January 2021

Annual Report of
Coca-Cola Department of Regional Water Studies

January- December 2020

Highlights

This report gives information related to the activities of the Department carried out during January -December 2020. These activities include:

- Student Admissions/Placements/Major Projects
- Academic activities
  - Online Classes & Semester Examinations
  - Major Project Opportunities
- Special Achievements by Students
- Events/Seminars/Workshops
- Collaborations & MoU
- Field Based Learning
- Projects/MoU
- Research Publications

The table below summarises the activities carried out by/achievements of the department during January-December 2020:

Items	Count
Research/Conference Publications	14
Events/Seminars/Workshops	24
Field Based Learning	2
Projects/MoU	4

1 Student Admissions/Placements/Major Projects

1.1 Admissions

In 2020-2022 batch, a total of 18 students have taken admission for Master's programme out of which 12 students are in MSc while 6 in MTech programme.

S. No.	Name	Course
1	Aluri Sai Vardhan	M.Sc.
2	Anubhuti Shekhar	M.Sc.
3	Ayush Tyagi	M.Sc.
4	Dayadra Mandal	M.Sc.
5	Manika Saxena	M.Sc.
6	Palash Kandey	M.Sc.
7	Rishi S Nair	M.Sc.
8	Rohit Anand	M.Sc.
9	Sahil Sanjay Majmudar	M.Sc.

10	Sayan Debnath	M.Sc.
11	Shivani Jadaun	M.Sc.
12	Srishti Ramnani	M.Sc.
13	Kasturi Basu	M.Tech
14	Mayank Prasher	M.Tech
15	Nidhi Nitin Puranik	M.Tech
16	Anil Kumar Maddipatla	M.Tech
17	Raghav Raja	M.Tech
18	Balpreet Kaur	M.Tech

One PhD student also has joined the department, Ms. Chetna Kulhari and will be conducting her research in the area of waterscapes.

1.2 Placements

In spite of the tough period caused by the pandemic, majority of the students in 2018-2020 batch have been placed. Those who are yet to be placed are mostly very specific about the job profile and turned down the offer from their Major project organisation. The student placement for the batch 2018-20 is as follows:

Sl. No	**Name**	**Degree**	**Placement Status**
1	Hardi Sukhadiya	MTech	Consultant, Neta Analytics Private Limited
2	Sidhant Raheja	MTech	Managing Director, Raheja Ecotech Engineers Pvt Ltd
3	Palash Raghava	MTech	Consultant, SG Analytics
4	Akash Gaur	MTech	Consultant, SG Analytics
5	Manjaut Saluja	MTech	Consultant, SG Analytics
6	Aishani Goswami	MTech	Consultant, ACT
7	Nitish Rai	MTech	Consultant, TERI
8	Apoorv Nandwana	MTech	Consultant, Collectives for Integrated Livelihood Initiative
9	Vinni Munjal	MTech	Consultant, UNDP
10	Ananya Malik	MSc	Hosachiguru, Bangalore
11	Dikshita Arora	MSc	Attending training for navy job
12	Tejaswi Joshi	MSc	Consultant, SG Analytics
13	Rashi Kakkar	MSc	Open to jobs

1.3 Major Project Opportunities

The student major projects for the batch 2019-21 are still in progress. Eight out of ten students secured offers from various organisations. The remaining two are searching for further opportunities.

S.No.	Name	Program	Organisation
1.	Aayush Saigal	MTech WREM	Royal Haskoning DHV
2.	Niharika Labhsetwar	MTech WREM	IIT Bombay
3.	Preethi Vasudevan	MTech WREM	Wetlands International
4.	Sougata Bera	MTech WREM	TERI SAS - Solidaridad
5.	Sandipan Samanta	MTech WREM	Taru Leading Edge
6.	Lipi Gandhi	MSc WSG	Taru Leading Edge
7.	Prutha Machiwal	MSc WSG	TERI SAS - Solidaridad
8.	Bhuyashee Rajkumari	MSc WSG	CTRAN, Assam

2 Academic Activities

All Academic activities during the lockdown period, namely, online classes, official and project meetings, and semester examinations have been conducted through online mode using MS Teams platform.

2.1 Online Classes & Semester Examinations

The department, aligned with our university guidelines, continued with online classes through MS Teams platform so as to ensure no disruption in the academic activities during the lockdown period. Our department has also completed the evaluation in time and the results have been published.

2.2 Major Projects in the Fourth Semester

The major projects that 2018 batch students took up involved both field and desktop-based tasks. The students who had field component in their study had either fully or partially completed their survey or data collection before lockdown. However, those students who could not continue with their laboratory experiments modified their thesis objectives to substitute with more desktop-based activities through statistical, geospatial and numerical analyses. As the project timelines, timely evaluations were carried out for monthly progress reports, mid-term presentation, final presentation and thesis followed by results publishing.

The Major Project thesis titles of 2018-20 batch students are as follows:

Student	Degree	Organization	Topic
Hardi Sukhadiya	MTech	International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)	Optimization of natural resources for sustainable watershed development
Vinni Munjal	MTech	UNDP	Sustainable groundwater management - protecting the precious invisible

Manjaut Saluja	MTech	Hindustan Unilever Foundation	Water Use Optimization through Sustainable Practices for Rice Production
Aishani Goswami	MTech	Centre for Environment Education	Drinking water security in Gujarat: Understanding approaches
Apoorv Nandwana	MTech	UNNATI Organisation for Development	Analysis of local institutions and governance and designing water budget model - case studies of villages in western Rajasthan
Nitish Rai	MTech	TERI	Impact of LULC and Climate Change on Natural Flow of Manjra River Basin
Akash Gaur	MTech	Centre for Ecology Development and Research, Dehradun	Impact of land cover changes on the ecosystem services provided by the Renuka Wetland
Siddhant Raheja	MTech	TERI SAS	Financial evaluation of evaporators for zero liquid discharge in industries
Palash Raghav	MTech	Centre for Ecology Development and Research	Impact of Urbanization on Water Resources & Opportunity of RWH structures in Nainital
Rashi Kakkar	MSc	Centre for Urban and Regional Excellence (CURE)	Rainwater harvesting potential in north-west Delhi and assessment of water supply sustainability
Tejaswi Joshi	MSc	Barton Breeze Pvt Ltd	Comparative analysis of nutrient contents and water use in vegetables grown by hydroponics and commercial agriculture
Ananya Malik	MSc	Council on Energy, Environment and Water	Climate Change, Urbanisation, and Wetlands: A case study of Arthala lake
Dikshita Arora	MSc	Irrigation Department, Punjab	Water Energy Food nexus and its effects on groundwater- a case study of Ludhiana, Punjab

