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# **SOUTH ASIA WATER (SAWA) LEADERSHIP PROGRAM ON CLIMATE CHANGE (2017 – 2021)**

## **FINAL TECHNICAL REPORT**

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South Asia Consortium for Interdisciplinary Water Resources Studies  
(SaciWATERs)  
Project Report Publication  
November 2021





**IDRC | CRDI**

International Development Research Centre  
Centre de recherches pour le développement international

**SaciWATERS**  
SOUTH ASIA CONSORTIUM FOR INTERDISCIPLINARY  
WATER RESOURCES STUDIES

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**SHREYA CHAKRABORTY  
SREENITA MONDAL**

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**Full name of the collaborating Institutions:**

1. Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh
2. Centre for Water Resources(CWR),Anna University, Chennai, India
3. Centre for Post-Graduate Studies, Nepal Engineering College(NEC), Kathmandu, Nepal.
4. Post Graduate Institute of Agriculture (PGIA), University of Peradeniya, Peradeniya, Sri Lanka

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# Executive Summary

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This is the Final Technical Report for the IDRC funded project SAWA Leadership Program on Climate Change, discussion the activities, contributions, impacts, and lessons from the implementation of this capacity building project. The overall objective of the program was to increase the number of women occupying leadership roles in the water sector and fostering an interdisciplinary and gendered approach linking climate change and water insecurity by awarding fellowships to 36 women enrolled in masters-level Integrated Water Resources Management (IWRM) programs in Bangladesh, India, Nepal and Sri Lanka, and providing these women with opportunities to access decision-making environments. The implementing consortium comprised SasiWATERS as the project lead and coordinating body and four partner institutions Centre for Water Resources (CWR), Anna University; Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering and Technology (BUET); Nepal Engineering College (NEC); and Postgraduate Institute of Agriculture (PGIA).

The specific objectives of the project were:

- 1) To train the fellows in IWRM and in the application of research methods that include gender and social approaches in primary field contexts with the goal to implement more gender-sensitive strategies to adapt to climate change and water insecurity.
- 2) To develop the leadership skills of the fellows through leadership-building activities.
- 3) To facilitate internships for the fellows through collaborations with government, NGOs and the private sector in order to provide an authentic work environment allowing candidates to link their research to actual decisions and/or applications within the communities with which they are engaging.
- 4) To generate interdisciplinary research theses and scientific articles on IWRM as well as cross-cutting communications for regional or national audiences that will focus on the impact of climate change, adaptation solutions, water insecurity and resilience and that will help tackle these issues through gender and equity-based perspectives.
- 5) To facilitate inter-university collaborations and the exchange of knowledge and ideas throughout South Asia through alumni, thus forming a South-South learning network, including men and women, to create a broader base of leaders and professionals in the water sector.
- 6) To develop a common curriculum that will promote a common understanding of the way gender intersects with the issues of climate change and water insecurities across the four partner institutions (PIs); this to allow for the development of a broad base of trainers and researchers, both men and women, who will share the leadership program's vision.

The methods used to attain these varied objectives included:

- Fellowships to 36 women fellows enrolled in masters-level Integrated Water Resources Management (IWRM) programs

- Core curriculum on IWRM, gender and water as part of the Master's program
- Regional training Workshops on leadership and interdisciplinary research methods
- Field based research and leadership training and postgraduate research
- Common curriculum development and training of trainers
- Interdisciplinary research mentorship from external regional subject experts
- Facilitation of internships at national, international, government, and non-government sectors of practice in water and climate change
- Training and practice in science communication and dissemination through conferences, publications, blogs, knowledge exchange among peer groups
- Facilitation of south-south partnerships and regional peer networks

The project methodology was highly reflexive and benefitted from internal learning, open and regular communication, and modifications to ensure the best possible pathway to the intended outcomes and vision of the project. The COVID pandemic related lockdowns, health, and livelihood insecurities posed severe constraints to the intended project methods. Yet it also offered new opportunities for developing novel and innovative methods for implementing the program activities.

The project over its lifetime succeeded in awarding 36 SAWA fellowships across 3 years and 4 partner Universities. 3 annual regional training workshops, 1 training of trainers workshop, and 1 research tool-shop were conducted with support and participation of global and regional expert resource persons. These trainings covered a variety of themes and topics related to climate change vulnerability in sensitive environments of mountainous and coastal regions, urban and periurban water issues, gender and water linkages, interdisciplinary field research methods, and concepts and practice of interdisciplinarity, through classroom and field based teaching. Internship opportunities provided to fellows at varied organizations provided fellows ground experience in action research and implementation on varied themes of global and regional concern and priority, helping them to understand the sector – its market, practice, and internal decision processes. The project has led to significant research outputs in the form of publications, conference presentations, collaborative research outputs, and active participation in youth platforms on transboundary water issues.

In the project, women's leadership in water and climate change was built based on the following axioms:

1. A solely physical and technical understanding of the problems around Climate change and water often leads to technocratic solutions. However climate and water leadership also requires an intensive understanding of social causes and differential social impacts that could enable designing solutions seeking not only mitigation and adaptation but also inclusive governance and justice.
2. Exposure to field realities across the region through direct engagement and research with stakeholders and vulnerable affected communities, builds a base for understanding social vulnerabilities in qualitative terms, creating empathy, building communication skills across cultural and social settings, and recognising context specific challenges and opportunities for solutions.



3. Cross-country student peer networks and research collaborations allow for a regional exposure to varied mindsets, work environments and aspirations, common professional and social challenges faced in different country contexts, and build a base for future transboundary professional and personal networks of support.

4. Joint practical activities and concept building exercises under new and challenging fieldwork contexts help in fostering and cementing peer relations and networks among fellows from different countries, and between fellows and senior mentors. It also engages fellows in team building, conflict management, and communication capacities.

5. Exposure to the sector and market where practical implementation, impact, and policy making occurs helps fellows understand mechanics and tradeoffs of ground impact and decision making, co-learning about ground realities as well as develops more agency and exposure towards the processes of professional entry and growth in these sectors.

6. Engagement with established women professionals and leaders in the sector can provide motivation and a capacity to envision larger aspirations for one's own future development, beyond the limits posed by social barriers, personal temperaments, and reproducing gender stereotypes.

Additionally, the project implemented direct training initiatives towards leadership in varied effective ways:

- lectures on concepts and varied aspects of leadership, as well as the importance and role of leadership in climate change
- sharing success stories of past SAWA fellows and their growth over the years
- experience sharing with alumni SAWA fellows who are currently established water professionals in sectors ranging from government departments, development sector, to academic spaces
- training in broader science communication, including and beyond scientific writing and academic publications, to incorporate training on communicating science to local communities, to governments, and through popular media
- exposure to varied sectors, including and beyond academia, in the water and climate change sector where the fellows could eventually contribute as leaders in different ways

Education in IWRM and gender issues also helped fellows transition from technocratic thinking about the water and climate change sectors to greater appreciation of the social causes and impacts of climatic and environmental changes. It brought more sensitivity towards environmental injustice and complexity of sustainable solutions to water issues. These outcomes formed the foundation of future impact in building leadership.

The project brought focused attention to the aspects of gender in water and climate change research. For many fellows 'gender' as a concept was entirely novel, especially in linkage with IWRM and climate change. This has had a positive impact in introducing 'gender' as a lens in interdisciplinary research in the project as well as for the PIs. Gender narratives, indepth interviews, time use surveys, and gender disaggregated quantitative household and individual surveys were the most prominent methods used to incorporate gender in their IWRM research.



Yet, a challenge observed was that 'gender' continues to be a complex concept for most fellows as well as faculty members and supervisors despite the intensive training and varied methods of training and mentorship implemented, which reflects the stringent boundaries of disciplines – their language, underlying principles and priority lenses, and methods – which are further institutionalized in University systems thus requiring more systemic changes.

One of the most valued outcomes of the SAWA program for many fellows was the opportunity that it provided for building relationships, mentor and peer networks, and exposure to the sector. However this strength of the project was significantly limited by the restrictions of the COVID pandemic. Not only the students, but the PIs also effectively collaborated over the project period strengthening the consortium.

With the wide array of opportunities and research support that the project has provided many fellows have been able to gain employment in the water sector. The learning from the project in interdisciplinarity and gender in water has been brought by fellows to their employment positions and sectors. In the academic institutions this has involved bringing these insights to their classroom and teaching curriculum. In the government and development sector this has gone towards better implementation and involvement of fellows in their respective projects.

Some of the important lessons emerging from the project include:

- More sustained mentorship is needed beyond the limits of the project to break systemic disciplinary boundaries for better interdisciplinary and gender inclusive research
- Exposure to the sector through internships are successful in building sectoral linkages and professional networks that provide a leverage for building women professionals in the water sector
- Intensive field based experiential learning has been more effective than classroom lectures alone in imparting knowledge on concepts of interdisciplinarity and gender
- Transcending disciplinary boundaries require more systemic and pedagogical shifts. Interactive methods of lectures and experiential learning have been more effective than others in translating these new concepts for the fellows.

# CHAPTER 1: PROJECT DESCRIPTION

## Purpose and Objectives

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Climate change and variability pose formidable impediments to the development of South Asia. The 5th report of the Intergovernmental Panel on Climate Change assesses that key risks for South Asia are increased riverine, coastal and urban flooding as well as drought-related water and food shortage, with significant impacts for both rural and urban populations. The report highlights the lack of the knowledge required for developing gender-sensitive adaptation strategies to manage climate change impacts. This is further aggravated by the fact that the water sector in South Asia is dominated by men at all levels and there is a dearth of women water professionals, particularly in leadership roles. Although women are intrinsically linked with water, and instrumental in securing access to water sources, they have a negligible voice in the decision-making process and in the creation of water policies.

To address these knowledge gaps and capacity deficits, the South Asia Consortium for Interdisciplinary Water Resources Studies (SaciWATERs) launched the South Asian Water (SAWA) Leadership Program on Climate Change. The overall objective of the program was to increase the number of women occupying leadership roles in the water sector and fostering an interdisciplinary and gendered approach linking climate change and water insecurity by awarding fellowships to 36 women enrolled in masters-level Integrated Water Resources Management (IWRM) programs in Bangladesh, India, Nepal and Sri Lanka, and providing these women with opportunities to access decision-making environments through internships.

### Specific Objectives

- 1) To train the fellows in IWRM and in the application of research methods that include gender and social approaches in primary field contexts with the goal to implement more gender-sensitive strategies to adapt to climate change and water insecurity.
- 2) To develop the leadership skills of the fellows through leadership-building activities.
- 3) To facilitate internships for the fellows through collaborations with government, NGOs and the private sector in order to provide an authentic work environment allowing candidates to link their research to actual decisions and/or applications within the communities with which they are engaging.
- 4) To generate interdisciplinary research theses and scientific articles on IWRM as well as cross-cutting communications for regional or national audiences that will focus on the impact of climate change, adaptation solutions, water insecurity and resilience and that will help tackle these issues through gender and equity-based perspectives.
- 5) To facilitate inter-university collaborations and the exchange of knowledge and ideas throughout South Asia through alumni, thus forming a South-South learning network, including men and women, to create a broader base of leaders and professionals in the water sector.

6) To develop a common curriculum that will promote a common understanding of the way gender intersects with the issues of climate change and water insecurities across the four partner institutions (PIs); this to allow for the development of a broad base of trainers and researchers, both men and women, who will share the leadership program's vision.

Gender is represented by Sustainable Development Goal (SDG) five "Achieve gender equality and empower all women and girls", water by SDG 6 "Ensure access to water and sanitation for all" and climate action is represented by SDG13 "Take urgent action to combat climate change and its impacts". However, rather than looking at the SDGs independently, a more holistic approach is needed to cater to the intricate linkages between these SDGs. The connections between gender and water and between water and climate have been illustrated through research; the connection between gender, climate and water needs deeper and wider scientific development. In addition to understanding vulnerabilities of men and women emanating from climate change and water linkages, it is also necessary to recognize their agency in mitigation and adaptation to climate change. This program therefore attempted to bridge the gap by providing training to young women who will be the future water professionals and leaders responsive to gender concerns in the water and climate change sectors – in policy, planning, and implementation.

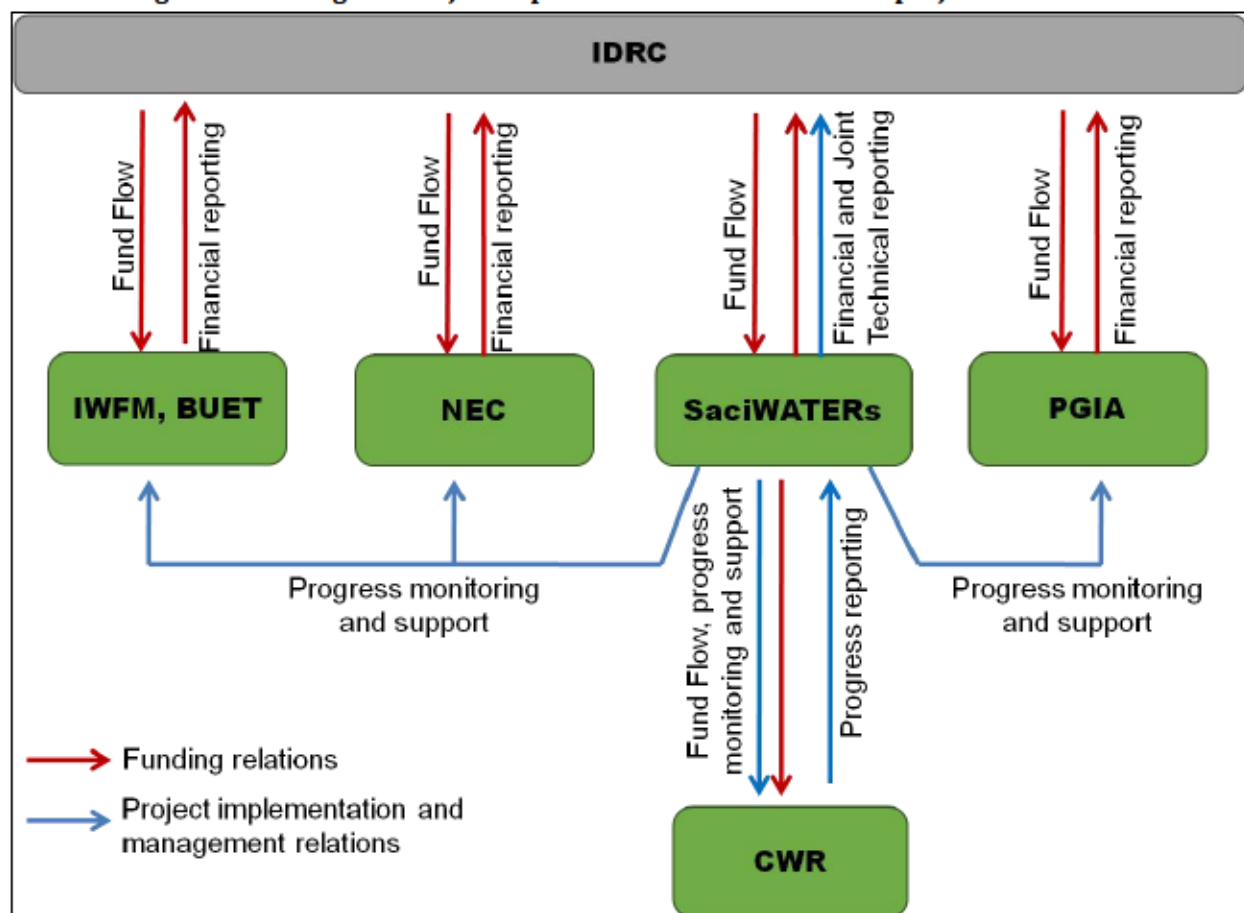


# CHAPTER 2: PROJECT IMPLEMENTATION

## Consortium Design and Management

The “SAWA Leadership” project funded by International Development Research Centre (IDRC) started in November 2017, building and developing on the SAWA Fellowship Program<sup>1</sup> (2012-2016). The consortium comprised SaciWATERS as the project lead and coordinating body and four partner institutions Centre for Water Resources (CWR), Anna University; Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering and Technology (BUET); Nepal Engineering College (NEC); and Postgraduate Institute of Agriculture (PGIA). Figure 1 below presents the funding and project implementation and management relations between partners and funder designed for the project execution.

**Figure 1: Funding and Project implementation relations in the project consortium**



Due to national policies for non-governmental organizations in India, SaciWATERS was not permitted to transfer funds outside the India. Therefore for the transfer of funds, SaciWATERS and three of the PIs signed a Memorandum of Understanding (MoU) with IDRC. Only the funds for CWR

<sup>1</sup> SaciWATERS 2018. South Asian Water Fellowship - Final Technical Report. Report number 5/2018. SaciWATERS (South Asia Consortium for Interdisciplinary Water Resources Studies), Hyderabad  
[http://www.saciwaters.org/sawafellowships/pdfs/Technical%20Report%20\(24%20Sep%202018\).pdf](http://www.saciwaters.org/sawafellowships/pdfs/Technical%20Report%20(24%20Sep%202018).pdf)

were transferred through SaciWATERS. On a half-yearly basis each of the partners submitted a financial report to IDRC<sup>2</sup> indicating the details of expenditures in the reporting period and the forecast of expenditures for the following project period. SaciWATERS was the nodal agency in the implementation of the project and also functioned as the coordinating body with IDRC and the four PIs.

SaciWATERS was the central organisation in planning and monitoring of all project-related activities such as regional workshops, interdisciplinary research mentorship, coordinating internships, and technical reporting in consultation with the PIs and IDRC. The project team at SaciWATERS monitored and reviewed activities of each reporting period in close communication with the coordinators at the PIs and prepared the interim technical reports for IDRC. In addition, the granting of fellowships and monitoring of the fellows was conducted on a yearly basis at the partner universities with a representative from SaciWATERS on board. In order to ensure efficacy in the implementation of the project, the following key indicators were developed:

1. Selection of eligible students (all women) with motivation to work in interdisciplinary areas.
2. Criteria to evaluate the thesis on the basis of mainstreaming climate change, incorporating an interdisciplinary lens, bringing in a gender focus, and effective application of interdisciplinary research methods.
3. Academic performance of SAWA fellows in IWRM courses.
4. Leadership roles and individual initiatives taken up by the fellows
5. Timeliness for submission of the thesis.
6. Contribution to larger body of research through publications.
7. Expanding existing networks and creation of new networks.
8. Fellows' perception about the efficacy of the program based on the following criteria:
  - Qualitative and quantitative data analysis
  - Data collection methods, tools, and techniques
  - Publication in the field of water and climate change with gender as the cross-cutting theme - Interdisciplinary approach in research
  - Science communication and presentation initiatives and skills
  - Networking and collaboration

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<sup>2</sup> Except PGIA which being in Sri Lanka, has to report only annually to IDRC

# CHAPTER 3: PROJECT METHODOLOGY

## Practice, Challenges, and Response

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This section details out the methodology adopted to achieve the project-specific objectives. The sections detailed here elaborate upon the original method design, challenges faced and how the methods were adapted over the period of the project in response to these challenges, and opportunities and limitations presented by this adaptive project implementation process.

### 3.1 Objective 1

*To train the fellows in IWRM and in the application of research methods that include gender and social approaches in primary field contexts with the goal to implement more gender-sensitive strategies to adapt to climate change and water insecurity*

The methodologies that are being used and how they evolved over the period of the project to achieve the project objectives are given in details below:

#### **A. The method for selection of potential awardees:**

A systematic method for selection of awardees was envisioned in the project to ensure that all PIs uniformly align with the project objectives and directions of impact. The method for selection of the awardees was decided through discussion during the inception meeting between SaciWATERS and PIs. All four Universities thereafter followed the proposed methods. Selection of the potential candidates for awarding the fellowship was done based on Statement of Purpose (SOP) and oral interview. All female candidates that qualify for IWRM program were eligible to apply for the fellowship.

A common SoP template<sup>3</sup> was prepared by SaciWATERS and also shared with the PIs. SoPs prepared by the candidates in the given format were sent to the members of the selection committee well in advance of the interview. SoPs were assessed based on the given criteria, like:

- Degree of inter-disciplinarity in the proposed research idea,
- Definition of broad objective and research questions,
- The relevance of the proposed research to climate change and social elements,
- Understanding of gender and its integration in the research idea,
- Technical knowledge and leadership skills.

