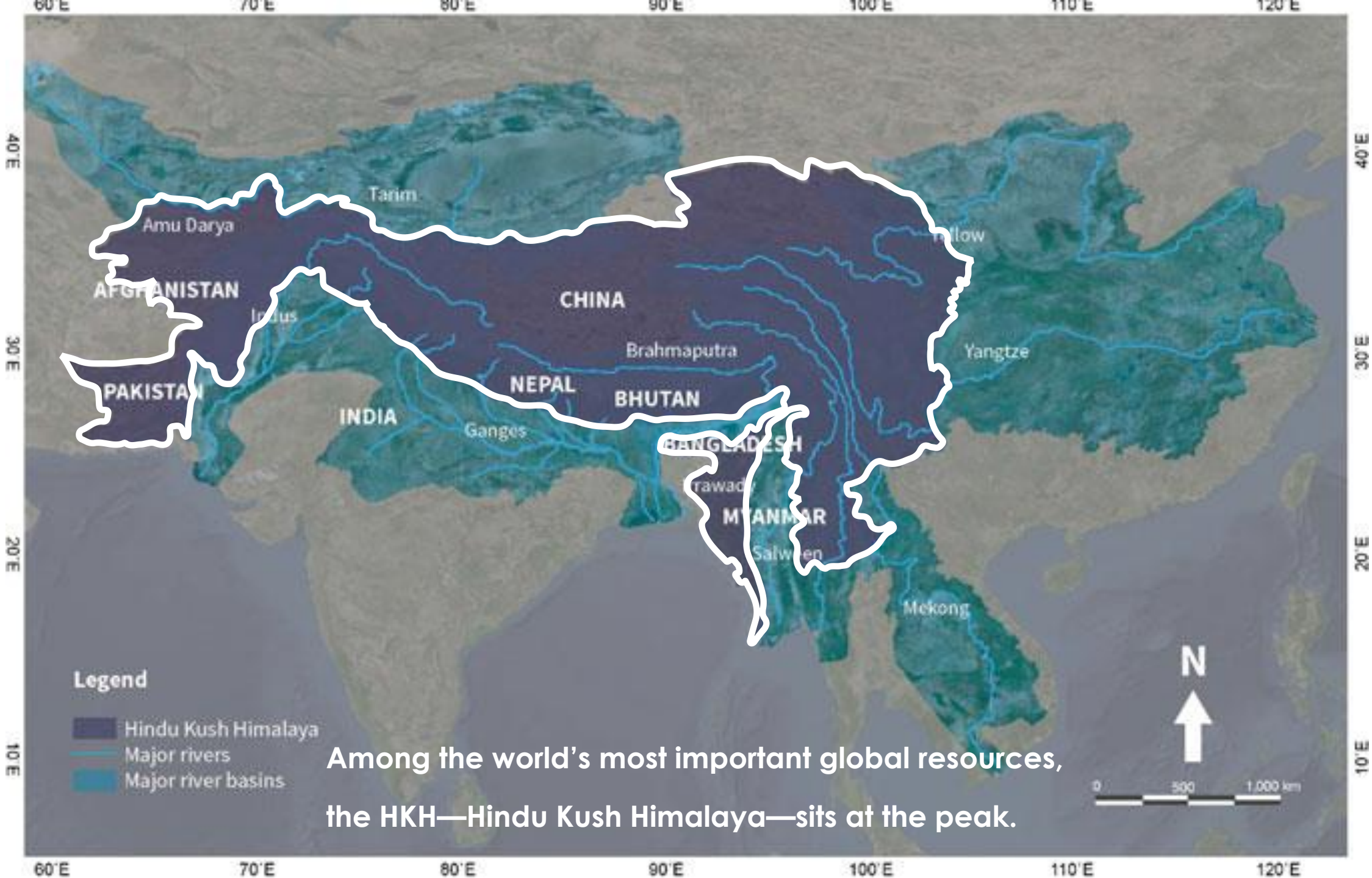



Among the world's most important global resources,

the HKH—Hindu Kush Himalaya—sits at the peak.