3 Special Achievements by Students

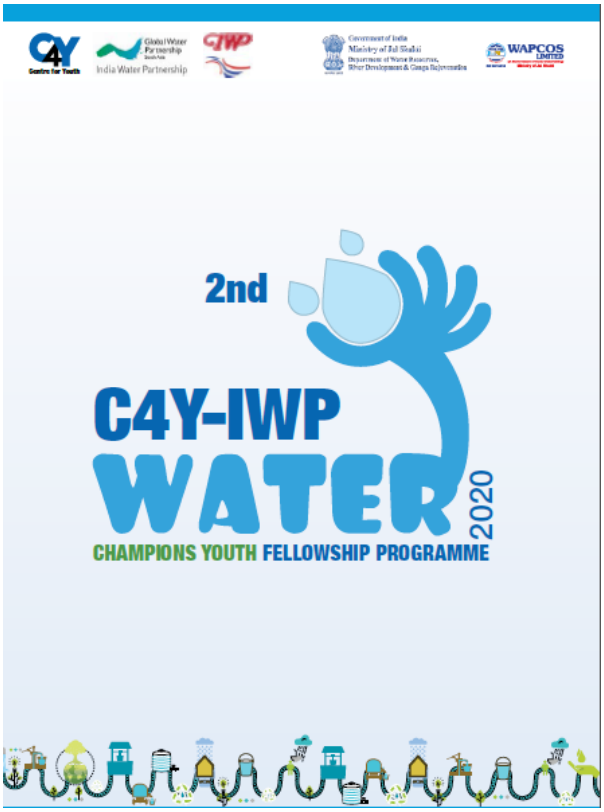
2nd C4Y-IWP Water Champions Youth Fellowship Programme 2020

The C4Y-IWP Water Champion is a prestigious fellowship on India's water concerns awarded jointly by C4Y, IWP, GWP, Jal Shakti and WAPCOS with duration of 3 months (June-September 2020). The main objectives of this fellowship are: i) To understand India's water concerns: Raise awareness and social consciousness on India's pressing water concerns, ii) To engage with existing problems and solutions: See first-hand the problems and strategies to deal with the water exigency in the country, iii) To evolve as aspiring young leaders: Develop leadership skills among youth towards a sustainable future, iv) To support partner

organisations: Contribute positively in the non-profit partner's working processes, v) To develop strategies: Explore disruptive concepts for reducing the India's pressing water concerns and vi) To implement projects: Research, ideate and execute the innovative water smart solutions.

The winners of the programme are eligible for a cash prize of 10,000INR.The following students of our department have won the scholarship from 2019 batch:

- Ekansha Khanduja
- Lipi Gandhi
- Niharika Labhsetwar
- Preethi Vasudevan



4 Events/Seminars/Workshops

4.1 Organised by the department

4.1.1 Workshop on "Redefining Urban Water Space" on Tuesday, 28 Jan 2020

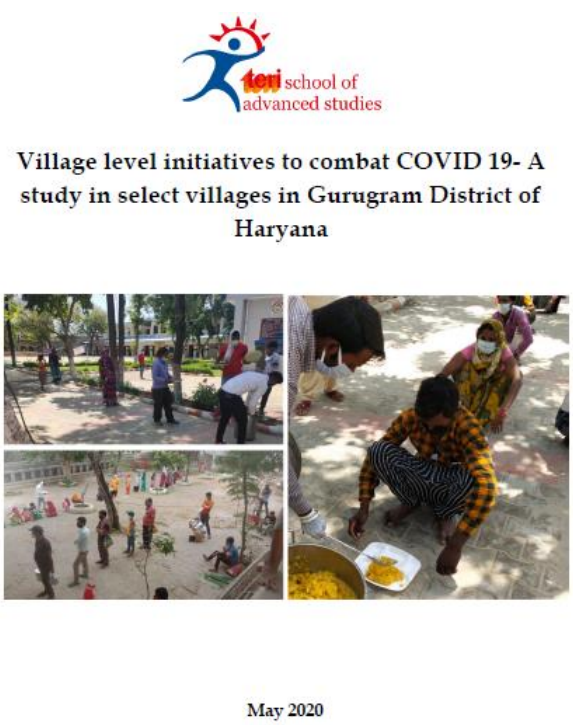
One-day workshop was organised on Tuesday, 28 Jan 2020 by our department in association with the DHAN Foundation on 'Redefining Urban Water Spaces' with focus on reviving of urban water bodies. Many eminent speakers (Ms. Madhulika Choudhary, CEO, Dhruvansh, Mr. Ankit Srivastava, Technical Advisor, Delhi Jal Board, Mr. Lokendra Balasaria, Architect and Urban Planner, Mr. Lalit Bajare, Managing Director, Nixie Engineers, Dr. Prasanna Jogdeo, Co-Founder, Lemnion Green Solutions Pvt. Ltd and others) participated in the panel discussion that focussed on 360 degree view of sustainable management of urban water space. The panel discussion was followed by breakout sessions for specific strategies to rejuvenate urban waterbodies.

