

Course schedule  
**SGR016F, Sustainability Science and the SDGs: Foundations, concepts, methodologies, 7.5 credits, third cycle**

*Note:* all scheduled course learning activities will take place on Zoom unless further instructed. The Zoom address will be distributed prior to course start.

**Learning block 1: Knowledge, context and concepts**

Dates	Time*	Theme	Specific topic	Teaching staff
1 Feb	13-15	<i>Course kickoff</i>	Course overview & assignments	Barry Ness
2 Feb	9-12	<i>Theoretical foundations</i>	Theories of social change	Lennart Olsson
3 Feb	9-12		Natural systems & social fields	Lennart
4 Feb	9-12	<i>Sustainability Science (1.0)</i>	Field establishment	Barry
5 Feb	9-12 13-14 14-16	<i>Sustainability Science (2.0)</i>	Field evolution Critical perspectives US Perspectives (tentative)	Barry Stefano Longo Clark & Harley
8 Feb	9-12 13-14	<i>Sustainability &amp; the SDGs</i>	Overview, measurement, applications, limitations History of the SDGs	Ann Åkerman, Ruben Zondervan
9 Feb	9-12		Interlinkages, conflicts and tradeoffs & critical perspectives	Ann
10 Feb	9-12 13-15		Education for the SDGs workshop	Ann & Barry
15 Feb	9-12	<i>Resilience</i>	Fundamentals for SESs	Emily Boyd with Carl Folke
16 Feb	9-12		Critical perspectives	Ebba Brink
17 Feb	9-12	<i>Political ecology</i>	Power, politics and sustainability	Wim Carton & Inge Hougaard
18 Feb	9-12		Doing Political ecology	Wim & Inge
22-26 Feb		<i>Swedish "Sportlov"</i>	No classes	

\*Actual scheduled start times will be 15 minutes past the hour (e.g., a scheduled time of 13 means an actual start time of 13:15).

## Learning block 2: Approaches & methodologies for sustainability (science) research

Date	Time	Theme	Specific topic	Teaching staff
1 March	9-12	<i>Descriptive-analytical methods</i>	Measuring the SDGs	Kimberly Nicholas
2 March	9-12		Case research in SustSci	Anne Jerneck
3 March	9-12	<i>Systems Perspectives</i>	Systems thinking & the SDGs	Henner Busch
4 March	9-12		Intro to CLDs	Henner
9 March	9-12	<i>Participation in SustSci</i>	Multi, inter & transdisciplinarity	Barry
10 March	9-12	<i>Inclusion</i>	Inequality, gender, participation, critical perspectives & the SDGs	Mine Islar
11 March		<i>Other approaches</i>	Enchantment	Emily (& Stephen)
12 March	9-11	<i>Anticipatory approaches</i>	Storylines & imaginaries	Emily
16 March	9-12		Visioning, scenarios	Barry
17 March	9-11	<i>Solutions orientation</i>	Design thinking, urban living labs	Barry
18 March	9-12 13-15	<i>Transitions</i> <i>Course paper</i>	Transition Theory/Mgmt. <i>Paper idea presentations</i>	Barry & Maryam Barry
31 March	Upload to Canvas	<i>Final assignment submission</i>	Kappa contribution or other agreed on paper	

### Administrative team

Barry Ness Course coordinator & instructor LUCSUS [barry.ness@lucsus.lu.se](mailto:barry.ness@lucsus.lu.se)

Frank Schreier, Course administrator, [frank.schreier@sam.lu.se](mailto:frank.schreier@sam.lu.se)

### Teaching team

Emily Boyd, LUCSUS, [Emily.boyd@lucsus.lu.se](mailto:Emily.boyd@lucsus.lu.se)

Henner Busch, LUCSUS, [henner.busch@lucsus.lu.se](mailto:henner.busch@lucsus.lu.se)

Wim Carton, LUCSUS, [wim.carton@lucsus.lu.se](mailto:wim.carton@lucsus.lu.se)

Carl Folke, Stockholm Resilience Centre

Inge-Merete Hougaard, LUCSUS, [inge-merete.hougaard@lucsus.lu.se](mailto:inge-merete.hougaard@lucsus.lu.se)