After assessing the SoPs, oral interviews were conducted at the Universities. The additional criteria that were used to assess the applicants during the oral interview are as follows:

- Applicant's understanding of the proposed research, Basic concepts of Integrated Water Resources Management (IWRM),
- Understanding of gender,
- Leadership capabilities,
- Commitment towards completing the program and thesis.

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<sup>3</sup>The template circulated for the applicants to submit SoP is *presented in annexure*.



While all the universities adopted the broad selection criteria of SoP and oral interview, the additional criteria on which the assessment was done differed at the four institutions. The following table shows the selection criteria that were adopted by the four universities:

**Table 1: Method and Weightage for Criteria of Selection of SAWA Fellows**

		BUET	CWR	NEC	PGIA
Entrance Examination					
Statement of purpose					
Shortlisting		<i>Whether received GATE scholarship</i>			
Selection Criteria and Weightage	Personality	10	10	10	15
	Knowledge/Aptitude	10		20	10
	Leadership quality	—	—	10	—
	SoP	30	30	30	30
	Responsiveness	20	20	20	15
	Commitment	10	—	10	20
	Work Experience	10	30	—	10
	Marks in entrance exam	10	10	—	—

While the composition of the selection committee varied across the PIs, the program coordinator and the Head of the Department and/or the Principal of the respective institution and two members from SasiWATERS were consistently a part of the committee at each PI. The score given by each panelist was ranked and then aggregated and the top three students securing the highest marks were awarded the fellowship and the next two students were placed in the waiting list.

**Photo 1: Ranking and aggregation of scores by the panel for selection of fellows**



**Photo 2 (left): Online Recruitment Meeting for the selection of awardees**  
**Photo 3 (right): Recruitment meeting at CWR, Anna University for the selection of awardees**



The program coordinator at the PIs was responsible for collecting the SoPs from the applicants, organize the interview and prepare the minutes of the interview meeting, while the project coordinator at SaciWATERs was responsible for preparing the recruitment report. All-female candidates who registered for the IWRM program were eligible to apply for the fellowship. There was no age limit as the program is flexible, especially to encourage women.

**Table 2: Eligibility criteria for admission into the Masters' program**

Institutions	Eligibility Criteria
Institute of Water and Flood Management, <i>Bangladesh University of Engineering and Technology, Dhaka, Bangladesh</i>	Bachelor's degree in Civil Engineering/ Water Resources Engineering/ Agricultural Engineering/ Urban and Regional Planning/ Environmental Science/Environmental Science and Management/ Soil, Water and Environment/ Geography and Environment/ Geology/ Disaster Management
Centre for Water Resources, <i>Anna University, Chennai, India</i>	BE / B.Tech Civil Engineering, Agricultural and Irrigation Engineering, Agricultural engineering, Geo-informatics, Energy and Environmental Engineering
<i>Nepal Engineering College, Kathmandu, Nepal</i>	Science graduates [Natural science, Pure Science and Engineering]
Post-Graduate Institute of Agriculture, <i>University of Peradeniya, Kandy, Sri Lanka</i>	Bachelor's in Agriculture, Engineering, Humanities, Medicine, Natural Sciences or any other equivalent qualification from a recognized institute of higher education acceptable to the Board of Study in Agricultural Engineering

One important aspect was that the selection was not based solely on academic talent. It was imperative that the students provided a rationale and demonstrated a clear vision of their aspirations after completing the leadership program, including a strategy for reaching that objective, an explanation of how it will contribute to their career, and an explanation of how the



grant could link their research to decisions and/or applications within the community with which they are engaging. In addition to this, the applicant's proficiency in English language was also assessed to understand their communication skill.

The common selection criteria developed during the inception meeting based on the learnings from earlier phases helped in eliminating the bias in the selection process by giving equal opportunity to all the female students including those with a lower academic score/grade obtained during the Bachelor degree compared to their peers, but having greater interest in IWRM and commitment to learning, growth, communication, and social impact in the relevant field.

**Challenges and response** - The recruitment meetings for the initial two cohorts were conducted in all PIs at the universities. However, for the 3rd cohort awardees at PGIA and NEC, recruitment was conducted through online platform during the first wave of COVID when all the academic institutions were functioning remotely. Some of the Universities faced issues of sex ratio in some batches to allow for larger number of applicants eligible for the fellowship. This brought out the importance of this program more strongly given skewed ratios in the water sector, especially engineers.

#### **B. Core courses on IWRM, gender and water as part of the Master's program**

The courses offered at the four universities were such that they laid a strong foundation on the concepts of IWRM, gender, climate change, and field research methodology; all of which have been the thrust areas of the SAWA fellowship as well. Some of the courses offered are listed below:

**Table 3: Courses offered at the Partner Institutions**

<b>Institution</b>	<b>Courses Offered</b>
Institute of Water and Flood Management, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh	<ol style="list-style-type: none"> <li>1. Water, gender and society</li> <li>2. Socio-economic analysis</li> <li>3. Interdisciplinary field research methodology in water management</li> <li>4. Integrated water resources management</li> </ol>
Centre for Water Resources, Anna University, Chennai, India	<ol style="list-style-type: none"> <li>1. Integrated water resources management</li> <li>2. Gender and Water</li> <li>3. Participatory field research methodology</li> <li>4. Legal aspects of water resources</li> <li>5. Climate change and water resources</li> <li>6. Environmental Impact Assessment for water resources</li> <li>7. Integrated river basin management</li> <li>8. Watershed conservation and management</li> </ol>



Nepal Engineering College, Kathmandu, Nepal	<ol style="list-style-type: none"> <li>1. Society and water</li> <li>2. Gender, Water and Social Inclusion</li> <li>3. Legal and policy Dimensions of Water Management</li> <li>4. Conflicts in water management</li> <li>5. Integrated water resources management</li> <li>6. Field Research methodology</li> <li>7. Climate change, livelihood and adaptation</li> </ol>
Post-Graduate Institute of Agriculture, University of Peradeniya, Peradeniya, Sri Lanka	<ol style="list-style-type: none"> <li>1. Gender in IWRM</li> <li>2. Water and Society</li> <li>3. River basin planning and management</li> <li>4. Interdisciplinary field research methodology</li> </ol>

### C. Regional training Workshop

A key feature of this program was an intensive training of two weeks duration in the application of research methods and theoretical frameworks for interdisciplinary water research. The regional training workshops aimed (a) to build the capacities of the SAWA fellows in understanding climate change and water insecurity through the application of interdisciplinary research methods that include gender and social approaches, (b) to develop leadership skills through activities such as team-building sessions, communication skills, application of negotiations and conflict resolution in the field. These workshops were planned and conducted at the end of the first semester to ensure that the students attending them already have a basic knowledge on IWRM and research methods. The workshops focused on an advanced level of training to complement their regular course structure in the respective PIs. Classroom learning during the trainings was followed by fieldwork to train the students in applying the research methods learnt during the regional workshop.

**Photo 4 (left): Lectures at Regional Workshops**

**Photo 5 (right): Group activities and presentation at Regional workshops**



The training program was designed in such a manner that students can have a hold of research methods and theoretical frameworks for interdisciplinary water research, including paradigms in interdisciplinary research, interdisciplinary framework and theories in water research, research tools and techniques for urban water research, Climate change Science and society; Methods of analysis and interpretation. It also included a strong component of conceptualization and

application of gender. The sessions were interactive in nature. Each classroom session included class room lecture using power-point, followed by discussion of about 15 minutes. Participants were encouraged to take active part during the discussions. Some sessions were even more interactive, having exercises for each individual.<sup>4</sup>

Three trainings were held once a year at the regional level for each batch of the awardees. The PIs were responsible for organizing and hosting the regional workshops in their respective institutions, while SaciWATERS was responsible for designing the workshop, identifying and inviting resource person, explore co-funding support from sources, like- UNDP Cap-Net and finally for reporting. The 1<sup>st</sup> and 2<sup>nd</sup> regional workshops were hosted by NEC in Nepal and Anna University in India respectively.

**Challenges and response:** The 3<sup>rd</sup> regional workshop could not be held online due to COVID related travel restrictions. Therefore the method of the workshop was adapted to a virtual mode keeping into consideration limitations of mobility, varied schedules of course curriculum of the different Universities, limitations of internet infrastructure and connectivity in different parts of the 4 countries, limited concentration spans on online trainings, and need for creative methods for practical training in methods and communication. Also, field method training was planned through engagements and analysis of issues in local neighborhoods of fellows. This virtual workshop was planned and designed for a virtual mode by SaciWATERS and conducted jointly with PGIA. Since virtual workshops have limitations for time and intensity in practical field training, SaciWATERS organized an additional “Research tool-shop” on specific research tools with a focus on step-by-step description of practical implementation of these tools on ground through innovative and interactive practical exercises and illustrative experience sharing by trainers.

#### D. Field work based research

- *Field practicum as part of the training program:*

In addition to classroom teaching, the training had a strong fieldwork component to ensure that the fellows could apply what they have learnt in terms of research methods. The fieldwork was directed in such a way that they apply research methods that they have learnt to answer the question on “what are the differences in access and use of water and adaptations to water scarcity and excesses within different sections of the community, grouped by gender, class, caste and ethnicity? What are the intersectionalities - that exist between these social axes with respect to water access and use?”

**Challenges and response:** Fieldwork during the virtual 3<sup>rd</sup> regional workshop was planned such that fellows could select relevant issues from their neighbourhoods and local contexts related to water and climate change and social linkages which allows for some field data collection and analysis within safe and limited mobility and engagement conditions of the pandemic. Further 3 days of intensive reporting, feedback, and analysis support sessions were held with field research expert mentors to provide constant hand-holding through the entire individual fieldwork process.

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<sup>4</sup> Workshop reports are attached as annexures



Photo 6: Field research training



- *Fieldwork based research for thesis*

The research carried out by all the SAWA fellows had an intensive component of field research attached to it. This ensured that the students applied the research methods learnt during 18 months of course work and the regional training. It also ensured that the research findings were not just restricted to analysis based on secondary data, but that a mixed methods approach using both quantitative and qualitative methods was adopted; thus making the research interdisciplinary in nature.

**Challenges and response:** Due to pandemic related lockdowns the 2<sup>nd</sup> and 3<sup>rd</sup> cohorts of some Universities could not complete fieldwork therefore delaying their thesis submissions and degree completion. This delay is registered in the progress and outputs of the project. Efforts have been made to identify field locations for multiple fellows in the same area to ease travel, time, and support in jointly doing fieldwork in the same area for their separate thesis topics. This was practiced in PGIA. Research costs provided in the project also helped fellows afford safe modes of travel to field in prevailing conditions of limited mobility and health insecurity in public transport and gatherings.

### 3.2 Objective 2

*To develop the leadership skills of the candidates through leadership building activities such as; team building workshops, communication skills training, application of negotiations and conflict resolution training in the field, mentorship by senior leaders and networking*

#### A. Leadership training via regional workshop

The sessions of the regional training workshop were designed in such a way that it enhances the leadership capacity of the fellows. It emphasized on activities like - team building and networking, working in groups, leadership quality and style, communication skills, professional and research ethics, application of leadership skills, etc. Lectures and key notes on leadership, networking and learning with senior SAWA alumni, practical and field exercises in cross-country student groups, and training in science communication all contributed towards building leadership skills.



## **B. Leadership training through field-based research**

The fieldwork component was also included in the training program to ensure that the fellow could apply their learning from the leadership training. The students engaged with community stakeholders and learned specific skills of communicating with respondents and groups picked up varied views from the community and used their mediation skills with different sections of the community to come up with a best common solution with justice and equity as guiding principles. For conducting the field study the fellows were divided into three groups where in each group had representation from every institute. The responsibility of guiding these groups was with the coordinating professors from 4 PIs, expert trainers in field engagement methods, and the program in-charge and coordinator from SaciWATERS. The research and community engagement methods involved training in –

- ways to ask questions
- appropriate ways to approach the community with a sense of respect and sincerity,
- respecting the time and work burdens of women in the household while engaging,
- seeking appointments and aligning with daily time schedules of respondents,
- importance of engaging with women respondents in a safe and trusting space as they often would not open up with the men of their household around
- Observing behavioral and cultural practices and norms in the village to ensure self conduct in such a way so as to not inconvenience the community
- Enabling dialogue, debate, and negotiation in focused group discussions

The 1<sup>st</sup> Regional Workshop had 4-days fieldwork training in a village near Kathmandu studying gender and intersections with climate change, disaster, and agriculture in a mountain ecosystem. During the 2<sup>nd</sup> Regional Training Workshop this field training was conducted in a coastal village context near Chennai, India. During the 3<sup>rd</sup> Regional Workshop the field studies were conducted by the fellows individually in their respective neighborhoods given mobility restrictions.

### **3.3 Objective 3**

*To facilitate internships to provide an authentic work environment that will link the candidate's research to actual decisions and/or applications within the community with which they are engaging*

#### **A. Facilitate Internship**

This project included a compulsory internship for duration of four weeks for the SAWA fellows. The objective was linking the participants' research to actual decisions and/or applications within the community with which they are engaging. With support from IDRC, SaciWATERS networked with few potential organisations for engaging the SAWA fellows in internships. The PIs helped in mapping and networking, with the potential institutions in each region. The output of the internship was evaluated using the criterion of interdisciplinarity. The internship should feed into the dissertation i.e. the students are expected to start doing their initial research during this period and the output of the internship i.e. a report or a publication would facilitate their research. One of the finding is that people learn best by doing, hence it was important that a well-designed leadership program not just focuses on skill development, but also gives space and exposure for experiential learning approach, which is not embedded in most of the leadership programs.

***Challenges and response:*** Due to the COVID pandemic many organizations had to halt their scheduled work and therefore access to internship positions reduced. In the wake of this change in situation, many fellows took on volunteer activities for COVID relief in their areas. They were also supported to take on personal initiative to seek out opportunities for sectoral exposure and experience. This process was aimed to enable fellows and provide them more agency for developing their own interests and sectoral networks.

### 3.4 Objective 4

*To generate interdisciplinary research theses and scientific articles on IWRM that will closely study the impact of climate change, adaptation solutions, water insecurity and resilience and help tackle these issues through gender and equity perspectives*

#### A. Curriculum Development and Guest Lectures

SaciWATERS with its research experience identified gaps in IWRM training in South Asia, such as - lack of interdisciplinarity (specifically inclusion of issues like human development, gender, ecology, climate change etc.), lack of field exposure and an entirely lecture-based pedagogy in the IWRM studies. To fill these gaps SaciWATERS introduced two courses i.e. (1) Interdisciplinary Field Research Methods (IFRM) and (2) Gender and Water in 2006-07 for the four universities in Bangladesh, India, Nepal and Sri Lanka. However, it was further identified that ensuring satisfactory interdisciplinarity in the research work has been a challenge even after incorporation of new courses which also require further upgradation incorporating emerging aspects of IWRM to the existing curriculum after a certain interval. Hence, there was a need for the involvement of experts from social science in modifying the existing course curriculum and providing handholding support to the engineering faculty and the students to ensure a greater degree of interdisciplinary element in the student's research.

- *Curriculum Development*

The process of curriculum development was done through the following steps:

First, the subject expert was identified by SaciWATERS and a meeting was held to decide on the scope of work and timeline for drafting curriculum. Second, a draft curriculum was developed by the consultants (senior professor expert in relevant fields) and then it was shared with the coordinators and the faculty members teaching the course at the four institutions and also with two external experts each from the relevant fields to get their suggestions and comments. It was then circulated at large within the institutions. A final draft was prepared based on the comments received.

***Challenges and response:*** Political instability at the University of one of the selected experts for curriculum development on Gender and Water led to delays and ultimately selection of an alternate expert for the same. While the curriculum design was completed in line with the vision of the activity, most of the PIs being government funded public Universities, formal institutional incorporation of this curriculum was challenged by the extensive and complicated official procedures for curricular revisions. Therefore during the 2<sup>nd</sup> Regional Workshop a detailed discussion was held with PI coordinators and heads to understand institutional limitations and processes for modifying existing curricula. The old curriculum was mapped to identify specific gaps in the curricula of the 4 PIs and missing/new aspects of the newly designed curriculum were incorporated under the existing broader modules titles of the old curriculum.



- *Guest Lectures*

As a follow up to the curriculum designing, it was also decided that guest lectures will be delivered by the consultants in the relevant fields. This was to provide handholding support to the four institutions for at least two years after the common course content and structure is developed and implemented. Guest lecturers will be identified for 2 days of lectures at each institute.

***Challenges and response:*** However, given the COVID related lockdown and travel restrictions it was not possible for the consultant to travel to the partner institutions for delivering the lecture. Under these circumstances, SaciWATERS organized an online training-of-trainers program for the faculty members and students spread over a month. There were a total of 10 two-hour interactive lecture sessions in this training program. SaciWATERS received co-funding support from UNDP Cap-Net as part of their newly adopted strategy for online capacity building for faculty and students in the water sector.

## **B. Interdisciplinary Research approach for thesis writing**

All SAWA fellows under the program were mandated to take research questions with an interdisciplinary lens and bringing special focus to gender implications and linkages of their research themes. This interdisciplinary research was monitored and reviewed by the SaciWATERS project team who are all experienced in interdisciplinary research. External expert consultants and mentors were also included in this review process providing detailed feedback to students on strengthening the interdisciplinary analysis and inferences of their research.

***Challenges and response:*** Fellows, coming from pure science and engineering backgrounds often struggled with social and socioecological/sociohydrological concepts and analysis. Therefore, apart from the budgeted activities of mentorship, and training workshops, the project lead team at SaciWATERS maintained regular communication with fellows beyond scheduled mentorship timelines and encouraged queries and discussions about their thesis at any and all times throughout the project period. Fellows often requested for individual meetings with the project lead team members at SaciWATERS, who are all experienced or emerging interdisciplinary researchers themselves, for clarifications, discussions, and feedbacks about their thesis topics, methods, and analysis. This open communication channel maintained with fellows allowed more rigorous sustained mentorship and provided a safe space for fellows to communicate their personal, professional, and research challenges.

## **C. Monitoring and review**

- *Monitoring meetings*

Monitoring of the SAWA fellows at each PI was done by the project in-charge and/or the project coordinator from SaciWATERS. These visits were used to monitor the research progress and academic performance of the fellows. The students were required to make a presentation on their thesis/project indicating their objectives and methods to be used for the study. Based on these presentations, comments or suggestions were given to tailor their work as per the mandate of the SAWA fellowship programme and to improve upon their methodologies adopted for the study. During these visits, one-on-one discussions between the project coordinator and the awardees were conducted wherein the students shared challenges they faced in conducting their research.



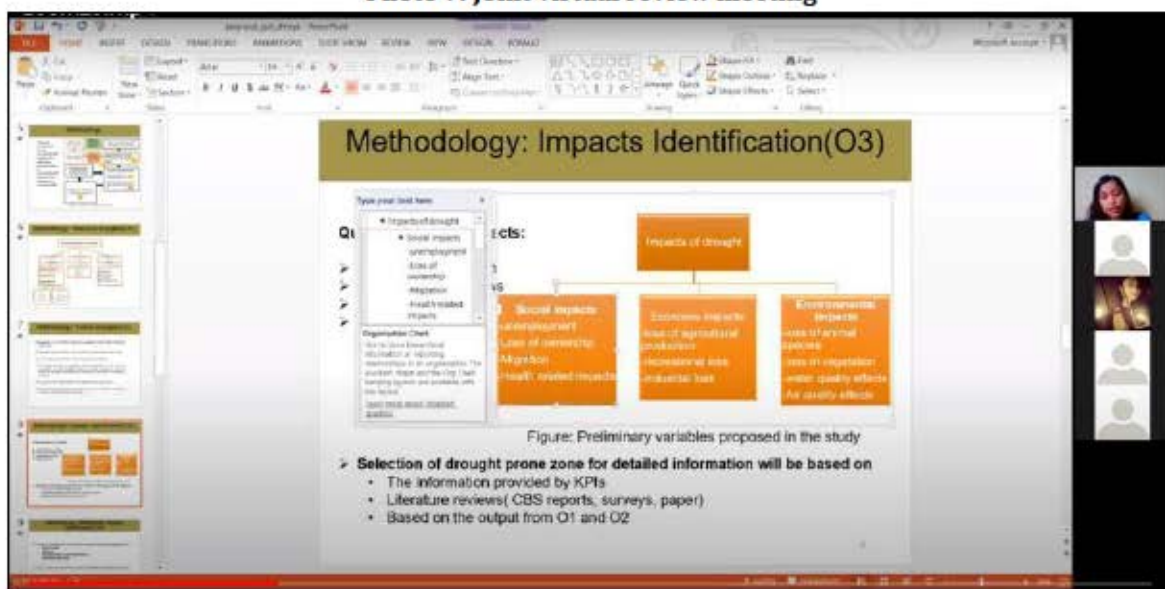
These discussions provided insight into the challenges faced by the PIs and fellows in their research and opportunities to seek alternate directions.

