Studies of Socio-Ecological Production Landscapes and Seascapes (SEPLS)

United Nations University
Institute for the Advanced Study of Sustainability (UNU-IAS)
Spring 2024

Location: 6F Lecture Room
Time: Mondays 11:20-13:00 (100 min.)
with some exceptions

Lecturer: Maiko Nishi (nishi@unu.edu)
Office Hours: by appointment

Course Description

Recent global assessments of life on Earth show pervasive human-driven decline in nature. Biodiversity loss ranks as one of the three most potentially severe risks for the next decade (World Economic Forum 2022). Understanding the dynamics in human-nature interactions across multiple scales and levels is crucial for designing and implementing the interventions to enhance biodiversity conservation and ensure sustainability. Socio-ecological production landscapes and seascapes (SEPLS) – defined as dynamic mosaics of habitats and land and sea uses where harmonious human-nature interactions maintain both biodiversity and human wellbeing – manifest a sustainable model of management practices that helps us to achieve the 2050 Vision for Biodiversity: living in harmony with nature. This course aims to deepen the understanding of SEPLS and explore various approaches to the studies of SEPLS. It will introduce key concepts, theories, methodologies that are useful to understand and undertake research on productive landscapes and seascapes hinging on the concept of SEPLS.

Course Objectives and Leaning Goals

This course will provide students with knowledge concerning key features of SEPLS as well as challenges and opportunities in managing SEPLS. It will also demonstrate various methodological approaches to the studies of SEPLS. By the end of the semester, students will be able to:
  • Be familiarized with science-policy-practice processes concerning biodiversity, nature's contributions to people, and sustainability;
  • Understand key concepts, approaches and methods for research on SEPLS, including landscape approaches, multiple values to nature, social-ecological resilience, mapping and modeling, and scenario development and analyses;
  • Gain hands-on training experiences where students demonstrate a few selected methodological tools; and
  • Conceptualize, design and critique empirical research on SEPLS.

Requirements and evaluation policy

The course requirements include class participation, mid-term and final group presentations, a final group report, and a final individual paper. The grading policy is as follows:
- Class participation: 20%
- Final group presentation and report: 40%
- Final individual paper: 40%

Class Participation:
Students are expected to do the assigned readings and come to sessions prepared for active participate in class discussions. The course requires students to show up to class on time and actively participate in all the classes.

Group Presentations and Report:
Students are required to design and conduct group work on one topic in which group members are interested. Outputs from each group will include a mid-term group presentation, a final group presentation, and a final report (approximately 3,000 words excluding references). A final presentation, as well as a final report, is expected to cover the problem statement (background), objectives and research questions (including hypotheses if appropriate), methodologies and methods, study materials and area/sites, results, discussion, conclusion, and references. Each group will make a mid-term presentation, which will not be graded, to report the progress of its work and receive feedback from the instructor (and possibly guest critiques) for further work and any improvements.

Individual Paper:
Students are required to produce one individual term paper on the topic related to the group work but with a focus on certain element(s)/part(s) of the group work, which is of individual interest (approximately 3,000 words excluding references). The format of the individual paper follows the final report of the group work. Each student is expected to include additional analysis on the group work in their individual paper, which should not be a mere short review or summary of the final group presentation but a paper to show an additional individual effort on the topic or subtopic of the group work.

Course Outline

#	Date	Topic	Instructor
Introduction and overview of science-policy-practice interface and key concepts			
1	4/1 (11:20-13:00) *Mon.*	**Introduction and overview of the course** Key concepts (biodiversity, ecosystem services, nature's contributions to people, SEPLS, etc.) and development of science-policy interface	Maiko Nishi
2	4/1 (14:00-15:40) *Mon.*	**Biodiversity-climate nexus** Interlinkages between biodiversity and climate change, and nexus approaches	Himangana Gupta (Research Fellow and Academic Associate, UNU-IAS)
3	4/8 (11:20-13:00)	**Landscape approaches and land policy**	Maiko Nishi

