Bridging the climate information gap for adaptation: Mainstreaming climate services into higher education in Bangladesh

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1. Introduction:

Bangladesh has proactively integrated climate change into national policies, and is renowned for constantly improving adaptation capacity. Yet, much of the focus has concentrated on long-term climate change scenarios and short-term weather forecasts. Additionally, most decision-makers (both policymakers and practitioners) lack the knowledge and skills to understand and use available climate information (past, present, short-, medium- and long-term future) that can support locally-led adaptation and reduce loss and damage. Bangladesh Meteorological Department (BMD) has been working with IRI and others to improve not only the range and quality of information products but also its communication modalities. International Centre for Climate Change and Development (ICCCAD), International Research Institute for Climate and Society (IRI), Bangladesh Meteorological Department (BMD), and International Maize and Wheat Improvement Center (CIMMYT) jointly created the Bangladesh Academy for Climate Services (BACS) to strengthen national climate services through training, academic engagement and stakeholder convening.

This report describes the outcomes of an Adaptation Research Alliance (ARA) funded microgrant project aligned with the BACS goals of co-producing climate services content that can help bridge the climate services knowledge gap in Bangladesh through transdisciplinary collaboration. The project was a collaboration between several universities across the country to support a long-term vision where young people are trained in every climate-sensitive sector to make use of all information available to improve their resilience.

The ARA microgrant project deliverables included (i) Defined climate service learning outcomes tailored to local curriculum needs and educational frameworks; (ii) Design of the climate services curriculum based on learning outcomes defined; (iii) A roadmap and commitment for developing the curriculum pending future funding; (iv) A commitment to integrating curriculum to be developed into their academic programs from working group members, pending future available funding.

Select Bangladesh universities with an interest in climate services curriculum were invited to participate in the project, including the Institute of Water and Flood Management (IWFM)-Bangladesh University of Engineering and Technology (BUET), the Department of Agricultural Extension and Rural Development (DAERD), Patuakhali University of Science and Technology (PSTU), the Department of Environmental Science, Bangladesh Agricultural University (BAU), the Department of Environmental Science and Management (DESM), Independent University, Bangladesh (IUB), and Dhaka University (DU). Further details on university partners available in Appendix 2 and Appendix 3.

BACS team with Professors from five universities

2. Methods

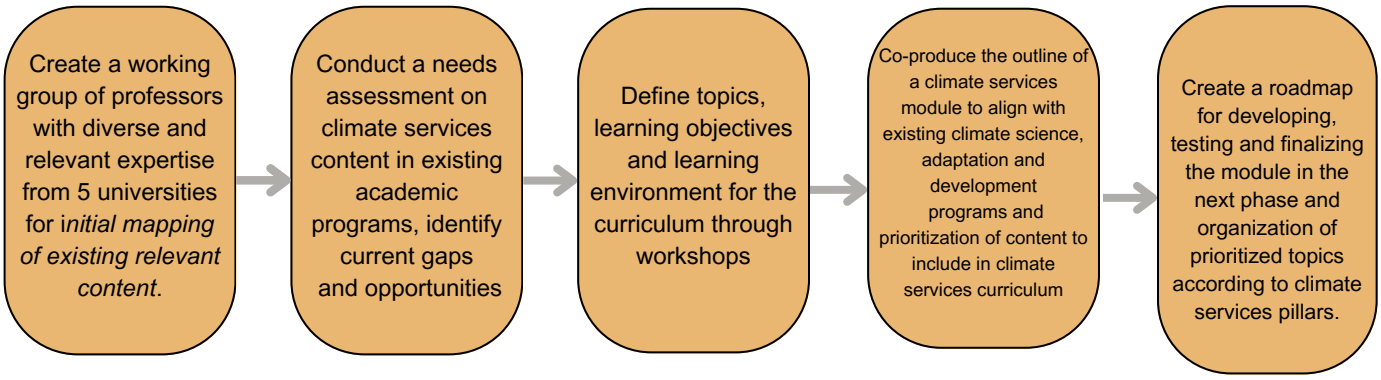
2.1 Overview

This project followed the **ADDIE** model, a well-established pedagogical approach for instructional design, well suited for university-level curriculum as designed in this project. This project included **(A)nalysis** and **(D)esign** steps. The **analysis** phase included taking stock of the currently available relevant curriculum, and gathering information on the learners and the learning context. The **Design** of the curriculum included the identification and prioritization of desired topics, generating learning outcomes for these topics, and mapping these topics across the four pillars of climate services. The subsequent **(D)evelopment, (I)mplementation** and **(E)valuation** steps in the ADDIE process can be pursued pending further funding support.