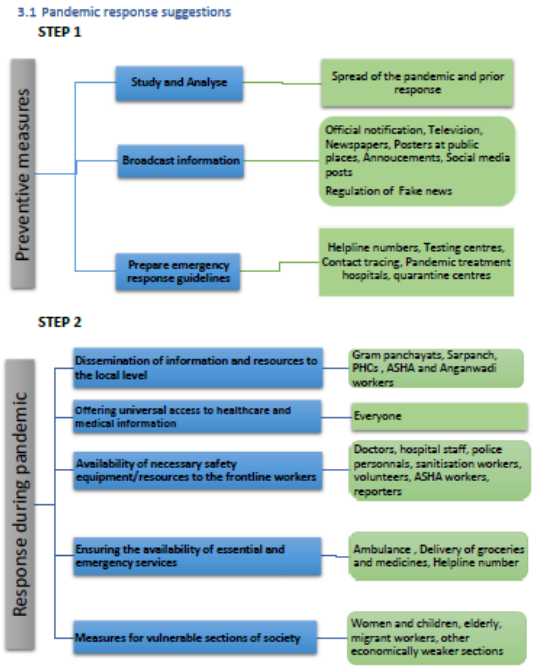
4.1.2 Study on COVID 19 Measure and Suggestion for MHRD during April-May 2020

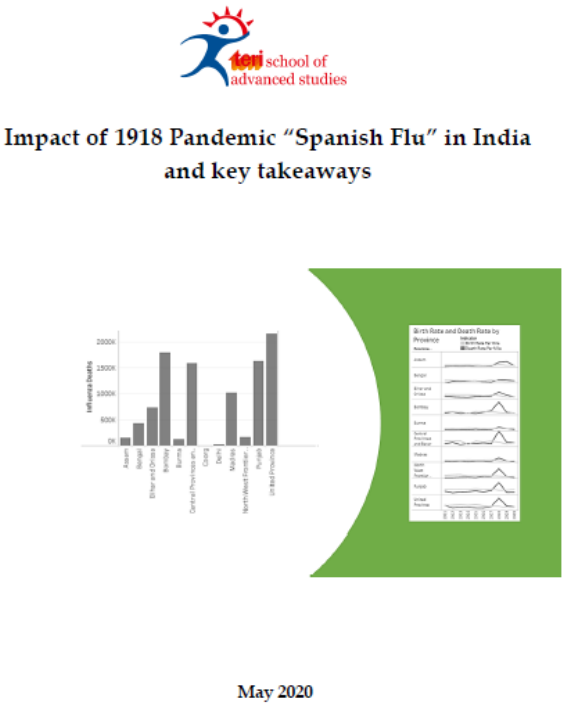
Dr Fawzia Tarannum with the support of student volunteers undertook three studies as part of the request by AICTE on behalf of the Minister for Human Resources Development, GoI who desired that Universities / Institutions study the following issues:

i. The best works done regarding response COVID-19 by 5-6 adjoining villages / villages adopted by the University / Institute;
ii. How the above villages have withstood the various challenges posed by COVID-19;

iii. How India handled the 1918 Pandemic (H1N1 Virus) “Spanish Flu (Influenza) and what measures were taken to boost the Indian economy after the Pandemic.





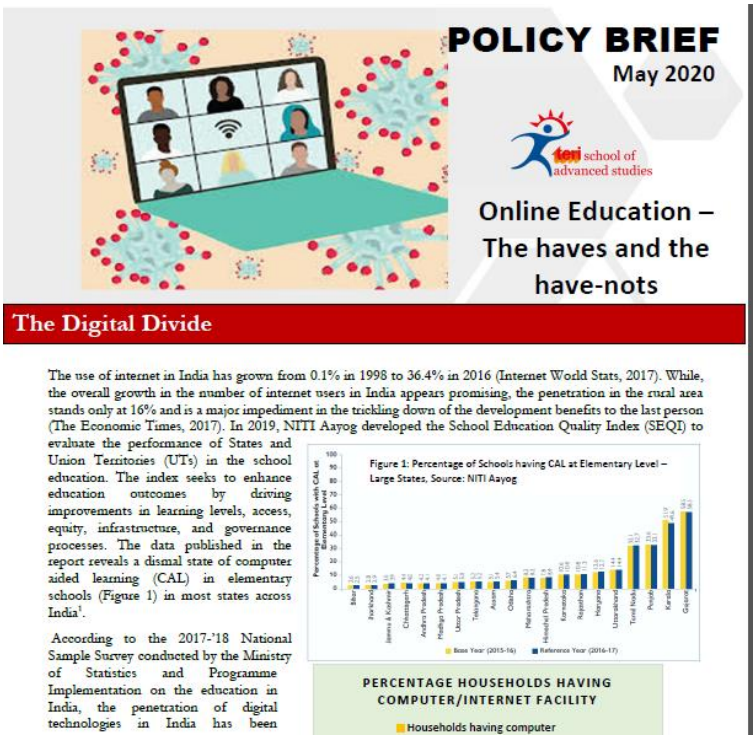


The three reports produced were titled:

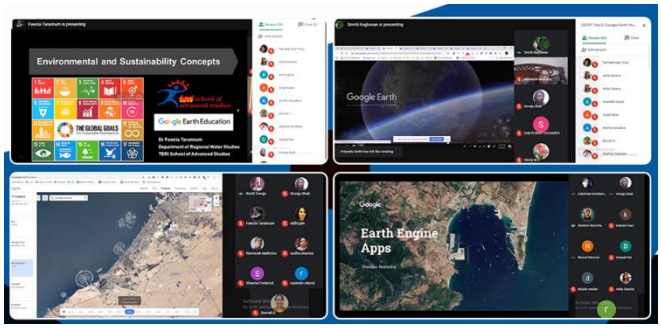
- **Village level initiatives to combat COVID 19- A study in select villages in Gurugram District of Haryana**

- **Impact of Spanish Flu in India and Key Takeaways**
- **Policy brief on Online Education for Schools - Digital Divide, Challenges and Suggestions**

These reports have been submitted to AICTE.

