

Spring
PEPS 310 Agriculture & Environment
(E-focus)

Instructor: Dr. Koon-Hui Wang
Lecture: T R 9:00 - 10:15 am
Location: Gil 306



Agricultural production uses land, fertilizers, pesticides, water, and other inputs (e.g. traditional breeding or genetically modified crops) that can have big impact on the environment and potentially harm human and ecosystem health. This course will introduce global as well as local issues of agricultural interactions with the environment, and discuss options for environmentally responsible agriculture practices. This course has a Contemporary Ethical Issues (E) Focus designation. Students will be involved in discussion about contemporary ethical issues throughout the semester. Students will have opportunities to interact with local experts dealing with some of these issues. In addition, field visits will be arranged for some hands on activities and to experience alternative farming approaches.

This class should be of interest to students in PEPS, TPSS, NREM as well as Environmental Studies. For further information about this class, please contact Koon-Hui Wang at koonhui@hawaii.edu.



Field visits to look at screenhouse production, aquaponic, hydroponic, cover cropping and etc.

Syllabus

Lecture	Date	Topic	Home Work
		Section I: Introduction	
1	Jan 10	Introduction to Agriculture and Environment	Reading 1: Easton and Easton pg. xxi-xxxiii (introduction)
2	Jan 12	The need for sustainable food production system: How to feed the world in the 21th century?	Debate 1: Is sustainable development compatible with human welfare (Easton pg. 22-36)
3	Jan 17	Agroecosystem Concept (Debate 1)	
4	Jan 19	Food safety for crop production (Guest lecture: Donna Meyer)	
		Section II: Various impacts of conventional agricultural practices	
5	Jan 24	Importance of tillage and its impact on the environment: soil degradation, soil conservation	
6	Jan 26	Water related issues and water use management	Saturday field trip (Jan 28) to Waimanalo Experiment station
7	Jan 31	Impacts of monoculture: examples of epidemic diseases <i>Movie: The Future of Food</i>	Debate 2: Should a price be put on the goods and services provided by the world's ecosystems? (Easton pg. 37-62)
8	Feb 2	Importance of pollinators (Debate 2) <i>Movie: Mark Lynas changes his view on GMO</i>	
9	Feb 7	Genetic resources in agroecosystem: Local seeds, heirloom seeds vs hybrid seeds	Debate 3: Is genetic engineering the answer to hunger? (Easton pg. 262-273)
	Feb 9	Debate 3	Exam I Study guide in Laulima
	Feb 14	Exam I	
10	Feb 16	Agricultural chemical fate in the environment	
12	Feb 21	Agroecosystem diversity and stability:	Mini-proposal title and outline due Debate 4: Are biofuels responsible for rising food prices? Easton pg. 202-221
13	Feb 23	Conventional Energy and Renewable Energy: Biofuel. Are Biofuels Responsible for Rising Food Prices (Debate 4)	
14	Feb 28	Animals in agroecosystems	Debate 5: Should DDT

		Movie: King of Corn	be banned worldwide? (Easton pg. 295-316)
		Section III: Intervention on Negative Impacts of Agriculture	
15	Mar 2	Pesticide and the environment (Debate 5)	
16	Mar 7	Environmental Laws and Regulation	
17	Mar 9	Restoration Ecology (Cunningham Chpt 13)	Take home Quiz 17 D 6: Can organic farming feed the world? (Easton pg. 274-298)
18	Mar 14	The World Food Problem: tackling the causes of under nutrition in the 3 rd world (Debate 6)	
11	Mar 16	Special seminar: Improve fertilizer use efficiency using growing degree days (Nick Andrew, Oregon State University). St. John 106	
19	Mar 21	Reducing carbon footprint of food production	D 7: Are improved aid policies the best way to improve global food supply and protect world population?
20	Mar 23	Policies aimed at improving access to food (Debate 7)	Exam II study guide in Laulima
		Spring Break (March 27-31)	Field trip to Olomana Garden
	Apr 4	Exam II	
		Section IV: Alternative Agricultural Approaches	
21	Apr 6	IPM/ Ecologically based pest management	
22	Apr 11	Aquaponic (Clyde Tamaru?) Meet at Hale Tuahini	D 8: Does commercial fishing have a future?
23	Apr 13	Alternative Farming Practices towards Higher Biodiversity and Stability (Debate 8)	D 9: Is global warming a catastrophe that warrants immediate action?
24	Apr 18	Agroforestry vs. Deforestation, Permaculture (Debate 9)	Mini-proposal draft turn in
25	Apr 20	Natural Farming (Movie: One Straw Revolution)	Mini-proposal due
	Apr 25	Student Presentation on mini-proposal related to Agriculture and Environment I	
	Apr 27	Student Presentation on mini-proposal related to Agriculture and Environment II	
26	May 2	Farmery: A great Urban Agriculture Model (Movie: The Farmery: http://www.bigpictureagriculture.com/2014/08/the-farmery-a-great-urban-agriculture-model-	D 10: Is the Farmery approach a great idea?

		video.html) (Debate 10)	
	May 9	Final exam (7:30 - 9:30 am)	

Course Objectives:

This class aim to 1) increase student knowledge on impact of agricultural practices on the environment; 2) give students tools for the development of responsible deliberation and ethical judgment on agricultural and environmental issues.