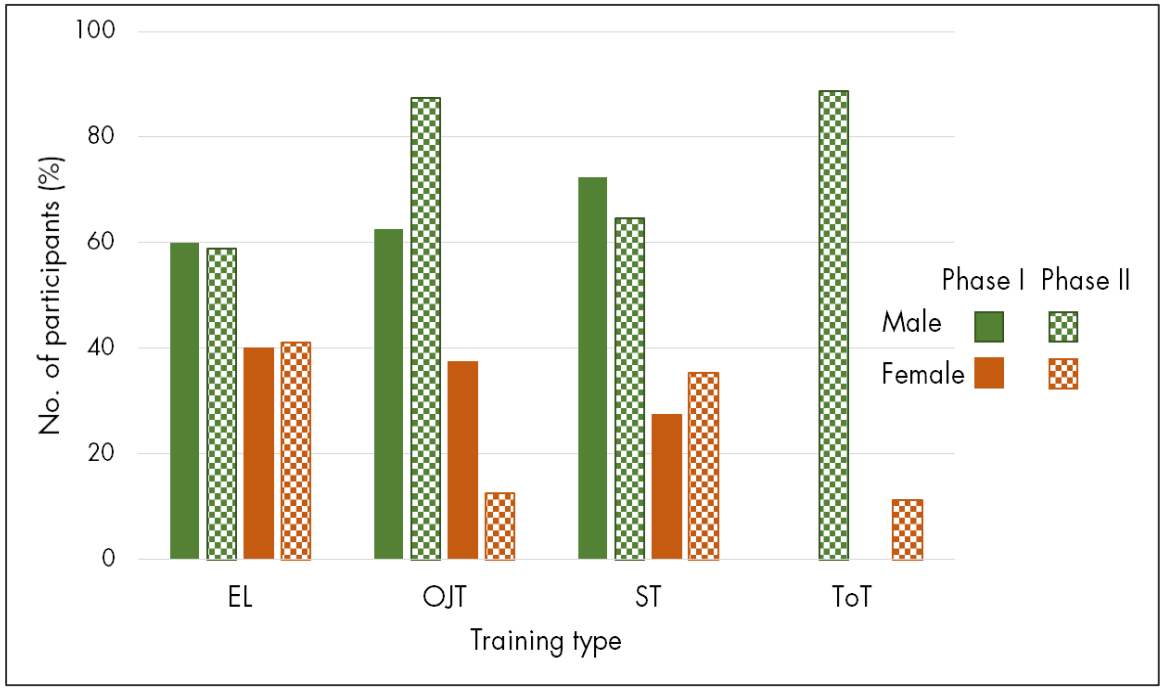
# Strength of GIT & EO

- Multi-disciplinary
- Innovative & emerging
- Analysis, modelling & Visualization
- Decision support capability
- Impact in policy making