		Mon.	Key features of landscape approaches and instruments for land policy (policy instruments, property rights, etc.)	
4	4/8 (14:00-15:40) Mon.		**Wise-use of marine and coastal ecosystem with ICM/Satoumi concept (Policies and practices for conservation and restoration of marine and coastal environments)** Coastal ecosystem restoration, integrated coastal management (ICM), mangrove forest, gobies revival project, blue carbon, climate change adaptation and mitigation, and civil science	Keita Furukawa (President, Association for Shore Environment Creation)
Methods, approaches and tools for assessing SEPLS				
5	4/15 (11:20-13:00) Mon.		**Measuring and quantifying SEPLS's contributions to people** Ecosystem services conceptualization, quantitative analysis, qualitative analysis	Rajarshi Dasgupta (Assistant Professor, Indian Institute of Technology, Delhi)
6	4/15 (14:00-15:40) Mon.		**Identifying the location of SEPLS for area-based conservation** Identification and mapping of SEPLs and discussion of SEPLS for OECM (Satoyama Index, Geographical identification of dynamic mosaics, area-based conservation, etc.)	Yoji Natori (Associate Professor, Akita International University)
7	4/22 (11:20-13:00) Mon.		**Discourses and practices of access and benefit sharing (ABS)** Policy evolution and practical implications of ABS	Suneetha M. Subramanian (Research Fellow, UNU-IAS)
8	4/29 (11:20-13:00) Mon.		**Mid-term group presentations**	Maiko Nishi
9	6/3 (11:20-13:00) Mon.		**Exploring plausible futures of SEPLS (Theory):** Future scenarios, drivers of change, uncertainties, story & simulation approach	Shizuka Hashimoto (Associate Professor, The University of Tokyo)
10	6/3 (14:00-15:40) Mon.		**Exploring plausible futures of SEPLS (Practice):** Scenario axes technique, drivers of change, uncertainties, delphi method	Gowhar Meraj (JSPS Post-Doctoral Fellow, The University of Tokyo)
11	6/10 (9:30-11:20) Mon.		**Tools and models of ecosystem services assessments (Theory&Practice): Introduction to InVEST models** Ecosystem services assessment, GIS, Mapping, InVEST	Kikuko Shoyama (Associate Professor, College of Agriculture, Department of Regional and Comprehensive

			Agriculture, Ibaraki University)
12	6/10 (11:20-13:00) *Mon.*	**Evaluating resilience in SEPLS from the local perspectives (Theory)** Concept of social-ecological resilience, Transition theories, Resilience indicators	Maiko Nishi
13	6/10 (14:00-15:40) *Mon.*	**Evaluating resilience in SEPLS from the local perspectives (Practice)** Resilience indicators, community-based participatory assessments	Maiko Nishi
Finals			
14	6/24 (11:20-13:00) *Mon.*	**Final presentations (Group presentations)**	Maiko Nishi
15	7/8 (11:20-13:00) *Tue.*	**Feedback session (Feedback to individual papers due on July 1)**	Maiko Nishi

Course Readings

Each class will have a set of required readings that should be completed prior to the class. The average reading load per class is 40-80 pages (although it depends on the subject of each class). The lecturer reserves the right to update the reading list throughout the course and will alert students to the changes in class.

Course Readings by Each Lecture

#	Topic
1	**Introduction and overview of the course**
	• Díaz, S., Demissew, S., Carabias, J., Joly, C., Lonsdale, M., Ash, N., ... & Zlatanova, D. (2015). The IPBES Conceptual Framework—connecting nature and people. *Current opinion in environmental sustainability*, *14*, 1-16. • Saito, O., Shibata, H., Ichikawa, K., Nakamura, T., Honda, Y., & Morimoto, J. (2012). Satoyama and Satoumi, and ecosystem services: A conceptual framework. In Duraiappah, A.K., Nakamura, K., Takeuchi, K. Watanabe, M. and Nishi, M. (ed.): Satoyama-Satoumi ecosystems and human well-being: Socio-ecological production landscapes of Japan, 17-59.
2	**Biodiversity-climate nexus**