**Challenges and response:** Monitoring of the former cohort was carried out generally along with the recruitment of the subsequent cohort to rationalize travel time and costs. Since March 2020, SaciWATeRs conducted the meetings virtually to monitor the progress of the fellows. Another tool used for keeping a track of student's work systematically in situation of remote monitoring was a progress report. A template was prepared and circulated among the fellows in PIs to receive the regular updates on their curricular and extra-curricular progress.

- **Thesis Review meeting**

A joint review meeting was held towards the end of the program. The aim of the meeting was to provide a platform for the SAWA fellows to present their final research output and get feedback on improving it into a publishable material. It was essentially focused on to what extent their research use an interdisciplinary lens to study water and climate change issues. The fellows were asked to present their research before the meeting, and were encouraged for timely submission of their master dissertation. Such an exposure helped the fellows get feedback on their research work from invited experts. Presenting their thesis progress in front of fellows from other countries also allowed them to learn from one another since many of the fellows across the four countries had many common elements in their research enabling cross-learning. The review workshop conducted through webinars to save on travel expenses and it was also meaningful in the context of COVID.

**Photo 7: Joint virtual review meeting**



#### **D. Interdisciplinary Mentorship**

Each of the fellows was assigned a mentor based on her area of focus. Since the faculty at Partner Institutions does not have expertise in all dimensions of IWRM, there was a need to connect the fellows to experts having expertise on gender, research methodology etc. The mentor's role was to ensure that the students' theses were well aligned with the general goals of the program as well as revising the students' thesis proposals at an early stage to provide written comments and guidance on the integration of qualitative methods and gender approaches with the students' research focus.

A virtual meeting was organized between the mentor, the student and the student's thesis advisor, to take place separately for each fellow. Drafts of theses/proposals were shared with the mentor a week prior to the scheduled meeting. The involvement of the thesis advisor was found to be crucial to avoid any potential misunderstandings between the student, mentor and advisor. Therefore, SaciWATERs and the internal supervisor of the student were copied in all email exchanges between the fellows and the mentor. The students were encouraged to publish their research findings jointly with their mentors.

The faculty coordinators at the PIs were responsible for guiding the students in selecting and assigning the mentors. In the case of BUET, a research advisory committee was formed with three internal supervisors and two external experts in social sciences. One of them is a gender expert and the other is an academic who was responsible for coordinating the Crossing Boundaries project and who has been trained in interdisciplinary research. The research advisory committee supervised the students' theses on a continuous basis.

In case of NEC, the university itself arranged for the mentor. For PGIA and CWR, SaciWATERs was responsible for selection and contracts of mentors.

***Challenges and response:*** Due to a change in national policy on foreign funded projects in India in 2020 (FCRA Amendment Act), selected mentors from government funded Universities/institutions had to be discontinued and new mentors had to be assigned for CWR. The mentorship responsibility for PGIA fellows, which was earlier under SaciWATERs, had to be shifted to PGIA for the last cohort of fellows. The fellows interacted with the mentor at the beginning of their third semester.

### 3.5 Objective 5

*To facilitate inter-university collaborations and knowledge exchange and ideas throughout South Asia, thus forming a South-South learning network, including men and women, to create a broader base of water leader professionals*

#### A. Knowledge sharing via conferences

Students participated in a number of national and international conferences and presented their research work in the form of conference presentations/proceedings and poster presentations. These conferences were seen as platforms to disseminate their research results and share their ideas with a wider audience and to actively interact with researchers outside their institution.

***Challenges and responses:*** Ability to travel nationally and internationally for conferences and workshops was completely restricted since March 2020 due to the pandemic. This led to the shift of many dissemination and learning platforms to the virtual mode allowed immense ease of accessibility to many esteemed conferences and workshops for fellows of the global south without the burdens and restrictions of travel cost burdens. The project outreach cost provided registration support for some of these platforms within its budget limits.



**Photo 8: SAWA Fellows disseminating research at international conferences**



### **B. Knowledge sharing via research publications**

The grantees in the project have generated research outputs in the form of academic publications in South Asian Water Journal, other national and international peer-reviewed journals, newsletters, and symposium proceedings. Through these, the grantees have been able to reach an increasingly diverse audience. Grantees have co-authored a number of academic publications and conference proceedings with their supervisors and other SAWA fellows, thus aiding in sharing and exchange of ideas within the institution and the consortium.

### **C. Capacity building for joint publications through Write-shops and Working Paper series**

The regional workshop had a component on write-shop to hone the skill of the fellows in research writing, presentation, communication. These sessions of the regional workshop were designed to ensure that students from all four universities were teamed to share their experiences and analyses from their respective countries and joint fieldwork training. This included the field practicum wherein groups were divided in a manner that each group had representation from each institution. The assignments given to them required participation of all students. One such assignment was that students were asked to write the methods that they have employed in answering the question and elaborating on the findings and suggested solutions. Three groups, each consisting one SAWA fellow from the 4 countries communicated its research findings on the last day of the workshop, while the external experts were invited as discussants to provide suggestions on improving the research presentations for further submission for a joint publication.

**Challenges and responses:** While the regional workshops covered initial training in science communication and presentation, it could not cover assistance and training for subsequent processes involved in publication – such as following journal specific writing structures, editorial processes, and peer reviews. A Working Paper series has been initiated in last phase of the project where fellows were asked to jointly submit papers with other fellows and faculty, to a formal call for papers on a common theme of Climate Change, Water, and Society. The submitted working papers were put through 2 rounds of reviews by SaciWATERS senior researchers and invited

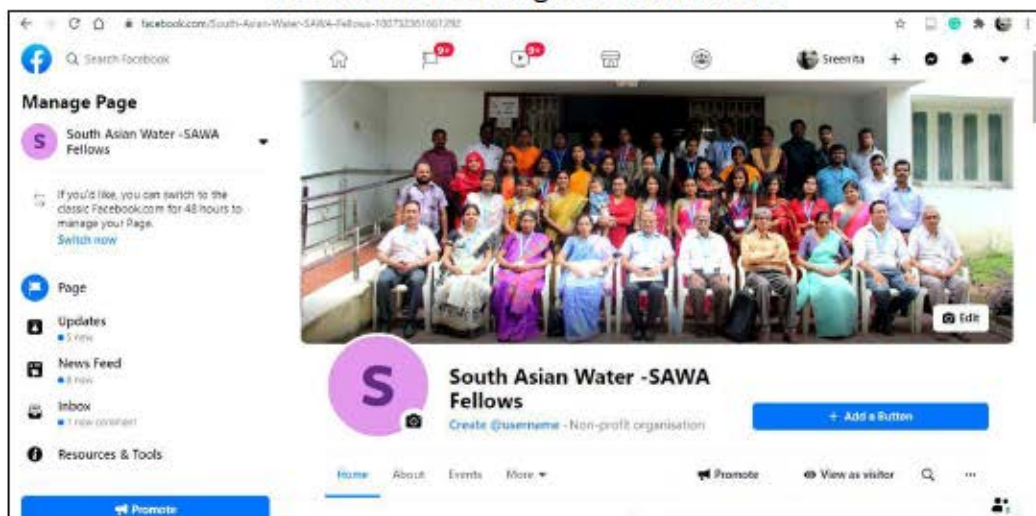


editors and revisions by fellows. This initiative has assisted not only in preparing papers for potential publications but also training for fellows in the process of scientific writing, peer reviews

#### **D. Knowledge exchange through establishment of an Alumni Network**

The program initiated an alumni network that would integrate all the awardees of the SAWA fellowship (2012-2016) as well as SAWA leadership program (2017-2021). The objective was that the alumni program would build a long-term community of peer support for participants as they take on new leadership challenges in government, business and civil society. It is also proposed to create a LinkedIn/ facebook group that would authorize SaciWATERS to track the career trajectories and progress of fellows who had completed the training. It is proposed that an online survey for the alumni will be conducted for doing a systematic impact assessment of the SAWA fellowship.

**Photo 9: Facebook Page for SAWA Fellows**



On the first day of the workshop, SaciWATERS and Anna University organized alumni meet, in order to enhance and shape the current training program based on student experiences. Most of the SAWA fellows (phase 1) have either a position in government, private or research organization or are pursuing research, and hence are in a position to make a difference in the trend of research in the future and policymaking in the respective areas. However, they also are facing challenges in their work environments in an attempt to bring about this paradigm shift in the water sector. Through this meeting, a platform was created to learn from the student's experiences of how the fellowship program has helped shaped their career and how the program can be further developed to enable the fellows to work in this sector. This meeting also provided the opportunity for the current awardees to interact with the alumni of the program and learn on the future paths that can be taken. It aided in cross-fertilization of knowledge and ideas among the current batch of students and the alumni.

#### **E. SAWA Website**

The project website was launched during the first SAWA regional workshop. Link to access the website is mentioned below <http://www.saciwaters.org/sawaleadershipprogram/>. Since then some new features have been added to the website. The website is interactive with options that enable the students and the project team to log in and post comments and initiate discussions. The website has pages for posting blogs, photo stories, field notes and research notes that have been

developed by the SAWA fellows. The website is being managed by the web manager at SaciWATERS. Login credentials will be also given to the alumni from the previous phase to enable interactions for the current awardees with their seniors. The features of the webpage were designed (1) to create an opportunity for extensive networking and exchange of ideas amongst all the SAWA fellows; (2) to publicise the student's work to a larger audience.

#### **F. SAWAS Journal and Research Publication**

The SAWAS Journal (South Asia Water Journal) is a reviewed publishing platform that was initiated to promote scientific writing and publications of fellows alongside contributions from an international network of water and climate change experts. All the published volumes of SAWAS journal are available online at <http://saciwaters.org/sawasj.php>. The last issue (volume 8 issue 1) of SAWAS journal was published online in 2018. SaciWATERS also published an advertisement on call for paper for the volume 9 issue 1 on the theme 'Groundwater use and Governance in South Asia'.



***Challenges and response:*** The editorial process for the journal was considered too intensive for an unbudgeted component. Also the journal had not applied for an ISSN number since in the early periods of the journal this was not a mandate. But in recent years as ISSN requirements have become a norm; SaciWATERS attempted to gain an ISSN number for this journal but could not complete the process as it was not fulfilling certain technical criteria. Given these technical difficulties, the board members of SaciWATERS decided to not to continue with the SAWAS journal. However, it was also decided that SaciWATERS will help the SAWA fellows to write articles for other national and international journals. SaciWATERS therefore initiated the double reviewed Working Paper series for the fellows to prepare quality interdisciplinary papers and training in scientific writing. SaciWATERS further identified WH2O journal, a peer-reviewed journal in the area of gender and water, which has shown interest for the research articles by the SAWA Fellows.



# CHAPTER 4: PROJECT PROGRESS

## Outputs and Milestones

While Chapter 3 has covered many aspects of progress and outputs in its elaboration of evolving methodologies of the project, this chapter will systematically focus on the milestones, outputs, and broader outcomes achieved by the project.

### 4.1 OBJECTIVE 1

*To train the fellows in IWRM and in the application of research methods that include gender and social approaches in primary field contexts with the goal to implement more gender-sensitive strategies to adapt to climate change and water insecurity*

#### A. Fellowships and Completion of Research Thesis/Degree

36 fellowship awardees across 3 batches of women students from the four PIs were proposed for the project. A total of 36 fellows (40 including 4 additional fellows<sup>5</sup> at CWR) have been recruited and awarded SAWA fellowships in the project. Due to the COVID pandemic, PI Universities faced changes and delays in the regular scheduled timelines of their academic semesters and consequently SAWA recruitment timelines. The schedule of recruitment of SAWA fellows for the 4 PIs is given in Figure 2 below.

Figure 2: Timeline of awarding Fellowship

Institutions	2017	2018				2019				2020				2021		
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
CWR																
BUET																
NEC																
PGIA																

Cohort		1st Cohort		2nd Cohort		3rd Cohort		4th Cohort
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Due to these unforeseen changes and delays in the PI's academic calendars, fellows are currently at different stages of their fellowships and progress towards their degree completions. All the fellows of 3 cohorts have submitted their research theses and completed their degrees. One cohort of fellows at BUET has completed their degrees satisfactorily. The second and third cohorts are scheduled to submit and complete their degrees by December 2021. Having faced significant semester and admission delays due to the pandemic lockdowns, NEC and PGIA had delayed recruitments of their 3<sup>rd</sup> batch of SAWA fellows who are currently completing their coursework and

<sup>5</sup> Due to budgetary modifications after the significant changes in methods, for adapting to the COVID pandemic conditions, an additional 7 fellows (4 from CWR and 3 from PGIA) was approved, bringing proposed SAWA fellows to a total of 43. 3 additional fellows from CWR were selected in June 2021 and are currently in their first semester of the fellowship.



initiating their master's research work. Dissertation fieldwork was significantly delayed for these two PIs. Fieldwork for the 2<sup>nd</sup> cohort of fellows is ongoing or recently completed. Since different universities have differing norms around maximum number of years that students are permitted to extend their degree/research dissertation. PGIA permits their students upto 5 years. However SAWA fellows at PGIA have a higher rate of timely degree completions compared to non-SAWA students. During the inception meeting it was decided to retain 4 months of fellowships until thesis submission to incentivize timely degree completions. However given the livelihood and health crises faced in the region and by many of the fellows under the COVID pandemic, this measure was not implemented. The joint review workshop recently held for all the fellows who are yet to submit, all of the fellows showed significant progress in research and conceptual/methodological development which indicates positively towards expected completions over the coming few months.

**Table 4: Institution wise progress status of the fellows**

<b>Progress status</b>	<b>BUET</b>	<b>CWR</b>	<b>NEC</b>	<b>PGIA</b>
Degree Completed	3	9	3	2
Thesis Defense completed (Pending final submission)	2	0	0	0
Writing Dissertation/Thesis (Fieldwork Completed)	1	0	1	1
Conducting fieldwork along with writing dissertation	3	4	2	3
Course Work ongoing	0	0	3	3
Yet to be awarded the fellowship	0	0	0	3
<b>Total Number of Fellows</b>	<b>9</b>	<b>13</b>	<b>9</b>	<b>12</b>

No dropouts have been reported among the SAWA fellows over the project period. However some fellows have reported delays in degrees and thesis submissions because of personal constraints that often reflect the gendered challenges faced in higher by women due to traditional gender relations around marriage, maternity, child care, and relocation for their spouses/partners. Additional support has been provided to fellows facing these constraints with certain timeline flexibility, additional meetings and support for research mentorship, child care support at trainings, and encouragement to progress and submit through joint review meetings to keep them connected and motivated in their ongoing research work.

#### **B. Regional Training Workshops and Field practicum during workshops**

Three annual Regional Training Workshops were successfully conducted over the project period. Firstly, the training workshops covered three lecture based thematic components – leadership, interdisciplinarity and gender in water and climate change research, and research methods training in quantitative methods, qualitative methods, and field research methods. Secondly, the workshop incorporated 3-days of intensive field research and data collection, followed by 2 days of training in data analysis and tools. Finally, the workshop included a write-shop covering training in scientific writing and general science communication, and a joint research presentation.

- *1<sup>st</sup> Regional Workshop*

The 1<sup>st</sup> Regional training Workshop on leadership and research methods was conducted in Kathmandu, Nepal between Aug 24<sup>th</sup> and Sep 5<sup>th</sup> 2018 – organized by SaciWATERS and NEC for the first batch of awarded fellows. It was co-funded by the UNDP CapNet network. Expert resource persons were invited from International Centre for Integrated Mountain Development (ICIMOD, Nepal); SaciWATERS; Management Development Institute, Gurgaon; School of Oriental and African Studies (SOAS), University of London; and Institute for Social and Environmental Transition (ISET – Nepal). The core lecture based training sessions of the workshop were:

- Leadership
- Climate Change and Leadership
- The role of science and leadership in addressing mountain challenges
- Understanding ‘interdisciplinarity’
- Doing ‘interdisciplinarity’
- Climate Change vulnerability, assessment, and adaptation
- Gender and Water: methods and linkages
- Qualitative and Quantitative research methods

In addition, lessons were drawn from experiences shared by the PI coordinators from past collaborations on earlier phases of the SAWA fellowship.

The 3-day fieldwork was conducted at Bhotechaur village of Sindupal chowk district in Nepal. The students were divided into three groups and by design each group consisted of four people, one each from the 4 institutions. This division of groups ensured that there is at least one person with knowledge of local language to conduct interviews. The three groups worked on the following three themes, which are:

- Gender roles in accessing and managing common property resources;
- Role of women in agriculture as a result of male-selective outmigration and;
- Gender and Climate change perceptions

The students prepared the research questions and designed a strategy to address these. Students prepared broad guiding questions to conduct Key Person Interviews (KPIs) and house listing questionnaire based on which they administered the detailed household survey. . Under the quantitative methods, students were trained in questionnaire designing and conducted house-listing surveys, detailed questionnaire surveys and time use surveys. Students conducted in-depth interviews and detailed questionnaire surveys. Under the qualitative research methods, students conducted in-depth interviews and methods to understand life histories from older men and women in the village. Students also made visual observations and documented it through photographs and captions.

- *2<sup>nd</sup> Regional Workshop*

The 2<sup>nd</sup> Regional training workshop was conducted in Chennai, India – jointly organized by SaciWATERS and CWR – between 26<sup>th</sup> Aug and 7<sup>th</sup> Sep 2019, for the 2<sup>nd</sup> batch of SAWA fellows. The same workshop structure was followed as the 1<sup>st</sup> Regional training workshop. Expert resource persons were invited from Indian Institute of Sciences (Bangalore, India); SaciWATERS; Management Development Institute, Gurgaon; School of Oriental and African Studies (SOAS), University of London; Madras School of Economics; Vishva Bharati central University (West Bengal, India); India Meteorological Department, Chennai; Central Marine Fisheries Research Institute



(ICAR- Govt.of India); and Centre for Biodiversity Policy and Law - National Biodiversity Authority.

The core lecture based training sessions of the workshop were:

- Introduction to Coastal Challenges (Climate change and adaptation)
- Climate change: concepts, impacts and emerging food security concerns
- Climate change vulnerability assessment and adaptation
- Urban and Periurban Water
- Understanding 'interdisciplinarity'
- Doing 'interdisciplinarity'
- Gender and Water: methods and linkages
- Qualitative and Quantitative research methods

The field research training was conducted in a coastal village Kovalam (Covelong), Chennai for three days. The students picked varied views from the community (fisherman, Salt pan workers, restaurant and hotel owners) to understand the quality and accessibility of the groundwater, the impact of climate change as well as environmental changes and its impact on livelihoods that occurred over time and used their mediation skills with different sections of the community to come up with the best common solution and adaptation strategies with justice and equity as guiding principles. The students were divided into three groups and by design each group consisted of four/five people, one each from the 4 institutions. This division of groups ensured that there is at least one person with knowledge of local language to conduct interviews. The three groups worked on the following three themes, which are:

- The intersection between gender and water within diverse livelihood practices
- The social, economic and environmental vulnerability due to natural and human-induced disasters
- The impact of anthropogenic factors on water resources and to assess the gendered impact of degradation of water resources

The field research training included training in questionnaire design, varied qualitative and quantitative field methods such as household surveys, indepth interviews, gender narratives, timeline surveys, social mapping, mental maps, KPIs, and Focussed group discussions (FGDs). This field research was followed by training in data analysis methods and tools, scientific writing, and presentation techniques.

- *3<sup>rd</sup> Regional Workshop*

Due to the COVID pandemic, the 3<sup>rd</sup> Regional training workshop was conducted virtually by SasiWATERS and PGIA, over 8 days in December 2020, for the 3<sup>rd</sup> batch of fellows. Expert resource persons were invited from Management Development Institute, Gurgaon; School of Oriental and African Studies (SOAS), University of London; Vishva Bharati central University (West Bengal, India); V.V Giri National Labour Institute (Noida, India); GenUrb network; The Third Pole (thethirdpole.net international environmental media platform); Indian School of Business (Hyderabad); and the Ashoka Trust For Research In Ecology And The Environment (ATREE – Bangalore, India).