# Gender Gap in GIT & EO Capacity

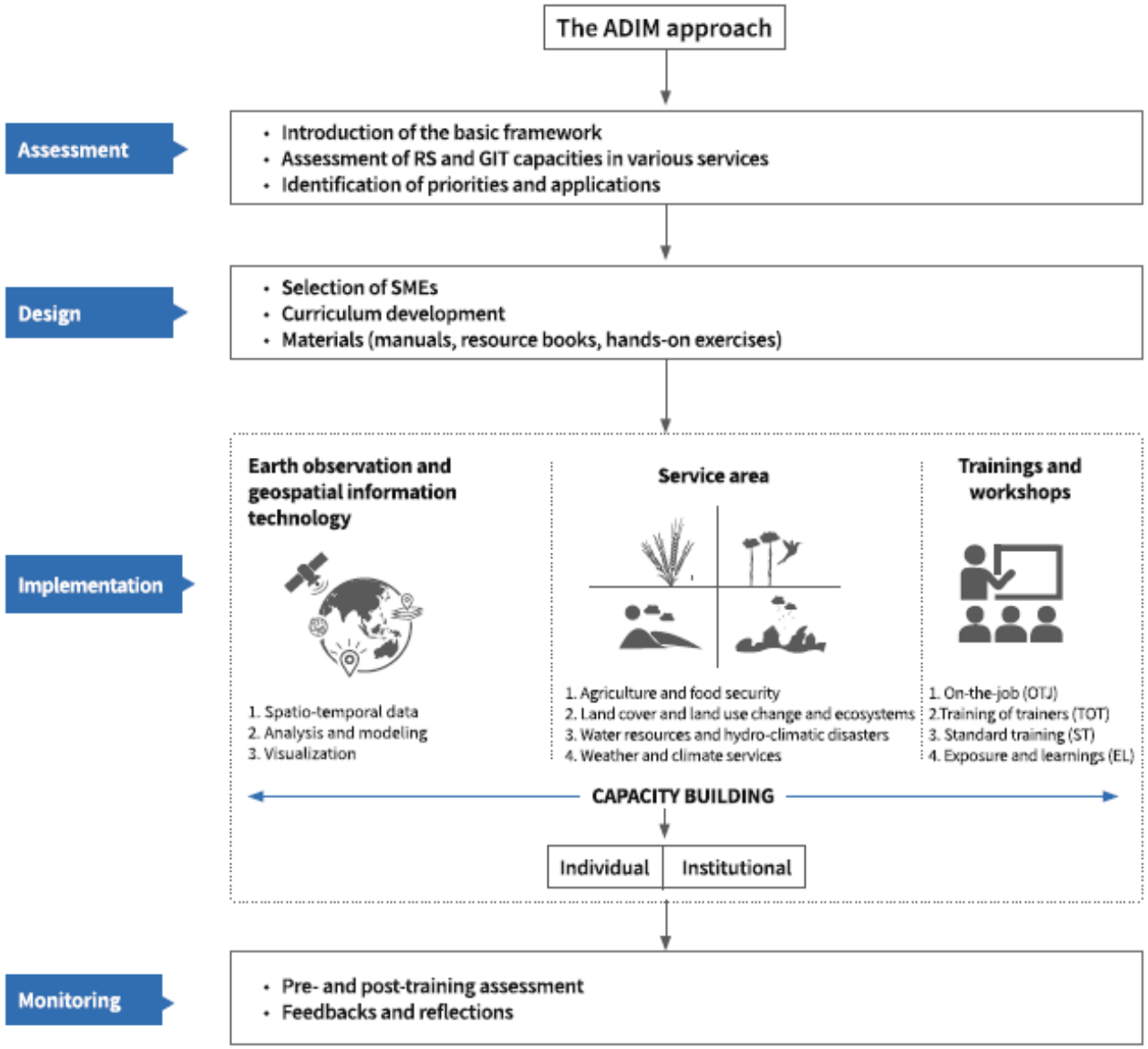
- Capacity gap and Gender disparity

A clear inter-linkage between gender and EO and GIT technology has been observed wherein the **dominance of male due to societal gender stereotype** sheds the light on why there is gender gap in the workforce in HKH region (Goodrich et al., 2021)




Gender based comparison of participation for SERVIR-HKH Phases I and II

*EL: Exposure & learning; OJT: On-the-job training; ST: Standard training; TOT: Training of trainers
*No TOT was organized during SRVIR Phase - I




