

Course number	G-AGR06 7FC09 LE82					
Course title (and course title in English)	生物資源經濟学特別講義 VB Special Lecture on Natural Resources Economics VB		Instructor's name, job title, and department of affiliation	Part-time Lecturer, ATTAVANICH WITSANU		
Target year	1st year students or above	Number of credits	1	Year/semesters	2021/Intensive, Second semester	
Days and periods	Intensive	Class style	Lecture	Language of instruction	English	
[Overview and purpose of the course]						
<p>【 This intensive course, themed "Implications of Climate Change, Agricultural Policies and COVID-19 Pandemic for Food Security," will be delivered online by Dr. Witsanu Attavanich, Associate Professor, Department of Economics, Faculty of Economics, Kasetsart University, Thailand. 】</p> <p>Rising global population has increased the concern about food security. A future challenge will be to secure the food supply for people and double the food production to feed a population that is projected to reach 9.73 billion by 2050. Aside from population growth, several previous studies found that food security can be affected by several other factors, including climate change, which influences food production through changes in crop yields and cropland and hence food availability. Studies also concluded that climate change is projected to negatively affect the global food system and food availability especially in the developing countries. Recent COVID-19 pandemic has also posted challenges on food security. Through eight lectures and class discussion, students are expected to understand the issues covering climate change, food security and agriculture with methods and applications to evaluate the impacts of climate change plus implications of mitigation and adaptation strategies. Moreover, students are expected to learn methods and applications of program and public policy evaluation in agriculture.</p>						
[Course objectives]						
<p>By the end of the course, each student is expected to:</p> <ol style="list-style-type: none"> 1. Understand methods used to quantify the impact of climate change on agriculture and their applications plus the implications of adaptation and mitigation strategies 2. Understand the linkage among food security, climate vulnerability, and outcomes of economic development plus structural transformation and COVID-19 pandemic in Thai agriculture as a case study 3. Understand methods used to evaluation program and policy evaluation and applications of policy aiming to address the impact of climate change 						
[Course schedule and contents]						
<p>【 This course is scheduled to be delivered online on November 4, 11, 18 and 25 at 15:00-16:30 (4th period) and 16:45-18:15 (5th period). 】</p> <p>Lecture 1) Impact of climate change and agriculture: Methodologies</p> <ul style="list-style-type: none"> - Introduction - Climate change and its impacts on agriculture 						
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生物資源經濟學特別講義 VB(2)

- Methods of measuring impacts of climate change
 - o Just and Pope production function
 - o Ricardian approach
 - o Econometrics
 - o Optimization models

Lecture 2) Impact of climate change and agriculture: Applications (Part 1)

- How is CO₂ affecting yields and technological progress? A statistical analysis
- Effect of climate change on Thailand ' s agriculture: New results
- Response and adaptation of agriculture to climate change: evidence from China

Lecture 3) Impact of climate change and agriculture: Applications (Part 2)

- Climate change impacts on sugarcane production in Thailand
- Effects of climate change on US grain transport
- Land Use, Climate Change, and Ecosystem Services

Lecture 4) Adaptation & mitigation in agriculture: Methodologies & applications

- Possible adaptation and mitigation options in agriculture
- Adaptation and mitigation options and emission reduction of greenhouse gases in Thailand ' s agriculture

Lecture 5) Food security, climate vulnerability, and COVID-19 pandemic

- Linking climate change, food system, and food security
- Developing the climate-induced food security index
- Impacts of COVID-19 pandemic on food systems and food security in Thailand

Lecture 6) Structural transformation in Thai agriculture

- Stylized facts on farms, farmers and farming
- Understanding drivers to agricultural productivity and competitiveness

Lecture 7) Evaluating agricultural policies

- Methods for program and policy evaluation

Lecture 8) Applications of public policy evaluation

- Application of Propensity Score Matching
- Application of Subjective Well-Being

[Course requirements]

English proficiency suitable for completing all assigned readings and participating in class activities for this course.

[Evaluation methods and policy]

Participation (30%), 24-hour take-home exam (40%) and homework (30%)

Note: Detailed information will be provided on the first day of class.

Refer to "2021 Guide to Degree Programs" for attainment levels of evaluation.

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生物資源經濟學特別講義 VB(3)

[Textbooks]

No textbook required

[References, etc.]

(Reference books)

Attavanich, W. (2020). COVID-19 Country Assessment of Impacts and Response Options on Food Systems, Food Security and Nutrition, and Livelihoods. Funded by UN FAO Regional Office for Asia and the Pacific (FAORAP)

Attavanich, W., Chantararat, S., Chenphuengpaw, J., Mahasuweerachai, P., & Thampanishvong, K. (2019). Farms, Farmers and Farming: A Perspective through Data and Behavioral Insights (No. 122). Puey Ungphakorn Institute for Economic Research.

Attavanich, W., & McCarl, B. A. (2014). How is CO₂ affecting yields and technological progress? A statistical analysis. *Climatic Change*, 124(4), 747-762.

Attavanich, W., McCarl, B. A., Ahmedov, Z., Fuller, S. W., & Vedenov, D. V. (2013). Effects of climate change on US grain transport. *Nature Climate Change*, 3(7), 638-643.

Attavanich, W., B.S. Rashford, R.M. Adams, and B.A. McCarl. (2014). Land Use, Climate Change, and Ecosystem Services. In the *Oxford Handbook of Land Economics*, Eds. Duke, M. Joshua, and J.J. Wu. Oxford University Press. ISBN 978-0-19-976374-0, pp 800.

Brown, M. E., Antle, J. M., Backlund, P., Carr, E. R., Easterling, W. E., Walsh, M. K., ... & Dancheck, V. (2015). Climate change, global food security, and the US food system.

Brown, M. E., Carr, E. R., Grace, K. L., Wiebe, K., Funk, C. C., Attavanich, W., ... & Buja, L. (2017). Do markets and trade help or hurt the global food system adapt to climate change?. *Food Policy*, 68, 154-159.

Chen, S., & Gong, B. (2021). Response and adaptation of agriculture to climate change: evidence from China. *Journal of Development Economics*, 148, 102557.

Just, R. E., & Pope, R. D. (1978). Stochastic specification of production functions and economic implications. *Journal of econometrics*, 7(1), 67-86.

McCarl, B.A., W. Attavanich, M. Musumba, J. Mu, and R. Aisabokhae. (2014). Land use and climate change. In the *Oxford Handbook of Land Economics*, Eds. Duke, M. Joshua, and J.J. Wu. Oxford University Press. ISBN 978-0-19-976374-0, pp 800.

Mendelsohn, R., Nordhaus, W. D., & Shaw, D. (1994). The impact of global warming on agriculture: a Ricardian analysis. *American Economic Review*, 753-771.

Pipitpukdee, S., Attavanich, W., & Bejranonda, S. (2020). Climate change impacts on sugarcane production in Thailand. *Atmosphere*, 11(4), 408.

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生物資源経済学特別講義 VB(4)

Pipitpukdee, S., Attavanich, W., & Bejranonda, S. (2020). Impact of Climate Change on Land Use, Yield and Production of Cassava in Thailand. *Agriculture*, 10(9), 402

[Study outside of class (preparation and review)]

Reading the above papers.

(Other information (office hours, etc.))

For updated information, please check the website of the Division of Natural Resource Economics at:
<http://www.reseco.kais.kyoto-u.ac.jp/en/>

*Please visit KULASIS to find out about office hours.