International Sustainable Development Studies Institute
สถาบันการศึกษาการพัฒนาที่ยั่งยืนนานาชาติ

Sustainable Food Systems: Social and Biological Factors in Sustainable Agriculture

Biology / Sociology
Short Name: Sustainable Food Systems
Credits: 4
Contact Hours: 64.5

- Lecture Hours: 45
- Directed Field Studies: 19.5 (39 at 2:1 ratio)

Course Description

This is an advanced course examining key issues in sustainable food production, with a special emphasis on field-based studies of organic polycultures. Perhaps one of the most challenging topics in sustainability studies, sustainable food systems are critical to creating a sustainable future. This course will look at agroecology, regenerative agriculture, study both lowland and upland agriculture as practiced in Thailand, and learning in the fields and gardens of farmers and villagers. This course will focus on Southeast Asian smallholder agriculture, with a special emphasis on organic farming and agroecology. Students will be learning about both the biology of sustainable agriculture as well as the social and political issues surrounding sustainable agriculture and current commercial food systems. Students will also explore the role of cash cropping in small-scale farming including a focus on coffee, cacao, and cannabis.

Course Objectives

The objectives for this course are to:

- Understand the major issues in sustainable food systems.
- Understand the major ecological, biological and social challenges to sustainable agriculture.
- Have specific knowledge of agriculture and its ecological and social context in both upland and lowland Thailand and Southeast Asia.
- Understand the role cash crops play in small landholding farmers in Northern Thailand including a deeper understanding of the ecology and economics of coffee, cacao, and cannabis.

Methodology

The course will integrate course lectures and readings with group discussions and seminars. Experiential field studies will be an important component of the course, both formal and informal. A large portion of the course is based on field research and on-site research and study. Guest lecturers will be a part of the course to share their experiences and perspective with students. Keeping up with readings, materials presented in class, and assignments is critical for success during this course.

Grading and Assessment

Engagement	
This means participation in and out of the classroom, being an active member of the course, and being fully present and engaged in the field. This includes participation in discussions during seminars and in the village, etc. This also means being an active and supportive member of the course, including as a designated leader and active follower/self leadership.	10
Writing	
Seminar and Observation Notes: An important component of learning to observe and analyze the issues during this course is taking notes in class as well as keeping an on-going daily record of observations outside the classroom. Put the date at the top of each page.	5
Field Research Notebook: A more structured way of collecting quantitative and qualitative data assigned to specific field studies. See the end of the syllabus for details on this course's FRN.	15
Essays: There are two essays during the course (10 points each). Essays should be 4-5 pages, handwritten in your field observation notebooks, and cover the following points: • State how this issue or topic links to the overall topic of the course (1) • Explain why you are interested in this specific issue or topic (1) • **Describe and analyze** the specific issue, including why it is important and new insights you have made from your observations (5) • Include at least two references to interviews or observations during the course (2) • Suggest other questions that this issue raises for you to explore further (1)	20
Independent Field Research Project (IFRP)	
Each student will choose an issue to study independently. The topic must be **related to the course** and concern the connection between environment and people. This should be a combination of research, observations, and analysis of a topic that the student is interested in. The **emphasis is primarily on field observations** drawing on field studies as well as independent observations. This is not a book report or literature review, but field research. **Students must receive instructor approval for their chosen topic.**	
Part 1: Proposal: The IFRP proposal is a written outline and a short presentation to the class explaining the question, how it is related to the course topic, how data will be gathered, and any potential challenges you may anticipate running into. 1 page (double-spaced, typed) as well as a short in-class presentation (1-2 minutes, no powerpoint needed).	10
Part 2: Progress Update: An update during the mid-course seminar on what the student has discovered about their topic so far, what further questions this raises, any challenges and how they have been overcome, as well as further information they will be looking for during the second half of the field study. 1 page written in your notebook as well as a short in-class presentation.	5
Part 3: Final Presentation: On the last day of the course each student will give a five minute presentation on their research. Focus on clarity, field observations, interviews with community members, and analytical depth. Use a powerpoint of 5-10 slides in PDF format. <u>Organization for final presentation:</u> 1. Describe the focus of your research and how it is related to the course topic. (2) 2. Explain your methods for collecting information or data? (3) 3. Present your findings and analysis. (7) 4. Pose further questions your research has raised for you. (2) 5. Final slide of references, interviews, or other sources of information. (1)	15
Final Exam	
The final exam will be a comprehensive review of course topics with an emphasis on what was learned during the field portion of the course, though there will also be some questions related to the seminar and mid-course. There will be 10 short answer questions (worth 2 points each). Students may use their field observation and field research notes, but not their course readers or any digital sources during the exam.	20
TOTAL	100