Mine Islar, LUCSUS, [mine.islar@lucsus.lu.se](mailto:mine.islar@lucsus.lu.se)  
Anne Jerneck, LUCSUS, [anne.jerneck@lucsus.lu.se](mailto:anne.jerneck@lucsus.lu.se)  
Stefano Longo, Department of Sociology, [Stefano.longo@soc.lu.se](mailto:Stefano.longo@soc.lu.se)  
Maryam Nastar, LUCSUS, [Maryam.nastar@lucsus.lu.se](mailto:Maryam.nastar@lucsus.lu.se)  
Barry Ness, LUCSUS, [barry.ness@lucsus.lu.se](mailto:barry.ness@lucsus.lu.se)  
Kimberly Nicholas, LUCSUS, [kimberly.nicholas@lucsus.lu.se](mailto:kimberly.nicholas@lucsus.lu.se)  
Lennart Olsson, LUCSUS, [Lennart.olsson@lucsus.lu.se](mailto:Lennart.olsson@lucsus.lu.se)  
Ruben Zondervan, Sustainability consultant, the Netherlands  
Ann Åkerman, LUCSUS, [ann.akerman@lucsus.lu.se](mailto:ann.akerman@lucsus.lu.se)

## Course Literature

Note: the literature is expected to be read prior to the scheduled course learning block.

### *Foundations*

Olsson, Lennart & Jerneck, Anne. 2018. Social fields and natural systems: integrating knowledge about society and nature. *Ecology and Society* 23(3): 26. <https://doi.org/10.5751/ES-10333-230326> (18 pages)

### *SustSci*

Kates, Robert W., et al. 2001. Sustainability Science. *Science* 292(5517): 641-2. DOI: 10.1126/science.1059386 (2 pages)

Clark, William C. & Dickson, Nancy M. 2003. Sustainability Science: the emerging research program. *PNAS* 100(14): 8059-8061. <https://doi.org/10.1073/pnas.1231333100> (3 pages)

Cash, David W. et al. 2003. Knowledge systems for sustainable development. *PNAS* 100(14): 8086-8091. <https://doi.org/10.1073/pnas.1231332100> (6 pages)

Komiyama, Hiroshi & Takeuchi, Kazuhiko. 2006. Sustainability science: building a new discipline. *Sustain Science* 1:1-6. DOI 10.1007/s11625-006-0007-4 (6 pages)

Spangenberg, Joachim. 2011. Sustainability science: a review, an analysis and some empirical lessons. *Environmental Conservation* 38(3): 275–287. <https://doi.org/10.1017/S0376892911000270> (12 pages)

Jerneck, Anne; Olsson, Lennart; Ness, Barry; Anderberg, Stefan; Baier, Matthias; Clark, Eric, et al. 2011. Structuring sustainability science. *Sustainability Science* 6:69-82. <https://doi.org/10.1007/s11625-010-0117-x> (13 pages)

Rokaya, Prabin; Sheikholeslami, Raz; Kurkute, Sopan; Nazarbakhsh, Mahtab; Zhang, Fan & Reed, Maureen E. 2017. Multiple factors that shaped sustainability science journal: 1 10-year review. *Sustainability Science* 1-14. <https://doi.org/10.1007/s11625-017-0495-4> (14 pages)

Clark, William C. & Harley, Alicia G. 2020. Sustainability Science: Toward a Synthesis. *Review of Environment and Resources* 45: 331-386. <https://doi.org/10.1146/annurev-environ-012420-043621> (55 pages)

### *SDGs*

Schneider, Flurina; Kläy, Andreas; Zimmermann, Anne B. et al. 2019. How can science support the 2030 Agenda for Sustainable Development? Four tasks to tackle the normative dimension of sustainability. *Sustainability Science* 14: 1593-1604. <https://doi.org/10.1007/s11625-019-00675-y> (11 pages)

Kroll, Christian; Warchold, Anne & Pradhan, Prajal. 2019. Sustainable Development Goals (SDGs): Are we successful in turning trade-offs into synergies? *Palgrave Communications* 5(140): 1-11. <https://doi.org/10.1057/s41599-019-0335-5> (11 pages)

Kopnina, Helen. 2020. Education for the future? Critical evaluation of education for sustainable development goals. *Journal of Environmental Education* 1-13. <https://doi.org/10.1080/00958964.2019.1710444> (13 pages)

Nilsson, Måns; Griggs, Dave & Visbeck, Martin. 2016. Map the interactions between Sustainable Development Goals. Comment in *Nature* 534. doi:10.1038/534320a (3 pages)

Norström, Albert V.; Dannenberg, Astrid; McCarney, Geoff; Milkoreit, Manjana; Diekert, Florian; Engström, Gustav; Fishman, Ram; Gars, Johan; Kyriakopoulou, Efthymia; Manoussi, Vassiliki; Meng, Kyle; Metian, Marc; Sanctuary, Mark; Schlüter, Maja; Schoon, Michael; Schultz, Lisen & Sjöstedt, Martin. 2014. Three necessary conditions for establishing effective Sustainable Development Goals in the Anthropocene. *Ecology and Society* 19(3): 8. <http://dx.doi.org/10.5751/ES-06602-190308> (8 pages)

