

MS in Climate Smart Agriculture
Institute of Climate Smart Agriculture
Patuakhali Science and Technology University, Dumki, Patuakhali

Course Profile

Course Code: 5116

Course Title: Climate Information Services

Credit Hour: 2

Student Level: Level- 6, Semester – 1

Rationale: graduates in scientific and professional field require knowledge on the theoretical design principles of climate services and how to apply those concepts into a scientific proposal; this course will help prepare them in this regard.

Objectives: After successful completion of this course students are expected to be able to:

- i. Understand general data, concepts and methods for large-n comparative climate change adaptation policy research and apply the to identify adaptation challenges in Bangladesh;
- ii. Comprehend and de construct the concepts, categories and processes involved in design a climate information services by exploring theory and real case examples;
- iii. Identify potential users and related decisions and link it to relevant climatic data for a scientific proposal

Learning Outcomes	Course Content	Teaching-Learning Strategy	Assessment Strategy
Understand general data, concepts and methods for large-n comparative climate change adaptation policy research and apply the to identify adaptation challenges in Bangladesh;	General introduction to adaptation: Climate change impacts, socio-economic and gas scenarios, vulnerability and risk assessment into policy research for adaptation	Lectures Reading material Assignment	Assignment
Comprehend and de construct the concepts, categories and processes involved in design a climate	Introduction to Climate services: definition of climate services, categorization of climate services, co-production and co-creation and identification to user needs and	Lecture Guest lectures	Assignment

information services by exploring theory and real case examples;	decisions., usability gaps. Examples of real climate services around the globe	Reading material Assignment Peer feedback	
Identify potential users and related decisions and link it to relevant climatic data sources and temporal and spatial climate data for a scientific proposal	Linking decisions to relevant data: introduction to climate data on types and sources and process chain. Climatic indices for agriculture. Relation of data and type of decisions.	Lecture Reading material Assignment Presentations	Assignment (Draft Proposal) Presentation

Recommended Books and Periodicals

- Biesbroek, R., L. Berrang-Ford, J. D. Ford, A. Tanabe, S. E. Austin, and A. Lesnikowski. 2018. Data, concepts and methods for large-n comparative climate change adaptation policy research: A systematic literature review. *Wiley Interdisciplinary Reviews: Climate Change* 9(6):e548.
- Denton, F., T.J. Wilbanks, A. C. Abeysinghe, I. Burton, Q. Gao, M. C. Lemos, T. Masui, K. L. O'Brien, and K. Warner. 2014. Climate-resilient pathways: adaptation, mitigation, and sustainable development. Pages 1101-1131 in C. B. Field, V. R. Barros, D. J. Dokken, K. J. Mach, M. D. Mastrandrea, T. E. Bilir, M. Chatterjee, K. L. Ebi, Y. O. Estrada, R. C. Genova, B. Girma, E. S. Kissel, A. N. Levy, S. MacCracken, P. R. Mastrandrea, and L.L. White, editors. *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- Kok, K., S. Pedde, M. Gramberger, P. A. Harrison, and I. P. Holman. 2019. New European socio-economic scenarios for climate change research: operationalising concepts to extend the shared socio-economic pathways. *Regional Environmental Change* 19(3):643–654.
- Kok, K., M. van Vliet, I. Barlund, A. Dubel, and J. Sendzimir. 2011. Combining participative backcasting and explorative scenario development: Experiences from the SCENES project. *Technological Forecasting and Social Change* 78(5):835-851.
- Biesbroek, R., L. Berrang-Ford, J. D. Ford, A. Tanabe, S. E. Austin, and A. Lesnikowski. 2018. Data, concepts and methods for large-n comparative climate change adaptation policy research: A systematic literature review. *Wiley Interdisciplinary Reviews: Climate Change* 9(6):e548.
- Denton, F., T.J. Wilbanks, A. C. Abeysinghe, I. Burton, Q. Gao, M. C. Lemos, T. Masui, K. L. O'Brien, and K. Warner. 2014. Climate-resilient pathways: adaptation, mitigation, and sustainable development. Pages 1101-1131 in C. B. Field, V. R. Barros, D. J. Dokken,