Schedule Overview

Readings are in the course reader. The readings are a resource for the seminars, field studies, and for your final presentation. There are a lot of readings the first week, which you will refer to later on during the field section of the course. **Be strategic in your reading** so that you focus on new materials and information, and then go back and dive deeper into the readings as needed.

Notes:
- All activities are dependent on local instructor availability, weather conditions, and other complex factors so are subject to change.
- Additional activities such as Student Designated Leadership, Species ID Presentations, and FRN opportunities, will be announced by Field Instructors.

Seminar Week Topics and Schedule

Monday - September 30
Agroecology and People's Movements
Agroecology is an approach to food production based on the idea of a farm as an ecosystem. More than that, it also represents a global people's movement for food sovereignty. We will examine some of the problems with industrial agriculture, but primarily focus on the approach of small holder agroecological farming, as well as the communities in the Global South using agroecology as a way to re-establish control over their food systems.

Readings:
- Oehen, Bernadette, and Angelika Hilbeck, eds., *Feeding the People: Agroecology for Nourishing the World and Transforming the Agri-Food System.* IFOAM EU Group, Brussels, Belgium, 2015 (Introduction, Chapter 1 & 2)
- Gliessman, S. 2007. *Agroecology: The Ecology of Sustainable Food Systems*, 2nd ed. CRC Press (Chapter 1 & 2)

Tuesday - October 1
Regenerative Agriculture and Climate Change
Regenerative agriculture uses a similar approach to agroecology by looking to natural ecosystems as the model for sustainable food production. Regenerative agriculture is especially focused on restoration of natural ecosystems, building soil health, and sequestering carbon in the soil to help both mitigate climate change and in some cases help draw down more carbon than regenerative food production emits.

Readings:
- Olson, Kristin, *The Soil Will Save Us: How Scientists, Farmers, and Foodies are Healing the Soil to Save the Planet*, Rodale Books, 2014. (Chapter 1 & 2)
- Ferguson, Rafter, "Why We Can't Separate Justice and Sustainability in the Food System," Union of Concerned Scientists, September 20, 2019
- Oehen, Bernadette, and Angelika Hilbeck, eds., *Feeding the People: Agroecology for Nourishing the World and Transforming the Agri-Food System*. IFOAM EU Group, Brussels, Belgium, 2015 (Chapter 3)

Wednesday - October 2
Field Trip - ECHO Demonstration Farm
We will spend the afternoon at ECHO Asia's demonstration farm, learning about how this international NGO supports and works with farmers in Asia, especially small holders. We will also learn how regenerative agriculture principles are applied here.

Readings:
- Marten, Gerald G., "Small-Scale Agriculture in Southeast Asia," In M.A. Altieri and S. Hecht (eds.), Agroecology and Small Farm Development (CRC Press. 1990), p. 177-194.
- Shepard, M. 2013 *Restoration Agriculture: Real World Permaculture for Farmers*. Acres USA. 59-68. (Chapter 6, 9 & 18)

- Oehen, Bernadette, and Angelika Hilbeck, eds., *Feeding the People: Agroecology for Nourishing the World and Transforming the Agri-Food System*. IFOAM EU Group, Brussels, Belgium, 2015 (Chapter 8)

Thursday - October 3
Agriculture in Southeast Asia and Thailand
Agriculture in Southeast Asia is diverse, based on specific cultural and agronomic practices rooted in distinct ecosystems and bioregions. Most agriculture in mainland Southeast Asia, and Thailand in particular, can be divided into lowland paddy / "wet-rice" agriculture, and upland farming, often using long fallow shifting cultivation practices. We will be examining the specific practices of both upland and lowland agriculture, with an emphasis on both production methods and the social systems that have developed around these two practices.

