

## **Sustainable Development SOSC 5620**

**Spring 2022**

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**Wednesdays 18:30-21:20 Classroom: 3494, Lift 25-26**

### **Sustainable Development of the Greater Bay Area**

The goal of this course is to provide a venue for students to develop an understanding of sustainable development as a collective effort among diverse stakeholders. Pursuing that goal will enable students to understand how science, policy, business and other actors can contribute to sustainable development. In order to achieve this goal, the venue for our investigation represents one of the predominant sustainable development challenges.

Sustainable development is a multi-scale process, integrating global and local ecosystems and socio-economic systems, but increasingly development is concentrating in mega-city regions. The innovativeness and economic productivity of mega-city regions drive growth and trade, and these regions are also global scale polluters and resource users. Therefore, we examine sustainable development by investigating the Greater Bay Area (GBA) because this megacity region is a particularly powerful expression of rapid and powerful development and it can be an important model for the sustainable development of other mega-city regions.

The theoretical and practical basis of the course is the cities of the GBA are competing for development (and increasingly their own sustainable development), but also must cooperate on many different sector activities to ensure sustainable development of the region. Cooperation among the cities is difficult because each city has its own developmental trajectories and priorities that are primarily under the authority of the city, yet each city must accommodate its interest to mutual regional interests. We explore this city-region interplay with regard to the different development trajectories of the cities, regional collective action problems, and sustainability transitions, governance and green growth perspectives. Students consolidate and focus their understanding by examining how a sustainability issue is dealt with at the city and regional levels. For example, by examining how an industrial cluster becomes more sustainable, a public good such as railways reduces its environmental impact, how villages in the city are made more socially and environmentally sustainable, how air pollution is controlled or how ecological corridors in the region are created.

If you can understand and demonstrate how sustainable development can be built in the GBA, not only will you have an excellent understanding of how an impactful region can be improved, but you will also have deep insights into the

practice of sustainable development—collective action among stakeholders—that can be applied elsewhere.

## **Course Requirements**

This course requires substantial reading, research, discussion and presentation. Readings are discussed in class to ensure that you have understood key points and arguments. Attendance is mandatory. The readings are also guides for your research on your final project.

You will be evaluated on:

- Attendance and participation in class 10%
- Short presentations through semester (two) 30%
- Group final presentation 20%
- Final report 40% (grade derived from individual contribution)

## **Group Projects:**

The goal of the project is for students to experience the potentials and constraints on sustainable development by analyzing the collective action needs of an issue or sector shared by the cities of the GBA. You are free to choose a sustainability issue, determine how the cities and stakeholders of the GBA balance cooperation and competition on the issue, analyse collective action and governance barriers and develop a proposal on how they can improve. The issue may focus on a coordination need of all cities or an activity where a city's policies and actions have regional impacts. Groups of 2-3 members will be formed and choose a topic after a few weeks into the semester. Classes and presentations through the semester will help you build your understanding and generate improvements for your sustainability issue.

The group will make a presentation in the last 2 weeks of class and final reports are expected shortly after classes end. The presentation will be graded on the group's overall and collective understanding of the issue and creativeness of approach taken to deal with the issue. In the final report, each member will prepare a section on their own project and it will be marked individually.

Depending on group size: Twenty-Forty pages, 4000-8000 words (references excepted), double spaced, submitted on Microsoft Word.

Dimensions of the issue for inclusion in projects:

- Environmental, social and economic considerations
- Collective action problems
- Competition and cooperation among cities and their stakeholders
- Sustainability transitions
- Multi-level governance
- Planning and policy approaches
- Green growth and clusters
- Stakeholder analysis and engagement and indicator systems

### Short presentations and literature discussions:

Each group will make 1 short presentation identifying the sustainability issues related to their sector. The presentation should be about 15 minutes.

Each person will present a focused literature review for their issue/sector of about 10 minutes.