	• Basics: Connecting biodiversity and climate change mitigation and adaptation: Report of the second ad hoc technical expert group on biodiversity and climate change (16 pages): https://www.cbd.int/doc/publications/ahteg-brochure-en.pdf • Biodiversity and climate action Information note by CBD (17 pages): https://www.cbd.int/climate/doc/information-note-01-unfccc-cop15-en.pdf • IPBES and IPCC workshop report (28 pages): https://www.ipcc.ch/site/assets/uploads/2021/07/IPBES_IPCC_WR_12_2020.pdf • UNFCCC COP 21 decision on alternative policy approaches (2 pages): https://unfccc.int/files/meetings/paris_nov_2015/application/pdf/sbsta_42_agenda_item_4_alternative_policy_approaches_auv_template.pdf • UNFCCC decision on Ecosystem based adaptation (30 pages): https://digitallibrary.un.org/record/721003?ln=en
3	**Landscape approaches and land policy**
	• Reed, J., Van Vianen, J., Deakin, E. L., Barlow, J., & Sunderland, T. (2016). Integrated landscape approaches to managing social and environmental issues in the tropics: learning from the past to guide the future. *Global change biology*, *22*(7), 2540-2554. • Sayer, J., Sunderland, T., Ghazoul, J., Pfund, J. L., Sheil, D., Meijaard, E., ... & Buck, L. E. (2013). Ten principles for a landscape approach to reconciling agriculture, conservation, and other competing land uses. *Proceedings of the national academy of sciences*, *110*(21), 8349-8356.
4	**Wise-use of Marine and coastal ecosystem with ICM/Satoumi concept**
	• Ramsar Convention Secretariat, 2007. Wise use of wetlands: A Conceptual Framework for the wise use of wetlands. Ramsar handbooks for the wise use of wetlands, 3rd edition, vol. 1. Ramsar Convention Secretariat, Gland, Switzerland (It already new edition has been published, but I would like to recommend this version because the framework of the wise-use is well illustrated). • Tanaka, T. and K. Furukawa 2019. Prospects for practical "Satoumi" implementation for Sustainable Development goals: lessons learnt from the Seto Inland Sea, Japan, in Proceedings of Coast Bordeaux Symposium and of the 17th French – Japanese Oceanography Symposium 2017. • Furukawa, K., M. Atsumi and T. Okada 2019. Importance of citizen science application for integrated coastal management - Change of Gobies' survival strategies in Tokyo Bay, Japan, Estuarine, Coastal and Shelf Science 228(2019) 106388. • Furukawa, K. et.al. 2019, A Community Based Mangrove Rehabilitation of High Energy Coasts in Pedada Bay, Philippines, J. of Tropical Forest Research, 3(1): 54-61.
5	**Measuring and quantifying SEPLS's contributions to people**