Readings:
- Srimongkol, Katin, and Gerald Marten, "Traditional Agriculture in Northern Thailand," *Traditional Agriculture in Southeast Asia: A Human Ecology Perspective*, Westview Press, 1986.
- Halwart, Matthias and Modadugu V. Gupta, eds., "The Rice Field Ecosystem," in *Culture of fish in rice fields,* FAO, 2004
- Prasit W., et al. 2010. "Fallow to Forest: Applying indigenous and scientific knowledge of swidden cultivation to tropical forest restoration." *Forest Ecology and Management* 260: 1399-1406.
- Plews-Ogan, Erin, et al. "Polyculture, Autonomy, and Community: the Pursuit of Sustainability in a Northern Thai Farming Village." International Journal of Agricultural Sustainability, vol. 15, no. 4, Nov. 2017, pp. 418–431., doi:10.1080/14735903.2017.1335044.

Friday - October 4
AM: Independent Field Research Project Proposal Presentations
You will not have Thai lessons this day. In the morning present your proposed focused inquiry, and discuss both challenges and opportunities in gathering data in the field.
Assignments: IFRP Presentation and submit typed proposal to Ajaan
Cash Crop Foundations and Cacao Seminar
Explanation of Field Research Notebooks
Introduction to Field Expedition (Field Instructors)

Readings:
- Coe, Sophie and Coe, Michael, *The True History of Chocolate*, Third Edition, Thames and Hudson, 2019. (Introduction and Chapter 1)

Field Schedule

Monday - October 7
AM: Travel from ISDSI to Donjiang village
Donjiang is an organic farming village located in the northern part of Chiang Mai that borders Maerim. We will have a village introduction and take a tour of the village, completing Village Survey 1 (FRN).

PM: Learn about basket weaving and herbal medicines. Then you will meet and go to your host families. After dinner, we have a village meeting.

Readings: *The Soil Will Save Us* (Chapter 3-4)

Tuesday - October 8
Market day
AM: Help your host family prepare for the Khuang Kasey Insri Market. This may include harvesting, washing, and packaging vegetables and other produce.

Travel to Muang Mai Market

Muang Mai market is the main market for wholesale fruit and produce shopping in the city. The market has a massive collection of around a dozen wholesale vendors within a large building, plus another 50 smaller vendors nearby selling even more produce. This is where restaurants and other establishments around the city come to shop for their fresh fruits and vegetables at really low prices. We will conduct a market survey (FRN) here.

Travel to Khuang Kaset Insri Market

KKIM is an organic-only market established by a small group of farmers dedicated to sustainable agriculture. By selling direct to consumer they can get a better price and build relationships with customers. Help your family sell at the organic market and learn about how it is run. Conduct another market survey (FRN).

Wednesday - October 9

AM: Agricultural practicum

Learn about agroforestry initiatives at Donjiang. Then, get your hands dirty learning how to make herbal pesticide and an effective micro-organism juice (Organic compost/fertilizer FRN)

PM: Cultural learning: Learn how to make Baisri-Suquan and bamboo weave.
Farewell dinner

Readings:

- Burnette, Richard R., *Agroforestry Options for Small Upland Farms, Upland Holistic Development Project* April 2006.

(Introduction, Chapter 1-4, & 6)

Thursday - October 10

AM: Travel from Donjiang to Maetha

Maetha is an organic farming village located in the southern part of Chiang Mai that borders Lamphun. Over the past decades, many families have become dedicated to organic farming practices and have developed a number of successful agricultural initiatives.

PM: Introduction to Maetha & Village Survey

Pi Aun, a second generation organic farmer and community representative, will show us around the village and explain significant places in the community. We will complete FRN Village Survey 2.