Capacity building framework within SERVIR-HKH

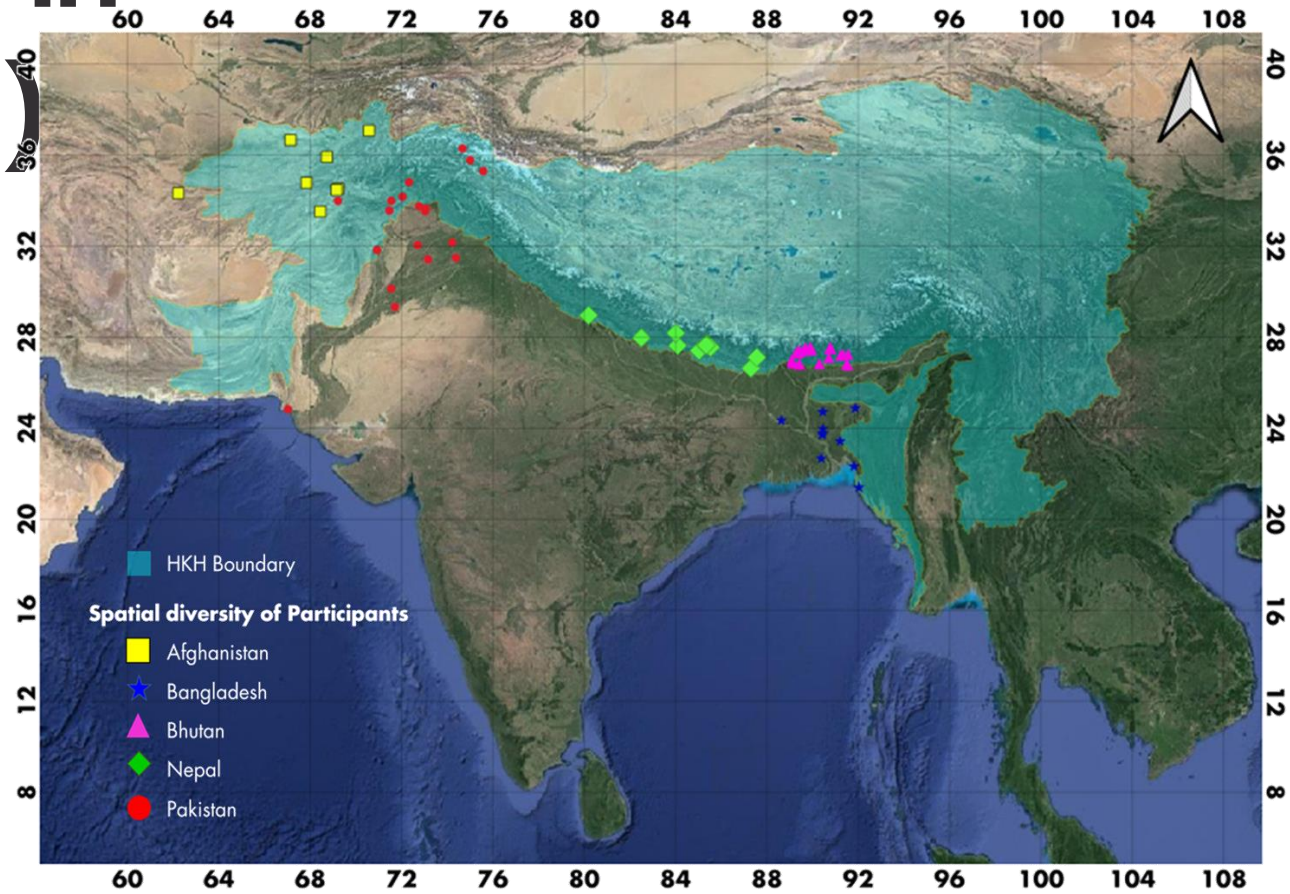
Source: **Thapa, R.B., Tripathi, P., Matin, M.A., Bajracharya, B. and Sandoval, B.E.H., 2021. Strengthening the capacity on geospatial information technology and Earth observation applications. In Bajracharya, B. et al. (eds.), Earth Observation Science and Applications for Risk Reduction and Enhanced Resilience in Hindu Kush Himalaya Region, Springer Nature Switzerland AG.**

# Capacity Building Pathways

- **Assessment:** User needs and corresponding technological solutions
- **Design:** Customized training materials
- **Implementation:** On the job (OJT), training of trainers (TOT), Exposure learning (EL), standard training (ST)
- **Monitoring:** Review and feedback

# Empowering Women in GIT, 2021 (Outscaling)

- Open calls (Country specific)
- Selection of candidates (~50 from each country)
- Communication and back-up channel
- Training delivery
- Impact tracing