The workshop design was modified to suit the conditions and requirements of a virtual workshop. Additionally the fellows had to attend the workshop alongside their other curricular commitments and semester course work, timelines for which varied across the universities due to the different



institutional responses to the pandemic. Under these circumstances the workshop focussed on the following modified training sessions:

**Online Lectures:** 2.5 hrs lectures per day by experts was planned after normal University coursework schedule of students. Each lecture was complemented by small practical exercises, interactive sessions and breakout room discussions. The practical exercises provided were aligned with the fellows' fieldwork training so that the lectures could feed into the practical fieldwork training. Lectures were more focused on research methods training and interdisciplinarity.

**Fieldwork:** All students selected one water related issue in their near vicinity, from an area of their choice and convenience for travel and interaction. This could be their neighbourhood, their own residential complex, a slum nearby, a park/water body in the near vicinity etc. The field research was designed to incorporate a few qualitative KPIs and indepth interviews, a few questionnaires based quantitative data collection, photographs, field diaries, resource mapping etc. Students were encouraged to use GIS mapping techniques, secondary data, and some policy document assessment to add to their analysis considering limited options for physical stakeholder interactions.

**Poster presentations and feedback:** 2 hour sessions were planned on all 3 fieldwork days for students to present and receive training support for the ongoing data collection processes and emerging analyses. Instead of the group presentations made in earlier workshops, fellows here presented the 5 day research as individual poster form with feedback from invited expert resource person discussant.

- *Research tool-shop*

Since virtual workshops had limitations with regard to intensity and scope of training, particularly in practical implementation of research methods, SaciWATERs organized a Research tool-shop (co-funded by the UNDP CapNet network) in September-October 2021 to supplement and strengthen the 3<sup>rd</sup> Regional Workshop with practical training of specific research tools. During the 3<sup>rd</sup> Regional workshop fellows were asked through a poll about what methods they wanted to learn more indepth. This revealed the need for more hands-on training in everyday research methods and science communication.

The tool-shop was divided into 3 modules – Qualitative tools, Quantitative tools, and Science Communication. The virtual mode of lectures allowed for a wider reach across SAWA fellows of the 3 batches as well as non-SAWA fellows from the PIs. The aim of this workshop was to provide more in-depth supervised training in the practical use of some essential research tools - its uses, benefits and challenges, dos and don'ts, and stepwise implementation. The lectures and practical sessions covered the following research tools:

1. Qualitative research tools

- Doing Indepth interviews and FGDs
- Qualitative data coding and introduction to qualitative analysis software
- Translation, Transcription, and Qualitative data management

2. Quantitative research tools

- Using GIS for interdisciplinary mapping

- SPSS – I
- SPSS – II

### 3. Science Communication

- Methods for Reviewing, Citing, and Managing Literature and References
- Communicating Science to local Communities and Policy makers
- Popular Science Communication

### C. Curriculum Development and Training of Trainers

Two common curriculums were designed by Dr. Vishal Narain with inputs from experts from the four PIs, SaciWATERs and external peer reviewers on:

- Gender and Water
- Interdisciplinary Field Research Methods

While these broad courses were already a part of the curricula at the four PIs, the activity was intended for building a more common curriculum structure and content across all PIs. A half day session on Day 4 of the 2<sup>nd</sup> Regional Workshop was conducted for a joint meeting including PI coordinators and administrative heads to map out their existing curriculum on these themes and identify the new/missing elements in alignment with the new curriculum. The faculty members voiced the challenges and complex intricate procedures of institutionalizing new curricula. It was thus found that significant common improvements in the old curriculum could be made through inclusion of innovative elements in the new designed curriculum without completely altering the overall module structures and titles. This allowed for easing the process of curriculum improvements without significant procedural delays.

Communication and feedback from the PI Universities brought out that while there were no new courses added or formal curriculum changes, there were several improvements and value additions to the teaching of courses on gender and field research methods in the existing curriculum. Since course additions and formal curriculum changes require long drawn institutional procedures with academic councils and boards at the Universities, such formal changes would take a long time.

*Field research methodology and Gender water and social inclusion courses have been modified while delivering the lectures. The specific resource persons of each course are well aware about the changes and are delivering them in the similar pattern as far as possible. However, these courses need to be approved by the subject committee of the University for the full and official implementation. – Coordinator, NEC*

Further, to strengthen the implementation of these newly designed curricula, an intensive month-long Training of Trainers (ToT) was conducted virtually in October 2020 for several faculty members of the four PI Universities. There were a total of 10 2-hours long lecture sessions held and on the two topics covered each week. Each Tuesday's lecture session was taken up on the topic, 'Interdisciplinary Field Research Methodology' and each Thursday's topic was 'Gender and Water'. Modules covered by the training were:

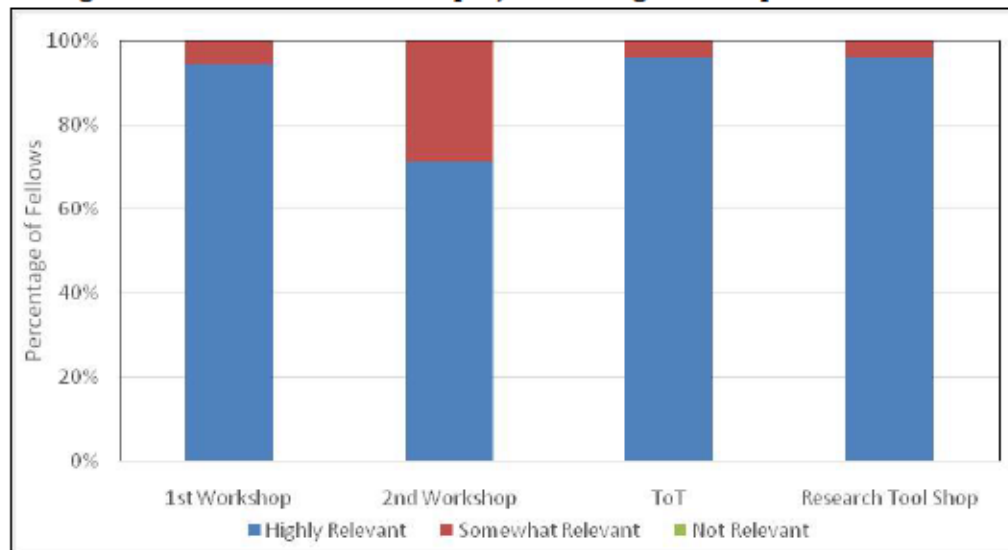
- Thinking about water in an inter-disciplinary way: some approaches and frameworks
- Paradigms in social science research

- Qualitative Research: ethnography, semi-structured interviews, key informant meetings and Focus Group Discussions
- Collecting and analysing qualitative data: case study and grounded theory
- Appreciative inquiry and Participatory Rural Appraisal
- Conceptual groundwork for the analysis of gender-water relationships
- Rationale for a gendered analysis of water
- Approaches to engendering the water sector: a review of the experience
- Ecofeminism and feminist environmentalism; feminist political ecology
- Bringing a gender perspective to our research

A feedback poll on the activity showed that the course was not only relevant for the students who are willing to apply the learnings to their research but also for the trainers who gained the knowledge and are willing to share it further. It would also help the relevant trainers to teach these new curricula for their IWRM students at the PI Universities for more sustained impact of the curriculum development.

*We already offer courses like Water, Gender and Society; Interdisciplinary Field Research Methodology; and Integrated Water Resources Management in our postgraduate academic program on Water Resources Development. The faculties who teach these courses were associated with the project and attended the 2020 training of trainers. They also supervised the students' theses and attended monitoring meetings for the students regularly. Thus, the learnings from the project through training and students theses got translated in their classroom teaching. Particularly, the Gender and PRA (Participatory Research Analysis) parts in the courses were improved because of the project. – Coordinator, BUET*

**Figure 3: Perceived relevance of project training workshops for their work<sup>6</sup>**



<sup>6</sup> The 2<sup>nd</sup> Regional Workshop also included non-SAWA fellows from CWR for workshop lectures and training but not fieldwork and therefore responses are restricted to responses based on the lectures.

The Research Tool shop was also opened to non-SAWA fellows from the four PI Universities, benefitting from the virtual mode of training.

The 3<sup>rd</sup> Regional workshop was not considered independently, and taken jointly with the Research tool-shop due to the virtual less-intensive mode of the workshop.



*Since two new courses were introduced during CB (Crossing Boundaries 2005-2011) project, PGIA did not introduce new courses during IDRC-SAWA project period. However, the project activities helped us to improve the teaching content of courses such as Interdisciplinary Field Research Methodology (IFRM) and Gender in IWRM, River Basin Planning and Management etc. The 2020 SAWA training programme and the way students conducted field work were very helpful for us to formulate the field research component of the IFRM course in 2020 and 2021. – Coordinator, PGIA*

## **4.2 Objective 2**

*To develop the leadership skills of the candidates through leadership building activities such as; team building workshops, communication skills training, application of negotiations and conflict resolution training in the field, mentorship by senior leaders and networking*

### **A. Leadership training through Regional Workshops**

The Regional Workshops conducted all approached leadership development through various methods.

- The 1<sup>st</sup> Regional workshop introduced lectures on concepts and varied aspects of leadership, as well as the importance and role of leadership in climate change.
- The 2<sup>nd</sup> Regional Workshop held interactive sessions designed for engagements on leadership. Success stories of past SAWA fellows and their growth over the years, was shared by PI coordinators. An experience sharing session was conducted with 8 alumni SAWA fellows who are currently established water professionals in sectors ranging from government departments of groundwater, water conservation, Water Resource Development and PWD, to academic professionals. This experiential engagement of past SAWA fellows with new fellows provided inspiration to fellows as well as first-hand experience of development of women water professionals and leaders through the SAWA fellowship.
- The 3<sup>rd</sup> Regional Workshop contributed to leadership development through two new training elements. Firstly, training in scientific writing was broadened in scope beyond scientific writing to also include popular science writing with an expert resource person from the international media sector focussing on environmental issues. Secondly, a session titled "Space and Opportunities for Leadership and Change in the Water Sector" exposed the fellows to varied sectors including and beyond academia and research in the water sector where the fellows could eventually contribute as leaders in different ways.

Further the fieldwork components of the workshops were designed for team building, cross-cultural engagements and communications, and negotiating conflicts and cooperation with varied local stakeholders in the villages as well as among the fellows from different countries. The field training and research was conducted such that fellows from different PIs were brought together in groups wherein each group had one SAWA fellow from each PI and each group jointly worked in a team on a single research problem on the field using different research methods. They also analyzed and presented their work jointly. These joint group research activities conducted in challenging and new field contexts for the fellows built healthy peer networks among the fellows from different countries. Within these groups the multi-country teams managed among themselves delegation of responsibilities, intellectual collaboration and exchange, field logistics, differences and

conflicts, and support for dialogues and negotiations with and among varied stakeholders from the local community.

**Photo 10 (left): Joint fieldwork activities**

**Photo 11 (right): Joint research analysis and communication building student peer-networks**



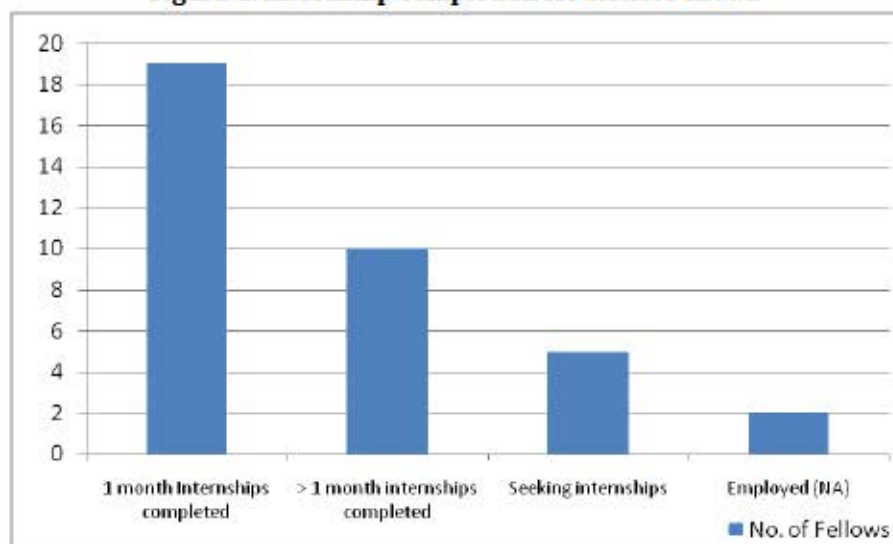
### 4.3 Objective 3

*To facilitate internships to provide an authentic work environment that will link the candidate's research to actual decisions and/or applications within the community with which they are engaging*

#### A. Internships for SAWA Fellows

29 out of 36 fellows completed internships of periods ranging from 1 month to 6 months. 2 of the fellows were employed and therefore not permitted to apply for internships outside. 5 fellows are still in early periods of their semester work and will be seeking internships in the upcoming months. Internships were conducted in major national and international development sector organizations across South Asia. Through their internships the fellows worked on various water and climate change related issues.

**Figure 4: Internship completion for SAWA Fellows**





**Table 5: Internship organizations and Themes/issues covered under internship experience**

<b>Internship organizations</b>	<ul style="list-style-type: none"> <li>- ICLEI South Asia, New Delhi, India</li> <li>- SaciWATERs, Hyderabad, India</li> <li>- Integrated Research and Action for Development (IRADe), New Delhi, India</li> <li>- The Small Earth Nepal</li> <li>- International Water Management Institute (IWMI), Nepal</li> <li>- Bangladesh Centre for Advanced Studies (BCAS)</li> <li>- United Nations Development Program (UNDP)</li> <li>- BRAC (Urban Development Program)</li> <li>- Cap-net (Global Water Partnership)</li> <li>- Global Water Partnership Organization</li> <li>- Tamil Nadu Consumer Protection and Environmental Research Centre</li> <li>- International Water Management Institute (IWMI), Colombo</li> <li>- TROSA, Oxfam</li> <li>- Interdisciplinary Research Institute for Sustainability (IRIS), Kathmandu</li> <li>- Health Environment and Climate Action Foundation (HECAF 360)</li> </ul>
<b>Themes and issues worked on for internships</b>	<ul style="list-style-type: none"> <li>- Nature Based solutions</li> <li>- Gender and Agriculture policies</li> <li>- Urban vulnerability heat stress and gender</li> <li>- Implementation proposal development</li> <li>- Climate Change Impacts and gender perspective on Water Sufficiency</li> <li>- Water security mapping</li> <li>- Women empowerment through Water Management Programs</li> <li>- Arsenic Mitigation Policies, Institutional Mapping for Water Quality</li> <li>- Epidemiology of Arsenicosis and Arsenic mitigation technologies and practice</li> <li>- History of water quality issues</li> <li>- Municipality Masterplan Studies</li> <li>- Monitoring, Evaluation and Learning Planning of IWRM related capacity building and development interventions</li> <li>- IWRM-Tool box</li> <li>- Framework for loss and damage for climate hazards</li> <li>- Universal Salt Iodization</li> <li>- Green Infrastructure in Drought Prone Areas</li> <li>- Crop production and water use</li> <li>- e-flows assessments</li> </ul>

#### 4.4 Objective 4

*To generate interdisciplinary research theses and scientific articles on IWRM that will closely study the impact of climate change, adaptation solutions, water insecurity and resilience and help tackle these issues through gender and equity perspectives*

##### A. Research Thesis

Earlier Table 4 showed that a majority of the awarded fellows are at various levels of progress on their master's research theses. 18 fellows have completed their interdisciplinary research theses and 16 fellows are in process of field work and thesis writing. All the fellows are working on interdisciplinary water and climate change related thesis topics that are listed in Table 6. Gender



focus in the research varied across theses. 8 of the fellows had core focus on gender water linkages which is reflected even in the title of the theses. All other fellows, including those currently working on their theses had gender as an intersectional aspect producing gender aggregated data and results along with other axes of inequality and vulnerability. 16 of the theses focused on climate change as a core theme of research while the remaining studied climate change as intersectional and an aggregator of water security related issues and associated social vulnerabilities. 6 fellows are still in coursework components of their degrees due to the extension/delay in semesters at NEC and PGIA.

**Table 6: Interdisciplinary master's research theses themes of awarded fellows**

University (PI)	Topics of Theses <sup>7</sup>
<b>CWR</b>	<p><b>Batch 1:</b></p> <ul style="list-style-type: none"> <li>• Impact of Climate Variation on Ecosystem Services</li> <li>• Impact of anthropogenic activities on growing mismatch between extraction and recharge of groundwater</li> <li>• Impacts of heat stress on water and on livelihood of people with special focus on women</li> </ul> <p><b>Batch 2:</b></p> <ul style="list-style-type: none"> <li>• Stakeholder impact of Surface and ground water quality in river basin</li> <li>• Aquifer vulnerability assessment and its socio-economic impact in limestone mining region</li> <li>• Impact of Anthropogenic Activities on the livelihood of the community with gendered lens in river basin</li> </ul> <p><b>Batch 3:</b></p> <ul style="list-style-type: none"> <li>• Impact, risk and future scope in Socio-Hydrology of climate characteristics on groundwater vulnerability</li> <li>• Climate Smart Agriculture through sustainable irrigation management and conservation tillage practices</li> <li>• A critical appraisal of Irrigation water policies and irrigation water rights</li> </ul>
<b>PGIA</b>	<p><b>Batch 1:</b></p> <ul style="list-style-type: none"> <li>• Effectiveness of Climate Change Adaptation Strategies in Dry Zone Farming Systems</li> <li>• Status of ecological components, their functions and the efficiency of rehabilitation activities in Tank cascade systems</li> <li>• Index based sustainability assessment of Cascade System</li> </ul> <p><b>Batch 2:</b></p> <ul style="list-style-type: none"> <li>• Drought management of a cascade system in the dry zone of Sri Lanka</li> <li>• Vulnerability of Crop Farmers to Agricultural Risk Induced by Climate Variability and Exploration of Adaptive Strategies</li> <li>• Investigation of the relationship between flood and drought in terms of ecosystem services</li> </ul> <p><b>Batch 3: (ongoing coursework and thesis topics to be finalized)</b></p>
<b>NEC</b>	<p><b>Batch 1:</b></p> <ul style="list-style-type: none"> <li>• Dam Breach Analysis and Impact Assessment of Hydropower Project</li> <li>• Causes and Consequence of Damaging Flood Incidences in Rapidly Urbanizing Urban Sprawl</li> <li>• Assessment of Climate Change Impacts and gender perspective on Water Sufficiency</li> </ul> <p><b>Batch 2:</b></p> <ul style="list-style-type: none"> <li>• Drought Characteristics, Impacts and Responses</li> <li>• Drought assessment using soil moisture indicator</li> </ul>

<sup>7</sup> Detailed theses topics are in the Annexure

	<ul style="list-style-type: none"> <li>• Efficacy and participation of local stakeholders of the early warning system of river basin</li> </ul> <p>Batch 3: (ongoing coursework and thesis topics to be finalized)</p>
<b>BUET</b>	<p><b>Batch 1:</b></p> <ul style="list-style-type: none"> <li>• Water Poverty for Different Livelihood Groups in Peri-urban areas in a Changing Environment</li> <li>• Lowering of groundwater level and its impact on livelihood</li> <li>• Gender inclusive water security in peri-urban areas in the context of climate change</li> </ul> <p><b>Batch 2:</b></p> <ul style="list-style-type: none"> <li>• Development of a water pricing model for urban domestic water uses</li> <li>• Assessment of vulnerability to water scarcity through gender lens in the context of informal settlements</li> <li>• Urban flooding and its impact on gender in urban slum</li> </ul> <p><b>Batch 3:</b></p> <ul style="list-style-type: none"> <li>• Household level tipping points for flood induced damages</li> <li>• Migration Decisions, Destinations and Impacted Gender Relationship in river chars</li> <li>• Vulnerability of women due to flood</li> </ul>

## B. Monitoring and review

Every batch of fellows underwent a progress and research monitoring meeting. The monitoring schedule for the four PIs is given in Figure 5 below. The monitoring was conducted by the project lead and coordinator(s)/senior fellows at SaciWATERs. Intensive feedback on research methodology, limitations and means of adapting to these challenges were provided for the fellows.