Readings: *The Soil Will Save Us* (Chapters 5-6)

Friday - October 11

AM: Maetha Sustainable Agriculture with Paw Panomkorn

Paw Panomkorn is one of the first people in Maetha who switched from chemical to organic farming. He will tell us about the history of organic initiates in the community and the current activities of the well-established organization, Maetha Sustainable Agriculture.

PM: Chicken Farm, Farm Survey, Polyculture Survey

We will learn about organic chicken farming and egg production at Pi Por's farm. We will then do a polyculture survey (FRN) at Pi Aun's field, followed by a discussion about integrated pest management with Mae Suphan.

Readings: *The Soil Will Save Us* (Chapters 7-8)

Saturday - October 12

Community Work Day

This activity is dependent on villager availability. We will probably visit the conservation forest and learn about irrigation and maintaining water quality. We may help dig canals in the stream.

Assignments: Essay 1 & Field Observation Notes due by 5:00 PM

Sunday - October 13

AM: Seed Bank & Seed Saving Workshop with Pi Pui

We will learn about seed saving and seed banking from Pi Pui who is an organic farmer and a seed saving expert, completing the seed saving FRN.

PM: Agriculture Practicum

We will have an opportunity to learn how to grow food from bedding to seeding with Pi Pui, and then do a field transect (FRN) at her garden to study the biodiversity there.

Reading:

- Gill, Thomas, et al. "Strengthening Informal Seed Systems to Enhance Food Security in Southeast Asia." Journal of Agriculture, Food Systems, and Community Development, vol. 3, no. 3, Spring 2013, pp. 139-153.

Monday - October 14

All day: Field Research Notebook activities

We will conduct many FRNs including Polyculture Surveys (Pi Dtey and Pi Pui's Farm); and Comparative Soil Assessments—Polyculture (Pi Dtey and Pi Pui's Farm), Agroforest (Pi Pui's Agroforest), Chemical Monocrop (Baby Corn Field)

Tuesday -October 15

AM: Cacao Farm Visit

We will go to Thai Coffee & Cocoa—a cacao learning centre in Lampang province—to learn about the chocolate production process from cacao plant to cacao nibs. You will complete the Cacao Practicum FRN

Reading:

- Walters, Dale, *Chocolate Crisis: Climate Change and Other Threats to the Future of Cacao*, University of Florida Press, 2021.
  (Chapter 13-15)

Wednesday - October 16

AM: MIDCOURSE

Update the class on your IFRP progress

Seminar topics will include cannabis and coffee foundations, introduction to ethnographies, and discussion of *The Soil Will Save Us.*

Assignments:

- **IFRP progress update (in class, about 3 minute update), one page written in observation notebook**
- **Have completed *The Soil Will Save Us***

Readings:

- Simms, Jessica, *I Know Coffee: Harvesting, Blending, Roasting, Brewing, Gridding & Tasting Coffee*, Skinny Bottle, 2017.
  ("Introduction to Coffee" to "Environmental Conditions" (p.1-22))
- Russo, Ethan B., "History of Cannabis and Its Preparations in Saga, Science, and Sobriquet." *Chemistry & Biodiversity*, vol. 4, 2097, (pp. 1614–2648.)

PM: Discussion with Young Farmers Group

We will hear from representatives of the Young Farmer's Group about their journeys to becoming organic farmers, the work that they are currently doing, and hopes for the future.

Thursday - October 17

AM: Cannabis Farm Field Study

We will go to Rimping Best Flower—a cannabis farm in Lamphun province—to learn about cannabis farm management, cannabis law in Thailand, and how to process cannabis. You will complete the FRN cannabis practicum.

PM: Dairy Farm Field Study

We will go to Imm Farm—a Jersey cow farm in Lamphun province—to learn about dairy farm management, the cow's diet and how they turn cow manure into organic fertilizer and biogas, and use byproducts to create compost. We will also learn how to make ice cream. Complete the Dairy Farm FRN.