### Schedule

Week	Topic	In-class task
1. Feb 9	SD: multi-scale process, regional nodes, and sectors	
2. Feb 16	The Mega-City Region Sustainability Challenge	Marine air emissions case study: coopetition a sector in a city, in a region
3. Feb 23	SD: collective action, principles, goals	How are SDGs set at different scales and sectors?
4. Mar 2	The GBA's coooperative development	Group allocation and environmental topic assignment
5. Mar 9	GBA environment and social issues	Describe the state of an environmental issue in the GBA. All groups. Graded
6. Mar 16	Sustainability transitions	Identifying actors and arenas
7. Mar 23	Governance, policy, and planning	Policies related to your sector/issue
8. Mar 30	Agglomeration, green growth, and clusters	Governance literature review
9. Apr 2	Transitions: sectors in cities, regions, nations	Green growth literature review
10. Apr 6	Stakeholder analysis, engagement, indicators	Sector transition literature review
11. Apr 20	Presentations	
12. Apr 27	Presentations	
13. May 4	Course review and projects preview	

## Weekly Readings

**Core readings** will be discussed in class, and you are expected to read before class.

**Supplementary readings** are for your reference for projects and provide background material that may be referred to in class. Read according to your needs.

Unless otherwise noted, all readings are available on Canvas in the appropriate weekly folder.

### 1. Sustainable Development: multi-scale process with regional nodes

#### Core Readings

- Ch. 1 introduction to sustainable development, in Sachs, J. (2015) *The Age of Sustainable Development*, New York: Columbia University Press.
- Andonova L.B. and Mitchell R.B. 2010 “The Rescaling of Global Environmental Politics” *Annual Review of Environment and Resources* 35: 255-82.

### 2. The Mega-City Region Sustainability Challenge

#### Core Readings

- Yeh, A.G.O. and Chen, Z. (2020) From cities to super mega city regions in China in a new wave of urbanisation and economic transition: Issues and challenges, *Urban Studies* 57(3) 636-654.
- Lee, F. and Chu, V. (2017) Policy Entrepreneurship, Policy Diffusion and Transboundary Environmental Regulation: Evidence from Southern China
- Zhang, Y. et al. (2018) The roles of scientific research and stakeholder engagement for evidence-based policy formulation on shipping emissions control in Hong Kong

#### Supplementary readings

- Wheeler, S. 2009 Regions, Megaregions, and Sustainability, *Regional Studies*, 43.6: 863–876.
- Zhou, W., Yu, W. and Fu, B. (2021) Urbanization and its environmental affects in six emerging mega-city regions, China, in Yeh, A., Lin, G. and Yang, F. *Mega-City Region Development in China*, London: Routledge.
- Chu, V.H.Y. & Lee, A.K.Y. (2019) Institutional obstacles and opportunities for policy entrepreneurship in cross-border environmental management: a case study in China’s Greater Pearl River Delta region, *Asian Geographer*, 36:2, 165-183, DOI: 10.1080/10225706.2018.1563797
- Ch. 1 “From Metropolis to Polyopolis” in Hall, P. and Pain, K (eds) (2006) *The Polycentric Metropolis: Learning from Mega-City Regions in Europe*, London: Earthscan.
- Scott, A. (2019) City-regions reconsidered, *EPA: Economy and Space*, 51(3).

- Scott A. et al. Ch. 1 Global City-Regions: An Overview, Ch. 1 in Scott, A. 2001 *Global City-Regions: trends, theory, policy* Oxford: Oxford University Press.

### 3. Sustainable Development: collective action, principles, goals

#### Core Readings:

- Ch. 14 Sustainable Development Goals in Sachs, J. (2015) *The Age of Sustainable Development*, New York: Columbia University Press.
- Ostrom, E. (2010) Beyond Markets and States, *American Economic Review* 100: 641–672.