Reference:

Gliessman, S. R. 2006. Agroecology: The Ecology of Sustainable Food Systems. CRC Press, Taylor and Francis Group, Boca Raton, FL.

Cunningham, W.P. and M. Cunningham. 2012. Environmental Science: A Global Concern (12th edition). McGraw Hill, New York, NY. (<http://www.mhhe.com/cunningham12e>)

Easton, T. and Easton, T. A. 2010. Taking Sides: Clashing Views on Environmental Issues. 14th ed. McGraw-Hill Professional.

Brown, L. 2012. Full planet, empty plates. The new geopolitics of food scarcity. W.W. Norton & Company, New York, NY. 144 pp.

Student Learning Outcomes:

Students will achieve basic competency in analyzing and deliberating upon contemporary ethical issues, and demonstrate growth in the ability to analyze and communicate an environmental issue.

Assignment:

1. Turn in **quiz** at the end of every class lecture.
2. Each student has to select one **debate** topic from the list on pg 4, refer to the reading assignment in the syllabus, and lead a class debate. Class debate is scheduled on the syllabus. The rest of the class will choose their side to participate in the debate. The students that lead the debate have to turn in individual concluding remarks from the debate within one week after the debate (~ 1 page). The other students in the class are required to pre-read the article (from Easton and Easton (2010) or articles posted in Laulima) and prepare 3 questions/comments for each debate. Please use these questions to participate in the class debate.
3. Participate in field trips: students must participate in at least one of the field trips scheduled during a weekend (to be announced)
 - a. Diversify agriculture: visit Poamoho experiment station with CTAHR Extension agents on a weekend (planting insectary plants in hydroponic/aquaponic systems, learn about cover cropping, high tunnel screen house production, reflective mulch for pest management);
 - b. Roof top gardening: visit Roof top garden at St. John building (6th floor).
4. A **mini-proposal** (8 pages long, single or double space, 12 point font, include citations) on a local issue related to agriculture and environment. Pre-proposal due Feb 21, 2017. Please provide an introduction to this issue, what is its impact, and propose approaches that might be able to resolve this issue. All facts need to be cited in reference format. Full written proposal is due on April 20, 2017.
5. Present your miniproposal in a **power point** format to the class. Each student will have 10 minutes including question and answer. The rest of the class will serve as the judges and

score your presentation. You will be judged on clarity of presentation, significance of the issue presented, and sound of your proposed approach.

6. Exams: Two mid-terms and a final exam will be used to evaluate the materials learn by the student from the lectures.

Debate topics (dents pick one topic and one side of the debate)

1. Is sustainable development compatible with human welfare?
2. Should a price be put on the goods and services provided by the world's ecosystems?
3. Is Genetic Engineering the Answer to Hunger?
4. Are biofuels responsible for rising food prices?
5. Should DDT be banned worldwide?
6. Can organic farming feed the world?
7. Are improved aid policies the best way to improve global food supply and protect world population?
8. Does commercial fishing have a future?
9. Is global warming a catastrophe that warrants immediate action?
10. Is farmery a sound approach for sustainable agriculture?

Format for Mini-proposal

1. Justification (30 points) – Briefly introduces the issue, what information is missing, and what do you propose to study, and why is this important.
2. Introduction (45 points) – Present a comprehensive but concise summary of the information available in the literature. Synthesize these information, point out its weaknesses, identifies gaps that need to be addressed.
3. Objectives (15 points) – specifically list out what do you proposed to study in numbered form.
4. Materials and Methods (30 points) – precisely describe how these objectives can be achieved through your study methods.
5. Outcome (15 points) – Describe what the outcome of this project will be if it were to be carried out successfully. Who will benefit from this, and how big will the potential impact be?
6. References (15 points) – List all the references cited follow the journal format in Weed Science. They should be accurate and allow others to locate the reference. The vast majority of the references should come from peer reviewed sources.
7. Abstract of proposal (one page only) summarizing 1-6. This will be handed to every student in the class.

Full written proposal and abstract must be turn in to the instructor on April 20, 2017. Abstract must be distributed to the entire class through Laulima. Please prepare a brief summary of your proposal in power point to be presented to the class within 8 minutes on designated class period.

Grading System:

Description	Points available	% of Grade
Questions for assigned readings and quiz	100	10%
Participating in field trips	50	5%
Mid-term Exam I	100	10%
Mid-term Exam II	200	20%

Final Exam	200	20%
Performance on leading the debate	50	5%
Concluding remarks on the debate	100	10%
Miniproposal	150	15%
Presentation on term project	50	5%
Total	1000	100%

Grade	Score (%)
A	90-100
B	80-89
C	70-79
D	60-69
F	<60