Timeline for ARA Project Activities:

- February 2022: Created a working group of professors with diverse and relevant expertise from 5 universities.
- March 2022: Conducted a needs assessment on climate services content in existing academic programs, identifying current gaps and opportunities. A virtual workshop on March 3 and an in-person workshop on March 25 was then conducted to define topics, learning objectives, and learning environment for the curriculum through workshops
- April 2022: A final virtual workshop on April 13 was conducted to finalize the co-produced report defining priority climate service content to be designed and developed to align with existing climate science, adaptation, and development program and contents in consultation with professors, regional ARA knowledge sharing meetings.

Collaborative processes were fully integrated into project methods and activities. The professors were engaged at all stages of the project, including initial calls, a needs assessment, 2 virtual and 1 in-person workshop, engagement in regional ARA workshops, and final co-produced knowledge products.



Collaborative processes for mainstreaming climate services into higher education in Bangladesh

2.2 Curriculum design workshop activities

Initial mapping of existing relevant content: Professors from the five universities followed a rigorous co-production method through discussion, interactive exercises, voting, prioritization, and consensus to reach the final proposed curriculum. In preparation for the workshops, professors were asked in a survey to identify existing courses and modules that they were aware of that already included climate services-relevant content.

Professors discussing and considering topics relevant to climate change in the pre-existing courses and modules

Joint discussion on existing content and content gaps: During the workshops, professors were first divided into two groups of diverse backgrounds and were asked to discuss and list content and topics that they consider relevant to climate services in those pre-existing courses and modules, and existing gaps in content that they consider important to address. A short introduction on climate services pillars was provided to lay out the foundations and ensure a common understanding of climate services to support the discussion, and co-facilitators were present and available to provide additional guidance in inputs.

Developing learning outcomes of the courses: Originally described as "competencies" in the ARA micro grant proposal, initial co-production feedback from professors communicated that "learning outcomes" are more commonly used in their universities. A group discussion was held to define the learning outcomes of the desired and prioritized courses. All the professors discussed together to outline the rationale and goal and usability behind the course and the potential aim of each of the courses. The discussion also highlighted the structure of courses, such as curriculum, and the credit of the courses (whether 2 or 3 credits) would be decided based on the contents as; whether the courses should be a module, a stand-alone course, or integrated into the existing courses of their curriculum. Also, professors emphasized that these courses should be part of the Master's level later on.

Prioritization of content to include in climate services curriculum: Once the existing topics and gaps were identified, professors were asked to vote on which of these existing topics was the most important to include in a climate services curriculum. To vote, each professor was given stickers of a different color, that they could stick on each topic listed on the flipcharts to mark their preferred topics. A topic receiving five stickers would be unanimously considered important to be included in the final curriculum. A topic receiving just one sticker would be considered important by one of the professors but not all and would thus be less prioritized. For the exercise, it was clarified that:

- Votes were informed by each professor's academic experience, perception of needs and potential for each topic, and uptake and usability.
- Inputs were only about desired content, and those modalities would be discussed in a separate exercise.
- The pre-existing topics that were listed were each taught in some, but not all universities. As a result, a gap in content in one university can be filled by existing content in another university.

Organization of prioritized topics according to climate services pillars: The topics that were prioritized in the voting process were then organized by professors into the four pillars of climate services (generation, translation, communication, and use of climate information), and a cross-cutting section. Professors also discussed relevant chronological sequence for the topics to be taught, and identified topics that could be optional or reserved to more advanced tracks, depending on the program.

