

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	2022/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 "Climate Change, Environment, Agriculture, and Rural Development: The Growing Interaction and Impact," will be delivered in person by Dr. Witsanu Attavanich, Associate Professor, Department of Economics, Faculty of Economics, Kasetsart University, Thailand. 】</p> <p>Recent studies, including study from the Intergovernmental Panel on Climate Change (IPCC) 6th assessment report indicate that greenhouse gas (GHG) emissions and resultant atmospheric concentrations have led to changes in the world ' s climate conditions, such as increases in temperatures, extreme temperatures, droughts, and rainfall intensity. Such changes are expected to continue and agriculture is potentially the most sensitive economic sector to climate change, given that agricultural production is highly influenced by climatic conditions. Other environmental problems (i.e., Food waste, forest deforestation and air pollution) have also echoed the problem of climate change and posted challenges to society. Through eight lectures and class discussion, students are expected to understand the issues covering climate change, environment, agriculture and rural development with methods and applications to evaluate the impacts of climate change plus implications of mitigation and adaptation strategies. Students are also expected to understand challenges, opportunities, and recommendations for food waste reduction in the APEC region. Moreover, students are expected to learn methods and applications of: non-market valuation for natural resource and environment, Thailand ' s rural income diagnostic, and program and 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 challenges, opportunities and solutions for food waste reduction; 3. Understand methods and applications of non-market valuation for natural resource and environment; 4. Understand methods and applications to evaluate the values of environment and program and policy 						
[Course schedule and contents]						
<p>【 This course is scheduled to be delivered in person in late January to early February 2023. The exact dates, time and venue will be announced later. 】</p> <p>Lecture 1) Impact of climate change on agriculture: Methodologies</p> <ul style="list-style-type: none"> - Introduction - Nature of the climate change problem from the perspective of economics - Recent findings from IPCC 6th assessment report - Methods of measuring impacts of climate change <ul style="list-style-type: none"> o Just and Pope production function 						
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- o Ricardian approach
- o Econometrics
- o Optimization models

Lecture 2) Impact of climate change on agriculture and food security: Applications

- Linking climate change, food system, and food security
- How is CO₂ affecting yields and technological progress? A statistical analysis
- Effects of climate change on US grain transport
- Effect of climate change on Thailand ' s agriculture: New results
- Climate change impacts on sugarcane production in Thailand
- Impacts of climate change and agricultural diversification on agricultural production value of Thai farm households

Lecture 3) Climate change adaptation & mitigation strategies in Agriculture

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

Lecture 4) Food waste reduction: Challenges, opportunities, and recommendations in the APEC region

- Current status of food waste and policies addressing food waste
- Challenges and opportunities plus the role of modern technologies on reducing food waste
- Best practices for food waste reduction
- Role of public-private partnerships in addressing MSMEs ' food waste
- Recommendations

Lecture 5) Valuing ecosystem service using the meta-analysis

- Total economic value of national resource and environment
- Non-market valuation methods
- Valuing ecosystem service of mangrove blue carbon in Thailand

Lecture 6) Evaluating the social cost of air pollution and solutions

- Sources of air pollution
- Social cost of air pollution around the world
- Evaluating the social cost of air pollution in Thailand: Method & application
- Solutions for clean air

Lecture 7) Thailand ' s rural income diagnostic: Framework & application

- Introduction
- The World Bank ' s framework for the rural income diagnostic
- Income and challenges of rural households
- Opportunities and constraints
- Priority actions to overcome major constraints

Lecture 8) Program and policy evaluation: Method and application

- Methods for program and policy evaluation
- Measuring the benefit of farm digital technology ' adoption before and after the emerging of COVID-19 pandemic
- Solutions to promote the adoption of farm digital technology

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[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 "2022 Guide to Degree Programs" for attainment levels of evaluation.

[Textbooks]

No textbook required

[References, etc.]

(Reference books)

Attavanich, W. (2021). Willingness to pay for air quality in Thailand: An analysis of multiple pollutants. Working paper of Economics Department, Kasetsart University. No.15/2021.

Attavanich, W. (2017). Effect of climate change on Thailand ' s agriculture: New results. Working paper of Economics Department, Kasetsart University. No.25/2017.

Attavanich, W. (2022). Did the adoption of digital farm applications improve income of farm households?: An investigation before and after the emerging of COVID-19 pandemic. Working paper.

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., Diloksumpun, S., Pengthamkeerati, P., Worachananant, P., Jarusutthirak, C., Satapanajaru, T. and Worachananant, S. (2021). Valuing Ecosystem Service of Mangrove Blue Carbon in Thailand: A Meta Analysis. Presented at EEPSEA Annual Conference 2021, December 1-3, 2021.

Attavanich, W., Chantararat, S., Belghith, N.B.H., Haile, M. (2022). Thailand rural income diagnostic (RID). The World Bank Group. Washington, DC.

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., Sirbuaiam, K., Sirimongkonlertkun, N., Kajitvichyanukul, P., Saetang, P., Nasanit, R., Limsawart, W., and Pongpiachan, S., 2020. Clean Air Blue Paper: Insights on the Impact of Air Pollution and its Root Causes. 1st Edition. Thailand Clean Air Network. ISBN: 978-616-393-295-2, 216 pp.

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- Attavanich, W. Thampanichvong, K. and Srijuntrapun, P. (2022). Enhancing Micro, Small and Medium Enterprises (MSMEs) ' food waste reduction for a sustainable and inclusive Asia. The APEC Handbook. APEC Small and Medium Enterprises Working Group.
- 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.
- Just, R. E., & Pope, R. D. (1978). Stochastic specification of production functions and economic implications. *Journal of econometrics*, 7(1), 67-86.
- Malhi, G. S., Kaur, M., & Kaushik, P. (2021). Impact of climate change on agriculture and its mitigation strategies: A review. *Sustainability*, 13(3), 1318.
- 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.
- 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
- Prommawin, B., Svavasu, N., Tanpraphan, S., Saengavut, V., Jithitikulchai, T., Attavanich, W., & McCarl, B. A. (2022). Impacts of Climate Change and Agricultural Diversification on Agricultural Production Value of Thai Farm Households (No. 184). Puey Ungphakorn Institute for Economic Research, Bank of Thailand

[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.