Course number	G-AGR06 7FC09 LE82		
Course title (and course title in English)	生物資源経済学特別講義 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	2020/Intensive, Second semester
Days and periods	Intensive	Class style	Lecture	Language of instruction	English

[Overview and purpose of the course]

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. 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.

[Course objectives]

By the end of the course, each student is expected to:

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 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]

Lecture 1) Impact of climate change and agriculture: Methodologies
- Introduction
- Climate change and its impacts on agriculture
- 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)

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- How is CO2 affecting yields and technological progress? A statistical analysis
- Effect of climate change on Thailand's agriculture: New results
- The distributional effect of climate change on agriculture: Evidence from a Ricardian quantile analysis of Brazilian census data

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 outcomes of economic development
- Linking climate change, food system, and food security
- Developing the climate-induced food security index
- Effects of the climate-induced food security index on outcomes of economic development

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 "2020 Guide to Degree Programs" for attainment levels of evaluation.

[Textbooks]

No textbook required

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生物資源経済学特別講義 VB(3)

[References, etc.]

（Reference books）

Attavanich, W., Chantarat, S., Chenphuengpawn, 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 CO 2 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.

DePaula, G. (2020). The distributional effect of climate change on agriculture: Evidence from a Ricardian quantile analysis of Brazilian census data. Journal of Environmental Economics and Management, 102378.

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.

[Study outside of class (preparation and review)]

Reading the above papers.

（Other information (office hours, etc.)）

The instructor of this intensive course is Dr. Witsanu Attavanich, Associate Professor, Department of Economics, Faculty of Economics, Kasetsart University, Thailand.

This course is scheduled to be delivered online on November 12, 19, 26 and December 3 at 14:45-16:15 (4th period) and 16:30-18:00 (5th period).

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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.