United Nations University – Institute for the Advanced Study of Sustainability
Postgraduate Programme 2019-2020
Autum 2019 Semester Course

Title of Course: Resilience and Adaptation Science (RAS)
Sub-Title: Using the Sustainable Development Goals as a Framework for Climate-Resilient Development
Coordinators: Dr. Riyanti Djalante
Course Schedule: From 1 Oct. until 6 Dec. 2019
Version: July 8th, 2019

Overview:

In 2015, countries adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals. The Sustainable Development Goals (SDGs) are the blueprint to achieve a better and more sustainable future for all. They address the global challenges we face, including those related to poverty, inequality, climate, environmental degradation, prosperity, and peace and justice. Because the Goals interconnect, they also offer a way to tackle all the goals simultaneously. Resilience is understood as the ability to respond and withstand schosk, reorganize, learn and adapt. Strengthening resilience is vital to achieve the SDGs. This underpins the core message of the Sustainable Development Goals (SDGs) that development is multi-faceted and the achievement of many of the individual development goals is dependent on the accomplishment of other goals. It also acknowledges that shocks and stresses can reverse years of development gains and efforts to eradicate poverty by 2030.

Learning Outcomes:

This course outlines a comprehensive approach for developing a cross-sectoral, multi-dimensional and dynamic understanding of resilience. It further covers a range of issues on the science and impacts of climate change, adaptation and mitigation to climate change, governance and climate resilience. There are 3 parts of this course:
Part 1: Climate change, resilience and sustainable development: What is sustainable development? How have the concepts of resilience and sustainability progresses in science and policy. How have and will climate change will undermine development?
Part 2: Climate change and the 17 SDGs: What are the 17 goals, What is the current progress of each goal?, How are the 17 goals interlinked through Goal 13?
Part 3: Governing and financing climate change: What are the sources of finance for climate change? What other international frameworks are related to the SDGs?, what are the innovative climate change governance?

Course Outline

Lecture	Date	Content	Assignment	Instructor
Part 1: Climate change, resilience and sustainable development				
Lecture 1	15 Oct, 11:00-12:30	Introduction of the course Resilience, climate change and sustainable development: history and conceptual development	Assignment 1: Annotated bibliography 1 (Due on the Friday, 23.55)	Dr. Riyanti Djalante
Lecture 2	15 Oct, 14:00-15:30	The science and impacts of climate change: Air, Land, Biota, Water, Ocean	Assg 1: AB 2	Dr. Riyanti Djalante
Part 2: Climate change and the 17 SDGs				
Lecture 3	17 Oct, 11:00-12:30	SDG 13 and key interlinkages with the other 16 SDGs Introduction to climate change mitigation and adaptation planning	Assg 1: AB 3	Dr. Riyanti Djalante
Part 2.1		Climate change, Human Development, inequality		
Lecture 4	17 Oct, 14:00-15:30	Cliamte change, poverty and hunger: SDG 1, SDG 2	Assg 1: AB 4	Dr. Riyanti Djalante
Lecture 5	12 Nov, 11:00-12:30	Climate change, health and education: SDG 3, SDG 4	Assg 1: AB 5	Dr. Riyanti Djalante
Lecture 6	12 Nov, 14:00-15:30	Climate change, gender and inequality: SDG 5, SDG 10	Assg 1: AB 6	**Guest Lecture TBA**
Part 2.2		Climate change and sectoral resilience		
Lecture 7	19 Nov, 11:00-12:30	Climate change and water resilience: SDG 6	Assg 1: AB 7	Dr. Riyanti Djalante
Lecture 8	21 Nov, 11:00-12:30	Climate change and energy resilience: SDG 7 Climate change mitigation: Key policies and progresses in different energy sectors	Assg 1: AB 8	**Guest Lecture TBA**
		COP 25, Santiago, 11-22 Nov 2019,	Assignment 2 Research paper 25 Oct. (Fri) 2019, 23.55pm	
Lecture 9	26 Nov, 11:00-12:30	Climate change and economic resilience: SDGs 8 & 9	Assg 1: AB 9	Dr. Riyanti Djalante
Lecture 10	28 Nov, 11:00-12:30	Climate change and sustainable production and concsumption: SDG12	Assg 1: AB 10	**Guest Lecture TBA**
Lecture 11	3 Dec, 11:00-12:30	Climate change and urban resilience: SDG 11	Assg 1: AB 11	**Guest Lecture TBA**
Lecture 12	5 Dec, 11:00-12:30	Climate change and disasters: SDG13 Climate Change adaptation and Disaster risk reduction	Assg 1: AB 12	Dr. Riyanti Djalante
Lecture 13	10 Dec, , 11:00-12:30	Climate change and the ecosytem: SDGs 14, 15 Climate change impacts, adaptation and mitigation water, agriculture, forestry sectors	Assg 1: AB 13	**Guest Lecture TBA**
Part 2.3		Financing and governing climate change		
Lecture 14	12 Dec, , 11:00-12:30	Climate change finance and insurance, and governance Global coherence: Linking Paris Agreement, SFDRR and SDG	Assg 1: AB 14	**Guest Lecture TBA**
Lecture 15	17 Dec, , 11:00-12:30	Conclusion of the class Student presentations	Assignment 3 Presentation (Due 17 Dec, 23.55) (ppt file)	Dr. Riyanti Djalante
			Assignment 4 Critical review 19 Dec, 23.55pm	