For the last year of the project, since physical visits could not be made, a half day joint thesis review meeting was conducted online on 22<sup>nd</sup> September 2021. Dr. Poulomi Banerjee and Dr. Sreenita Mondal were invited for expert mentorship and review in addition to the project lead. All fellows who had not yet submitted their theses from all 4 PIs were invited to present their ongoing research work on a single platform. 13 fellows from across all PIs presented their ongoing thesis work. This review meeting brought out many common themes, methods, and challenges faced by fellows across the 4 countries and significant cross-learning among the fellows was enabled on similar themes and methods.

**Figure 5: Timeline of monitoring of the fellows**

Institutions	2018				2019				2020				2021			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
CWR																
BUET																
NEC																
PGIA																

<b>Cohorts</b>		1st Cohort		2nd Cohort		3rd Cohort
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### C. Interdisciplinary Mentorship

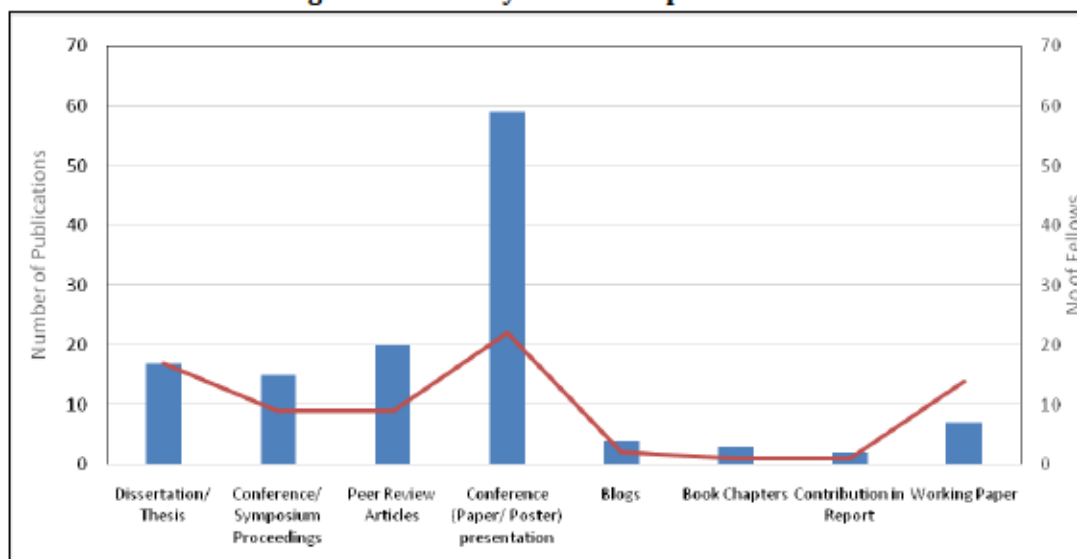
While all the theses (completed and ongoing) have used significant focus on interdisciplinary research methods and have incorporated interdisciplinary research questions, the physical and technical aspects of the research tend to be stronger than the social linkages. This component has required significant hand-holding and mentorship. In many cases social aspects are seen as an outlier or marginal to the physical problem. The practice of true interdisciplinarity is thus seen to be complex and gradual requiring a learning curve and significant mentoring support.

3 rounds of mentorship and written or meeting-based feedback sessions were provided to each fellow by an external expert mentor. The mentorship arrangement at BUET is in the form of an advisory council. It comprised of internal supervisors and a gender expert Dr Rokeya from UNDP and Prof. Hamidul Huq, WUR Professor and Director Institute of Development Studies and Sustainability (IDSS). The advisory council met regularly to advise the students on their research and to assess their progress. The mentorship arrangement at NEC has started from February 2019 with Dr Ashutosh Shukla and Dr. Aditya Bastola. SaciWATERs was responsible to follow up with both BUET and NEC on the progress of mentorship. In the case of PGIA, and CWR the students was mentored by Prof. Vishal Narain (Management Development Institute, Gurgaon), Dr.Tanusree Paul (Viswa Bharati central University, Shantiniketan, WB), and Dr Poulomi Banerjee (Senior consultant, SaciWATERs).

### D. Scientific Publications

Scientific publications of different types were a major output for the interdisciplinary master's research that the fellows conducted. Science communication was an important part of the fellows' training in leadership, interdisciplinary research, and science communication. Fellows published scientific articles in peer reviewed journals, online blogs, papers and posters for national and international conference presentations, and working papers initiated in the project. Figure 6 below presents the publication related outputs of the fellows over the project period.

Figure 6: Summary of research publications



Overall the fellows have submitted 17 theses/dissertations, published 18 peer reviewed articles, 15 conference proceeding papers, 58 conference presentations, 4 blogs, 3 book chapters, 2 report

contributions, and 7 working papers. Peer reviewed articles were published in international journals including Advanced Journal of Social Science, Landscape Architecture and Regional Planning, City and Environment Interactions, Earth Systems and Environment (ESEV), Regional Environmental Change, Tropical Agricultural Research, WASH Journal etc. The shift to virtual mode of operation for many international conferences also provided a greater opportunity for fellows to present on international platforms.

The project also initiated a Working Paper series for SAWA fellows on the theme of 'Climate Change, Water, and Society' in March 2021. The intent of the initiative was to promote scientific writing while being capacitated in doing the same in a safe environment within the project where fellows received 2 rounds of reviews for each paper based on which they provided revisions. Fellows were encouraged to write jointly with other fellows and at least one senior researcher/faculty/supervisor. 7 Working Papers were submitted to the series. In addition to these publications and scientific research dissemination, fellows also prepared papers based on the field research they conducted during the three Regional Training Workshops. These papers were presented by cross-country team of fellows at international conferences, published in conference proceedings, and some are under preparation for scientific publications.

For the dissemination of the project SaciWATERs also published a project profile paper in the international journal *wh2O: The Journal of Gender and Water*<sup>8</sup>. SaciWATERs also coordinated and presented on a panel on adaptive leadership at the Adaptation Futures Conference 2021. The project profile and a case study on the project was prepared for Women for Water Partnership as a part of a research study on women inclusive governance in water. The project consortium is also currently in the process of preparing a publication on the lessons on leadership from the project in the coming quarter. Before the closure of the SAWAS journal in the project period, one issue of the journal was published - volume 8 issue 1 of the SAWAS journal<sup>9</sup> as a special issue that focused on the theme 'Water Governance in South Asia', guest edited by Prof. Dik Roth and Prof. Jeroen Warner of the Wageningen University.

#### 4.5 Objective 5

*To facilitate inter-university collaborations and knowledge exchange and ideas throughout South Asia, thus forming a South-South learning network, including men and women, to create a broader base of water leader professionals*

Inter-University collaborations were promoted through the joint field work and research in Regional training workshops, collaborative papers written and presented based on this research, and joint Working Papers. Further conferences and workshops organized PIs in the project provided special support to encourage fellows from other PIs to participate and gain from the initiatives of the organiser PI.

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<sup>8</sup> Mondal, S., Bal Bhargava, M., & Robertson, M. (2021). Women Water Leaders in the Making: South Asian Water Leadership Programme on Climate Change. *wh2O: The Journal of Gender and Water*, 8(1), 15. Open access on <https://repository.upenn.edu/cgi/viewcontent.cgi?article=1077&context=wh2ojournal>

<sup>9</sup> [http://saciwaters.org/sawasjournal/Full%20-%20SAWAS%208\(1\),%202018.pdf](http://saciwaters.org/sawasjournal/Full%20-%20SAWAS%208(1),%202018.pdf)



# CHAPTER 5: LEADERSHIP AND DEVELOPMENT OUTCOMES

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Having discussed the key outputs of the project, this chapter will look at some of the larger outcomes, impacts, and limitations faced in various objectives and initiatives of the project.

## 5.1 Leadership

In this project women water and climate change leadership building is based on the axioms that:

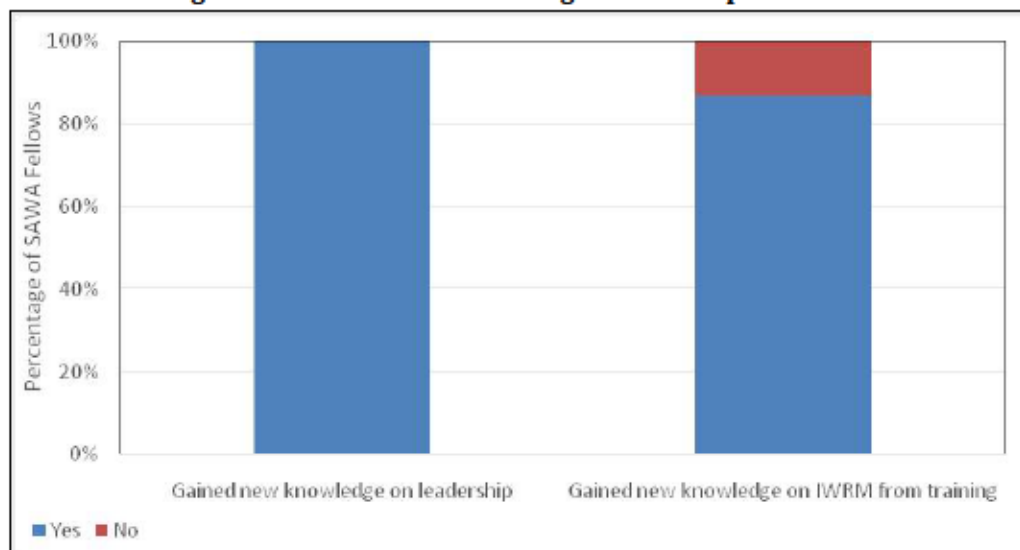
1. A solely physical and technical understanding of the problems around Climate change and water often leads to technocratic solutions. However climate and water leadership also requires an intensive understanding of social causes and differential social impacts that could enable designing solutions seeking not only mitigation and adaptation but also inclusive governance and justice.
2. Exposure to field realities across the region through direct engagement and research with stakeholders and vulnerable affected communities, builds a base for understanding social vulnerabilities in qualitative terms, creating empathy, building communication skills across cultural and social settings, and recognising context specific challenges and opportunities for solutions. This was particularly significant for the engineering students whose traditional disciplinary training is mostly focussed on infrastructure and technology and rarely involves direct interaction with stakeholders, communities and their social vulnerabilities.
3. Cross-country student peer networks and research collaborations allow for a regional exposure to varied mindsets, work environments and aspirations, common professional and social challenges faced in different country contexts, and build a base for future transboundary professional and personal networks of support.
4. Joint practical activities and concept building exercises under new and challenging fieldwork contexts help in fostering and cementing peer relations and networks among fellows from different countries, and between fellows and senior mentors. It also engages fellows in team building, conflict management, and communication capacities.
5. Exposure to the sector and market where practical implementation, impact, and policy making occurs helps fellows understand mechanics and tradeoffs of ground impact and decision making. Encouraging individual initiatives towards volunteering, internships, research dissemination, and thematic and regional youth network platforms – also helps in co-learning about ground realities as well as develops more agency and exposure towards the processes of professional entry and growth in these sectors.
6. Engagement with established women professionals and leaders in the sector can provide motivation and a capacity to envision larger aspirations for one's own future development, beyond the limits posed by social barriers, personal temperaments, and reproducing gender stereotypes.

Further, the project implemented direct training initiatives towards leadership in varied ways. As discussed in Chapter 4 some of the training initiatives were:

- lectures on concepts and varied aspects of leadership, as well as the importance and role of leadership in climate change
- sharing success stories of past SAWA fellows and their growth over the years
- experience sharing with alumni SAWA fellows who are currently established water professionals in sectors ranging from government departments, development sector, to academic spaces
- training in broader science communication, including and beyond scientific writing and academic publications, to incorporate training on communicating science to local communities, to governments, and through popular media
- exposure to varied sectors, including and beyond academia, in the water and climate change sector where the fellows could eventually contribute as leaders in different ways

A feedback session from fellows and participants of the training workshops showed that a 100% of the participants gained new knowledge on leadership from the trainings.

**Figure 7: Contribution of training in leadership and IWRM**



Education in IWRM and gender issues also helped fellows transition from technocratic thinking about the water and climate change sectors to greater appreciation of the social causes and impacts of climatic and environmental changes. It brought more sensitivity towards environmental injustice and complexity of sustainable solutions to water issues. These outcomes form the foundation of future impact in building leadership. The following testimonials illustrate this impact:

*"During my interview, I expressed that I wanted to join a structures based engineering program but when they asked me the favourite course in the current semester, I replied Hydrology. I never knew that the subjects on gender & water, legal aspects of water, participatory field research methodology, and climate change are going*



*to create an alternative impact on my views I had so far on water. While getting the knowledge on these I got angry about society and its poor functioning. There were a lot of questions raised in my mind such as 1) where it failed to manage? and 2) why it's just like this?" – SAWA Fellow, CWR, Batch 2*

*"The most important subject which touched my heart was to understand the link between gender and water. I studied so many case studies from different countries. It was really an eye-opener for me to understand gender equality. It gave a big impact on my personal life also. Now I felt that I am the one who is always against gender discrimination in my family." – SAWA Fellow, CWR, Batch 1*

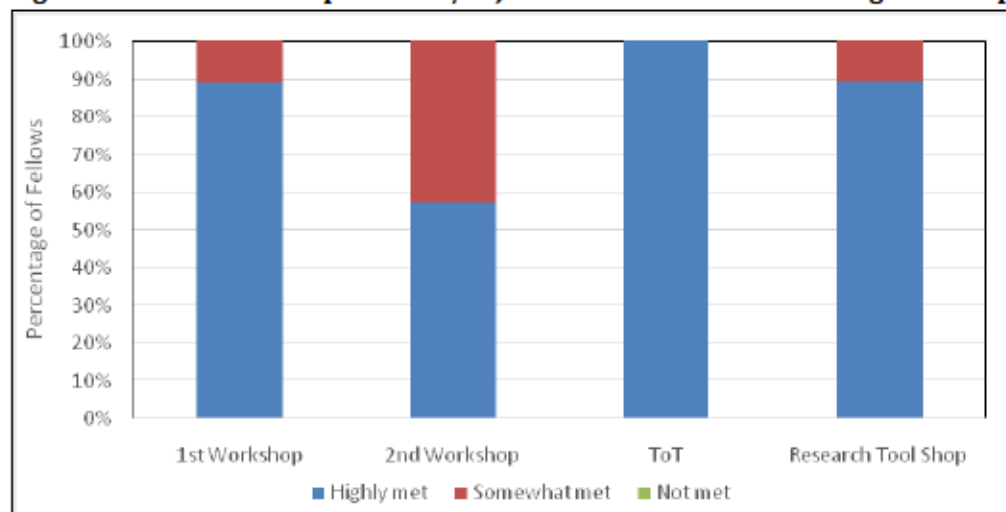
## 5.2 Regional training workshops:

The Regional workshops were a core initiative of the project and were intensively designed towards many objectives including:

- conceptual development on interdisciplinarity, IWRM, climate change, and gender;
- training in research methods, data collection and data analysis,
- communication and engagement with local stakeholders and communities
- scientific writing and science communication;
- developing cross-country peer networks,
- team building, collaboration, negotiation and conflict resolution

The workshops led to impacts in multiple aspects. Figure 8 and 9 show results of the feedback poll on the efficacy of the workshops in fulfilling expected objectives of the participants and its ability of the training to improve work performance.

**Figure 8: Fulfillment of expectations/objectives of fellows from training workshops**



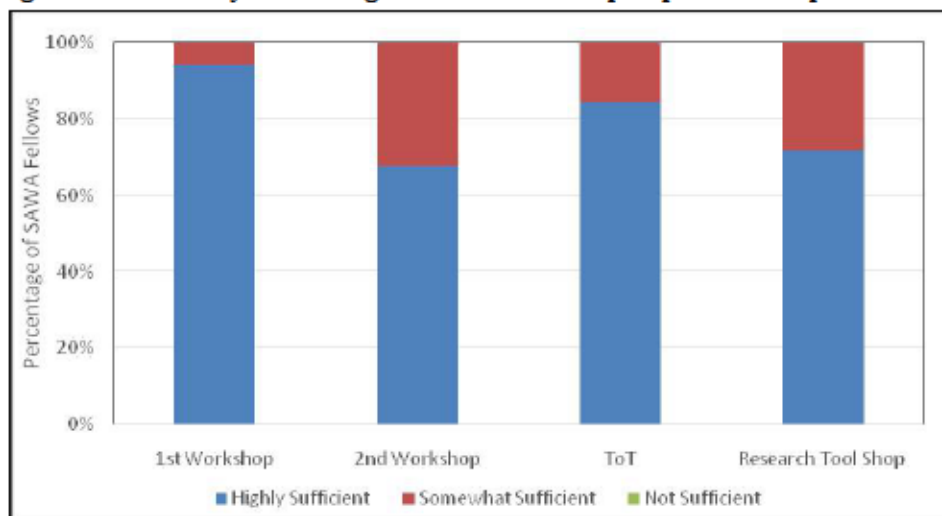
In various testimonials and feedback sessions fellows reported that research methods taught through practical field exposure, data collection, and data analysis helped fellows develop the questions and methodologies for their interdisciplinary research thesis. The workshops were also treasured by fellows for the opportunity to be exposed to different country contexts and building personal and professional networks with mentors and fellows from other PIs.

*I haven't realized before, the importance of gender perspective in water management which I realized from this workshop. This training inspires me to develop a strong determination towards our common goal. The most*

*beautiful moment during the program is the interaction with other SAWA fellows and supporting teachers and sharing our views and concerns which are similar across other country's water issues and research.* - SAWA Fellow, NEC, Batch 1

*"This workshop was very useful to practice PRA tools which I have learned in Participatory field research methodology. It has helped me to do the questionnaire survey for my thesis. It was a new and great experience for me to work and share our knowledge with other country students and to know their culture also."* – SAWA Fellow, CWR, Batch 2

**Figure 9: Sufficiency of training information to help improve work performance**



The joint field based research carried out by fellows in their research training during the Regional workshops also helped develop collaborative research outputs among fellows of the different PIs.

*"Our field research group (with fellows from different countries) were able to publish abstract prepared over the research work titled "Distribution, Access and Gendered Roles of Common Property Water Resources in Bhotechaur, Nepal" at the 7th International Conference on Water and Flood Management (ICWFM) which was held in Dhaka, Bangladesh in March 2019. Furthermore, the opportunity I obtained to participate in the 7th ICWFM was also one of the outcomes I received through networking opportunities during the SAWA regional workshop."* – SAWA Fellow, PGIA, Batch 1

Some suggestions for improvement were also offered by the participants for the workshops:

- Increase training on data analysis on softwares
- More practical sessions would be effective, increase duration of field work
- Focus can be enlarged in spatial scope to cover global concerns, north-south differences and conflicts and global climate relations
- If and where possible, permit non-SAWA students in the host country to also benefit if it does not require added costs
- Training methods based on gaming, active debates and more hands-on group activities

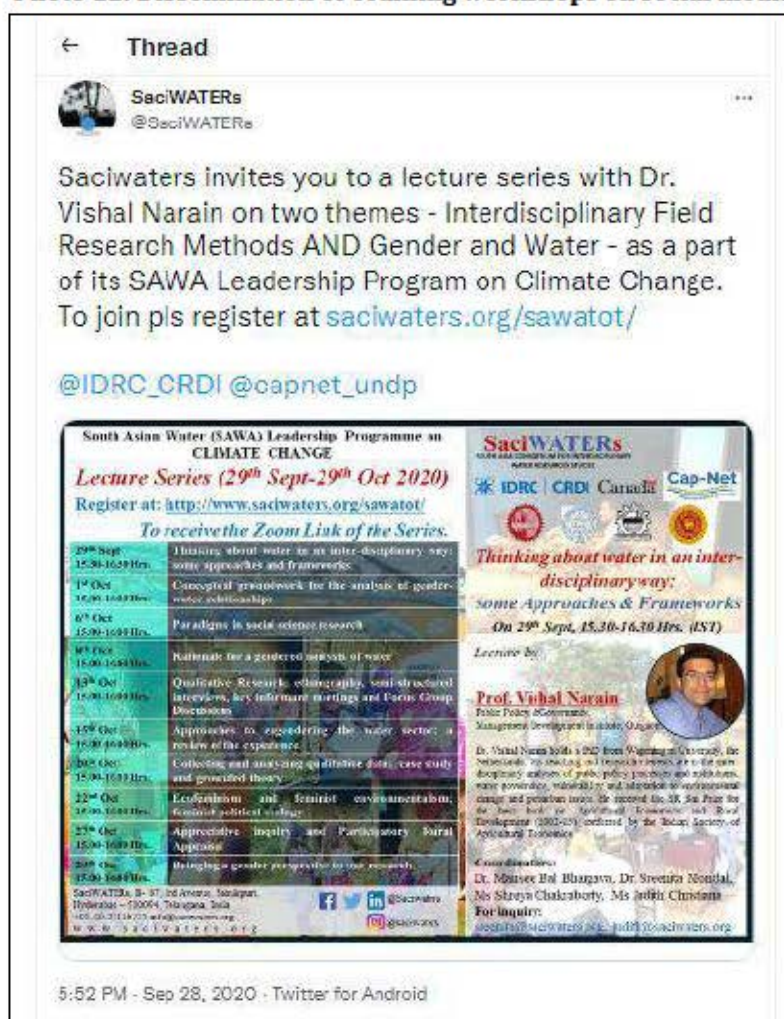
Some participants (SAWA and non-SAWA who attended) reported that the workshops and the ToT has helped bring greater impact at their subsequent places of employment in government sectors, academic institutes, and planning organizations. These are evidenced in the following sample of testimonials and responses from workshop participants.