#### Supplementary readings

- Ch. 2 “Towards Sustainable Development” in World Commission on Environment and Development 1987 *Our Common Future* United Nations (CANVAS) or <http://www.un-documents.net/wced-ocf.htm>
- Ch. 2 “Towards Sustainable Development” and Ch. 9 “The Urban Challenge” in World Commission on Environment and Development 1987 *Our Common Future* United Nations (CANVAS) or <http://www.un-documents.net/wced-ocf.htm>
- Hopwood, Bob, Mary Mellor, Geoff O'Brien 2005. “Sustainable development: mapping different approaches,” *Sustainable Development* 13:38-52.
- Rio Declaration
- Hardin, G. 1968 The Tragedy of the Commons, *Science* 162: 1243-1248.
- Ostrom, E. 1999 Collective Action and the Evolution of Social Norms
- Chs. 1-3 in Brandenburger, A. and Nalebuff, B. *Co-opetition*. New York: Double; (CANVAS) (book on reserve)
- Ch. 1 “Introduction: *The Incentive to Supply Global Public Goods*, in Barrett, S. 2007 *Why Cooperate?: The Incentive to Supply Global Public Goods*. Oxford: Oxford University Press.
- Ostrom, E. 1999 Collective Action and the Evolution of Social Norms, *The Journal of Economic Perspectives*, 14/3: 137-158
- Ostrom, E. et al. 1999 Revisiting the Commons: Local Lessons, Global Challenges, *Science* 284: 278-282.
- Ch. 10 The Prisoners’ Dilemma and Repeated Games in Dixit, A., Skeath, S. and Reilly, D. 2015 *Games of Strategy*, New York: W.W. Norton & Co.
- Ch. 11 Collective Action Games in Dixit, A., Skeath, S. and Reilly, D. 2015 *Games of Strategy*, New York: W.W. Norton & Co.

### 4. The PRD’s cooperative development

#### Core Readings:

- Zhang, M., Xu, J. and Chung, C. (2020) Politics of Scale, Bargaining Power and Its Spatial Impacts: Planning for Intercity Railways in the Pearl River Delta, China, *China Quarterly*, 243: 676–700

- Shen, J. (2010) Chapter 10. Assessing inter-city relations between Hong Kong and Shenzhen: the case of airport competition or cooperation in Vogel, R. et al. *Governing global city regions in China and the West, Progress in Planning* 73: 1-75.
- Government of China, Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area

### Supplemental readings

- Verhoef, Erik T. and Peter Nijkamp 2003 "Externalities in the Urban Economy" TI 2003-078/3 *Tinbergen Institute Discussion Paper*
- Xu, Z. 2015 Globalization and the megaregion: investigating the evolution of the Pearl River Delta in a historical perspective in Harrison, J. and Hoyler, M. *Megaregions*, Cheltenham: Edward Elgar.
- Ch. 5 "Economic and Spatial Transformation" in Lin, G. C. S. (1997) *Red Capitalism in South China: Growth and Development of the Pearl River Delta*. Vancouver: UBC Press.
- Ch. 3 "The Economic Development of the PRD Region" in Enright, M, Scott, E. E. and Chang, K. (2005) *Regional Powerhouses: The Greater Pearl River Delta and the Rise of China*. Singapore: John Wiley & Sons (Asia).
- Ch. 4 "The Southern China Engine" in Marco R. Di Tommaso, Laretta Rubini, and Elisa Barbieri 2013 *Southern China : industry, development and industrial policy*. London : Routledge, 2013
- InvestHK Greater PRD Report 2010
- InvestHK Greater PRD Report 2014

## 5. The State of the GBA's Environment: air and water sheds, land interactions, biodiversity, nature and agriculture, culture, ecological footprint

### Core Readings:

- "People Said Extinction Was Not Possible:" 2,000 Years of Environmental Change in South China 2003 Robert Marks
- Future flood Losses in major coastal cities 2013 Stephane Hallegatte et al. *Nature Climate Change* COI: 10.10 38/NClimate1979

### Supplementary readings

- *Liquid Assets* 2009 Civic Exchange
- Ch. 6 Ecological-Environmental Plans 2009 in HKSAR, Guangdong Construction Ministry etc. *Building a Coordinated and Sustainable World-class City-region*
- A conceptual framework for the study of human ecosystems in urban areas 1997 Steward Pickett et al. *Urban Ecosystems* 1 pgs. 185-199.
- Tracking emission sources of sulfur and elemental carbon in Hong Kong/Pearl River Delta region 2012 Jimmy Fung et al. *Journal of Atmospheric Chemistry* 69 pgs. 1-22.