Zeng, Yiwen; Maxwell, Sean; Runting, Rebecca K. et al. 2020. Environmental destruction not avoided with the Sustainable Development Goals. *Nature Sustainability*. <https://doi.org/10.1038/s41893-020-0555-0> (6 pages)

### **Resilience**

Adger, W. Neil. 2000. Social and ecological resilience: are they related? *Progress in Human Geography* 24(3): 347-364. doi:10.1191/030913200701540465 (17 pages)

Xu, Li; [Marinova, Dora](#) & Guo, Xiumei. 2015. Resilience thinking: a renewed system approach for sustainability science. *Sustainability Science* 10(1): 123. <https://search.ebscohost.com> (16 pages)

Olsson, Lennart; [Jerneck, Anne](#); Thoren, Henrik; Persson, Johannes & O'Byrne, David. 2015 Why resilience is unappealing to social science: Theoretical and empirical investigations of the scientific use of resilience. *Science Advances* 1(4): DOI: 10.1126/sciadv.1400217 (12 pages)

### **Political Ecology**

Turner II, B.L. & Robbins, Paul. 2008. Land-Change Science and Political Ecology: Similarities, Differences, and Implications for Sustainability Science. *Annual Review of Environment and Resources* 33(1): 295-316. <https://doi.org/10.1146/annurev.enviro.33.022207.104943> (21 pages)

Adger, W. Neil; Benjaminsen, Tor A.; [Brown, Katrina](#) & [Svarstad, Hanne](#). 2001. Advancing a political ecology of global environmental discourses. *Development and Change* 32(4): 681-715. <https://doi.org/10.1111/1467-7660.00222> (34 pages)

Swyngedouw, Erik & Heynen, Nikolas C. 2003. Urban Political Ecology, Justice and the Politics of Scale. *Antipode* 35(5): 898-918. <https://doi.org/10.1111/j.1467-8330.2003.00364.x> (10 pages)

[Truelove, Yaffa](#). 2011. (Re-) Conceptualizing water inequality in Delhi, India through a feminist political ecology framework. *Geoforum* 2(2): 143-152. <https://doi.org/10.1016/j.geoforum.2011.01.004> (9 pages)

### **Systems**

[Meadows, Donella](#). 2008. *Thinking in Systems: A Primer*. White River Junction: Chelsea Green. (Intro chapter. selected parts only; pdf will be made available) (20 pages)

Kim, Daniel H. 1999. Introduction to systems thinking. Pegasus Communications Inc. (21 pages) <https://thesystemsthinker.com/introduction-to-systems-thinking/>

Tan, David T. et al. 2019. Systems approaches for localising the SDGs: co-production of place-based case Studies. *Globalization and Health* 15:85. <https://doi.org/10.1186/s12992-019-0527-1> (10 pages)

### **Transdisciplinarity**

Funtowicz, Silvio O. & Ravetz, Jerome R. 1993. Science for the Post-Normal Age. *Futures* 25(7): 739-755. [https://doi.org/10.1016/0016-3287\(93\)90022-L](https://doi.org/10.1016/0016-3287(93)90022-L) (16 pages)

OECD. 2020. Addressing Societal Challenges Using Transdisciplinary Research. OECD Policy Paper, No 88. [https://www.oecd-ilibrary.org/science-and-technology/addressing-societal-challenges-using-transdisciplinary-research\\_0ca0ca45-en](https://www.oecd-ilibrary.org/science-and-technology/addressing-societal-challenges-using-transdisciplinary-research_0ca0ca45-en) (80 pages. *Read the first 40 pages*)

Caniglia, Guido; Luederitz, C.; von Wirth, T. et al. 2020. A pluralistic and integrated approach to action-oriented knowledge for sustainability. *Nature Sustainability*. <https://doi.org/10.1038/s41893-020-00616-z> (8 pages)

[Polk, Merritt](#). 2014. Achieving the promise of transdisciplinarity: a critical exploration of the relationship between transdisciplinary research and societal problem solving. *Sustainability Science* 9:1-13. <https://doi.org/10.1007/s11625-014-0247-7> (13 pages)

Mitchell, Ronald K.; Agle, Bradley R. & Wood, Donna J. 1997. Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *Academy of management review* 22(4): 853-886. <https://www.jstor.org/stable/259247> (34 pages)

Lam, David P. M.; Martín-López, Berta; Wiek, Arnim; Bennett, Elena M.; Frantzeskaki, Niki; Horcea-Milcu, Andra I. & Lang, Daniel J. 2020. Scaling the impact of sustainability initiatives: a typology of amplification processes. *Urban Transformations* 2:24. 3. [10.1186/s42854-020-00007-9](https://doi.org/10.1186/s42854-020-00007-9) (24 pages)