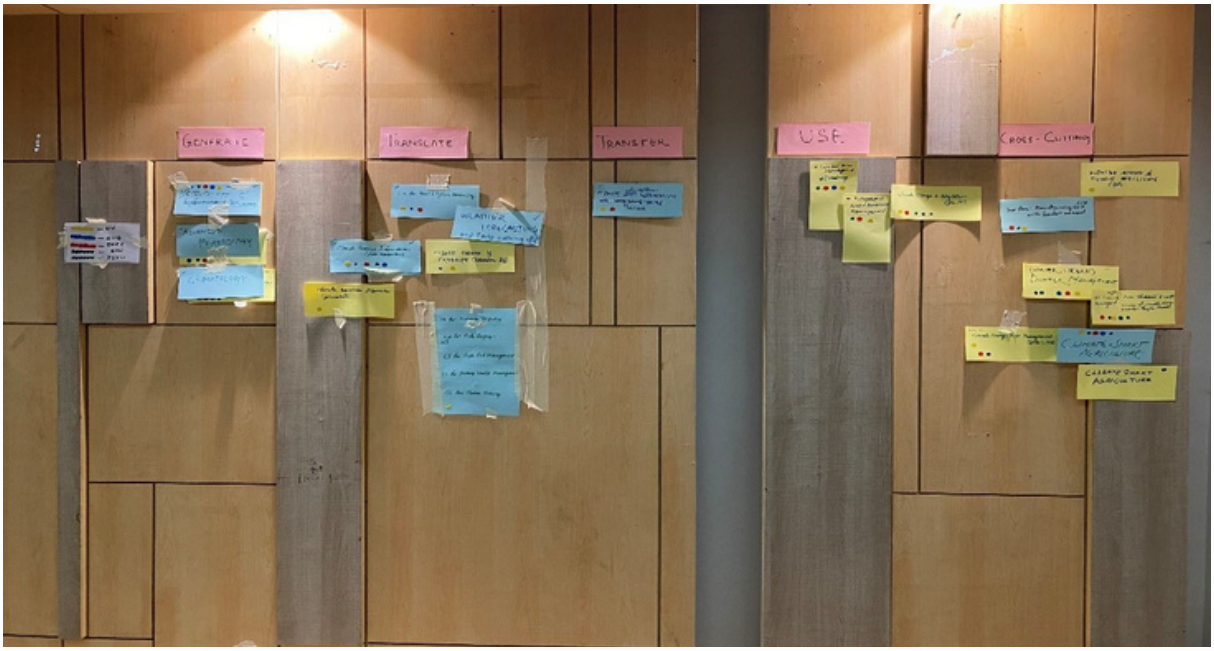
3. Results

The results of this project included the assessment of currently available relevant climate services content and the definition of priority areas of content development in support of a robust curriculum on climate services in Bangladesh. We also defined the target learners and learning environments for the new curriculum topics and evaluated gender and diversity considerations.

Various courses related to climate services are already being taught across the universities. However, climate is typically integrated into specific courses, but no university currently teaches climate services as a full-fledged subject. See Appendices for a full list of current relevant courses.

3.1 Proposed climate service curriculum

In the following table, the proposed courses (prioritized by professors through a voting system) are shown as per the four pillars of climate services and a “cross-cutting” theme along with their rationale and learning objectives. The professors all noted the importance of the need for internal university capacity building on these topics and the importance of cross-pollination of topics and themes across disciplines to prevent knowledge and expertise from being “siloed.” In this context, curriculum describes the full range of proposed climate service topics being offered, while “content” describes specific courses or topics to be included in a potential overall curriculum. The table below was fully formulated by the professors.



Professors discussed and arranged the proposed courses into the four pillars of climate services and a cross-cutting theme, according to their rationale and learning objectives.