	• Chan, K. M., Balvanera, P., Benessaiah, K., Chapman, M., Díaz, S., Gómez-Baggethun, E., ... & Turner, N. (2016). Opinion: Why protect nature? Rethinking values and the environment. *Proceedings of the national academy of sciences*, 113(6), 1462-1465. https://www.pnas.org/content/pnas/113/6/1462.full.pdf • Schägner, J. P., Brander, L., Maes, J., & Hartje, V. (2013). Mapping ecosystem services' values: Current practice and future prospects. *Ecosystem Services*, 4, 33-46. https://www.sciencedirect.com/science/article/pii/S2212041613000120 • Takahashi, Y., Park, K. J., Natori, Y., Dublin, D., Dasgupta, R., & Miwa, K. (2021). Enhancing synergies in nature's contributions to people in socio-ecological production landscapes and seascapes: Lessons learnt from ten site-based projects in biodiversity hotspots. *Sustainability Science*, 1-14. https://link.springer.com/article/10.1007/s11625-021-00927-w • Hashimoto, S., DasGupta, R., Kabaya, K., Matsui, T., Haga, C., Saito, O., & Takeuchi, K. (2019). Scenario analysis of land-use and ecosystem services of social-ecological landscapes: implications of alternative development pathways under declining population in the Noto Peninsula, Japan. *Sustainability Science*, 14(1), 53-75. https://link.springer.com/article/10.1007%2Fs11625-018-0626-6 • Dasgupta, R., Hashimoto, S., Basu, M., Okuro, T., Johnson, B. A., Kumar, P., & Dhyani, S. (2021). Spatial characterization of non-material values across multiple coastal production landscapes in the Indian Sundarban delta. *Sustainability Science*, 1-14. https://link.springer.com/article/10.1007/s11625-020-00899-3 • Wolff, S., Schulp, C. J. E., & Verburg, P. H. (2015). Mapping ecosystem services demand: A review of current research and future perspectives. *Ecological Indicators*, 55, 159-171. https://www.sciencedirect.com/science/article/pii/S1470160X15001405 • DasGupta, R., Hashimoto, S., & Gundimeda, H. (2019). Biodiversity/ecosystem services scenario exercises from the Asia–Pacific: typology, archetypes and implications for sustainable development goals (SDGs). *Sustainability Science*, 14(1), 241-257. https://link.springer.com/article/10.1007/s11625-018-0647-1 • Alcamo, J. (Ed.). (2008). Environmental futures: the practice of environmental scenario analysis. Elsevier.
6	**Identifying the location of SEPLS for area-based conservation**
	• Natori Y, Hino A. Global identification and mapping of socio- ecological production landscapes with the Satoyama Index. PLoS One. 2021;16: e0256327.https://doi.org/10.1371/journal.pone.0256327 (An article on how SEPLs might be mapped) • Jonas, H. D., MacKinnon, K., Dudley, N., Hockings, M., Jessen, S., Dan Laffoley, MacKinnon, D., Matallana-Tobón, C. L., Sandwith, T., Waithaka, J., & Woodley, S. (2018). Editorial Essay: Other effective area-based conservation measures: From Aichi Target 11 to the post-2020 biodiversity framework. *Parks*, *24*(Special issue), 9–16. https://doi.org/10.2305/IUCN.CH.2018.PARKS-24-SIHDJ.en
7	**Discourses and practices of access and benefit sharing (ABS)**

	- Basics of concepts: https://www.cbd.int/abs/doc/protocol/factsheets/abs-en.pdf - On Nagoya Protocol: https://www.cbd.int/abs/doc/protocol/factsheets/nagoya-en.pdf - ABS options: https://www.frontiersin.org/articles/10.3389/fpls.2019.01175/full - ABS in practice: https://www.cbd.int/doc/publications/cbd-ts-38-en.pdf - ABS and Community wellbeing https://documents.pub/document/learning-from-the-learning-from-the-practitioners-benefit-sharing-perspectives.html?page=2
9	**Exploring plausible futures of SEPLS (Theory):**
	- Alcamo, J., & Ribeiro, T. (2001). Scenarios as tools for international environmental assessment (Vol. 5). European Environment Agency. (https://www.eea.europa.eu/publications/environmental_issue_report_2001_24) - Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, IPBES. (2016). Summary for policymakers of the methodological assessment of scenarios and models of biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Zenodo. https://doi.org/10.5281/zenodo.3235275
10	**Exploring plausible futures of SEPLS (Practice):**
	- Rhydderch, Alun. "Scenario Building: The 2x2 Matrix." Futuribles. Retrieved from https://www.futuribles.com/en/group/prospective-and-strategic-foresight-toolbox/document/scenariobuilding-the-2x2-matrix-technique (2017). - van't Klooster, Susan A., and Marjolein BA van Asselt. "Practising the scenario-axes technique." *Futures* 38.1 (2006): 15-30.
11	**Tools and models of ecosystem services assessments**
	- Peter Kareiva, Heather Tallis, Taylor H. Ricketts, Gretchen C. Daily, Stephen Polasky (2011) Natural Capital: Theory & Practice of Mapping Ecosystem Services, Oxford Univ Pr. 365pp.
12, 13	**Evaluating resilience in SEPLS from the local perspectives**
	- Folke, C., Biggs, R., Norström, A. V., Reyers, B., & Rockström, J. (2016). Social-ecological resilience and biosphere-based sustainability science. *Ecology and Society*, *21*(3). http://www.jstor.org/stable/26269981 - Li, T., Dong, Y., & Liu, Z. (2020). A review of social-ecological system resilience: Mechanism, assessment and management. *Science of the Total Environment*, *723*, 138113. https://doi.org/10.1016/j.scitotenv.2020.138113. - UNU-IAS, Bioversity International, IGES and UNDP (2014) Toolkit for the Indicators of Resilience in Socio-ecological Production Landscapes and Seascapes (SEPLS). Available at: https://collections.unu.edu/eserv/UNU:5435/Toolkit_for_the_Indicators_of_Resilience.pdf