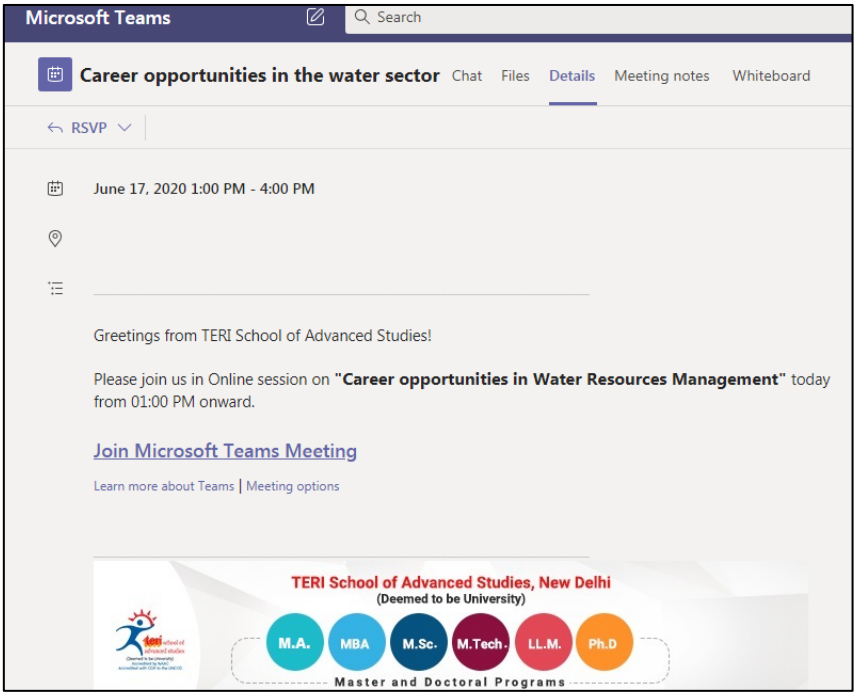


4.1.3 Google Earth Sustainability Program for School Teachers from 02 -23 June 2020, supported by Google Earth Education



Dr Fawzia Tarannum organised an online training program from 02 -23 June 2020, on the use of Google Earth Tools and Applications as teaching aids for integrating Environment and Sustainability education in the school curriculum. Dr Sherly M A also extended her support. The program had an overwhelming response from across the country. A total of 34 teachers participated in the training. Student volunteers were assigned to each teacher and they helped them to navigate through the tools and develop lessons across all subjects ranging from languages, sciences, social sciences to mathematics and physical education. The content that is developed in the training shall be compiled into e-resources and uploaded on the TERI SAS website.

4.1.4 Webinar on 'Career opportunities in the water sector' open to all prospective students on 17 June 2020



Our department organised a webinar on 'Career opportunities in the water sector' through MS Teams platform to introduce the prospective students of water department about: 1) Department's vision, mission and activities; 2) Programmes offered by the department; 3) Career prospects in water sector; and 4) Addressing queries raised by the applicants. The session started with the welcome speech by Prof. Kansal along with a brief introduction of the faculty members, the importance of water as a career and a brief note on of the department. This was followed by Dr. Fawzia Tarannum with a presentation of the programmes being offered by the department. Finally, the applicants were given opportunity to interact with the faculty members and clarify their queries related to water as a subject and career. The duration of the entire session was about 3 h between 1:00-4:00PM.

4.1.5 SWASH 2020: Online Training in Rainwater Harvesting and Management during 14, 16 & 18 July 2020

As part of SWASH 2020 (Save Water Save Humanity), our department along with the support from Tata Steel and the Climate Reality Group successfully organised a 3-Day online training programme in rainwater harvesting and management. The workshop was set around the need for community level water conservation in the light of spatial and temporal variability in the rainfall due to climate change. The primary focus of the workshop was to build capabilities in rainwater harvesting (RWH) techniques for addressing water security issues.

The workshops spread across 3 days (between 5:00-7:00PM) discussed on various topics that included:

a. Understanding Rainwater Harvesting
b. Estimating water demand and the potential for the RWH
c. Residential/ Resident welfare association (RWA) Rainwater Harvesting Setup Planning
d. Costing and Maintenance

There was an overwhelming registration and participation with e-certificate awarded to all successful participants. The participants included Youth, Resident Welfare Association (RWA) Members, Practitioners, Policy and decision makers, Representatives from Civil Society Organizations, Corporate, Academia and NGO.

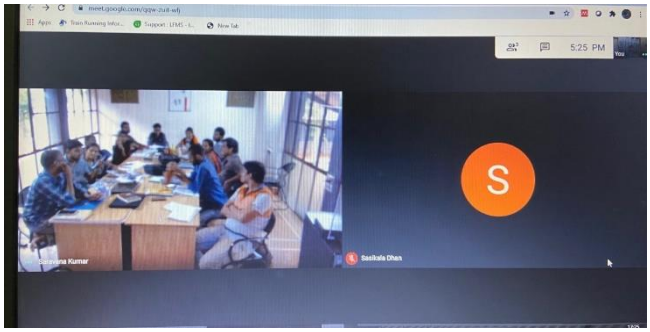
4.1.6 Webinar on 'Gendered Impacts of Work From Home (WFH) during COVID-19 Pandemic' on July 17, 2020.

Dr. Fawzia Tarannum organised an online discussion on the "Gendered impacts of Work From Home during COVID-19 Pandemic' on July 17, 2020 to deliberate on the magnitude of the impacts of the pandemic, especially on vulnerable communities. The webinar was attended by roughly 50 participants. The insights provided by experts Dr Anjal Prakash, Research Director and Adjunct Associate Professor,

Bharti Institute of Public Policy, ISB and Ranjana Das, Regional Manager, Oxfam India brought out an undeniable fact that whatever we know about the ordeal of the vulnerable communities till now isn't even the tip of the iceberg.