Table 1: Proposed new courses

Courses	Rationale	Learning Objectives	Universities interested
GENERATION			
Advanced Meteorology	Understanding meteorological processes will aid in comprehending climate and weather variability, two critical components of climate services.	• Understanding and explaining the basics of meteorological processes at various scales. • Learning key meteorological terms and concepts. • Understanding the distinction between climate and weather • integrating and applying weather and climate knowledge and products in real-world situations.	BUET DU IUB PSTU BAU
Climatology	Understanding the climate system is vital to comprehend and interprete climate and weather data and design the services accordingly.	• Acquiring knowledge of physical, regional, and applied atmospheric and climate systems. • Understanding natural system dynamics and evolution. • Understanding climate data, climate information, and their limits. • Explaining long-term weather patterns and climate variability and change.	BUET IUB PSTU BAU
Climate data processing, analysis, and assessment	To enable students to handle large climate data and statistics, analyze it, and generate datasets and products to support climate risk management and climate services.	• Learning how to identify, access, and use different types of data. • Learning how to use open source tools for data processing and deal with missing value: data transformation, interpolation, and data correlations • Learning downscaling, pattern recognition, and machine learning • Learning effective data management system • Learning different tools, such as: IRI data library.	BUET CIMMYT

Courses	Rationale	Learning Objectives	Universities interested
Climate and earth system modeling/Climate Modeling and Risk Management ***(Master's level programmes)***	To increase the understanding and predictability of seasonal, yearly, decadal, and centennial-scale and climate phenomena through climatic models. It will also assist to enhance climate services through the output of climate and earth system models.	• Learning the use of climate models to forecast future climate change. • Learning the components of the climate and earth system model. • Understanding how to generate scenarios and predictions through models. • Understanding how to verify and validate climate projections and handle uncertainties in climate modeling	Universities interested
TRANSLATION			
Climate Services Information	Availability of the climate services information will benefit diverse climate-sensitive stakeholders to take effective decisions in mitigating climate risks.	• Learning about the purpose and importance of climate services. • Understanding the different pillars of climate services. • Developing the ability to translate, communicate and integrate climate information into decisions • Understanding the uses of climate services in different climate-sensitive sectors.	BUET DU IUB PSTU BAU
Weather Forecasting and Early Warning System	The availability of weather forecasting and early warning information will help climate-sensitive actors, such as farmers, fishermen, etc., protect from calamities and disasters.	• Learning about the weather forecasting • Enabling to convert the scientific data into the usable format • Understanding the use of climate information • Explaining the correlation between weather forecasting and EWS. • Learning about the limitations of weather forecasting and EWS.	BUET DU IUB PSTU BAU

Courses	Rationale	Learning Objectives	Universities interested
Vulnerability Assessment	To know the concept of vulnerability and how vulnerable physical systems are, what frameworks of vulnerability exist, the scale of vulnerability, and how vulnerability methods can be applied to adaptation. Also, how vulnerability can help better target climate services	• Learning the concept of vulnerability and the drivers and evaluation of framework. • Learning socio-economic vulnerability, integrating different vulnerability domains, and spatial-temporal vulnerability. • Identifying indicators and selection of vulnerability methods and effective planning modalities.	BUET
The development process of application-specific climate services through climate data	Climate service development technique for sector-specific and application-specific DSS is very important for the climate adaptation process	• How to find out the climatic threshold for different applications of climate-sensitive sectors	BMD, BUET
TRANSFER			
Climate Information Dissemination and Process	Proper dissemination of climate information will aid stakeholders in making timely and effective decisions and protecting resources.	• Understanding climate information. • Learning the target audience and data requirements. • Exploring communication modes or methods, techniques, and information dissemination processes.	BUET DU IUB PSTU BAU
USE			
Climate Change and Adaptation	Climate services will help develop effective adaptation strategies and implementation plans in the different time scales of climatic risks.	• Understanding the different climate change adaptation responses associated with risks, costs, and benefits. • Recognizing critical theories, analytical techniques, and sources of information relevant to climate change adaptation. • Learning about devising appropriate coping and adaptation strategies using climate information.	BUET DU IUB PSTU BAU