Spatial distribution of the training participants in 2021

# Empowering Women in GIT (Outscaling)

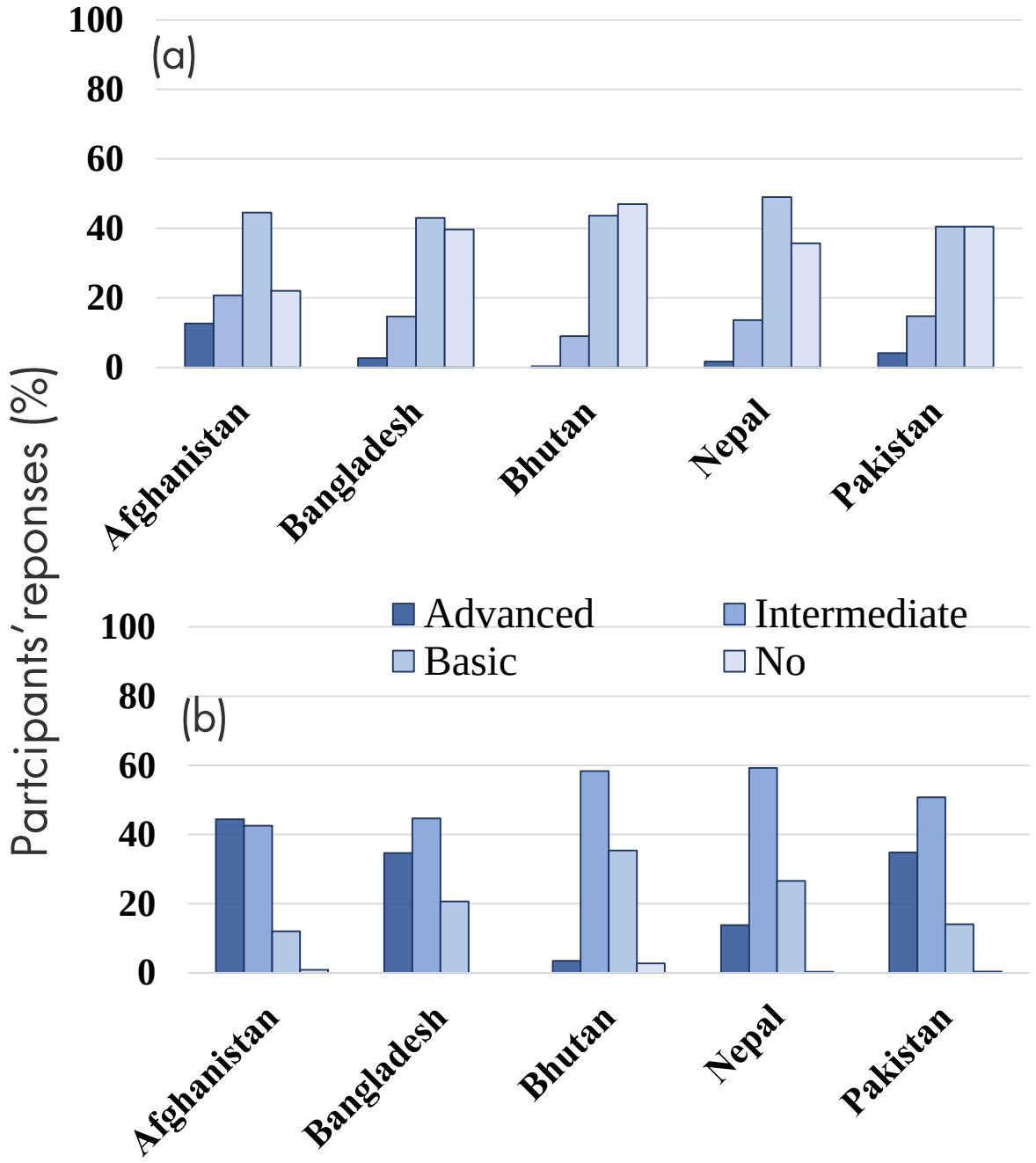
## Participants from diverse background

a) **Subject:** Ecology, agriculture, engineering, crisis management, environmental sciences, hydrology, forestry, geology, geotechnical, water, natural resources, zoology, geography, statistics, urban planning, communication, medical, and many others

b) **Work:** Students, researchers, engineers, lectures/professors, school teachers, officers, supervisors and freelancers