4.1.7 Talk on Gender Equity and Water Management for DHAN Foundation on 14 Aug 2020

Dr. Fawzia Tarannum conducted an online talk on Gender, Equity and Water Management for the trainees of DHAN Foundation on 14 Aug 2020.



4.1.8 Online workshops on Agriculture and Land-based water pollution in collaboration with the Dhan Academy, 18-21 November & 7–11 December 2020

Our department conducted the workshop spread across two weeks:

a) Agriculture-based water pollution: 18-21 November 2020

This one-week workshop introduced the participants to the various aspects of agriculture water pollution and management by investigating the sources, types, extent, consequences of the pollution and management techniques through effective policies. The workshop aimed at inspiring the participants to make conscious effort towards sustainable agriculture within their sphere of actions. The various sessions included:

Session 1: Agriculture and Traditional Practices - Dr. Sherly M. A.

Session 2: Agriculture Water Pollution – Ms. Ranjana Ray Chaudhuri

Session 3: Agriculture Water Quality Management – Prof. Arun Kansal

Session 4: Relevant Policies and Success Stories in Sustainable Agriculture - Dr. Fawzia Tarannum, Dr. Shiv Singh Rawat (Superintending Engineer, Irrigation and Water Resources Department, Haryana), Dr Murtaza Hasan (Principal Scientist, Indian Agriculture Research Institute)

The overall outcomes of the workshop included: Learning of traditional practices followed in agriculture, Understanding the sources, types and consequences of agriculture water pollution, Learning the various management techniques of sustainable agriculture aligned with the policies and Recommendations for new polices relevant to agriculture water pollution

b) Land-based water pollution: 7-11 December 2020

This one-week workshop introduced the participants to the various aspects of land-based sources of pollution and management by investigating the sources, geographical extent, and interlinkages. The workshop aimed at generating awareness regarding the challenges in this

field, the need to understand existing status and tools of management practices. The various sessions included:

Session 1: Land soil water continuum - Dr. Sherly M. A.

Session 2: Pathways of contamination – Prof. Arun Kansal

Session 3: Role of urbanization and industrialization – Ms. Ranjana Ray Chaudhuri

Session 4: Surface and Groundwater pollution- Prof Sirajuddin Ahmed (Department of Civil Engineering, Jamia Millia Islamia)

Session 5: Pollutant estimation and analysis-accounting – Prof. Arun Kansal

Session 6: Role of Policies in positive interventions – Mr. Zeeshan (Senior Project Associate, Solidaridad), Dr. Fawzia Tarannum

The overall outcomes of the workshop included: Overview of the extent of challenges in different geographies, Understanding of the need to develop different strategies for different sources of land-based water pollution like landfills, municipal sewage, and industrial effluents and Ability to reflect on roles of existing assessment tools and policies in the sector.

4.2 Organised by other organizations

4.2.1 Participation in writeshop on 'Education for Sustainable Mountain Futures' during February 25-29, 2020, Kathmandu, Nepal

Prof. Arun Kansal participated as an expert member in a writeshop for drafting a strategy paper on *Education for Sustainable Mountain Futures* at Kathmandu, Nepal during February 25-29, 2020.

4.2.2 Visit to Kala Kho dam, Dausa District, Rajasthan on 17 Feb 2020

In collaboration with the Centre for New Perspectives, a field visit to Kala Kho dam in Dausa District of Rajasthan was conducted. The team included Dr. Fawzia Tarannum, Ms. Ranjana Chaudhuri and Dr. Sherly M. A. along with a few other experts. An investigation on the reasons of

drying-up of the reservoir was conducted along with strategies to rejuvenation. A meeting was also conducted with the district authorities to understand the existing situation and to collate their inputs to the rejuvenation strategies.

4.2.3 Speaker in the webinar on "Climate action in a post Covid World" organised by the Climate Reality on the occasion of the Earth Day on 22 April 2020

Dr. Fawzia Tarannum was one of the panelists in the webinar on Climate action in a post Covid World" organised by the Climate Reality on the occasion of the Earth Day on 22 April 2020. She spoke on the importance of water management in the context of COVID 19 pandemic. She also shared her reflections on the relationship between outbreaks of these new viral infections and climate change and the sector that has been impacted the most due to COVID-19.

4.2.4 Invited Speaker in the webinar on 'Implication of COVID on Education Sector and the way forward from the lens of Climate Change and Sustainability', organised by the Climate Reality India and the Deccan Education Society, on 15 May 2020.

Dr Fawzia Tarannum was an invited speaker in the webinar on 'Implication of COVID on Education Sector and the way forward from the lens of Climate Change and Sustainability', organised by the Climate Reality India and the Deccan Education Society, on 15 May 2020. The webinar provided a platform to share different viewpoints from the sustainability and green campus portfolio and the steps taken by universities and educational institutes in various part of the country to maintain continuity in the education and student engagement during the COVID 19 pandemic. The recording of the webinar is available on https://www.youtube.com/watch?v=wsEAJVFjI4g&t=5597s

4.2.5 Panelist in the discussion on Gender and Water: The Intersection, organised by the Centre for Social Research on 17 May 2020.

Dr Fawzia Tarannum was a panelist in the discussion on 'Gender and Water: The Intersection', organised by the Centre for Social Research on 17 May 2020. She discussed the meaning of intersectionality, how water crisis disproportionately affects women and the ways in which we can make policies on water conservation gender responsive. The details of the discussion can be accessed from https://www.youtube.com/watch?v=enLCpTBrZvc

4.2.6 Invited speaker, New York Youth Institute 2020, organised by the Cornell University on 27 May 2020.

Dr. Fawzia Tarannum was invited to speak at first-ever virtual 2020 New York Youth Institute by the Cornell University. She interacted with the participants during the student immersion session on the topic "Water on my Plate" to help them appreciate how water is key to food security. She was one of the 20 experts invited to speak at the event from different institutes across the globe. http://project2385761.tilda.ws/

4.2.7 Invited speaker in the Department of Environmental Science, University of Kashmir, Srinagar on 8 June 2020.

Prof. Kansal was an invited to speaker for the One Day online seminar as part of the World Environment Day on 8th June 2020 by the University of Kashmir. The theme of the seminar was: “Time for Nature – Explore Nature with Iconic spots”.