Assessments:

- Attendance and class participation:
  - 7% of total marks
  - 80% attendance is required.
  - Prior approval is required for absence
- Assignment 1: Annotated bibliography
  - 14x2%=28% of total marks
  - Write an annotated bibliography on key topics discussed (from Lecture 1 to 14)
  - 4 References @ 75-100words (journal articles only). You can certainly use those from the reading list or other journal articles
  - Arial 12
  - Course name, lecture topic, student name and number, are in the header
  - For assignment 1, late assignment is not acceptable.
- Assignment 2: Review paper of negotiation processes, key issues, progress, challenges, key actors during COP 25 in Santiago
  - 20% of total marks
  - Write is a descrition / reporting style
  - Key topics to describe:
    - What is COP and how important is COP within the UNFCCC processes
    - Who are the key actors within UNFCCC processes
    - What are the key issues being negotiated
    - What are the issues brought by different actors/levels
    - What are the deadlocks and why
    - How is the representation of minority groups, youths, etc
    - What are the final decisions / key documents adopted
    - Do you think this is a successful COP? Why / Why not?
  - 2000 words, Arial 12, 1.5 space, double side, cover page, references (min 10 journal articles, and reports)
  - Harvard referencing style
- Assignment 3: Class Presentation of Assignment 4 (Critical review of climate change management at different sector)
  - 10% of total marks
  - 5 minute presentation,
  - Maximum 5 slides
    - 1 on discussion of the impacts of climate change on that particular sector (globally and regionally)
    - 1 on review of finances and progress in planning and implementation (globally and regionally)
    - 1 on your review and critique progress in planning and implementation (globally and regionally)
    - 2 on your critique on whether they have address the underlying causes vulnerability, reduce poverty and address inequality, building resilience, and reduce emissions

- Assignment 4: Critical review of climate change management at different sectors
    - 35% of total marks
    - Key topics to review and critique:
        - Choose a particular development sector (include but not limited to fisheries, agriculture, disaster management, gender empowerment, etc)
        - Discuss the impacts of climate change impacts on that particular sector (globally and regionally)
        - Outline the finances available to deal with the impacts, discuss whether this is sufficient or not, and why
        - Describe and critique progress in planning and implementation (globally and regionally) (adaptation and mitigation if appropriate)
        - Discuss whether the planning and implementation has been able to reduce the the underlying causes vulnerability of particular places/targets, reduce poverty and address inequality, building resilience, and reduce emissions
    - 3000 words, Arial 12, 1.5 space, double side, cover page, references (min 25 journal articles, and reports)
    - Harvard referencing style
- Others considerations:
    - For assignment 2,3,4, 3 points will be deducted for every day they are late. Assignments that are 1 month late will be rejected.
    - We will check for plagiarisms. A minimum 20% similarities is required.