Overall, 235 Participants representing 160+ unique institutes

| Job description | Afghanistan | Bangladesh | Bhutan | Nepal | Pakistan |
|---|---|---|---|---|---|
| Analyst | -------- | -------- | -------- | -------- | 2 |
| Assistant | 2 | -------- | -------- | -------- | -------- |
| Engineer | 2 | 7 | 1 | 5 | 1 |
| Forest ranger | -------- | -------- | 2 | -------- | -------- |
| Geologist | -------- | -------- | 2 | -------- | -------- |
| Intern | 2 | 3 | | 10 | 5 |
| **Lecturer** | **2** | **4** | **11** | | **7** |
| Meteorologist | -------- | 3 | -------- | -------- | 1 |
| Officer | 3 | 9 | 18 | 10 | 2 |
| **Professor** | **--------** | **2** | **--------** | | **1** |
| Researcher | 2 | 12 | -------- | 5 | 7 |
| Specialist | 2 | -------- | -------- | -------- | -------- |
| Supervisor | -------- | -------- | 5 | -------- | -------- |
| **Teacher** | **1** | **--------** | **5** | **-------** | **4** |
| University student | 7 | 4 | 5 | 6 | 8 |
| Other | 17 | 6 | 2 | 13 | 7 |
| **Total** | **40** | **50** | **51** | **49** | **45** |