4.2.8 Participation in the Workshop on 'From Ship to Coast: Blue Economy and Sustainable Livelihood’- DWIH New Delhi on 1st Oct 2020

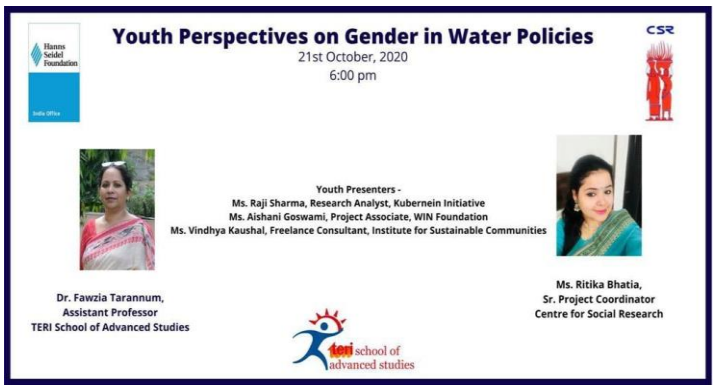
Dr Fawzia Tarannum participated in the workshop on Ship to Coast: Blue Economy and Sustainable Livelihood which is jointly organized by DWIH with the German Maritime Museum / Leibniz Institute for Maritime History. The aim of the workshop was to identify and prioritize short-term and long-term issues and corresponding areas of research on the following themes. It is also intended to discuss, discover and amplify good practices, methods and tools for science communication.

4.2.9 Webinar on Water and Climate Change during 24 Hours of Reality -Countdown to the Future on 11 Oct 2020

Dr. Fawzia Tarannum presented on Water and Climate Change during 24 Hours of Reality - Countdown to the Future on 11 Oct 2020. Awareness was generated among youth on the impact of Climate Change on Water Resources. The webinar was followed by a quiz. It was attended by 63 participants.

4.2.10 Discussion on Youth Perspectives on Gender in Water Policies in association with Center for Social Research on 21st October 2020

The department collaborated with the Center for Social Research to conduct a discussion on Youth Perspectives on Gender in Water Policies in association with Center for Social Research on 21st October 2020. Ms Aishani Goswami, Project Associate, Win Foundation and an Alimna of the M.Tech Water Resources Engineering and Management presented her Major Project Work in the discussion.



4.2.11 Invited Speaker at Cornell University for guest talk in the Course on The Global Food, Energy, and Water Nexus – Engaging Students from the US, China, and India to Chart a Sustainable Future on 01 Nov 2020

Dr. Fawzia Tarannum was invited by Cornell University to speak on Economic and social consequences of droughts and floods on farmers in the course on The Global Food, Energy, and Water Nexus – Engaging Students from the US, China, and India to Chart a Sustainable Future on 01 Nov 2020.

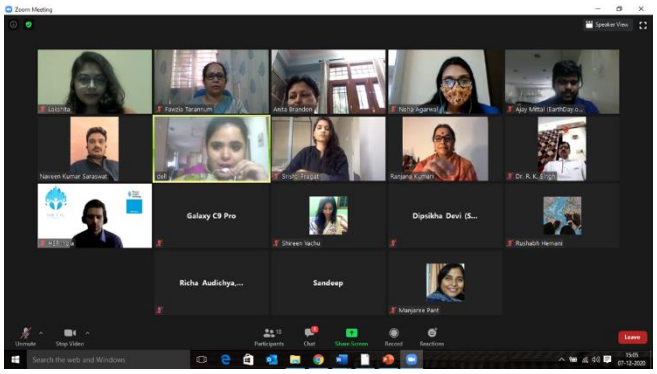
4.2.12 Participation in "Virtual Regional Dialogue on Agricultural Water Pollution and Water Management in South Asia" from November 17 – 19, 2020"

Dr Fawzia Tarannum participated in the "Virtual Regional Dialogue on Agricultural Water Pollution and Water Management in South Asia" from November 17 – 19, 2020" organised by Caritas Switzerland along with Local Initiatives for Biodiversity, Research and Development - Nepal, DHAN Foundation – India, Arthacharya - Sri Lanka; and Caritas Bangladesh.

4.2.13 Invited speaker for the webinar on 'Building Sustainability and Climate Action at campuses' on 25th November 2020 organised by Climate Reality India and Krishna University, Andhra Pradesh

Dr Fawzia Tarannum was invited to speak in the webinar on 'Building Sustainability and Climate Action at campuses' on 25th November 2020 organised by Climate Reality India and Krishna University, Andhra Pradesh. The webinar will focus on the need for green campuses, which are environment friendly and sustainable. The talk focussed on climate crisis, need for sustainability education in the campuses and climate action.