- K. J. Mach, M. D. Mastrandrea, T. E. Bilir, M. Chatterjee, K. L. Ebi, Y. O. Estrada, R. C. Genova, B. Girma, E. S. Kissel, A. N. Levy, S. MacCracken, P. R. Mastrandrea, and L.L.White, editors. *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
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- Kok, K., M. van Vliet, I. Barlund, A. Dubel, and J. Sendzimir. 2011. Combining participative backcasting and explorative scenario development: Experiences from the SCENES project. *Technological Forecasting and Social Change* 78(5):835-851.
- Kumar, U., Werners, S., Paparrizos, S., Datta, D. K., & Ludwig, F. (2020a). Hydroclimatic information needs of smallholder farmers in the lower bengal delta, bangladesh. *Atmosphere*, 11(9), 1009. doi:[10.3390/atmos11091009](https://doi.org/10.3390/atmos11091009)
- Kumar, U., Werners, S., Roy, S., Ashraf, S., Hoang, L. P., Kumar Datta, D., & Ludwig, F. (2020b). Role of information in farmers' response to weather and water related stresses in the lower Bengal delta, Bangladesh. *Sustainability*, 12(16), 6598. doi:[10.3390/su12166598](https://doi.org/10.3390/su12166598)
- Nalau, J., S. Becken, and B. Mackey. 2018. Ecosystem-based Adaptation: A review of the constraints. *Environmental Science & Policy* 89:357-364.
- Stone, R. C., and H. Meinke. 2006. Weather, climate, and farmers: an overview. *Meteorological Applications* 13(S1):7-20.
- Tall, A., J. Y. Coulibaly, and M. Diop. 2018. Do climate services make a difference? A review of evaluation methodologies and practices to assess the value of climate information services for farmers: Implications for Africa. *Climate Services* 11:1-12.
- van Notten, P. W. F., J. Rotmans, M. B. A. van Asselt, and D. S. Rothman. 2003. An updated scenario typology. *Futures* 35(5):423-443.
- Vaughan, C., and S. Dessai. 2014. Climate services for society: origins, institutional arrangements, and design elements for an evaluation framework. *Wiley Interdisciplinary Reviews: Climate Change* 5(5):587-603.
- Dilling, L. and Lemos, M. C. (2011) 'Creating usable science: Opportunities and constraints for climate knowledge use and their implications for science policy', *Global Environmental Change*, 21(2), pp. 680–689. doi: 10.1016/j.gloenvcha.2010.11.006.
- Karpouzoglou, T. *et al.* (2015) 'Environmental Virtual Observatories (EVOs): Prospects for knowledge co-creation and resilience in the Information Age', *Current Opinion in Environmental Sustainability*. Elsevier B.V., pp. 40–48. doi: 10.1016/j.cosust.2015.07.015.
- Kirchhoff, C. J., Carmen Lemos, M. and Dessai, S. (2013) 'Actionable Knowledge for Environmental Decision Making: Broadening the Usability of Climate Science', *Annual Review of Environment and Resources*. Annual Reviews, 38(1), pp. 393–414. doi: 10.1146/annurev-environ-022112-112828.
- Lemos, M. C., Kirchhoff, C. J. and Ramprasad, V. (2012) 'Narrowing the climate information usability gap', *Nature Climate Change*, pp. 789–794. doi: 10.1038/nclimate1614
- Paparrizos, S., Smolenaars, W., Gbangou, T., Slobbe, E., & Ludwig, F. (2020). Verification of weather and seasonal forecast information concerning the peri-urban farmers' needs

in the lower Ganges delta in Bangladesh. *Atmosphere*, 11(10), 1041.
doi:[10.3390/atmos11101041](https://doi.org/10.3390/atmos11101041)

Vincent, K. *et al.* (2018) ‘What can climate services learn from theory and practice of co-production?’, *Climate Services*. Elsevier B.V., 12, pp. 48–58. doi: 10.1016/j.cliser.2018.11.001.

Weichselgartner, J. and Arheimer, B. (2019) ‘Evolving Climate Services into Knowledge–Action Systems’, *Weather, Climate, and Society*. American Meteorological Society, 11(2), pp. 385–399. doi: 10.1175/wcas-d-18-0087.1