Important Information

Class Conduct & Etiquette
Students are expected to arrive on time and not to engage in disruptive behavior during class.
This includes, among other things, private side conversations, the use of cellphones and other

electronic devices, or the reading of newspapers. Cellphones should be switched off and stored in the bag. We wish to create an atmosphere of open and tolerant discussion in the classroom and request students to recognize every individual's right to have an opinion. The lecturer and other students should be treated with dignity and respect, in particular in discussions on contentious political issues where a diversity of opinion is likely to arise. However, we also recognize that there are limits to tolerance and the lecturer reserves the right to request disciplinary action against any student who violates this policy or repeatedly shows disruptive behavior in class.

Computer Use in Class
*For online classes, students must have access to a camera and audio and show their faces in class to ensure lessons are conducted in an interactive manner. In **The Law and Practice of the United Nations** course, students are expected to actively participate and engage in discussion during online lessons. Students are requested to turn off other notifications on their cell phones during class. The use of computers (including tablets) in the classroom is restricted to taking notes, reading the course materials, or searching for course related information on the internet. Any disruption of the class by cell phones, instant messaging programs or other communication devices will not be tolerated. The lecturer reserves the right to revoke this permission if a student is found using a computer for any non-course related activities.*

Plagiarism & Academic Misconduct
Please be aware that the consequences of plagiarism are severe, and students found guilty of academic misconduct will be punished in accordance with UNU's academic honesty policies. The lecturer reserves the right to run all assignments through an anti-plagiarism software provided by the UNU. If evidence of academic misconduct on the assigned presentations, the mid-term exam or the final essay should be found, the assignment will receive a failing grade. In case of repeated violations of academic conduct, the student may receive a failing grade for the entire course and will be reported to the appropriate authorities for disciplinary action.

Invited Speakers/Lecturers Bio
Maiko Nishi, Ph.D. (Lectures 1, 3, 12, and 13)
Research Fellow, UNU-IAS
Dr. Maiko Nishi is a Research Fellow of UNU-IAS, engaging in research and capacity development for the International Partnership for the Satoyama Initiative (IPSI). Her area of research interest includes social-ecological system governance, local and regional planning and agricultural land policy. In particular, her interest lies in multi-level governance, land tenure and use, and subjectivities of institutional actors in governing natural resources. She began her career as a consultant in urban planning and experienced projects related to participatory planning, rural

water supply and regional development. She currently serves as a Lead Author for the IPBES thematic assessment on transformative change.

Himangana Gupta, Ph.D. (Lecture 2)
Research Fellow and Academic Associate, UNU-IAS

Dr. Himangana Gupta is an expert in climate change and biodiversity policy. She has worked on climate adaptation, forestry, carbon markets, sustainability, and gender. She is Research Fellow and Academic Associate at UNU-IAS. Prior to this, she was Manager, World Resources Institute, India. From 2019-2021, she was a JSPS-UNU Postdoctoral Fellow. She also worked as Programme Officer, Ministry of Environment, Forest and Climate Change, India from 2016-2019. She has seven co-edited books to her credit and more than 30 research publications. She is also serving as Lead Author for the IPBES Nexus Assessment.

Keita Furukawa, Ph.D. (Lecture 4)

Dr Keita Furukawa, President of the Association for Shore Environment Creation (NPO), Affiliated Research Fellow, the Ocean Policy Research Institute of the Sasakawa Peace Foundation, Japan, and Technical session chair of the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA). He has more than 30 years of experience with marine and coastal environmental research and coastal ecosystem restoration project implementation with integrated coastal management (ICM).