*"Now we are working on EU WFD framework and Water Sensitive Cities with the Govt of India and these lectures helped in this initiative" - Faculty participant in ToT*

*"As a professor at the University I have been able to upgrade my own curriculum for teaching my students. Also, it has helped me bring more awareness among my students to incorporate gender in their research" – Faculty participant in ToT, CWR*

**Photo 12: Dissemination of Training workshops on social media**



### 5.3 Gender and interdisciplinarity in water and climate change research

The current phase of the SAWA project brought focused attention to the aspects of gender in water and climate change research. For many fellows 'gender' as a concept was entirely novel, especially in linkage with IWRM and climate change. This has had a positive impact in introducing 'gender' as a lens in interdisciplinary research in the project as well as for the PIs.

*"Along with the technical aspect, I have researched women's intersectionality impact and their gender mainstreaming in three communities of Khairahani Municipality of East Rapti watershed. This gender analysis helped me to understand that women are not a single entity, not a homogeneous group but it is a heterogeneous group, we should not define women's impact in one group but there is a need to understand the impact within a different category for women. The research journey makes me more curious and I want to explore more on the water sector and gender." – SAWA Fellow, NEC, Batch 1*

*"I used to earlier think that gender was only about women. But after this training I understood that gender is more about gender relations between men and women in society" – SAWA Fellow, PGIA, Batch 1*

The thesis (completed and ongoing) work presented by fellows all bring in gender into their research to varied levels. The themes of research theses were listed out in Table 6 earlier. 8 of the fellows had core focus on gender water linkages which is reflected even in the title of the theses. All other fellows, including those currently working on their theses had gender as an intersectional aspect producing gender aggregated data and results along with other axes of inequality and vulnerability. 16 of the theses focused on climate change as a core theme of research while the remaining studied climate change as intersectional and an aggregator of water security related issues and associated social vulnerabilities. Gender narratives, indepth interviews, time use surveys, and gender disaggregated quantitative household and individual surveys were the most prominent methods used to incorporate gender in their IWRM research.

Fellows have incorporated gender in their completed, ongoing, or proposed work in various ways:

- Focus of the research question directly on women's vulnerabilities
- Thesis topic relates most closely to gender-relevant water and climate change issues, eg. Household water access and climate migration related vulnerabilities
- Gender disaggregated data incorporated within or among other socioeconomic axes and inequalities
- Womens' narratives as more anecdotal than systematic and analytical

As a challenge observed during monitoring and review processes was that 'gender' continues to be a complex concept for most fellows as well as faculty members and supervisors. Misunderstanding or incomplete understanding of 'gender' related concepts often underlie the fellows' research. The external mentorship, reviews to working paper series, and progress monitoring meetings have been used to identify and clarify some of these conceptual misalignments. While inclusion of the 'socioeconomic factors,' in general, has been more developed in all the theses, inclusion of 'gender' has been relatively weaker.

Interdisciplinarity has been understood and implemented more strongly by most fellows in their research. PI departments and PI coordinators have been increasingly strengthened in their capacities for interdisciplinary research, through their involvement with training in interdisciplinarity through the past 15 years over the Crossing Boundaries (CB)<sup>10</sup> project and SAWA Fellowship<sup>11</sup> project of this consortium. This has assisted with strengthening the interdisciplinary research at the PIs. However, the PI coordinators have reported that in larger councils and panels of the Universities (which are focused on technical education) some research thesis topics and approaches are not understood or well accepted and therefore research topics have modulated to balance between the University perceptions/norms and project/IWRM education goals. Overall, the focus on interdisciplinarity and IWRM spearheaded at the PIs through the CB, SAWA Fellowship, and SAWA Leadership projects has brought significant appreciation and realization on the fact that solely a technical approach to water issues is inadequate to find holistic solutions.

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<sup>10</sup> <http://www.saciwaters.org/CB/>

<sup>11</sup> [http://saciwaters.org/sawa\\_fellowships.php](http://saciwaters.org/sawa_fellowships.php)



*"Initially, I struggled a lot to understand the definition of Integrated Water Resource Management because I never tried to see the problems in society and what is happening around me. This program worked as a huge eye-opener for me to see the entire world from a different perspective" - SAWA Fellow, CWR, Batch 2*

*"After taking the IWRM course at Anna University I learned so many different concepts and methods that are related to water conservation, legal aspects of water resources, and gender. I am very proud to have been an IWRM student. This is a unique course and taught both technical and social aspects" - SAWA Fellow, CWR, Batch 1*

With regard to communication and writing of interdisciplinary research, the Working Paper series provided a safe lab environment to practice and train in scientific writing in interdisciplinary research based on their research thesis. Another initiative which was found to be a value addition in this regard was the joint thesis review meeting organised in September 2021 bringing together fellows across the four PIs and across batches to present their ongoing research work. It provided a significant opportunity for fellows to learn from each others' work, methods, and challenges. Significant alignments were seen between fellows' research across the 4 countries providing future opportunities for collaborative research and publications.

*"The fellowship program was always encouraging us for scientific publications. Accordingly, they shared information about a number of international conferences and they were there to provide the fanatical supports for our publications wherever required. Hence, I could have a number of opportunities to publish my research outcomes. Additionally, I was funded for several workshops related to writing quality research papers as well". - SAWA Fellow, PGIA, Batch 1*

#### 5.4 Collaboration and peer networks

One of the most appreciated outcomes of the SAWA program for many fellows was the opportunity that it provided for fellows to be:

- exposed to the larger sector,
- network with national and international experts as trainers and mentors,
- work with multisectoral stakeholders as respondents and supervisors,
- build personal and professional networks with other SAWA fellows from different countries

*"The most beautiful moment during the program is the interaction with other SAWA fellows and supporting teachers and sharing our views, similar to other country's water issues and research. As part of this training workshop, we conducted a small research on 'Differences in perception of Climate Change: A Case Study on Bhotechaur Village in Nepal' and we have also jointly published its abstract in the Rajarata International Research Conference, Rajarata University of Sri Lanka, Mihintale, Sri Lanka". - SAWA Fellow, NEC, Batch 1*

However this strength of the project was significantly limited by the restrictions of the COVID pandemic. The inability to conduct joint field exercises in the virtual mode of training limited the opportunities for the 3<sup>rd</sup> batch of fellows to network closely with other fellows. The working paper series instead provided some opportunity for fellows to collaborate on papers among themselves towards a publication.

Not only the students, but the PIs also effectively collaborated over the project period strengthening the consortium. Regular review meetings were held with the Universities to understand their individual and differing concerns and challenges, and PIs mutually provided suggestions and support for adapting to the challenges. The consortium also successfully collaborated on a new proposal to build on the existing foundation of the team and is due to start a new project based on the learnings of the 15 years of collaboration of this consortium. Networks with faculty members of other PIs and external SAWA mentors and trainers are also mobilized by the PIs for other parallel initiatives such as conferences and research panels.

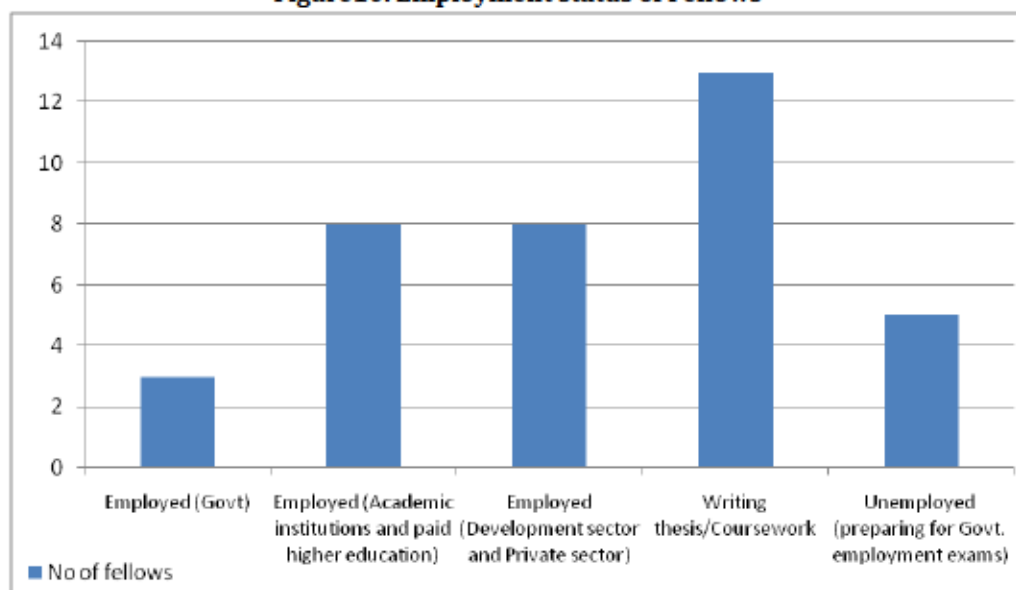
### 5.5 Employment and research uptake in the sector

With the wide array of opportunities and research support that the project has provided many fellows have been able to gain employment in the water sector. 17 of 36 fellows are working or employed in the sector, 14 fellows are still enrolled completing coursework or writing their thesis, 5 fellows are preparing for competitive examinations for application in the government sector and are thus unemployed (Figure 10). Details of employment are provided in the annexure.

The learning from the project in interdisciplinarity and gender in water has been brought by fellows to their employment positions and sectors. In the academic institutions this has involved bringing these insights to their classroom and teaching curriculum. In the government and development sector this has gone towards better implementation and involvement of fellows in their respective projects.

*"Now I am working in the governmental institution, which is the policy making organization. During the policy making time I will suggest to include the gender." – SAWA Fellow, NEC, Batch 1*

**Figure10. Employment status of Fellows**



In addition to the employment positions of the fellows, the internships provided under the project allowed fellows to be involved in real implementation and policy research projects promoting research uptake in the sector. Table 5 earlier provided a detailed list of the organizations and the themes of work the fellows were involved in under the water sector.



*“SAWA fellowship program gave me an opportunity to work as an intern at ICLEI South Asia, New Delhi, for a month. In my internship, I worked on reviewing the successful case studies on Nature-Based Solutions. While reading and compiling the case studies for the report, I realized the role of nature on sustainable development and its ability to provide applicable solutions for real-world problems.*

*These two events (inclusion fieldwork training in regional training workshop) enhanced my skills. My thought and idea of approaching a problem or perceiving a situation became different. I started to think holistically.” –*

**SAWA Fellow, CWR, Batch 1**

### **5.6 Personal initiatives for research and professional development by fellows**

Beyond the opportunities provided by the project for building experience in the sector, fellows have taken up initiatives for furthering such involvement for themselves. Khadiza Nahin and Sahika Ahmed, SAWA fellows at BUET have been selected as youth ambassadors for OXFAM project TROSSA for the Ganga-Brahmaputra-Meghna basin youth network platform. Radha Dhakal, SAWA Fellow at NEC, received award and financial research support from Interdisciplinary Research Institute for Sustainability (IRIS), Kathmandu. Deepa Neupane, SAWA Fellow at NEC, has over the project period also gained professional and sectoral work experience as consultant for WWF Nepal and GWP and worked on the Project “Study of Landsubsidence Issues in Kathmandu Valley due to Groundwater Abstraction”, and open space mapping project of International Organization for Migrants within the Kathmandu Valley. Further, many fellows have attended winter schools/summer schools on issues of sustainable cities, urban mobility, river basin management etc. Manimozhi R., SAWA Fellow CWR, along with others in her peers organised an awareness program on WASH for primary school students in a rural area focused on handwashing practices for the children and hygiene practices and health for girls.

These personal initiatives have been encouraged by the project team through providing recommendations, mentorship and guidance. A group on Whatsapp was initiated by the project coordinator early in the project with fellows to maintain a channel of formal and informal communication where opportunities are frequently shared for - internships, employment vacancies, calls for papers and conferences, relevant workshops, relevant reference material for research support, and doctoral position opportunities - to support such personal initiatives of the fellows.

**Photo 13: Manimozhi R, SAWA fellow CWR, training school students in WASH practices**





### 5.7 Reflexive implementation methodology

From the perspective of project design and implementation the project has benefitted from a reflexive approach of the project lead team and the consortium, with regular support and mentorship from IDRC. During the project period various activities of the project has faced challenges and received feedback and suggestions for improvement. These have been responded to innovatively keeping in the mind the overarching vision and goal of the project and capitalizing on opportunities presented by the challenging circumstances themselves. Some such initiatives were:

- Feedback from each Regional workshop was taken and improvements/suggestions were incorporated in successive workshops. For instance an interactive session with SAWA alumni established in the water sector was designed to the felt need of the fellows to engage more with professionals from various water related sectors. Non-SAWA fellows were included for lectures in the 2<sup>nd</sup> Regional workshop to cater to the request for more outreach where possible. In the virtual 3<sup>rd</sup> Regional workshop, fellows were asked to provide suggestions and choices on themes of training they would seek more intensive learning on. Based on this feedback, the Research tool-shop was designed.
- The COVID pandemic created significant challenges for the project, yet also presented new opportunities for exposure for the fellows. Fellows were encouraged and supported for virtual conferences, invited for special panels etc. Virtual workshops were designed in the project (ToT, 3<sup>rd</sup> Regional training workshop, and Research tool-shop) with deep considerations for the limits of online participation and learning. Trainings were designed around differing time schedules and academic calendars of Universities, period of concentration of fellows, innovative modes of group engagement and practical learning, and easier possibilities of reaching out to a wider group of students from the PIs who could benefit from the trainings.
- Gender was a significant factor of the project not only in research but also in implementation of the project. The gender relations in South Asia and the burdens it imposes on women professionals and scholars was understood and empathised with. Flexibility was maintained in the project to ensure that fellows faced with marital, maternity, and child care responsibilities are not disincentivised in the project and are more supported both financially and intellectually for their research and professional development.

*"I was expecting my first baby when I was selected for SAWA. It was only the 3rd month of my pregnancy and I was not very sure if I would be allowed to carry the fellowship under SAWA. SAWA is a big platform and I was interested to carry on. The SAWA committee allowed and encouraged me to continue. I missed the training session with my SAWA batchmates held in Nepal but instead was given the opportunity to attend the session next year in Chennai, India instead. It has been a memorable journey to become a mother, carrying the baby to field survey, attending training sessions in India, completing the thesis, and finally completing the degree. I am thankful to the SAWA committee for their always extended hand and support throughout the entire journey!" – SAWA Fellows, BUET, Batch 1*

The development and evolution of the project methodology throughout the project period has been an important impact of the project.



# CHAPTER 6: CHALLENGES AND LESSONS

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In the process of implementation of the project various challenges were faced and adapted to which provided lessons for improving project design in the future.

## 6.1 Challenges

1. Faculty coordinators of PIs are senior professors at their respective institutions and therefore are also burdened with significant teaching duties as well as administrative duties of the University. This has been particularly true in the precarity of the COVID lockdowns at the PIs. This makes regular monitoring of and communication with fellows, reporting on technical progress, and data management support for the project from the PIs difficult. Much of these responsibilities were taken on directly by SaciWATERs, including direct and regular communication with fellows. Therefore incorporating a project associate/postdoc fellow at the University would help with better coordination and data management under intellectual supervision of the PI coordinators.

2. Most of the PIs are public Universities that are heavily determined by larger norms and policies of governments and University administrations. These norms are also rapidly changing. There are requirements of university determined norms on overhead costs, long drawn procedures for fund release and activity approvals, approvals for thesis topics selected by fellows under the project, changing semester and coursework schedules for different Universities under COVID lockdowns, permissions for long absence of fellows from Universities for intensive regional training programmes etc all pose severe precarity and uncertainties for the project coordination, implementation, and impact.

3. Traditional gender relations in South Asia create gendered household and family burdens on the women fellows. The sensitive balancing required of women professional between personal/professional aspirations and familial responsibilities is clearly experienced in this project phase focused entirely on women fellows. Fellows faced delays in work and frequent distancing from their ongoing research due to responsibilities for marriage, maternity, child care, and location shifts expected for spouse's professional development.

4. Interdisciplinary concepts, particularly those related with gender, were seen to be challenging for most of the fellows in terms of understanding and operationalising despite the intensive training and varied methods of training and mentorship implemented, which reflects the stringent boundaries of disciplines – their language, underlying principles and priority lenses, and methods – which are further institutionalised in University systems thus requiring more systemic changes. These aspects of research require a learning curve, more sustained long term mentorship, and more experiential learning. However the project was very successful in introducing the significance of a gender lens within the discourse of research at the PIs and with the fellows.

5. Capacity development of fellows also requires significant capacities and support from the larger institutions. Most of the PIs being departments in technical Universities, their academic councils or University research approval boards, did not always share the understanding and appreciation for interdisciplinary and gender-focus research methods and topics. Institutional change is a much larger goal that is incremental and requires more systemic transformation. The PIs over the 15 years of collaboration on interdisciplinarity have developed in their approach. The current project

phase also extended this training to other faculty members of the departments. Impact at higher academic and administrative levels requires more high level sustained networks and advocacy.

6. The most intense challenge to the project was ofcourse posed by the uncertainties of the COVID pandemic, at levels of institution, health insecurity, livelihood precarity, mobility, and learning. This affected all aspects of the project – methods of training, completion of theses and degrees, opportunities for peer networking, space for cross-country collaborations, and availability of internship opportunities.

7. In terms of finance management and reporting for the project this consortium faced challenges emanating from varied sources:

- The Foreign Currency Regulation (FCRA) Act as well as Income Tax regulations of the Indian government do not permit transfers of funds outside of India. Since the project coordinating institution (SaciWATERS) is based in India, the mode of funding for the project needed to be changed wherein four separate grants had to be designed to maintain the project and consortium. This required more complex coordination of budgets across the four institutions, particularly for joint activities such as regional workshops and monitoring activities.
- 3 of the 4 grants were with Universities (2 public and 1 non-profit). While SaciWATERS had significant past experience with managing international projects and grants, the budgetary and reporting processes were relatively new for some of the Universities' administrations. The PI coordinators, being technical disciplinary experts and not with specific administrative expertise, found it challenging to direct the University finance teams and in some cases had to take on significant portions of financial reporting processes themselves.

## 6.2 Lessons

1. Involving early career researchers not only as fellowship beneficiaries but also in project implementation support would help better coordination in the consortium and provide more actual work experience in project design, research, project and data management.

2. More sustained mentorship is required beyond the limits of the project. This requires deliberate building and strengthening of peer and mentorship networks among fellows and other established professionals from various sectors in the water and climate change sectors.

3. Internships have been very successful in building sectoral linkages and networks for the fellows. Encouraging and supporting them in more individual initiatives in such networking has opened avenue for fellows to get more comfortable with building networks for employment and collaboration after their degrees.

4. Regular communication with project coordinators, providing both professional and personal support and mentorship has created deeper interaction between the project and its beneficiaries, which has created a better understanding of more nuanced and personal barriers to growth often faced by women in professional and leadership development.



5. Intensive field based experiential learning has been more effective than classroom lectures alone in imparting knowledge on concepts of interdisciplinarity and gender, which are complex concepts for students with an entirely technical education background.