Courses	Rationale	Learning Objectives	Universities interested
CROSS-CUTTING			
Climate Smart Agriculture	Integrating climate services will help take timely climate-smart decisions in agriculture, design proper technologies, and implement decisions accordingly.	• Understanding the scope of climate-smart agriculture in Bangladesh • Exploring the potential of reducing GHG emissions and enhancing agricultural productivity • Learning about adaptation and resilience-building in the agriculture sector. • Exploring climate risk management opportunities in agriculture.	BUET DU IUB PSTU BAU
Application of remote sensing in climate change	To utilize the advanced capabilities of satellites to monitor extreme events, groundwater, coastal and water quality, crop monitoring, etc., and learn to use these technologies in climate risk management and climate services.	• Learning methods of remote sensing, monitoring of remote sensing, and extreme events. • Utilizing the RS in tackling sustainable goals. • Learning HYDRA (Hyperspectral Data Viewer fr Development of Research Applications), and QGIS tools to apply RS.	BUET DU BAU
Gender issues in climate services	Given the importance of climate science to a varied range of stakeholders, a thorough understanding of gender issues and the social inclusion of diverse groups would aid in the acquisition of information, skills, and a shift in attitudes about gender in the field of CSA.	• Learning gender implications in translation and transfer of climate services • Gaining knowledge and awareness on pressing gender issues and understanding why it is important to incorporate gender climate services • Being able to explain important concepts related to gender and social inclusion in climate change vulnerability and resilience • Gaining the ability to build gender-sensitive teams, conduct a gender analysis taking climate change adaptation and mitigation, and design gender-responsive climate-smart measures. • Being able to develop a proposal on how to mainstream gender in CSA.	PSTU DU BAU BUET CIMMYT

Courses	Rationale	Learning Objectives	Universities interested
		• Acquiring skills such as analytical and critical thinking, group and individual work, presenting, discussing, and conveying and defending one's own opinion.	
Climate Risk Assessment and Resilience (MS level Course)	To assess the climate risks at a local level to make effective changes through adaptation practices and strengthening community resilience	• Identifying the risks at a different level to specify the appropriate adaptation strategies and attain climate resilience	DU BUET
Climate change and nature-based solutions ***(Could be part of a module rather than a whole new course)***	To link climate change problems with natural phenomena, where climate services can help build NbS and better manage natural resources	• Learning how to solve the climate change problem without harming the environment • Understanding the modalities to adopt actions, by considering environmental issues.	DU BAU CIMMYT
Green recovery from the coronavirus pandemic	To undertake climate services measures that can help in strengthening the recovery plans from the current global pandemic without harming the environment.	• Learning sustainable solutions to the coronavirus pandemic. • Designing recovery plans from the pandemic without harming the environment.	DU

3.2 Learner profile

In addition to assessing content priorities, the target learners for the proposed topics were also defined. The workshop's professors, partners, and practitioners highlighted in the workshop that these courses will be designed primarily for Master's or graduate-level students or as advanced-level undergraduate content. The majority of courses are geared toward developing students' fundamental understanding of climate and its components, as well as their ability to use various climate science methods and methodologies. Undergraduate courses focus on fundamental introductory science, whilst Master's level courses are more concerned with the application and practical demonstrations of the tools and processes.

For some courses, most notably those focused on the generation of climate services, a science background would be a prerequisite. There is also interest in a multidisciplinary course on the fundamentals of climate services that could be accessible to students of all disciplines without prior knowledge of climate science or related topics.

There is high interest in courses appropriate for the professional development of individuals with work experience, as a longer-term association or working experience in a particular sector may help individuals learn many issues and then apply their learning in a practical way in both the public and private sector. Course development should also take into consideration the wide range of ages for potential candidates for these courses as candidates may include fresh graduates and also working professionals with decades of experience. Other considerations discussed included cost, length of time away from academia, learning disabilities, part-time students, fee, and length of the course.

Proposed courses were highlighted and categorized by different universities according to the target learners.

Many differences between universities were also noted, for example, students at IWFM-BUET learn about climate science and services from an engineering viewpoint, whereas in PSTU and BAU, students are focused on agriculture-related themes, and students at PSTU study gender and gender-targeted development, which is critical for climate information dissemination. Students at IUB get degrees in environmental management and are taught from a global perspective. Undergraduate students study geography and fundamental climate science, while graduate students study the implications of climate services in numerous sectors (in this case, urban development). At Dhaka University, climate-related courses are given at several levels, from undergraduate to MPhil/Ph.D. Additionally, they learn about the principles of climatology, practical consequences, and policy-planning procedures, as they vary by department.