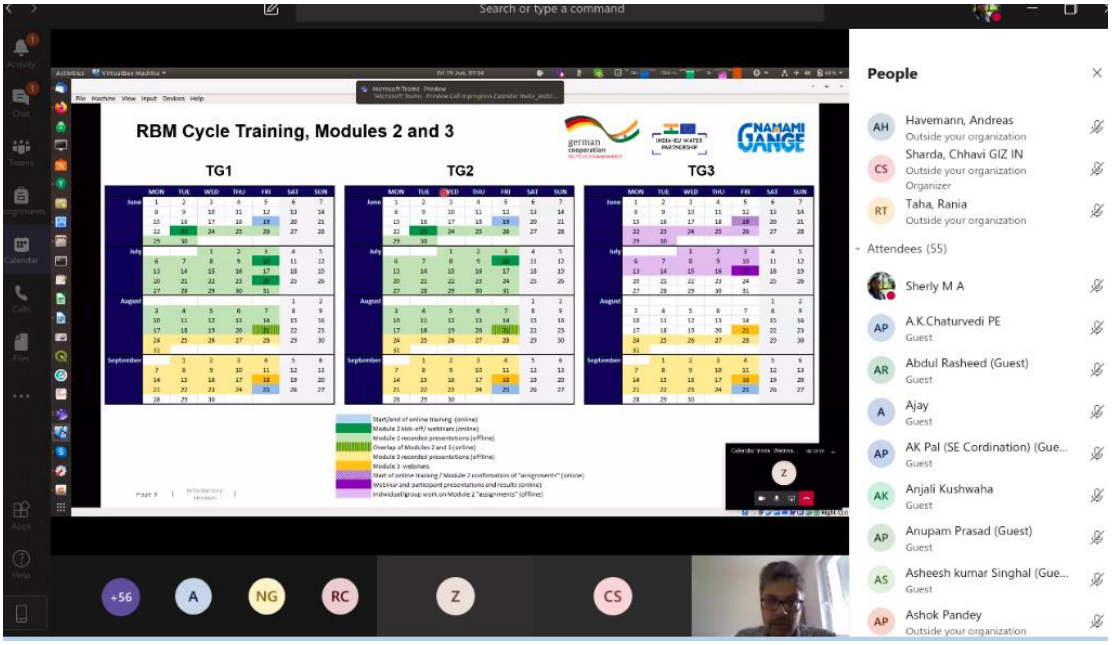
4.2.14 Panelist in the National Consultation on Creating a Strategic Framework for Gender-Inclusive Water Conservation Planning: Rajasthan organised by the Center for Social Research on 07 Dec 2020



Dr. Fawzia Tarannum was one of the panelists in the National Consultation on Creating a Strategic Framework for Gender-Inclusive Water Conservation Planning: Rajasthan organised by the Center for Social Research on 07 Dec 2020. The National Consultation was a closed-group meeting with stakeholders who play an important role in upholding the vision of making gender inclusive water policies. It was organised to propose key recommendations for mainstreaming gender in water policy.

4.2.15 Training sessions in the on-going RBM cycle 2 organised by GIZ with the support from NMCG

Ms. Ranjana Ray Chaudhuri, Dr. Fawzia Tarannum and Dr. Sherly M. A. have been participating in the River Basin Management Cycle 2 sessions conducted online by GIZ with the support of NMCG. The sessions are aimed at moulding trainers to conduct trainings on RBM practices as part of the Ganga rejuvenation initiative by NMCG.



4.2.16 Panelist in the discussion on 'Incremental Innovations: Taking small steps for a Sustainable lifestyle', in 'Sustainability Leadership Programme for Teachers' organised by Tata Steel and TERI during 25 November – 3 December 2020.

Ms. Ranjana Ray Chaudhuri was a panelist in the discussion on ''Incremental Innovations: Taking small steps for a Sustainable lifestyle', organised by Tata Steel and TERI during 25 November – 3 December 2020.

5 Collaborations & MoU

5.1 MoU with Canvest Infra

TERISAS, through the Coca Cola Department of Regional Water Studies, signed an MoU with Canvest Infra on 30 Sep 2020. Together they are setting up InfraCube, an engaging platform for knowledge creation, collaboration and entrepreneurial action built on a conducive dialogue between the key actors in the development, infrastructure, and finance. The platform in due course shall provide:

- Research & Content Development
- Education and Training
- Incubation Facility

5.2 MoU with the Dhan Academy

An MoU has been signed between TERI SAS and the Dhan Academy. Following which an online workshop on 'Agriculture and Land-based Water Pollution' was conducted during November – December 2020.

5.3 Discussions on collaboration with Daiki-Axis Japan for decentralised wastewater technologies

Prof. Kansal with the representatives from the Daiki Axis Japan Private Limited

A meeting with the executives from the Daiki Axis Japan was conducted over MS Teams on 1 September 2020 followed by a face-to-face discussion after which a proposal for collaboration has been submitted with a focus on the following areas:

- **TERISAS- Daiki Axis Incubation Centre**, for supporting and scaling up promising start-ups for decentralised treatment system. Currently there is no water related incubator in the country. The proposed incubator would propel start-up culture, create jobs, nourish innovative ideas and encourage new business models. Activities of the incubator may include - mentoring, counseling & training; business & marketing strategy support and value-added services such as - training sessions and workshops, professional advisory etc.
- **Research based adaptation and demonstration** of Jokasou system under various conditions including urban drains, integration with septic tanks and incorporating additional modules for resource recovery like Phosphorous.
- **Short-term training programmes** on design, operation and maintenance of wastewater treatment systems

6 Projects (Ongoing/Completed)

6.1 Project Guru-Jal with the District Administration of Gurugram, June 2019

The Guru Jal project was completed successfully with a concluding workshop to disseminate the findings of the study on 16 March 2020. The meeting was conducted at the Mini-Secretariate, Gurugram and was attended by the authorities, administrative staff and villagers. The workshop emphasized on the participatory approach from all stakeholders for successful implementation of the design recommendations.

6.2 Blue Green interventions for addressing flooding along Golf Course Road in Gurugram, September 2020

A 3-month duration project has been signed up in September 2020 with I Am Gurgaon on **Blue Green interventions for addressing flooding along Golf Course Road in Gurugram**. The project site is located between Sectors 26 and 56 along the Golf Course Road that is severely flood-prone in Gurgaon (Southwest of Aravalli biodiversity park) near the foothills of Aravalli Hills. The objective of the project is to propose blue green interventions for mitigating urban flooding with a special focus on:

i) Existing creek network (Creeks 1 to 4) and runoff capacity
ii) Existing stormwater drains and runoff capacity
iii) Existing innovative blue green interventions within the study area
iv) Proposing new blue green interventions to mitigate flooding

Three field visits were conducted to understand the hydrogeological characteristics of the site long with the flooding spots.