6. Social and gender theories and analysis, often rooted in social science and humanities fields, do not always organically translate to STEM education and research with ease. Sharp disciplinary boundaries create essential differences in language, pedagogy, underlying axioms, and paradigms between the natural and social sciences. Some methods of lectures and experiential learning have been more effective than others in translating these new concepts for the fellows. Teaching based on films, group activities, field work, and lectures that depend less on disciplinary jargon was identified by fellows in feedback sessions as being more effective for their learning.

7. Some capacity building early on for finance officers and project leads/coordinators on specific budgetary and reporting processes can help smoother and less-error prone finance reporting processes. This is particularly true for many global south institutions which struggle with adequate experience, changing finance processes of funders, changing government regulations in their own countries, and the general administrative norms and burdens of their Universities. Budgeting some resource for a dedicated partial or full time personnel to assist with finance and reporting could help streamline such processes.

# ANNEXTURES

## ANNEX 1: RESEARCH THESIS TOPICS AND STUDY AREAS OF SAWA FELLOWS

Name	Batch	PI	Supervisor	Thesis title	Study Area
Manimozhi	1st	CWR	Dr. Carolin Arul	Impact of Climate Variation on Ecosystem Services	Yelagiri Hills, Vellore, Tamil Nadu, India
Mohanaabitha	1st	CWR	Dr. Carolin Arul	Impact of anthropogenic activities on growing mismatch between extraction and recharge of groundwater in the middle reach of palar basin	Ranipet, Vellore district, Tamil Nadu, India
Deepika Laxme	1st	CWR	Dr. Carolin Arul	Impacts of heat stress on water and on livelihood of people with special focus on women	Vellore taluk, Vellore district, Tamil Nadu, India
Poonam Pandey	1st	NEC	Laxmi Prasad Devkota	Dam Breach Analysis and Impact Assessment of Budhi Ganga Hydropower Project	Achham
Purnima Acharya	1st	NEC	Ashutosh Shukla	Causes and Consequence of Damaging Flood Incidences in Rapidly Urbanizing Urban Sprawl: Unpacking Flood Incidence of July 12, 2018 in Hanumante River in Bhaktapur	MadhyapurThimi, Bhaktapur
Anupama Ray	1st	NEC	Dr. Vishnu Prashad Pandey	Assessment of Climate Change Impacts and gender perspective on Water Sufficiency in Extended East Rapti Watershed, Central Nepal	East Rapti Watershed (Chitwan&Makwanpur district)
Lamiya	1st	BUET	Dr. Mohammad Shahjahan Mondal	Water Poverty for Different Livelihood Groups in Peri-urban areas in a Changing Environment <a href="http://lib.buet.ac.bd:8080/xmlui/handle/123456789/5819">http://lib.buet.ac.bd:8080/xmlui/handle/123456789/5819</a>	Savarupazila of Dhaka district and Singairupazila of Manikganj district
Mafruha Ditu	1st	BUET	Dr. Mashfiqus Salehin	Lowering of groundwater level and its impact on livelihood: a case study of singair upazila, manikganj	Savarupazila of Dhaka district and Singairupazila of Manikganj district
Rabeya Sultana	1st	BUET	Dr. Sujit Kumar Bala	Gender inclusive water security in peri-urban areas in the context of climate change	Savarupazila of Dhaka district and Singairupazila of Manikganj district
Sathya	1st	PGIA	Senior Professor E.R.N. Gunawardena and Dr S Pathmaraja	Examine the Effectiveness of Climate Change Adaptation Strategies in Dry Zone Farming Systems (A Comparative Study in Horivila-Palugaswewa Cascade and Sivalakulama Cascade)	Horivila-Palugaswewa and Sivalakulama Cascades, Anuradhapura District, Sri Lanka
Kowshayini	1st	PGIA	Dr S Pathmaraja	Assessment of the status of ecological components, their functions and the efficiency of rehabilitation activities in samll tanks of Palugaswewa Tank cascade system	Palugaswewa, Anuradhapura



Gimhani	1st	PGIA	Professor. N.D.K. Dayawansa and Senior Professor RanjithPremalal de Silva	Sustainability of Horivila - Palugaswewa Cascade System: an index based assessment	Horivila-Palugaswewa Cascade System, Sri Lanka
Sumaia Kasem	2nd	BUET	Dr. Mohammad Shahjahan Mondal	Development of a water pricing model for domestic water uses in dhaka city using iworm framework.	Dhaka City
Nazwa Tahsin	2nd	BUET	Sonia Murshed	Assessment of vulnerability to water scarcity through <b>gender lens</b> in the context of informal settlements	Tejgaon Slum
Zarin Subah	2nd	BUET	Dr.Sujit Kumar Bala	An analysis of urban flooding and its impact on <b>gender</b> in a slum of dhaka city	Baunia Khal and Baganbari slum
Shreeya	2nd	NEC	Dr. Vishnu Prasad Pandey	Drought Characteristics, Impacts and Responses in the East Rapti Watershed, Nepal	Chitwan, Nepal
Manisa Sah	2nd	NEC	Vishnu Pandey	Drought assesment using soil moisture indicator in Narayani Basin	Narayani Basin
Deepa Neupane	2nd	NEC	Dr.Bhesh Raj Thapa	Assessing the efficacy and participation of local stakeholders of the early warning system of West Rapti Basin	Banke District
Sivaranjani	2nd	CWR	Dr. SOORYA VENNILA	"Surface and ground water quality on odambogaiyar river: an impact study on stakeholders in thiruvavarur district"	THIRUVARUR DISTRICT, TAMILNADU.
Shanmugapriya	2nd	CWR	Dr. R. Sarvanan	Aquifer vulnerability assessment and its socio-economic impact in limestone mining region	Kallakudi, Trichy
Manisha	2nd	CWR	Dr.Carolin Arul	Impact of Anthropogenic Activities on the livelihood of the community with <b>gendered lens</b> -A case study of the Ennore Creek	Ennore, Chennai District
P.C.D.A. Dissanayake	2nd	PGIA	Prof. E.R.N. Gunewardena, Prof. N.D.K. Dayawansa	Drought management of a selected cascade in the dry zone of Sri Lanka	Sivalakulama Cascade, Galenbindunuwewa, Anuradhapura, Sri Lanka
A.R.M.M.P. Menike	2nd	PGIA	Prof.M.I.M.Mowjood	An investigation of the relationship between flood and drought in terms of ecosystem services	Udakadawala command area, Horiwila-Palugaswewa cascade system, Northcentral province, Sri Lanka

S. D. N. M. Senadeera	2nd	PGIA	Prof.N.D.K.Dayawansa	Vulnerability of Upland Crop Farmers to Agricultural Risk Induced by Climate Variability and Exploration of Adaptive Strategies	North Central Province
Sumaiya Islam	3rd	BUET	Dr. Md. Shahjahan Mondal	Assesment of household level tipping points for flood induces damages	Dewanganj, Jamalpur
Sahika Ahmed	3rd	BUET	Dr. Sonia BinteMurshed	Migration Decisions, Destinations and Impacted <b>Gender</b> Relationship: A Case Study along the Erosion Prone Sites of Brahmaputra River	Left bank of Jamuna River, Dewanganj, Jamalpur
Khadiza Tul Kobra Nahin	3rd	BUET	Dr Sara Nowreen	Vulnerability of <b>women</b> due to flood in jamalpur: spatial distribution and future projection	Dewanganj, Jamalpur
Meena Sakthivel Pandian	3rd	CWR	Dr V. Ramji	Influential role of climate characteristics on groundwater vulnerability in Chittar Sub basin of Tamirabharani Basin -its impact, risk and future scope in Socio-Hydrology	Chittar Sub basin, Tamirabharani Basin
Priyadharshini R. C.	3rd	CWR	Dr.Carolin Arul	Impact of Climate Smart Agriculture through sustainable irrigation management and conservation tillage practices for maize production	Vellar sub basin - Salem
Melba Respina Baktha Singh	3rd	CWR	Dr.Carolin Arul	A critical appraisal of Irrigation water policies and irrigation water rights in Tamil Nadu: A case study	Thoothukudi District, Tamil Nadu
<p style="text-align: center;"><b><u>NOTE ABOUT AVAILABILITY OF THESIS ONLINE</u></b></p> <p>The submitted theses are provided in open access through respective University repositories. However the procedure between the submission of thesis to the departments and the uploading of the theses online by the University platforms takes significant time from a few months to a year, therefore the theses of the SAWA fellows listed here are not yet available online, but will be available over time on the following repositories:</p> <p>BUET: <a href="http://lib.buet.ac.bd:8080/xmlui/handle/123456789/640">http://lib.buet.ac.bd:8080/xmlui/handle/123456789/640</a>  PGIA: <a href="http://dlib.pdn.ac.lk/handle/123456789/9">http://dlib.pdn.ac.lk/handle/123456789/9</a>  CWR: <a href="https://library.annauniv.edu/ethesis.php?subject=Civil%20Engineering">https://library.annauniv.edu/ethesis.php?subject=Civil%20Engineering</a>  NEC: No online repository (theses available on request)</p>					



## ANNEX 2: INTERNSHIP STATUS OF SAWA FELLOWS

Name	Cohort	PI	Name of the organization	Duration	Topic of internship
Manimozhi	1st	CWR	ICLEI South Asia, New Delhi, India	1 month	Review on Nature based Solutions
Mohanaabitha	1st	CWR	SaciWATERs	1 month	Policy Evolution Analysis Of Gender And Agriculture in India from the Five Year Plans of India
Deepika Laxme	1st	CWR	Integrated Research and Action for Development (IRADe), New Delhi	1 month	Urban Vulnerability Index for Chennai city; Literature review on impacts of heat stress in women
Purnima Acharya	1st	NEC	The Small Earth Nepal	3 months	Assisted in research and proposal development.
Anupama Ray	1st	NEC	International Water Management Institute, Nepal	6 months	Assessment of Climate Change Impacts and gender perspective on Water Sufficiency in Extended East Rapti Watershed, Central Nepal
Lamiya	1st	BUET	Bangladesh Centre for Advanced Studies (BCAS)	1 month	Remote sensing (RS) and GIS (Geographic Information Science)
Mafruha Ditu	1st	BUET	Bangladesh Centre for Advanced Studies (BCAS)	1 month	Remote sensing (RS) and GIS (Geographic Information Science)
Rabeya Sultana	1st	BUET	UNDP	1 month	Women empowerment through Water Management Program
SathyaDilini	1st	PGIA	SaciWATERs	1 month	Arsenic Mitigation Policies, Institutional Mapping for Water Quality in Assam
Kowshayini	1st	PGIA	SaciWATERs	1 month	Epidemiology of Arsenicosis, Arsenic mitigation options adopted in Assam, Reduce the Impact of Arsenic Using Traditional Methods
Gimhani	1st	PGIA	SaciWATERs	1 month	History of Arsenic in drinking water and impact
Sumaia	2nd	BUET	BRAC (Urban Development Program)	2 Months	Gaibandha Municipality Masterplan Study: Socio economic analysis of the residents, Growth Analysis of the Municipality, Study design to understand environmentally critical areas and issues, Low Income Settlement Study
NazwaTahsin	2nd	BUET	Cap-net (GWP)	3 Months	Monitoring, Evaluation and Learning Plan
ZarinSubah	2nd	BUET	BRAC (Urban Development Program)	2 Months	Gaibandha Municipality Masterplan Study: Socio economic analysis of the residents, Growth Analysis of the Municipality, Study design to understand environmentally critical areas and issues, Low Income

Settlement Study					
Deepa Neupane	2nd	NEC	Global Water Partnership Organization	4 months	IWRM-Tool box Intern
Sivaranjani	2nd	CWR	Integrated Research And Action For Development (IRADe), New Delhi	1 month	Study and assessment of the existing framework for loss and damage for climate hazards
			Tamil Nadu Consumer Protection And Environmental Research Centre	2 Months	Universal salt iodization project
Shanmugapriya	2nd	CWR	SaciWATERs	1 month	Arsenic contamination in Groundwater in India
Manisha	2nd	CWR	ICLEI South Asia	1 month	Green Infrastructure in Drought Prone Areas with specific focus on Solapur
P.C.D.A. Dissanayake	2nd	PGIA	IWMI, Colombo	1 month	Data compilation on crop production and harvest, drafting an outline paper
A.R.M.M.P. Menike	2nd	PGIA	IWMI, Colombo	1 month	Estimating current and future water demand from e-flows assessment
S. D. N. M. Senadeera	2nd	PGIA	IWMI, Colombo	1 month	
Sahika Ahmed	3rd	BUET	TROSA GBM Youth Basin Amabassador (Oxfam)	6 months	
Khadiza Tul Kobra Nahin	3rd	BUET	TROSA GBM Youth Basin Amabassador (Oxfam)	6 months	
Meena Sakthivel Pandian	3rd	CWR	SaciWATERs	1 month	Block level GIS mapping of arsenic affected districts in Assam for Situational Paper on Arsenic Mitigation
Priyadharshini R. C.	3rd	CWR	SaciWATERs	1 month	Assistance for SAWA leadership paper
Melba Respina Baktha Singh	3rd	CWR	SaciWATERs	1 month	Workshop Report preparation
Radha Dhakal	3rd	NEC	Interdisciplinary Research Institute for Sustainability (IRIS), Kathmandu	6 months	Award and support from Interdisciplinary Research Institute for Sustainability (IRIS), Kathmandu
Sulochana Dhungana	3rd	NEC	Health Environment and Climate Action Foundation (HECAF 360)		



### ANNEX 3: CONFERENCE PRESENTATIONS BY SAWA FELLOWS

Name	Sl No	Name of the conference	Date and Place	Title of the Paper
Mafruha	1	7th International Conference on Water and Flood Management (ICWFM)	2-4 March'2019, Dhaka	Distribution, Access and Gendered Roles of Common Property Water Resources in Bhotechaur, Nepal
Rabeya Leya	1	ICWFM	March,2019, Dhaka	Gender Vulnerability Assessment due to Flood in Northern part of Bangladesh (A case study on 2017 Flood)
Zarin Subah	1	International Conference on Natural Science and Technology	March 30 - 31, 2018, Bangladesh	Impacts of Salinity Intrusion on Nitrogen Fixing Microbial Community of Sesbaniabispinosa from Three Different Regions of Bangladesh
	2	Online conference on Women, Water and Climate Change	4/4/2020, Online	
	3	International Conference on Information and Communication Technology for Sustainable Development (ICICT4SD)	February 27 - 28, Online	Data Assimilation: Two Different Perspectives Based on the Initial-Condition Dependence
	4	Water Security and Climate Change conference (WSCC)	March 01- 04, 2021, Online	Understanding Water Insecurity Dynamics in Slums of Dhaka
	5	International Conference on Water and Flood Management	March 28 - 30, 2021, Online	An Analysis of Urban Flooding Extent of the Baunia Khal Watershed of Dhaka City
	6	International Conference on Water and Flood Management	March 28 - 30, 2021, Online	Water Security in Slums of Dhaka
Nazwa Tahsin	1	16th International Conference on Urban Health: People Oriented Urbanisation: Transforming Cities for Health and Well-Being	4-8 November, 2019, Xiamen, China	Climate Change, Poverty and Health: A Case Study on Women and Children in Slums of Dhaka
	2	Ecocity Satellite Conference Dhaka	9-10 September, 2020	
	3	Fall Meeting AGU 2020	1-17 December, 2021	<a href="#">Climate Change, Water Resources Degradation and Water Scarcity Risk: A Cross-Section of Informal Settlements in Dhaka City</a>
	4	Water Security and Climate Change (WSCC) Conference 2021	1-3 March, 2021	Understanding Water Insecurity Dynamics in Slums of Dhaka
	5	8th ICWFM Conference 2021	29-31 March, 2021	Water Security in Selected Slums of Dhaka City
	6	Panel Discussion Amnesty International Nagoya Multicultural Group: Climate Refugee and Where to Go from Here?	25th April	Glimpse of Climate Crisis in Bangladesh

Sahika Ahmed	1	ICERIE, Fifth International Conference on Engineering Research Innovation and Education	January 25-27, 2019, Shahjalal University of Science and Tech, Sylhet, Bangladesh	GIS Based Flood Risk Assessment of Eastern Dhaka
	2	ICCESD, Fifth International Conference of Civil Engineering	Feb7-9, 2020, Khulna University of Engineering and Technology	Flood Inundation Mapping of Kushiya River Using HEC-RAS 1D/2D Coupled Model
	3	Adaptation Futures 2020	September, 2020, TERI India	Adaptation Framework for the Water logging Problem of Dhaka City Due to Increasing Rainfall Intensity and Land Use Changes.
	5	8th International Conference on Water and Flood Management (ICWFM)	March 29-31, 2021	Driving Factors of the Migration System due to Riverbank Erosion along the Brahmaputra River
Khadiza Tul Kobra Nahin	1	4th UIU-ICSD(International Conference on Sustainable Development) 2020	2020, Dhaka	SOCIO ECONOMIC IMPACTS OF SALINITY AFFECTATION: A SURVEY AMONG THE PEOPLE OF BAGERHAT DISTRICT
	2	4th UIU-ICSD(International Conference on Sustainable Development) 2020	2020, Dhaka	Evaluation of heavy metal contamination in Water, Soil and Plant around the OpenLandfill Site Mogla Bazar in Sylhet, Bangladesh
	3	4th UIU-ICSD(International Conference on Sustainable Development) 2020	2020, Dhaka	VULNERABILITY ASSESSMENT OF GROUNDWATER IN A COASTAL AQUIFER: A CASE STUDY IN BAGERHAT DISTRICT
	4	Conference on Transportation and Environment	2020, Dhaka	ASSESSING THE LEVEL OF SERVICES OF THE DHAKA CHATTOGRAM HIGHWAY
	5	ICWFM 2021	2021, Dhaka	WATER RIGHTS, EQUITY AND MANAGEMENT: A CASE STUDY ON WATER HAZARD VULNERABLE SLUMS IN DHAKA CITY, BANGLADESH
	6	ICWFM 2021	2021, Dhaka	Adaptation to Flooding Stress: Contexts of Location, Gender and Intersectionality
	7	ICWFM 2021	2021, Dhaka	Gender friendly flood shelter and emergency health services for the char islands of Sirajganj District
Sumaia Kashem	1	Annual Conference on Regional Science, 2018	22nd of October, Dhaka	A Comparative Analysis of Tourism Performance of Bangladesh with Adjacent South Asian Countries
	2	online-conference on "Women, water and climate change"	04 of April 2020	
	3	8th International Conference on Water and Flood Management	29-31 March 2021	Explaining Water Pricing as a Determinant of Water Security : A Comparative Analysis between Formal and Informal Settlements in Dhaka City
	4	8th International Conference on Water and Flood Management	29-31 March 2021	Assessment of Gender Inequalities in Accessing Water: A Case Study on Tejgaon Slum of Dhaka City
	5	8th International Conference on Water and Flood Management	29-31 March 2021	Water Security in Slums of Dhaka