All factors above will need to be considered in further design and development of the climate services content. The increased job potential in the climate services sector has also been noted, as learning climate services will provide credentials to future generations, increasing their ability to compete for jobs and secure their employment.

3.3 Learning environment

The learning environment includes the location of learning such as classrooms, and field trips and also virtual spaces such as online learning, or blended to include both in person and virtual modes. The learning environment also includes learning formats (lectures, practical exercises), resources (tools, technology, journal access), and accessibility considerations such as language of instruction. Critical aspects of the learning environment were considered in the context of the new content proposed to optimize learning.

Professors expressed their opinions about the learning environment for different proposed courses.

Professors agreed that science-based courses should include lab and field activities, case study, journal review, model demonstrations, and group discussions. In-depth research experience and discussions with a wide set of people can expand student understanding. Additionally, because climate services require scientific expertise, model demonstrations have been proven to be an efficient method of presenting potential solutions to climate crises. Traditional academic environment formats including class lectures, assignments, knowledge synthesis, and reports continue to also be useful strategies. Professors also highlighted that when complex terms are taught during lecture, both English and Bangla language can be used.

In terms of the course's delivery mode, the advantages and disadvantages of both physical and online classrooms have been explored. Online or remote classes frequently

aid in the acquisition of theoretical information and save time for students commuting long distances. The majority of teachers, on the other hand, have indicated using Google Classroom, Google Meet, or Zoom to hold classes and offer course materials. However, because some software does not permit students to record lectures, they may be unable to record all lessons owing to internet or network issues. Additionally, it can be difficult for professors to maintain the students' attention in online classes.

In terms of physical classes, lab activity is an integral part of requiring universities to have lab facilities with computers, advanced technologies, software, etc. Additionally, students require computers to collect climate or weather data from various websites and to work independently on any research task. Additionally, professors emphasized the value of internships and thesis projects for doing in-depth study on climate services and gaining practical knowledge. Internships and thesis work can be critical for transferring academic knowledge to the real world and gaining additional experience in this area.

3.4 Diversity and Inclusion Considerations

Diversity and inclusion was also considered across the content, learners, and learning environment. All agreed further design, development and implementation of the proposed content should fully examine how to ensure the content is as broadly accessible as possible going forward. For example, although courses are typically taught in English, Bangla content could be valuable to reach more learners. It was also noted that given women's and other marginalized people's greater susceptibility towards climatic threats, climate services courses should be tailored to maximize usability and application for them. Further discussion included recommendations to encourage open dialogues that include both men and women in order to improve awareness of climate services concerns from all viewpoints. Scholarships and fellowships and quota systems might be considered to promote more gender equality in the courses.

4. Conclusion and Roadmap for Curriculum Development

Based on the results of this project, there is great opportunity to enhance the climate services curriculum available within Bangladesh universities in alignment with the climate service topics proposed. Professors agreed to carry this work forward if resources become available to support the development and implementation of this content.

To develop a roadmap going forward, the professors defined the modality for integration of this content into the university setting. The professors generally agreed on the top three modalities for potentially integrating this content into the broader university curriculum, (i) developing specific courses to fit within existing programmes, (ii) developing content to integrate within existing courses, and (iii) developing short courses (with or without academic credit) or a diploma program. Professors agreed that the development of an entirely new graduate-level programme is not considered viable due to substantial administrative and financial challenges.

The specific new courses professors would like to add to existing programs include: Climate Modeling: Practical Implications of GIS and RS; Climate and Earth System Modeling; Climate Risk Assessment and Resilience; Climate Data Processing, Analysis, and Assessment by using GIS and RS. Developing content to integrate within existing courses. Content that the professors would like to integrate into existing courses includes Advanced Climatology/Meteorology, Climate Change Risk Management, Climate Change and Nature-based Solutions, Merits/Demerits of Coastal Embankment Projects, and Gender issues. For the development of Certificate Short Courses, the preferred modalities varied between universities based on their existing institutional context and target audience. Short courses varying in length between 3-6 months were suggested, as well as diploma courses and stand-alone modules.