### ***Anticipatory approaches***

Knappe, Henrike; Holfelder, Anne-Katrin; Löw Beer, David et al. 2019. The politics of making and unmaking (sustainable) futures: introduction to the special feature. *Sustainability Science* 14:891-898. <https://doi.org/10.1007/s11625-019-00704-w> (8 pages)

### ***Storylines & Imaginaries***

Cortes Arevalo, Vivian Juliette; Verbrugge, Laura N. H.; Sools, Anneke; Brugnach, Marcela; Wolterink, Rik; van Denderen, R. Pepijn; Candel, Jasper H. J.; Hulscher, Suzanne J. M. H. 2020. Storylines for practice: a visual storytelling approach to strengthen the science-practice interface. *Sustainability Science* 15:1013-1032. <https://doi.org/10.1007/s11625-020-00793-y> (19 pages)

Jasanoff, Sheila & Kim, Sang-Hyun. 2009. Containing the Atom: Sociotechnical Imaginaries and Nuclear Power in the United States and South Korea. *Minerva* 47(2): 119-146. <https://www-jstor-org.ludwig.lub.lu.se/stable/41821489> (27 pages)

Longhurst, Noel & Chilvers, Jason. 2019. J. Mapping diverse visions of energy transitions: co-producing sociotechnical imaginaries. *Sustainability Science* 14:973-990. <https://doi.org/10.1007/s11625-019-00702-y> 8 (17 pages)

### ***Scenarios & Visioning***

Swart R. J.; Raskin, P. & Robinson, J. 2004. The problem of the future: sustainability science and scenario analysis. *Global Environmental Change* 14:137-146. <https://doi.org/10.1016/j.gloenvcha.2003.10.002> (9 pages)

Mahmouda, Mohammed et al. 2009. A formal framework for scenario development in support of environmental decision-making. *Environmental Modelling & Software* 24:798-808. <https://doi.org/10.1016/j.envsoft.2008.11.010> (10 pages)

Raudsepp-Hearne, C.; Peterson, G.D.; Bennett, E.M. et al. 2019. Seeds of good anthropocenes: developing sustainability scenarios for Northern Europe. *Sustainability Science* 15:605-617. <https://doi.org/10.1007/s11625-019-00714-8> (12 pages)

Robinson, John; Burch Sarah; Talwar, Sonia; O'Shea, Meg & Walsh, Mike. 2011. Envisioning sustainability: Recent progress in the use of participatory backcasting approaches for sustainability research. *Technological Forecasting & Social Change* 78(5): 756-768. <https://doi.org/10.1016/j.techfore.2010.12.006> (12 pages)

Wiek, Arnim & Iwaniec, David. 2014. Quality criteria for visions and visioning in sustainability science. *Sustainability Science* 9:497-512. <https://doi.org/10.1007/s11625-013-0208-6> (15 pages)

### ***Inclusionary approaches***

Dyer, Alan. 2007. Inspiration, Enchantment and a Sense of Wonder ... Can a New Paradigm in Education Bring Nature and Culture Together Again? *International Journal of Heritage Studies* [s. l.], 13(4/5): 393-404. <https://doi.org/10.1080/13527250701351106> (11 pages)

### ***Solutions orientation***

Rotmans, Jan & Loorbach, Derk. 2009. Complexity and Transition Management. *Journal of Industrial Ecology* 13:184-196. <https://doi.org/10.1111/j.1530-9290.2009.00116.x> (12 pages)

Geels, Frank W. 2011. The multi-level perspective on sustainability transitions: responses to seven criticisms. *Journal of Environmental Innovation & Societal Transitions* 1(1): 24-40. <https://doi.org/10.1016/j.eist.2011.02.002> (16 pages)

Köhler, Jonathan; Geels, Frank W.; Kern, Florian; Markard, Jochen; Onsongo, Elsie; Wieczorek, Anna; Alkemade, Floortje; Avelino, Flor; Bergek, Anna et al. 2019. Viewpoint: An agenda for sustainability transitions research: State of the art and future directions. *Environmental Innovation and Societal Transitions* 31:1-32. <https://doi.org/10.1016/j.eist.2019.01.004> (32 pages)

Kanger, Laur & Schot, Johan. 2019. Deep transitions: Theorizing the long-term patterns of socio-technical change. 2019. *Environmental Innovation and Societal Transitions* 32:7-21. <https://doi.org/10.1016/j.eist.2018.07.006> (14 pages)