Comparative (a) pre and (b) post training responses of the participants

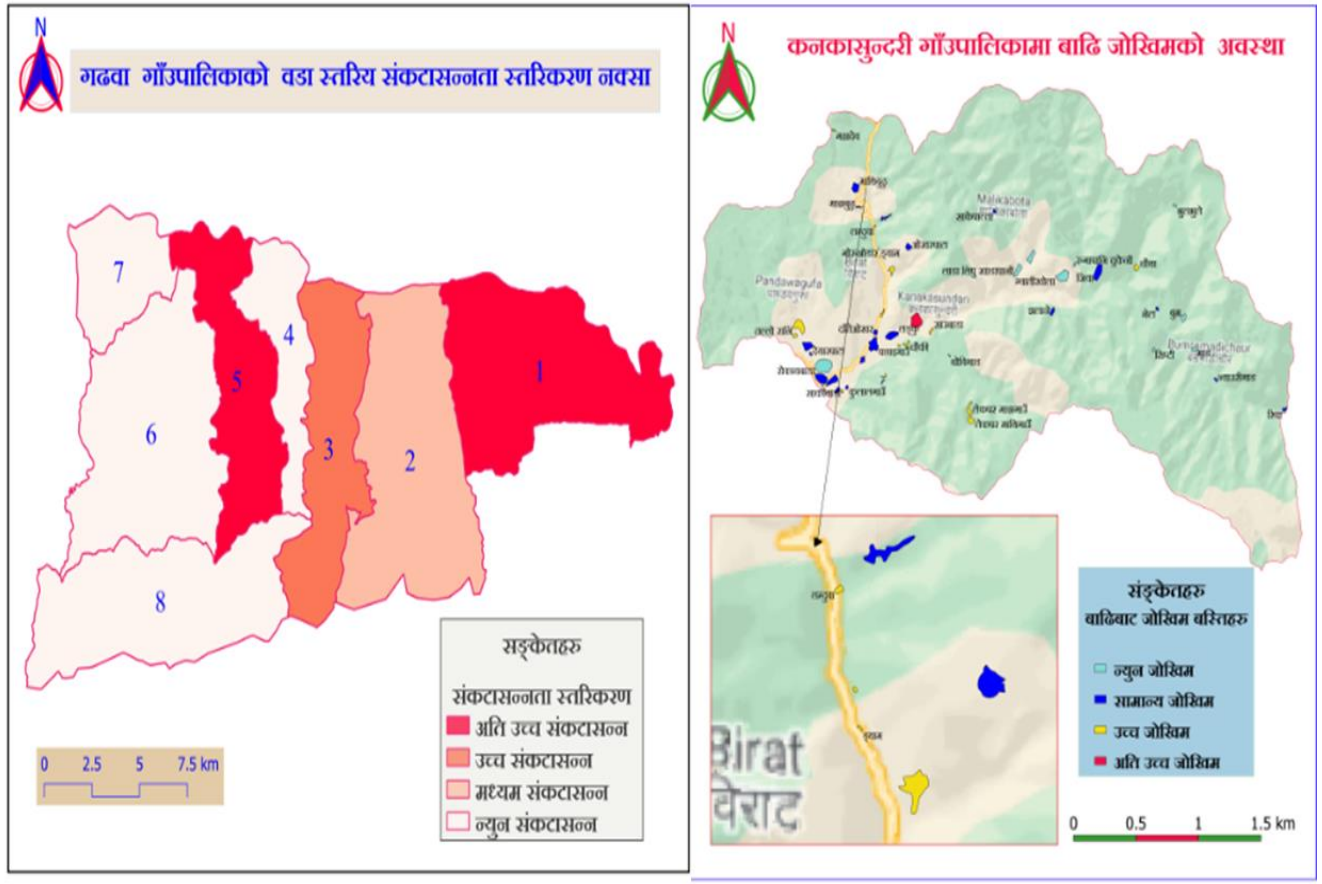
# Impact tracing

Maximum shift from ***No*** to ***Higher*** knowledge levels was observed for **Bhutan (44%)** followed by Bangladesh and Pakistan (40% each), Nepal (35%) and Afghanistan (21%), respectively

Evaluation for ***relevancy and quality*** carried out for five different levels (i.e. extremely high, high, moderate, low and not at all) revealed that participants were highly satisfied overall as more than 90% responses were at extremely high and high levels

# Impact

- Rama Ghimire a freelancer in the field of environmental science from **Nepal** could create ~ 50 climate risk maps for her work after the training
- Kainat Javed, former research assistant from Global Change Impact Study Center, **Pakistan** highlighted the training helped her to boost confidence to work for highlighting ecological imbalances, understand climate variation, urban sprawl, land degradation and gender mapping.




Maps created by Mrs. Rama Ghimire post training

School students learning GIT in the GIS lab, Bhutan


Taslima with the colleagues collected GPS field data for monitoring climate change impact at Gazipur, Bangladesh

# Impact

- Choki Wangmo, Geography teacher in Shaba Higher Secondary School, **Bhutan** shared that this training opened a new landmark of understanding the concepts of EO and GIT that will certainly help her to build the capacity of school students via teaching and learning process.
- Taslima Zahan, a scientific officer from **Bangladesh** Agricultural Research Institute (BARI) shared that this training opened a window for her to look for solutions and apply the knowledge and skills in her project work '*modeling climate change impact on agriculture and developing mitigation and adaptation strategies for sustaining agricultural production in Bangladesh*'.