The professors highlighted that any content development would need to be paired with training and capacity building for the professors and instructors (such as a Training of Trainers, (TOT) model), including support on the integration of gender perspectives. To work collaboratively across universities would also likely require a Memorandum of Understanding between universities. For the integration of new content into the universities in line with any of the proposed modalities, the professors noted that they will require technical support like computers, software, assignments, textbooks, teaching materials, recording, and field-based surveys. Administrative support needed would include approval from departments, faculty, academic council, and syndicate (for some but not all universities).

Professors from DU, BUET, IUB, PSTU and BAU attended the ARA Grant workshop, organized by ICCCAD, IRI, CIMMYT, BMD under the BACS umbrella

4.1 Additional Benefits of the Project

This project has several additional benefits worth noting here. Overall, professors enhanced their own awareness and capacity on the importance of climate services in Bangladesh through their engagement with this project. Methods used to gather results were requested by the professors so they could be further used and adapted by the professors within their respective universities. The co-production process also helped build and strengthen connections between universities interested in climate services, BMD as a climate services provider, and ICCCAD for convening, facilitating, and sharing expertise on climate service.

Appendix 1: Organizers

Scaling up climate services requires increased investment, which in turn requires an improved understanding of climate risks, climate impacts in specific sectors, and climate-resilient strategies, as well as better coordination between the generation, the translation, the communication, and the actual use of climate data, and information in climate-sensitive sectors. To address these issues, International Centre for Climate Change and Development (ICCCAD), International Research Institute for Climate and Society (IRI) at Columbia University, International Maize and Wheat Improvement Centre (CIMMYT), and Bangladesh Meteorological Department (BMD) co-founded the Bangladesh Academy for Climate Services (BACS) in January 2018. This academy is the very first of its kind in Bangladesh and goes beyond the often disconnected, ad-hoc, one-off workshop-based format of project-based activities by prioritizing holistic, high-quality, and sustainable capacity building to achieve the climate services goal.

Climate services are defined by the International Research Institute for Climate and Society (IRI) at Columbia University in terms of four pillars: production, translation, dissemination, and use. While generating climate data, it is critical to first establish a requirement for the data. Following generation, climatic data must be translated for specific user groups such as agriculture, public health, disaster management, natural resource management, or other related sectors. After translating climatic data, it is time to transfer it, which can be accomplished via a variety of formats or media. Climate data must then be employed in a variety of operational decision-making processes, policies, and plans. However, without institutional buy-in, climate services will have limited use.

Bangladesh Meteorological Department (BMD) is the nationally mandated provider of climate information in Bangladesh. The International Research Institute for Climate and Society (IRI) at Columbia University is working closely with BMD to support the development of best practices in the generation of climate services, and facilitate the translation, communication, and integration of that information across sectors. ICCCAD engaged in the role of knowledge broker in this project. CIMMYT supports research and integration of data and products into their work with agricultural communities and other sectoral stakeholders. Together, ICCCAD, BMD, IRI, and CIMMYT are well-positioned to support project activities across all four pillars of climate services.

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Appendix 2: Partner Universities

The partner universities, including public and private universities, in and outside Dhaka, are: Bangladesh Agricultural University (BAU), Bangladesh University of Engineering & Technology (BUET), University of Dhaka, Patuakhali Science & Technology University (PSTU), and Independent University, Bangladesh (IUB). These universities are part of the existing BACS network. The professors involved in the project team each came from departments within their universities that are relevant to climate services, such as climate science, agriculture, environment, water, and disaster.

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Appendix 3: Existing climate services-relevant content and courses in existing programs of participating universities

The professors listed the following courses related to climate services that already exist in their departments or the university's academic curriculum.