Reading materials:

Lecture	Content	Required (in bold) and recommended readings
Lecture 1	Resilience and sustainable development	- **Griggs, David, Mark Stafford-Smith, Owen Gaffney, Johan Rockström, Marcus C. Öhman, Priya Shyamsundar, Will Steffen, Gisbert Glaser, Norichika Kanie, and Ian Noble. "Policy: Sustainable development goals for people and planet."** ***Nature*** **495, no. 7441 (2013): 305.** - Lélé, Sharachchandra M. "Sustainable development: a critical review." *World development* 19, no. 6 (1991): 607-621. - Cash, David W., William C. Clark, Frank Alcock, Nancy M. Dickson, Noelle Eckley, David H. Guston, Jill Jäger, and Ronald B. Mitchell. "Knowledge systems for sustainable development." *Proceedings of the national academy of sciences* 100, no. 14 (2003): 8086-8091. - Pogge, Thomas, and Mitu Sengupta. "The Sustainable Development Goals: a plan for building a better world?." *Journal of Global Ethics* 11, no. 1 (2015): 56-64. - Langford, Malcolm. "Lost in transformation? The politics of the sustainable development goals." *Ethics & International Affairs*30, no. 2 (2016): 167-176. - **Folke, Carl, et al. "Resilience and sustainable development: building adaptive capacity in a world of transformations." AMBIO: A journal of the human environment 31.5 (2002): 437-440.** - **Turner, Billie L., et al. "A framework for vulnerability analysis in sustainability science." Proceedings of the national academy of sciences 100.14 (2003): 8074-8079.** - Gallopín, Gilberto C. "Linkages between vulnerability, resilience, and adaptive capacity." Global environmental change 16.3 (2006): 293-303. - Adger, W. Neil, et al. "Social-ecological resilience to coastal disasters." Science 309.5737 (2005): 1036-1039. - Klein, Richard JT, Robert J. Nicholls, and Frank Thomalla. "Resilience to natural hazards: How useful is this concept?." Global Environmental Change Part B: Environmental Hazards 5.1 (2003): 35-45. - Miller, Fiona, et al. "Resilience and vulnerability: complementary or conflicting concepts?." Ecology and Society 15.3 (2010). - Walker, Brian, et al. "Resilience, adaptability and transformability in social–ecological systems." Ecology and society 9.2 (2004). - Davoudi, S., Shaw, K., Haider, L. J., Quinlan, A. E., Peterson, G. D., Wilkinson, C., ... & Davoudi, S. (2012). Resilience: a bridging concept or a dead end?"Reframing" resilience: challenges for planning theory and practice interacting traps: resilience assessment of a pasture management system in Northern Afghanistan urban resilience: what does it mean in planning practice? Resilience as a useful concept for climate change adaptation? The politics of resilience for planning: a cautionary note: edited by Simin Davoudi and Libby Porter. *Planning theory & practice*, *13*(2), 299-333. - **Araos, Malcolm, Lea Berrang-Ford, James D. Ford, Stephanie E. Austin, Robbert Biesbroek, and Alexandra Lesnikowski. "Climate change adaptation planning in large cities: A systematic global assessment."** ***Environmental Science & Policy*** **66 (2016): 375-382.**
Lecture 2	The science and impacts of climate change: Air, Land, Biota, Water, Ocean	- **Pachauri, Rajendra K., et al.** ***Climate change 2014: synthesis report. Contribution of Working Groups I, II and III to the fifth assessment report of the Intergovernmental Panel on Climate Change*****. IPCC, 2014.** - **IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty** [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)].
		- **UNEP Global Environmental Outlook 6** - Scheffer, M., Carpenter, S., Foley, J. A., Folke, C., & Walker, B. (2001). Catastrophic shifts in ecosystems. *Nature*, *413*(6856), 591. - Walther, Gian-Reto, Eric Post, Peter Convey, Annette Menzel, Camille Parmesan, Trevor JC Beebee, Jean-Marc Fromentin, Ove Hoegh-Guldberg, and Franz Bairlein. "Ecological responses to recent climate change." *Nature* 416, no. 6879 (2002): 389.