- “PRD Regional Air Quality Monitoring Network – Regional Collaborative Efforts on Joint Air Quality Management” 2012 Liuju Zhong et al. *Aerosol and Air Quality Research*, x: 1–16, xxxx
- LIU Zhiwei, "Lineage on the Sands: The Case of Shawan." In David Faure and Helen F. Siu, eds., *Down to Earth: The Territorial Bond in South China*, pp. 21-43. Stanford, CA.: Stanford University Press, 1995.
- PRD Regional Air Quality Monitoring Network 2012
- Urban heat island effects of the Pearl River Delta city clusters—their interactions and seasonal variation 2011 Jian-Bin Wu et al. *Theoretical and Applied Climatology* 103 pgs. 489-499
- Pearl River Delta Water Quality Model 2008 HK EPD
- “Ch. 6 The Biophilic City” in Newman P. and Matan A. 2013 *Green Urbanism in Asia*. Hong Kong: World Scientific.
- “Ch. 22 Urban wildlife corridors: conduits for movement or linear habitat” in Douglas I., Goode D., Houck M. and Wang R. 2011 *The Routledge Handbook of Urban Ecology*. London: Routledge.
- Ch. 26 Urban Woodlands as distinctive and threatened nature-in-city patches” in Douglas I., Goode D., Houck M. and Wang R. 2011 *The Routledge Handbook of Urban Ecology*. London: Routledge.
- “Ch. 2 Planning Strategies for Urban Food System” in Philips A. 2013 *Designing Urban Agriculture : A Complete Guide to the Planning, Design, Construction, Maintenance and Management of Edible Landscapes*. New York: Wiley. **(CANVAS and Electronic)**

## 6. Sustainability Transitions

### Core Readings:

- Loorbach, D., Frantzeskaki, N. and Avelino, F. 2017 Sustainability Transitions Research: Transforming Science and Practice for Societal Change, *Annual Review of Environment and Resources*, 42: 599-626.
- Köhler et al. (2019) An agenda for sustainability transitions research: State of the art and future directions, *Environmental Innovation and Societal Transitions*, 31: 1–32

### Supplementary readings

- Geels, F. (2004) Processes and patterns in transitions and system innovations: Refining the co-evolutionary multi-level perspective, *Technological Forecasting & Social Change*, 72: 681–696.
- Geels, F. (2014) Reconceptualising the co-evolution of firms-in-industries and their environments: Developing an inter-disciplinary Triple Embeddedness Framework, *Research Policy* 43: 261– 277.
- Ostrom, E. (2009) A General Framework for Analyzing Sustainability of Social-Ecological Systems, *Science*, 325: 419-422.

## 7. Governance, policy and planning

### Core Readings:

- Lange, P. et al. 2015 Governing Towards Sustainability—Conceptualizing Modes of Governance, *Journal of Environmental Policy and Planning*, 15: 403-425. **(CANVAS)**
- Feiock, R. 2013 The Institutional Collective Action Framework, *Policy Studies Journal*, 41: 397-425. **(CANVAS)**
- Xu, J. and Yeh, A. 2017 Mega-city Region Governance and Urban Planning in Gómez-Álvarez, D., Rajack, López-Moreno, R. and Lanfranchi, G., eds. *Steering the metropolis: metropolitan governance for sustainable urban development*. Washington: IDB, 2017 (**electronic** at <https://publications.iadb.org/handle/11319/8596>)
- Li, S. (2021) Legal Instruments for the Integration and Cooperation in the Guangdong-Hong Kong-Macao Greater Bay Area (GBA): Better Implementation of the SDGs, *Sustainability*, 13(22), 12485.