1. Agrometeorology
2. Climate Change and Adaptation
3. Climate Change and Fisheries
4. Climate Change Risk Management
5. Climate Change Science
6. Climate Service Information (In terms of disaster management)
7. Climate Smart Agriculture
8. Climate Variability and Climate Change
9. Climatology
10. Coastal Zone Management
11. Disaster Management (Water/Urban)
12. Disaster Science and Climate Resilience
13. Environmental Studies and Disaster Management
14. Integrated Water Resource Management
15. Meteorology and Climatic Processes
16. Climate Change and Food Security

The professors provided additional context on their specific university structures and offerings related to climate services as described below.

Institute of Water and Flood Management (IWFM)-Bangladesh University of Engineering and Technology (BUET): In the Institute of Water and Flood Management, courses cover the global climate system, variabilities and changes in climate and assessment of climate change risk. Courses also cover the forecasting and scenario development, impacts of climate change hazards on water-related hazards, mitigation and adaptation techniques, and mainstreaming mechanisms of climate risk management. Courses aim to ensure the understanding of the students about the climate system, variability, and change as well as the practical implications of these mechanisms in professional and further higher studies.

Department of Environmental Science, Bangladesh Agricultural University (BAU): In the undergraduate level curriculum, Bangladesh Agricultural University includes the Disaster Mitigation Approaches course and at the master's level, disaster management is also taught. These two courses cover various climate service-related topics such as disaster, vulnerability, extreme weather events, advanced climatology, mitigation, and management techniques. These courses enhance various competencies of the students as the application of the understanding of climate-smart agriculture, weather parameters, GHG emissions, global warming, disasters, and skills to respond during disastrous periods.

Department of Agricultural Extension and Rural Development (DAERD), Patuakhali University of Science and Technology (PSTU): In the DAERD, PSTU, Climate Service-related topics are integrated into two different agriculture-oriented courses at the master's level. Firstly, the Environmental Studies and Disaster Management Course covers environmental aspects of agricultural development, global environmental issues, and pollution, technological innovation for environment-friendly agriculture, disaster management, population, environment, and poverty. The course is aimed to ensure various competencies of the students such as analyzing components of the environment, identification of environment-friendly agricultural technologies, disaster events and their impacts, and developing adaptation strategies for sustainability and food security. Aimed to ensure the concept of adoption, and diffusion of technology innovation among students, another masters' level course on technology transfer also somewhat covered various climate service-related topics, as follows: adoption and diffusion of technological innovation, models and research.

Department of Environmental Science and Management (DESM), Independent University, Bangladesh (IUB): In the DESM, one undergrad course and two master's level courses are related to climate services. Firstly, the Environmental Geography course, which includes topics such as the basic introduction to planet earth, weather, and climate, and climatology of the earth and Bangladesh. The course is designed to familiarize students with the concepts of global warming and climate change, as well as the climatic characteristics of Bangladesh, and to prepare them to think critically about their roles as citizens and environmental actors in order to resolve complex issues in a globalized world. At the master's level, the Climate Change Science course covers advanced climatology, and the other one, named Urbanization & Climate Change, covers the urban aspects of climate change and disasters. Both courses capacitate the students about climatic phenomena and climatological tools and techniques.

Dhaka University (DU): At the University of Dhaka, different departments explore and capacitate students about climate information and services. In the Department of Meteorology, One course on climatology and climate change at the postgraduate level has been offered. Furthermore, a course on Climatology and Climate Modelling at the undergraduate level and Climate Science and Modeling at the M.Phil/PhD level will be offered. Those courses cover the fundamentals of climate science and information, climate modeling. The Department of Geography and Environment, Dhaka University, provides one bachelor-level course and two masters level courses. The bachelor-level course covers basic concepts of earth climate, weather forecasting systems, and climate change. At the MS level, the course named Climate Change and Human Adaptation covers various aspects of human-climate interaction, especially focused on adaptation strategy. Another course named Natural Hazard and Disaster Management is also taught at the MS level, which covers necessary concepts of disasters and disaster management, policy, and planning. The Department of fisheries offers a course named Climate Change and Fisheries, which covers different essentials of climate change and its impact on the fisheries sector.