Lecture	Content	Required (in bold) and recommended readings
		- Parmesan, C., & Yohe, G. (2003). A globally coherent fingerprint of climate change impacts across natural systems. *Nature*, *421*(6918), 37. - Allen, C. D., Macalady, A. K., Chenchouni, H., Bachelet, D., McDowell, N., Vennetier, M., ... & Gonzalez, P. (2010). A global overview of drought and heat-induced tree mortality reveals emerging climate change risks for forests. *Forest ecology and management*, *259*(4), 660-684. - Hughes, T. P., Baird, A. H., Bellwood, D. R., Card, M., Connolly, S. R., Folke, C., ... & Lough, J. M. (2003). Climate change, human impacts, and the resilience of coral reefs. *science*, *301*(5635), 929-933. - Shrestha, U. B., Gautam, S., & Bawa, K. S. (2012). Widespread climate change in the Himalayas and associated changes in local ecosystems. *PLoS One*, *7*(5), e36741. - Kelly, A. E., & Goulden, M. L. (2008). Rapid shifts in plant distribution with recent climate change. *Proceedings of the National Academy of Sciences*, *105*(33), 11823-11826.
Lecture 3	SDG 13 and key interlinkages with the other 16 SDGs	- Nilsson, Måns, Dave Griggs, and Martin Visbeck. "Policy: map the interactions between Sustainable Development Goals." *Nature News* 534, no. 7607 (2016): 320. - Le Blanc, David. "Towards integration at last? The sustainable development goals as a network of targets." *Sustainable Development* 23, no. 3 (2015): 176-187. - https://newclimate.org/2018/05/07/ndc-update-report-special-edition-linking-ndcs-and-sdgs
	Introduction to climate change adaptation, and planning for adaptation	- **Füssel, H-M. "Adaptation planning for climate change: concepts, assessment approaches, and key lessons."** ***Sustainability science*** **2.2 (2007): 265-275.** - **Huq, Saleemul, et al. "Mainstreaming adaptation to climate change in least developed countries (LDCs)."** ***Climate Policy*** **4.1 (2004): 25-43.** - **Adger, W. Neil, et al. "Adaptation to climate change in the developing world."** ***Progress in development studies*** **3.3 (2003): 179-195.** - **Adger, W. Neil, Nigel W. Arnell, and Emma L. Tompkins. "Successful adaptation to climate change across scales."** ***Global environmental change*** **15.2 (2005): 77-86.** - Fankhauser, Samuel, Joel B. Smith, and Richard SJ Tol. "Weathering climate change: some simple rules to guide adaptation decisions." *Ecological economics* 30.1 (1999): 67-78. - Tang, Zhenghong, et al. "Moving from agenda to action: evaluating local climate change action plans." *Journal of environmental planning and management* 53.1 (2010): 41-62. - Füssel, H. M. (2007). Adaptation planning for climate change: concepts, assessment approaches, and key lessons. *Sustainability science*, *2*(2), 265-275. - Howard, J. (2009). Climate change mitigation and adaptation in developed nations: A critical perspective on the adaptation turn in urban climate planning. In *Planning for Climate Change*(pp. 43-56). Routledge. - Measham, T. G., Preston, B. L., Smith, T. F., Brooke, C., Gorddard, R., Withycombe, G., & Morrison, C. (2011). Adapting to climate change through local municipal planning: barriers and challenges. *Mitigation and adaptation strategies for global change*, *16*(8), 889-909. - Wamsler, C., Brink, E., & Rivera, C. (2013). Planning for climate change in urban areas: from theory to practice. *Journal of Cleaner Production*, *50*, 68-81.
Lecture 4	SDG 1: No poverty, SDG 2: No hunger	- Bolt, B., Nes, E. H., Bathiany, S., Vollebregt, M. E., & Scheffer, M. (2018). Climate reddening increases the chance of critical transitions. *Nature Climate Change*, *8*(6), 478. - Winsemius, H. C., Jongman, B., Veldkamp, T. I., Hallegatte, S., Bangalore, M., & Ward, P. J. (2018). Disaster risk, climate change, and poverty: assessing the global exposure of poor people to floods and droughts. *Environment and Development Economics*, 1-21. - Tanner, Thomas, David Lewis, David Wrathall, Robin Bronen, Nick Cradock-Henry, Saleemul Huq, Chris Lawless et al. "Livelihood resilience in the face of climate change." *Nature Climate Change* 5, no. 1 (2015): 23. - **King, A. D., & Harrington, L. J. (2018). The Inequality of Climate Change from 1.5° C to 2° C of Global Warming.** ***Geophysical Research Letters*****.** - **Byers, Edward, Matthew Gidden, David Leclère, Juraj Balkovic, Peter Burek, Kristie Ebi, Peter Greve et al. "Global exposure and vulnerability to multi-sector development and climate change hotspots."** ***Environmental Research Letters*** **13, no. 5 (2018): 055012.** - Reyer, Christopher PO, Kanta Kumari Rigaud, Erick Fernandes, William Hare, Olivia Serdeczny, and Hans Joachim Schellnhuber. "Turn down the heat: regional climate change impacts on development." (2017): 1563-1568. - Otto, I. M., Reckien, D., Reyer, C. P., Marcus, R., Le Masson, V., Jones, L., ... & Serdeczny, O. (2017). Social vulnerability to climate change: a review of concepts and evidence. *Regional environmental change*, *17*(6), 1651-1662. - Agrawal, A., & Perrin, N. (2009). Climate adaptation, local institutions and rural