### Supplementary readings

- Roberts, B. and Abbott, J. 2017 Collaborative Governance: Improving Sustainability of Development in Metropolises, in Gómez-Álvarez, D., Rajack, López-Moreno, R. and Lanfranchi, G., eds. *Steering the metropolis: metropolitan governance for sustainable urban development*. Washington: IDB, 2017 (**electronic** at [www.iadb.org/metrogov](http://www.iadb.org/metrogov)) pg. 123-139.
- One Country, Two Systems, One Smog: Cross-Boundary Air Pollution Policy Challenges for Hong Kong and Guangdong 2003 Lisa Hopkinson and Rachel Stern *China Environment Series* 6 pgs. 19-36
- Ch. 2 Ch. 9 “The Urban Challenge” in World Commission on Environment and Development 1987 *Our Common Future* United Nations **(CANVAS)** or <http://www.un-documents.net/wced-ocf.htm>
- Storper, M. 2014 Governing the Large Metropolis, *Territory, Politics, Governance* 2:115–134. **(CANVAS)**
- Feiock, R. 2016 Regional Governance and Institutional Collective Action for Environmental Sustainability in China, *Lincoln Institute of Land Policy*, Working Paper WP16RF1
- OECD Framework for Effective and Efficient Policies <http://www.oecd.org/env/tools-evaluation/>
- Xu, J. and Yeh, A. (2010) Chapter 3. Planning mega-city regions in China: rationales and policies in Vogel, R. et al. *Governing global city regions in China and the West*, *Progress in Planning* 73: 1-75.
- Vogel, R. et al. 2010 Governing Global Megacities in China and West *Progress in Planning* 73, 1–75 **(CANVAS)**
- PRD Governments 2011 *Regional Cooperation Plan on Building a Quality Living Area* **(CANVAS)**

## 8. Agglomeration, green growth, and clusters



### Core Readings:

- Capasso, M., Hansen, T., Heiberger, J., Klitkou, A., and Steen, M. (2019) Green growth – A synthesis of scientific findings, *Technological Forecasting & Social Change*, 146: 390–402.
- Grillitsch, M. and Hansen, T. (2019) Green industry development in different types of regions, *European Planning Studies*, 27 (11): 2163–2183
- Ch. 3 What are the high-priority green growth policies for cities? in OECD (2013), *Green Growth in Cities*, OECD Green Growth Studies, OECD Publishing. (CANVAS) and download at <http://dx.doi.org/10.1787/9789264195325-en>

### Supplementary readings

- Hansmeier, H. (2021) Geography of eco-innovations vis-à-vis geography of sustainability transitions: Two sides of the same coin?, GEIST Working Paper No. 2021(7).
- Ch. 1 “Perspectives on regional economic development” in Stimson, Robert, Stough, Roger and Brian Roberts 2006. *Regional Economic Development: Analysis and Planning Strategy*. Springer. (ELECTRONIC and CANVAS)
- Ch. 2 “Agglomeration and Clustering” in Philip McCann 2013 *Modern Urban and Regional Economics*. Oxford: Oxford University Press. (CANVAS)
- Deutz, P. and Gibbs, D. (2008) 'Industrial Ecology and Regional Development: Eco-Industrial Development as Cluster Policy', *Regional Studies*, 42 (10): 1313-1328.
- Sterr, T. and Ott, T. (2004) The industrial region as a promising unit for eco-industrial development – reflections, practical experience and establishment of innovative instruments to support industrial ecology, *Journal of Cleaner Production* 12, 947–965.
- Chapter 4 “Industrial Ecology” in Graedel T.E. and B.R. Allenby (1999). *Industrial Ecology 1<sup>st</sup> Edition*. Upper Saddle River: Prentice Hall. (Canvas)
- Graedel T.E. and B.R. Allenby (2003). *Industrial Ecology 2<sup>nd</sup> Edition*. Upper Saddle River: Prentice Hall. (Reserve)
- Ellen McArthur Foundation (2013) *Towards the Circular Economy* (Canvas)
- McDonough, W. and Braungart, M. (2002) *Cradle to cradle: remaking the way we make things*. New York: North Point Press. (Reserve)
- “A review of the circular economy in China: moving from rhetoric to implementation” 2013 Su, B. Heshmati, A., Geng, Y. and Yu, X. *Journal of Cleaner Production* 42: 215-227 (CANVAS)
- “Creating integrated business and environmental value within the context of China’s circular economy and ecological modernization” 2010 Park, J., Sarkis, J. and Wu, Z. *Journal of Cleaner Production* 18: 1494-1501 (CANVAS)