Manimozhi R.	1	Water Vulnerabilities in India's River Basins and Management Strategies	March 2, 2019 / at Meenakshi Sundararajan Engineering College, Chennai	Vulnerability Assessment using Remote Sensing Indices for Javadhu Hills
Mohanabitta	1	Water Vulnerabilities in India's River Basins and Management Strategies	March 2, 2019 / at Meenakshi Sundararajan Engineering College, Chennai	Numerical modelling of water quality Dynamics for Adyar river using MIKE 21
Deepika Laxme	1	Water Vulnerabilities in India's River Basins and Management Strategies	March 2, 2019 / at Meenakshi Sundararajan Engineering College, Chennai	Vulnerability Assessment using Remote Sensing Indices for Javadhu Hills
	2	7th International Conference on Water and Flood Management with special focus on Water security under changing Climate	March 2-4, 2019 at CIRDAP International Conference Center (CICC) in Dhaka, Bangladesh	Distribution, Access and Gendered Roles of Common Property Water Resources in Bhotechaur, Nepal
Deepa Neupane	1	Challenges and Opportunities for the Sustainable Groundwater Resources Management in Nepal	20th March 2019, Kathmandu	Spatial and Temporal Variation of Water Quality of Bishnumati and Dhobhikhola Rivers in Kathmandu
E.M.G.P. Hemachandra	1	Association for Tropical Biology and Conservation - Asia Pacific Conference	10 - 13 September 2019 at MAS Athena, Thulhiriya, Sri Lanka	Geo-Informatics as A Tool for Assessment of Village Tank Cascades
	2	32 nd Annual Congress of Postgraduate Institute of Agriculture	19 - 20 November, 2020	Application of Standard Precipitation Index (SPI) to assess rainfall variability in an area occupied with small tank cascades in Dry Zone of Sri Lanka
A.R.M.Meththa Prabodhani Menike	1	BAS-TWAS-CASAREP, International Young Scientists Meeting 2019, The theme of the meeting is Impact of Climate Change-A Way Forward.	28-30 September 2019, Bangladesh Academy of Sciences, Dhaka, Bangladesh	NA
M. M. G. S. Dilini	1	7th International Conference on Water and Flood Management (ICWFM)	Date: March 02-04, 2019 Place: Bangladesh University of Engineering and Technology, Dhaka, Bangladesh	Distribution, Access and Gendered Roles of Common Property Water Resources in Bhotechaur, Nepal
	2	GEOETHICS & GROUNDWATER MANAGEMENT CONGRESS (GEOETH&GWM' 20)	Date: May 18-22, 2020 Place: Porto-Portugal	Role of groundwater as a climate change adaptation strategy in dry zone farming systems, Sri Lanka
	3	36th International Geological Congress (Theme 21: Earth Observation System – Climate Variables, Proxies	Date: November 09-14, 2020 Place: India Expo Mart Ltd, NCR, Delhi, India	Climate Change Adaptation Strategies in Dry Zone Farming Systems in Sri Lanka: A Review

		and Modelling (Symposium 21.2 Climate Proxy Records: A Tool for Future Climate Modelling )		
Sumaiya Binte Islam	1	4th ICSD International Conference on Sustainable Development Towards Green Future	18-19 February 2020, UIU, Dhaka	Socio-economic impact on salinity intrusion: A survey among the people of Bagerhat district
	2	8th ICWFM	29/03/2020- 31/03/2021	
Lamiya Sharmeen Jaren	1	Adaptation Futures 2020	29 September - 1 October 2020, India	Barriers to Adaptation to Water Poverty Under Changing Climate in Peri-urban Areas of Bangladesh
E.M.Gimhani.P. Hemachandra	1	Association for Tropical Biology and Conservation - Asia Pacific Conference	10 - 13 September 2019 at MAS Athena, Thulhiriya, Sri Lanka	Geo-Informatics as A Tool for Assessment of Village Tank Cascades
	2	32 nd Annual Congress of Postgraduate Institute of Agriculture	19 - 20 November, 2020	Application of Standard Precipitation Index (SPI) to assess rainfall variability in an area occupied with small tank cascades in Dry Zone of Sri Lanka
	3	8th International Conference on Water and Flood Management (ICWFM).	29-31 March,2021	A Sustainability Index for Assessing Village Tank Cascade Systems (VTCs) in Sri Lanka
Shreeya Lohani	1	4th International Conference Kathmandu Symposia on Advanced Materials-2018	October 26-29,2018, Kathmandu	Synthesis and Characterisation of Zirconia Nanoparticles using zingiberofficinale and investigate the microbial activity
	2	First Science, Information and Technology National Youth Conference-2018	June 15-17,2018, Lalitpur	Synthesis and Characterisation of Zirconia Nanoparticles using zingiberofficinale and investigate the microbial activity
Purnima Acharya	1	International Conference on Water and Flood Management (ICWFM- 2021)	March 30, 2021 Presented Virtually	Causes and Management of Damaging Flood Incidences in Rapidly Urbanizing Areas of Kathmandu Valley: A Case Study of Flood event in Bhaktapur District, Nepal

#### ANNEX 4: EMPLOYMENT STATUS OF FELLOWS

Name	Cohort	Institution	Government Organization	Academic Institution	National/ International NGO and Others	Higher Study
Manimozhi	1st	CWR				Junior Research Fellow - DST INSPIRE, Centre for Water Resources, Anna University
Deepika Laxme	1st	CWR			GIS Engineer (Officer); Darashaw& Co. Pvt. Ltd., Chennai	
Poonam Pandey	1st	NEC	Hydropower Engineer at Department of Electricity Development / Ministry of Energy/ Government of Nepal			
Purnima Acharya	1st	NEC			DRR Officer at People in Need	
Anupama Ray	1st	NEC			Water and Climate Consultant in International Water Management Institute, Nepal (August 2020 to January 2021)	
					Water and Climate Research associate, Center of Research for Environment, Energy and Water (CREEW), Nepal (NGO) - (February 2021 to till date)	
Rabeya Sultana	1st	BUET		Assistant Professor, Khulna University, Khulna , Bangladesh		
Gimhani	1st	PGIA		Lecturer (Probationary), Department of Agricultural Engineering,		



				Faculty of Agriculture, University of Peradeniya, Sri Lanka	
NazwaTahsin	2nd	BUET			NeuroLandscape (Nature Connection & Mental Health of Communities)
ManisaSah	2nd	NEC	As site supervisor, (Civil engineer)		
Sivaranjani	2nd	CWR			Project Coordinator & Tamilnadu Consumer Protection And Environmental Research Centre (Sep 2021 To Oct 2021), Sri Infrastructure And Water Environs Consultants (Opc) Private Limited From Nov. 2021
Radha Dhakal	3rd	NEC	Engineer at Kathmandu valley water supply management board		
Nabina Prajapati	3rd	NEC			Water Supply Designer, Freelance
Zarin Subah	2nd	BUET			Ph.D. student and Teaching Assistant
Sumaiya Islam	3rd	BUET		World University of Bangladesh	

## ANNEX 5: PUBLICATION STATUS OF FELLOWS

- Abrunhosa, Manuel, António Chambel, Silvia Peppoloni, and Helder I. Chaminé, eds. *Advances in Geoethics and Groundwater Management : Theory and Practice for a Sustainable Development: Proceedings of the 1st Congress on Geoethics and Groundwater Management (GEOETH&GWM'20), Porto, Portugal 2020*. Advances in Science, Technology & Innovation. Cham: Springer International Publishing, 2021. <https://doi.org/10.1007/978-3-030-59320-9>.
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- Das, Anutosh, Sumaia Kashem, and Mahamudul Hasan. *Using Market Mechanism to Stimulate Sustainable Use of Non-Renewable Environmental Resource, Groundwater: Lesson Learnt from North-Western Bangladesh*, 2020.
- Dilini, M. M. G. S., E. R. N. Gunawardena, and S. Pathmarajah. "Impacts of Water Scarcity Induced Adaptation Strategies on Livelihood and Household Food Security of Farming Community of Horivila-Palugaswewa and Sivalakulama Cascades of Sri Lanka." *Tropical Agricultural Research* 32, no. 4 (October 1, 2021): 418–25. <https://doi.org/10.4038/tar.v32i4.8510>.
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- Islam, Muhaiminul, Sumaia Kashem, Shameem Morshed, Md Mostafizur Rahman, and Anutosh Das. "Dynamics of Seasonal Migration of Rural Livelihood: Capital Formation Perspective." *Advanced Journal of Social Science* 5, no. 1 (June 3, 2019): 81–92. <https://doi.org/10.21467/ajss.5.1.81-92>.
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- Leya, Rabeya Sultana, Debanjali Saha, Sujit Kumar Bala, and Hamidul Huq. "Gender Vulnerability Assessment Due to Flood in Northern Part of Bangladesh (A Case Study on 2017 Flood)." In *Water, Flood Management and Water Security Under a Changing Climate: Proceedings from the 7th International Conference on Water and Flood Management*, edited by Anisul Haque and Ahmed Ishtiaque Amin Chowdhury, 235–49. Cham: Springer International Publishing, 2020. [https://doi.org/10.1007/978-3-030-47786-8\\_17](https://doi.org/10.1007/978-3-030-47786-8_17).
- Murshed, Mohammad N., Zarin Subah, and M. Monir Uddin. "Data Assimilation: Two Different Perspectives Based on the Initial-Condition Dependence." *ArXiv:2012.06883 [Math]*, December 12, 2020. <http://arxiv.org/abs/2012.06883>.
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- Nahin, Khadiza Tul Kobra, Rony Basak, and Rafiul Alam. "Groundwater Vulnerability Assessment with DRASTIC Index Method in the Salinity-Affected Southwest Coastal Region of Bangladesh: A Case Study in Bagerhat Sadar, Fakirhat and Rampal." *Earth Systems and Environment* 4, no. 1 (March 1, 2020): 183–95. <https://doi.org/10.1007/s41748-019-00144-7>.
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## ANNEX 6: TOPICS OF FIELD RESEARCH COMPLETED IN REGIONAL WORKSHOPS

Regional Workshop	Title of the presentation	Name of the SAWA Fellows	Coordinators
1st Regional Workshop	Common Property Water Resource: Distribution, Access and Gendered Roles	Mafruha Akter, Poonam Pandey, Deepika Laxme K, Sathya Dilini, Sunil Tiwari	Dr. Carolin Arul, Mr. Robert Dongol
	Feminization in Agriculture and its impact on Women in Khalde village	Lamiya Sharmeen, Mohanabitha B, Kowshayini P, Purmina Acharya, Ayush Yadav	Prof. Sucharita Sen, Prof. Shahjahan Mondal
	Gender perceptions of Climate Change	Anupama Ray, Narendra Bahadur Shahi, Gimhani Paboda, Sadiksha Chauhan, Manimozhi Rajavelu	Dr. N.D. K. Dayawansa, Ms. Shreya Chakraborty
2nd Regional Workshop	the intersection between gender and water within diverse livelihood practices	Deepa Neupane, Rabeya sultana Leya, J. Sivaranjani, S.D.N.M. Senadeera, ZarinSubah	Dr Carolin Arul and Dr Tanusree Paul, Ms Shreya Chakraborty
	the social, economic and environmental vulnerability due to natural and human-induced disasters	Sumaia Kashem, Shreeya Lohani, Shanmuga Priya, Meththa Prabodhani Menike	Dr N K D Dayawansa, Dr Shahjahan Mandal, Dr Sreenita Mondal
	the impact of anthropogenic factors on water resources and to assess the gendered impact of degradation of water resources	M Manisha, Manisha Sha, Chaya Dissanayake, NazwaTahsin	Dr Robert Dongal, Dr SooryaVennila
3rd regional workshop	Urban Flood Vulnerability due to Nivar cyclone in Velachery, Chennai.	Meena S	Ms Shreya Chakraborty and Dr Sreenita Mondal
	Evaluation of Water Availability and Domestic Water Consumption: Survey in Welimada, Sri Lanka.	Awanthi Jayasekara	
	Impact and Adaptation to Flood: An Example from "Kospothuoya" stream, Kurunegala, Sri Lanka	Asiri Ranasinghe	
	Assessment of Domestic Water Availability in Uhangoda, Idampitiya Areas in Mawanella, Sri Lanka	Chaminie Wanasinghe	

Implementation of water supply act and the potential impacts in Mylapore, Chennai	Melba Respina B
Inequality in accessing irrigation water from Putheri tank at Kancheepuram taluk	Priyadharshini R C
Appraisal of river pollution on service communities of the Shitalakshya river with a gender perspective	Khadiza Tul Kobra Nahin
Assessment of Domestic Water Availability after the devastating earthquake at kharanitaar and buduneintregatedsettlement,Nuwakot,Nepal	Sulochana Dhungana
Water inequality with gender lens: A case study on Tejgaon slum in Dhaka city	Sumaiya Binte Islam
Dealing with Iron Contamination in Drinking Water in Haripur Union of Rajshahi	Sahika Ahmed
Changing pattern in Quality and Quantity of Water Supply available at an old settlement in Bhaktapur.	Nabina Prajapati
Peak flow change in Kathmandu after Melamchi coupled with climate change	Radha Dhakal



# ANNEX 7: APPLICANT VERSUS RECRUITMENT STATUS FOR SAWA FELLOWS

Institutions	Cohort	Applied	Appeared before interview committee	Awarded
BUET	1st	10	10	3
	2nd	15	15	3
	3rd	8	8	3
CWR	1st	13	13	3
	2nd	13	13	3
	3rd	8	8	3
	4th	8	8	4
NEC	1st	7	7	3
	2nd	10	10	3
	3rd	6	6	3
PGIA	1st	17	12	3
	2nd	16	8	3
	3rd	10	8	3

## ANNEX 8: CALL FOR WORKING PAPER SERIES

This is a call for papers towards a Working Paper Series on the theme - **Water, Climate Change and Society in South Asia** - targeted at recipients of the SAWA Fellowship administered by SaciWATERS and financially supported by IDRC, Canada. It seeks to provide a forum for the SAWA Fellows to disseminate their inter-disciplinary research on the complex relationships between water and climate change and their socially differentiated impacts on society. The Working Paper series is an attempt to support SAWA fellows get mentored and capacitated hands-on for scientific writing and a step towards a proposed edited volume/issue publication.

Water resources in South Asia are being impacted by a wide number of factors, such as urbanization and land use change, globalization, greater involvement of non-state actors; and climate change and variability. The Covid-19 pandemic has brought attention once again to the necessity of access to safe water and sanitation. This is evidenced by the rapid spread of the disease in areas characterized by high population densities and limited access to basic infrastructure. There is increased attention to the different ways in which climate change and water security issues are inter-related. This relationship manifests in the form of changes in precipitation patterns; changing seasonal distribution of rainfall; increasing intensities of precipitation over a shorter duration; instability in trends of precipitation, increased incidence of flooding and extreme events. Both, the lack of as well as an unexpected excess of precipitation can lead to constraints on water availability and access for society. The increased instability of precipitation and other climatic aspects can lead to high uncertainty with regard to planning, preparedness, coping and adaptive responses to these changes leading to greater vulnerabilities for society with regard to water access.

The burden of this increasing uncertainty and resulting constraints on water availability is however not borne by a homogenous population, rather by a population structured by inherent inequalities. Therefore as the access to water changes on account of the above factors, these effects are socially differentiated. While some sections may be able to cope better with these constraints and uncertainties, vulnerable sections suffer disproportionately. This socially differentiated experience of and response to this climate change induced water insecurity follow intersectional structural axes of class, caste, religion, gender, and other social categories. Policies that do not acknowledge as well as explicitly address such inequalities tend to flow along the existing social cleavages and concentrate the policy benefits among those who have more access to resources and social capital, thus exaggerating the vulnerability of the weakest sections.

SaciWATERS invites working papers from the SAWA Fellows on the interdisciplinary analyses of the relationships between climate change, water and society. **These papers should address the socially differentiated impacts of the changing access to water in a larger context of climate change.** Contributors are encouraged to use conceptual lenses or theoretical frameworks that encourage the integration of the social with the natural sciences. Contributions should speak to themes that highlight the socially differentiated nature of these processes. Scholars are encouraged to engage with concepts of gender and social inclusion, vulnerability, adaptation and resilience, or other frameworks that inform the current discourses on climate change vulnerability and adaptation.

Methodologically, research could be located in qualitative, quantitative or mixed methods approaches. SAWA Fellows are encouraged to use this as an opportunity to integrate their learnings on gender and water, and inter-disciplinary field research methodology trainings in the SAWA programme. They are encouraged to juxtapose some of the concepts and theories learnt in the training programmes with their empirical material. Each working paper could be authored by one or more SAWA Fellows, located within the same institute or across South Asia. We encourage the involvement of one or more senior researchers/faculty/SAWA coordinators/research supervisors on the papers as co-authors. In cases, where two or more SAWA Fellows co-author a paper, they are encouraged to consider their research in a comparative perspective, highlighting the rationale for comparison, but also bringing out important similarities or differences across the cases researched by them, respectively.

#### **Important deadlines for the Working Paper Series:**

**Call for Papers and Concept Note – 20<sup>th</sup> March 2021**

**Submission of Abstracts – 31<sup>st</sup> March 2021**

**Decision on acceptance of abstracts – 10<sup>th</sup> April 2021**

**Submission of Working Paper - 10<sup>th</sup> July, 2021**

**Feedback on working paper - 31<sup>st</sup> July, 2021**

**Submission of revised paper - 31<sup>st</sup> August, 2021**

#### **Guidelines for abstract:**

Each abstract should be 300- 500 words long and submitted along with five keywords. The abstract should mention the rationale and objectives of the study; specify the methodology and present the key results.

#### **Guidelines for working paper:**

Each working paper should be about 6000-8000 words long and submitted with five keywords. It should present the objectives and rationale for the research, grounded in a review of the relevant literature. The methodology and rationale for the choice of methodology should be specified. This should be followed by a description of the key research findings. The paper should provide a discussion of the contribution to knowledge of the subject domain, and relevance for theory and practice. It should conclude with a mention of the limitations of the research and scope for future research. Authors must ensure consistency between the literature cited in the text and the literature listed at the end in the reference list and use the APA style of referencing.

#### **Papers submitted:**

Authors (SAWA fellows)	PI	Co-authors	Title
P. Acharya	NEC	M. Wrobley, R.Dongol	An Analysis of Urban Flooding and Sustainable Adaptive Interventions in Kathmandu, Nepal
E.M.G.P. Hemachandra	PGIA	N.D.K. Dayawansa, Ranjith Premalal De Silva	Assessing sustainability of an ancient irrigation system – Application of a sustainability assessment index for Horivila Palugaswewa Cascade System in Anuradhapura Sri Lanka
Lamiya Sharmeen Jaren,	BUET	M. Shahjahan Mondal	Socially-differentiated impacts of dynamic water poverty under changing climate in peri-urban areas around dhaka,



<b>Rabeya Sultana Leya,</b>	bangladesh		
<b>Khadiza Tul Kobra Nahin</b>	BUET	M. Shahjahan Mondal, Sonia Binte Murshed, Sara Nowreen	Assessment of adaptation tipping points with gender perspectives in the floodplain of Brahmaputra River
<b>Sumaiya Binte Islam</b>			
<b>Sahika Ahmed</b>			
<b>Meena Sakthivel Pandian</b>	CWR	Ramji Vaidhyanathan, Poulomi Banerjee	Groundwater Vulnerability at Nature - Society Interface: A Case study of Chittar Sub basin
<b>Priyadharshini R C</b>	CWR	Caroin Arul	Impact of Climate Smart Agriculture through Sustainable Irrigation Management and Conservation Tillage Practices for Maize Production.
<b>Melba Respina B</b>			
<b>Anupama Ray</b>	NEC	Vishnu Prasad Pandey, Robert Dongol	Climate Change, Differential Impacts on Women and Gender Mainstreaming: A Case Study of East Rapti Watershed, Nepal
<b>Sumaia Kashem</b>	BUET	Sonia Binte Murshed, Sara Nowreen, M. Shahjahan Mondal, Sujit Kumar Bala	Future of Right to Water for Urban Poor in Dhaka City under Changing Climate
<b>Zarin Subah</b>			
<b>Nazwa Tahsin</b>			

## ANNEX 9: External Links and Attachments

1. SAWA Regional Workshop Report (2018) –  
<http://www.saciwaters.org/sawaleadershipprogram/wp-content/uploads/2019/04/SAWA-Regional-Workshop-2018-report-1.pdf>
2. SAWA Regional Workshop Report (2019)  
<http://www.saciwaters.org/sawaleadershipprogram/wp-content/uploads/2020/07/2nd-SAWA-Regional-workshop-Report-2019.pdf>
3. SAWA Regional Workshop Report (2020)  
<http://www.saciwaters.org/sawaleadershipprogram/wp-content/uploads/2021/10/SAWA-Regional-workshop-2020-Report-Final.pdf>
4. SAWA Training of Trainers Report (2020)  
<http://www.saciwaters.org/sawaleadershipprogram/wp-content/uploads/2021/10/SCaN-SAWA-Report-1.pdf>
5. SAWA Research Tool-Shop Report (2021)  
<http://www.saciwaters.org/sawaleadershipprogram/wp-content/uploads/2021/10/Report-Research-Tool-Shop.pdf>
6. Project dissemination documentary (2021)  
<https://www.youtube.com/watch?v=h4gLC9hd1Tc>
7. Dissemination of events in Newsletters  
<https://cap-net.org/workshops-in-asia-research-methods-gender-and-water/>  
<https://cap-net.org/climate-leadership-and-interdisciplinary-research-methods/>
8. Project Profile publication in wH2O journal of gender and water  
<https://repository.upenn.edu/cgi/viewcontent.cgi?article=1077&context=wh2ojournal>
9. SAWAS Journal archives  
<http://saciwaters.org/sawasi.php>
10. Inception Meeting Report  
<http://www.saciwaters.org/sawaleadershipprogram/wp-content/uploads/2019/04/Inception-meeting-Report-2018.pdf>