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		livelihoods. *Adapting to climate change: thresholds, values, governance*, 350-367.
Lecture 5	SDG 3: Health SDG 4: Education	- Hartig, Terry, and Peter H. Kahn. "Living in cities, naturally." *Science* 352, no. 6288 (2016): 938-940. - Rydin, Yvonne, Ana Bleahu, Michael Davies, Julio D. Dávila, Sharon Friel, Giovanni De Grandis, Nora Groce et al. "Shaping cities for health: complexity and the planning of urban environments in the 21st century." *The Lancet* 379, no. 9831 (2012): 2079-2108. - Haines, Andy, et al. "Climate change and human health: impacts, vulnerability and public health." *Public health* 120.7 (2006): 585-596.Stevenson, Mark, Jason Thompson, Thiago Hérick de Sá, Reid Ewing, Dinesh Mohan, Rod McClure, Ian Roberts et al. "Land use, transport, and population health: estimating the health benefits of compact cities." *The Lancet* 388, no. 10062 (2016): 2925-2935. - del Rosario González Ovalle, María, José Antonio Alvarado Márquez, and Samuel David Martínez Salomón. "A compilation of resources on knowledge cities and knowledge-based development." *Journal of knowledge management* 8, no. 5 (2004): 107-127. - Osborne, Michael, Peter Kearns, and Jin Yang. "Learning cities: Developing inclusive, prosperous and sustainable urban communities." *International Review of Education* 59, no. 4 (2013): 409-423. - Vitiello, Domenic. "Re-forming schools and cities: Placing education on the landscape of planning history." (2006): 183-195.
Lecture 6	SDG 5: Gender equality SDG 10: Reducing inequality	- Carr, E. R., & Thompson, M. C. (2014). Gender and climate change adaptation in agrarian settings: Current thinking, new directions, and research frontiers. *Geography Compass*, *8*(3), 182-197. - Alston, M. (2014, November). Gender mainstreaming and climate change. In *Women's Studies International Forum* (Vol. 47, pp. 287-294). Pergamon. - Kaijser, A., & Kronsell, A. (2014). Climate change through the lens of intersectionality. *Environmental politics*, *23*(3), 417-433. - Bryan, E., Bernier, Q., Espinal, M., & Ringler, C. (2017). Making climate change adaptation programmes in sub-Saharan Africa more gender responsive: insights from implementing organizations on the barriers and opportunities. *Climate and Development*, 1-15. - Gaard, G. (2015, March). Ecofeminism and climate change. In *Women's Studies International Forum* (Vol. 49, pp. 20-33). Pergamon. - Eastin, J. (2018). Climate change and gender equality in developing states. *World Development*, *107*, 289-305. - Sultana, F. (2014). Gendering climate change: Geographical insights. *The Professional Geographer*, *66*(3), 372-381. - Moosa, C. S., & Tuana, N. (2014). Mapping a research agenda concerning gender and climate change: A review of the literature. *Hypatia*, *29*(3), 677-694. - Jerneck, Anne. "What about Gender in Climate Change? Twelve Feminist Lessons from Development." *Sustainability*10.3 (2018): 627.
		- Cameron, E. S. (2012). Securing Indigenous politics: A critique of the vulnerability and adaptation approach to the human dimensions of climate change in the Canadian Arctic. *Global environmental change*, *22*(1), 103-114. - Green, D., & Raygorodetsky, G. (2010). Indigenous knowledge of a changing climate. *Climatic Change*, *100*(2), 239-242. - Alexander, Clarence, Nora Bynum, Elizabeth Johnson, Ursula King, Tero Mustonen, Peter Neofotis, Noel Oettlé et al. "Linking indigenous and scientific knowledge of climate change." *BioScience* 61, no. 6 (2011): 477-484. - **McLeman, R., & Smit, B. (2006). Migration as an adaptation to climate change. Climatic change, 76(1-2), 31-53.** - **Barnett, J., & Adger, W. N. (2007). Climate change, human security and violent conflict. Political geography, 26(6), 639-655.** - **Reuveny, R. (2007). Climate change-induced migration and violent conflict. Political geography, 26(6), 656-673.Kelley, C. P., Mohtadi, S., Cane, M. A., Seager, R., & Kushnir, Y. (2015). Climate change in the Fertile Crescent and implications of the recent Syrian drought. Proceedings of the National Academy of Sciences, 112(11), 3241-3246.** - **Black, R., Adger, W. N., Arnell, N. W., Dercon, S., Geddes, A., & Thomas, D. (2011). The effect of environmental change on human migration. Global environmental change, 21, S3-S11.** - Black, Richard, et al. "The effect of environmental change on human migration." Global