Field visit along the Gold course road in Gurugram with the representatives from the Administration and I Am Gurgaon on 12 September 2020 (left); Second field visit by Ms. Ranjana Chaudhuri, Dr. Fawzia Tarannum and Dr. Sherly M A on 12 September 2020. The location shown is Chakarpur-Wazirabad bundh, a green corridor in the project site (right).

The findings from the study were presented to both I Am Gurgaon and GMDA. The final report has also been prepared with a set of recommendations.

7 Field Based Learning

7.1 Field trip to Sanjay Van and Neela Hauz lake, Delhi on 26 February 2020

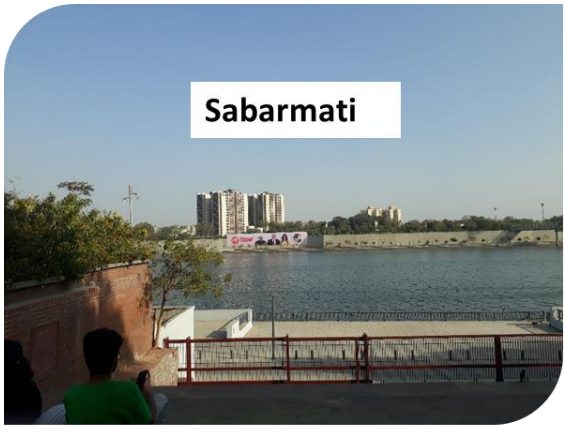
Neela Hauz lake is located within an urban forest, Sanjay Van within the city limits of Delhi. The lake is fed by the wastewater from a sewage treatment plant of Delhi Jal Board. The urban ecosystem maintained within the Sanjay Van naturally treats the waste water through an arrangement of multiple ponds that are connected through small check dams.

The students learned about the various treatment methods, economic and technical feasibility along with the ongoing monitoring and maintenance. As part of the visit, the students took the water and soil samples followed by testing in the lab to assess both soil and water quality.

7.2 Academic field trips to Ahmedabad for the batch 2019-2021 during 2-5 Mar 2020

Dr Sherly M A accompanied the student group who visited Ahmedabad for the academic field trip in the second semester. As part of the trip, they visited the following study sites:

1) Sabarmati Ashram and Sabarmati River front: Role of Sabramati Ashram in enhancing the hydrological characteristics of the Sabarmati River along with its catchment.
2) Nal Sarovar lake: Learned about the wetland ecosystem, ecosystem services and explored the land use types.
3) Space Applications Centre: Learned about various geospatial applications and relevant to water resources in particular. Also, there were demo sessions on sensor development followed by digital lab and capabilities showcase.
4) Tree Walks organised by the Second Alliance Foundation inside Parimal Garden, Ahmedabad: Learned about the co-existence of various trees, their characteristics and their relevance to ecosystem followed by class-room discussion regarding eco-friendly practices and importance of greens.



8 Research Publications

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Fawzia Tarannum (2020), 'Women as Agents of Change in Clean Energy Transition', Energy Future, TERI, Issue -Vol. 8(2) January-March 2020, 12-20
http://bookstore.teri.res.in/docs/magazines/Pages%20from_1_40_EF_Jan-Mar%202020.pdf

Ray Chaudhuri, R. and Sharma, P. (2020). "Climate Risk to Resilience-Analyzing short duration extreme rainfall for water planning in the megacity of Delhi." Journal of Disaster Advances, published June2020, E-ISSN: 2278-4543 Print ISSN: 0974-262X.

Yadav, V., **Sherly, M. A.,** Ranjan, P. and Prasad, V. (2020). "Clustering cities based on the categorized risks of plastics losses to the environment from landfills", International Conference on Resource Sustainability, Dublin (Ireland).

Yadav, V., **Sherly, M. A.** , Ranjan, P., Tinoco, R. O., Boldrin, A., Damgaard, A. and Laurent, A. (2020). "Framework for quantifying environmental losses of plastics from landfills". Resources, Conservation and Recycling, 161(104914), ISSN 0921-3449, DOI: https://doi.org/10.1016/j.resconrec.2020.104914.

Nanda, M., **Kansal, A.*,** Dana, C. (2020). 'Managing vulnerability to phosphorus scarcity in agriculture through bottom-up assessments of regional-scale opportunities'. Jr. Agricultural Systems. 184. Elsevier.

Goel, S., **Kansal, A.*** (2020). 'Phosphorous recovery from septic tank liquor: optimal conditions and effect of tapered velocity gradient'. Journal of Cleaner Production. 275. Elsevier.

Ray Chaudhuri, R.* and Sharma, P. (2020). 'An integrated stochastic approach for extreme rainfall analysis in the National Capital Region of India'. Journal of Earth System Science, Springer (accepted).

Ray Chaudhuri, R.* and Sharma, P. (2020).'Addressing Uncertainty in Extreme Rainfall Intensity for semi-arid urban Regions: Case study of Delhi, India.' Natural Hazards, Springer. DOI : 10.1007/s11069-020-04273-5; NHAZ-D-20-00020R1.

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Upadhyay, M. and **Sherly M. A.*** (2020). "Integrated Drought Vulnerability Index and Classification using Principal Component Analysis and Cluster Analysis – A Case study of India", Global Water Congress 2020, E-Conference, Jal Kranti Mission, 2-4 October 2020 (Full paper communicated).

Upadhyay, M. and **Sherly M. A.*** (2020). “Analysis of large dam storage capacity and its effect on water demand management in India”, International Conference on Sustainable Water Resources Management (SWARM 2020), Guwahati, Assam, June 19-21, 2020. (Full paper communicated)

Upadhyay, M. and **Sherly M. A.*** (2020). “Drought Vulnerability Assessment of India Using Meteorological, Agricultural and Socioeconomic Indicators”, AGU Fall Meeting 1-17 December 2020, E-conference,), URL: http://agu2020fallmeeting-agu.ipostersessions.com/Default.aspx?s=AB-18-DC-33-09-19-1D-87-6B-2F-5D-B5-F3-E6-3D-B9 (Poster presented).