# Highlights of Lesson Learned

## CHALLENGES

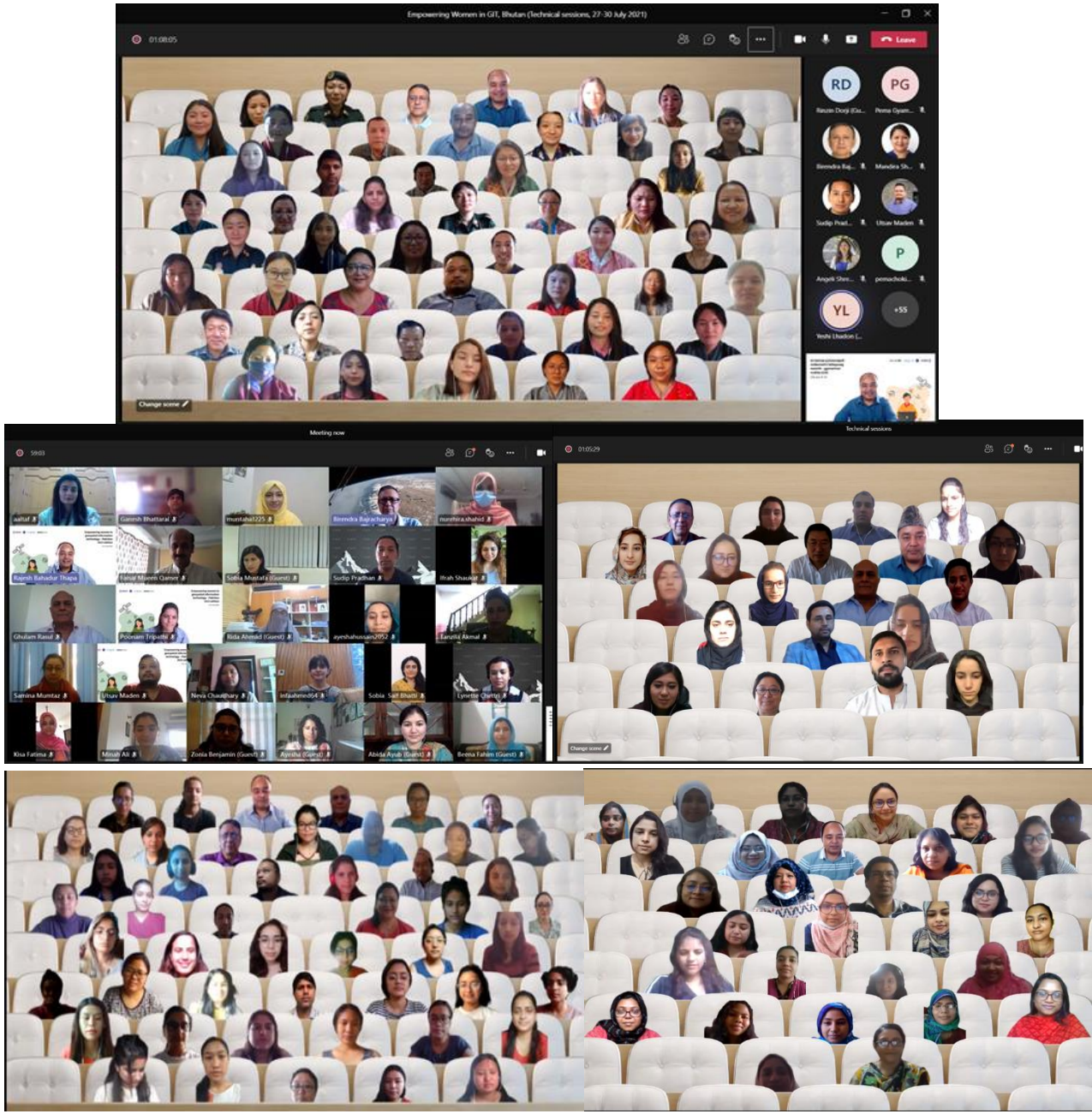
- Diverse group of participants
  (Subject, work, knowledge level)
- Regional knowledge gap
- Cultural, Social and Language
- Virtual training
- Impact tracing
- Others
  (Selection process, Customization, Post training, Local )

## OPPORTUNITIES

- Diverse exposure and well-designed materials from diverse subject
- Analyze the needs and demands for effective CB in future
- Cross cultural interaction, regional SMEs and MOOC presentation
- Wider Outreach
- Long term monitoring via tracer survey
- Collaborative work on mini projects

# WAY FORWARD

- Impacted over 400 women in the HKH region via in-person and virtual trainings (*57% in 2021*)
- Organizing advanced subject and/or theme-specific trainings
- Collaborative mini-projects with the outstanding participants for educational or research works




Thank you
Let’s protect
the pulse.