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		environmental change 21 (2011): S3-S11. - Tacoli, C. (2009). Crisis or adaptation? Migration and climate change in a context of high mobility. Environment and urbanization, 21(2), 513-525. - McLachlan, J. S., Hellmann, J. J., & Schwartz, M. W. (2007). A framework for debate of assisted migration in an era of climate change. Conservation biology, 21(2), 297-302. - Raleigh, C., & Urdal, H. (2007). Climate change, environmental degradation and armed conflict. Political geography, 26(6), 674-694. - Hendrix, C. S., & Glaser, S. M. (2007). Trends and triggers: Climate, climate change and civil conflict in Sub-Saharan Africa. Political geography, 26(6), 695-715. - Schleussner, C. F., Donges, J. F., Donner, R. V., & Schellnhuber, H. J. (2016). Armed-conflict risks enhanced by climate-related disasters in ethnically fractionalized countries. Proceedings of the National Academy of Sciences, 113(33), 9216-9221.
Lecture 7	Climate Change Impacts on Land and Mitigation and Adaptation in water and agriculture sector	**- Vörösmarty, Charles J., et al. "Global water resources: vulnerability from climate change and population growth." *science* 289.5477 (2000): 284-288.** - Alcamo, Joseph, Martina Flörke, and Michael Märker. "Future long-term changes in global water resources driven by socio-economic and climatic changes." *Hydrological Sciences Journal* 52.2 (2007): 247-275. - Immerzeel, W. W., Van Beek, L. P., & Bierkens, M. F. (2010). Climate change will affect the Asian water towers. *Science*, *328*(5984), 1382-1385. - Taylor, Richard G., Bridget Scanlon, Petra Döll, Matt Rodell, Rens Van Beek, Yoshihide Wada, Laurent Longuevergne et al. "Ground water and climate change." *Nature Climate Change*3, no. 4 (2013): 322. - Kelley, C. P., Mohtadi, S., Cane, M. A., Seager, R., & Kushnir, Y. (2015). Climate change in the Fertile Crescent and implications of the recent Syrian drought. *Proceedings of the National Academy of Sciences*, *112*(11), 3241-3246. - Smit, Barry, and Mark W. Skinner. "Adaptation options in agriculture to climate change: a typology." *Mitigation and adaptation strategies for global change* 7.1 (2002): 85-114. - Howden, S. M., Soussana, J. F., Tubiello, F. N., Chhetri, N., Dunlop, M., & Meinke, H. (2007). Adapting agriculture to climate change. *Proceedings of the national academy of sciences*, *104*(50), 19691-19696. - Lobell, D. B., Burke, M. B., Tebaldi, C., Mastrandrea, M. D., Falcon, W. P., & Naylor, R. L. (2008). Prioritizing climate change adaptation needs for food security in 2030. *Science*, *319*(5863), 607-610. - Mertz, O., Mbow, C., Reenberg, A., & Diouf, A. (2009). Farmers' perceptions of climate change and agricultural adaptation strategies in rural Sahel. *Environmental management*, *43*(5), 804-816. - Rickards, L., & Howden, S. M. (2012). Transformational adaptation: agriculture and climate change. *Crop and Pasture Science*, *63*(3), 240-250. - Rosenzweig, C., & Parry, M. L. (1994). Potential impact of climate change on world food supply. *Nature*, *367*(6459), 133-138.