Rajarshi Dasgupta, Ph.D. (Lecture 5)
Senior policy researcher, Institute for Global Environmental Strategies (IGES)

Dr Rajarshi Dasgupta is an Assistant Professor at the School of Public Policy, Indian Institute of Technology, Delhi. He is also a fellow of the Institute for Global Environmental Strategies (IGES). His research interests are environmental scenario planning, spatial quantification of ecosystem services and community-based conservation. He was a Lead Author (LA) for the Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services (IPBES) Asia-Pacific Regional Assessment Report and the IPBES assessment on Sustainable Use of Wild Species (2018-2022). Dr Dasgupta authored/co-authored more than 60 peer-reviewed papers in reputed international journals on the topic related to the mapping and monitoring of ecosystem services and natural resource conservation. He also worked as a chapter scientist for IPCC's sixth assessment report.

Yoji Natori, Ph.D. (Lecture 6)
Associate Professor, Global Studies, Faculty of International Liberal Arts, Akita International University

Expertise in landscape ecology and conservation. Joined AIU after 16 years with NGOs in 2019. At AIU, he builds on his experiences at NGOs in on-the-ground practice and policy work in issues of conservation, particularly biodiversity, the Satoyama Initiative and natural capital, and teaches environmental science, conservation and sustainable development. He also serves as an honorary advisor to Conservation International Japan, vice chair of the Japan Committee for IUCN, and a member of the Environment Council of Akita Prefecture.

Suneetha M Subramanian, Ph.D. (Lecture 7)
Research Fellow, UNU-IAS

Dr. Suneetha M. Subramanian is currently a Research fellow with the United Nations University Institute for the Advanced Study of Sustainability. She has more than 15 years of experience in international and sub-national research and capacity building activities relating to biodiversity and human well-being focusing on equity, traditional knowledge, linking policy goals to local priorities and community well-being, socio-ecological resilience. She has been involved in various assessments of the IPBES (Regional, Global and currently Values Assessment) as Lead/ Co-ordinating Lead author and is on the Editorial board of the Sustainability Science Journal and the Journal of Ecosystems and People.

Shizuka Hashimoto, Ph.D. (Lecture 9)
Associate Professor, The University of Tokyo
Dr. Shizuka Hashimoto is an associate professor at the Department of Ecosystem Studies, School of Agricultural and Life Sciences, the University of Tokyo. His research interests include land change & ecosystem service simulation, and scenario analysis. He contributed to a Japan Satoyama Satoumi Assessment as a Coordinating Lead Author and served as one of the expert group members for Japan Biodiversity Outlook 2 and 3. Internationally, he contributed to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Global Assessment and the Asia-Pacific Regional Assessment as a Lead Author. Since 2018, he has served as one of the Multidisciplinary Expert Panel members of IPBES.

Gowhar Meraj, Ph.D. (Lecture 10)
JSPS Post-Doctoral Fellow, The University of Tokyo
Dr. Gowhar Meraj is a JSPS Post-Doc Fellow at the Landscape Ecology and Planning Laboratory, Department of Ecosystem Studies, The University of Tokyo, Japan. His research interests include hydrology, river basin management, disaster risk assessment, and spatial analysis. Previously he was Young Scientist Fellow, Under the Department of Science and Technology, Government of India (DST-GOI), prestigious research programme of Scheme for Young Scientists and Technologists (SYST). He has also served as a Programme Officer in the flagship environmental coordination and awareness scheme of Government of India, Environmental Information Systems (ENVIS) for 5 years. He has collaborated with international researchers from Japan, Bangladesh, Vietnam, Italy, Turkey, Mongolia, and India. His dedication and expertise contribute significantly to global efforts addressing the critical challenges and opportunities in water security and environmental sustainability.

Kikuko Shoyama, Ph.D. (Lecture 11)
Associate Professor, College of Agriculture, Department of Regional and Comprehensive
Agriculture, Ibaraki University
Dr Kikuko Shoyama is an Associate Professor at the Department of Regional and Comprehensive Agriculture, College of Agriculture, Ibaraki University, Japan. Her research interests are in quantitative analysis of socio-ecological systems related to land-use change, ecosystem services, and disaster resilience, in particular, the role of scenario modeling in decision making under uncertain and changing environment. She contributed to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) as a Lead Author for the Methodological Assessment on Scenarios and Models of Biodiversity and Ecosystem Services.