## 9. Transitions: sectors in cities, regions, nations

### Core Readings

- Ch. 22 Sustainability Transitions and the City Linking to Transition Studies and Looking Forward, in *Urban Sustainability Transitions*, edited by Niki Frantzeskaki, et al., Taylor & Francis Group, 2017.
- Tödting, F., Tripl, M. and Frangenheim, A.P (2020) Policy options for green regional development: adopting a production and application perspective, *Science and Public Policy*, 2020, 865–875
- Nevens, F., Frantzeskaki, N., Gorissen, L. and Loorbach, D. (2013) Urban Transition Labs: co-creating transformative action for sustainable cities, *Journal of Cleaner Production*, 50: 111-122.

### Supplementary Readings

- Ch. 1 “The Conceptual Foundations of Sustainable Cities” in Portney, Ken 2013 *Taking sustainable cities seriously: economic development, the environment, and quality of life in American cities* Cambridge, Mass. : MIT Press 2<sup>nd</sup> Ed. (**ELECTRONIC**).
- Newman, P. and Matan, A. 2013 *Green Urbanism in Asia* Singapore: World Scientific [**ELECTRONIC**]
- Beatly, T. 2012 *Green cities of Europe* Washington: Island Press (**CANVAS**)
- Simpson, R. and Zimmerman, M. 2013 *The economy of green cities* London: Springer (**CANVAS**)
- Vesco, A., & Ferrero, F. (2015). Handbook of Research on Social, Economic, and Environmental Sustainability in the Development of Smart Cities (pp. 1-518). Hershey, PA: IGI Global [**ELECTRONIC**]
- Case Studies on sustainable cities and their activities at ICLEI website: [http://www.iclei.org/resources/publications.html?tx\\_solr%5Bq%5D=ICLEI&tx\\_solr%5Bfilter%5D%5B0%5D=agenda\\_stringM%253ASustainable%2BCity](http://www.iclei.org/resources/publications.html?tx_solr%5Bq%5D=ICLEI&tx_solr%5Bfilter%5D%5B0%5D=agenda_stringM%253ASustainable%2BCity)
- <http://www.sustainablecities.eu>
- EIU 2012 Supersized cities China’s 13 megalopolises (**CANVAS**)
- World Bank and the Development Research Center of the State Council, P. R. China. 2014. *Urban China: Toward Efficient, Inclusive, and Sustainable Urbanization*. Washington, DC: World Bank.
- McKinsey Global Institute 2009 Preparing for China’s Urban Billion (**CANVAS**)
- Green City Index: [http://www.siemens.com/entry/cc/features/greencityindex\\_international/all/en/pdf/gci\\_report\\_summary.pdf](http://www.siemens.com/entry/cc/features/greencityindex_international/all/en/pdf/gci_report_summary.pdf)

## 10. Stakeholder analysis, engagement, indicators

### Core Readings

- Reed, M. et al. (2009) Who’s in and why? A typology of stakeholder analysis methods for natural resource management, *Journal of Environmental Management* 90: 1933-1949.

- Landcare research, Stakeholder Analysis
- Reload, Methods for Stakeholder Analysis

### **Supplementary Readings**

- Ch. 1 Sustainable Development—the local context. 1996 ICLEI THE LOCAL AGENDA 21 PLANNING GUIDE An Introduction To Sustainable Development Planning **(CANVAS)**.
- OECD 2001 *OECD Environmental Indicators: development, measurement and use* Paris: OECD **(Canvas)**
- <http://www.oecd.org/env/tools-evaluation/> **(WEBSITE)**
- “Introduction: Sustainability—A Broad Perspective” and “Ch. 16 The Zofnass Rating System for Infrastructure Sustainability and Decision Making,” 2013 in Pollalis, Spiro N. Georgoulas, Andreas Ramos, Stephen J. eds. *Infrastructure Sustainability and Design*. Florence, KY: Routledge. **(Electronic)**

### **11. Presentations**

### **12. Presentations**

### **13. Course review and project preview**