Lecture 8	Climate change and energy resilience: SDGs 7 Climate change mitigation: Key policies and progresses in different sectors	- **IPCC, 2014: Summary for Policymakers. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.** - **IPCC special report on renewable energy sources and climate change mitigation. *Prepared By Working Group III of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, UK*.** - **IPCC 2018 Special Report on Impacts of 1.5 Degree C** - Steinbacher, K. and M. Pahle (2016), 'Leadership and the Energiewende: German Leadership by Diffusion', Global Environmental Politics, 16(4), pp. 70-89. - Bollen, J., Guay, B., Jamet, S., & Corfee-Morlot, J. (2009). *Co-benefits of climate change mitigation policies: literature review and new results* (No. 693). OECD Publishing. - Rogelj, J., McCollum, D. L., Reisinger, A., Meinshausen, M., & Riahi, K. (2013). Probabilistic cost estimates for climate change mitigation. *Nature*, *493*(7430), 79. - Büchs, M., Bardsley, N., & Duwe, S. (2011). Who bears the brunt? Distributional effects of climate change mitigation policies. *Critical Social Policy*, *31*(2), 285-307. - Mackey, B., Prentice, I. C., Steffen, W., House, J. I., Lindenmayer, D., Keith, H., & Berry, S. (2013). Untangling the confusion around land carbon science and climate change

Lecture	Content	Required (in bold) and recommended readings
		mitigation policy. *Nature Climate Change*, *3*(6), 552. - Lybbert, T., & Sumner, D. (2010). Agricultural technologies for climate change mitigation and adaptation in developing countries: policy options for innovation and technology diffusion. - Anderson, B., Bernauer, T., & Balietti, S. (2017). Effects of fairness principles on willingness to pay for climate change mitigation. *Climatic Change*, *142*(3-4), 447-461. - Brugnach, M., Craps, M., & Dewulf, A. R. P. J. (2017). Including indigenous peoples in climate change mitigation: addressing issues of scale, knowledge and power. *Climatic change*, *140*(1), 19-32. - Riti, J. S., Shu, Y., Song, D., & Kamah, M. (2017). The contribution of energy use and financial development by source in climate change mitigation process: A global empirical perspective. *Journal of Cleaner Production*, *148*, 882-894.
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