Readings:

- Nantthasorn Zinboonyahgoon et. al. “Medicinal cannabis in Thailand: 1-year experience after legalization,” PAIN, 162 (2021) S105–S109
- Conor McCabe, “Dairy Cows — The Original Upcyclers: How ruminant digestion turns byproducts into high-quality nutrition,” Clarity and Leadership for Environmental Awareness and Research at UC Davis, January 07, 2022
- Mitloehner, Frank, Ermias Kebreab and Michael Boccadoro, *Methane, Cows, and Climate Change: California Dairy’s Path to Climate Neutrality,* Clarity and Leadership for Environmental Awareness and Research Center University of California, Davis, September 2, 2020

Friday - October 18

AM: Family Day

Students will spend time with their host families and participate in day-to-day activities, including helping in their gardens or fields.

PM: Free Study & Farewell Dinner

Saturday - October 19

AM: Travel to 91 Coffee, Farm Introduction by Khun Waan

Khun Waan is the owner of 91 (“Nine-One”) Coffee. We will meet at their coffee shop in Doi Saket and take a truck to go up to the farm in Pa Miang. At 91 Coffee, we will learn about coffee farm management, agroforestry, and the process of coffee production from bean to cup.

PM: Make Compost/Organic Fertilizer

We will learn how to make an organic fertilizer from Khun Waan (Organic compost/fertilizer FRN).

Readings:

- Pendergrast, Mark, *Uncommon Grounds: The History of Coffee and How it Transformed the World*, Basic Books, 2010.
  (Chapter 17: The Speciality Revolution)
- Simms, Jessica, *I Know Coffee: Harvesting, Blending, Roasting, Brewing, Gridding & Tasting Coffee*, Skinny Bottle, 2017.
  (“Farming Methods” and “Growing Regions” (p.23-39))

Sunday - October 20

AM: Farm Management, Coffee Terrace Survey, Farm Survey, Making Insect Traps

We will have the opportunity to visit parts of the farm and learn from Khun Waan on how he grows coffee in an agroforestry, how he manages insects and disease without using chemical products, and the big picture process of coffee production.

PM: How to Manage Fungi, How to Spray Coffee Plant with Anti-Fungi Solution

We will learn from Khun Waan on how to manage fungi in coffee plants by using the anti-fungi spray.

Readings:

- Simms, Jessica, *I Know Coffee: Harvesting, Blending, Roasting, Brewing, Gridding & Tasting Coffee*, Skinny Bottle, 2017.
  (“Pest Control”, “Plucking and Sorting”, and “No Harvest? No Problem!” (p.40-52))

Monday - October 21

AM: Compost in Coffee Farm

We will do some farm work and put the compost that’s ready to use in the coffee farm.

PM: Sorting and Peeling Coffee Beans

We will learn how to peel and sort the coffee beans and understand the criteria of a good coffee bean.

Readings:

- Simms, Jessica, *I Know Coffee: Harvesting, Blending, Roasting, Brewing, Gridding & Tasting Coffee*, Skinny Bottle, 2017.

("How to Roast Green Coffee Beans Like a Pro", "Basic Roasting Process", and "Roast Levels" (p.87-107))

Tuesday - October 22
AM: Coffee Roasting, Travel Back to Chiang Mai

PM: Siamaya Chocolate Factory
We will learn about the process of chocolate making and how the chocolate business works in Thailand. We will also have the opportunity to make our own chocolate bars.

Readings:
- Edoh Adabe, K. Ngo-Samnick, E. (2014). Cocoa Production and Processing. (Chapter 6-8)

Wednesday - October 23
AM: Ethnography of Cafes/Dispensaries at Tha Pae Gate
You will be responsible for completing the shop ethnography activity. You may visit which ever cafes, dispensaries, or chocolate chops you find interesting. Refer to the FRN description of this activity.

PM: IFRP final presentation and Final Exam prep.

Thursday - October 24
AM: Final Exam & IFRP Final Presentations
Cafe Ethnography Discussion and Course Wrap Up with Ajaan
Assignments: Essay #2, Field Observation Notebook, and Field Research Notebook due at 5:00 PM'

PM: Off! Rest for Forests course

Field Research

Field research is an important component of this course, and mastery of the field research methods will help make the course a success. Each student will record detailed field observations and studies in their Field Research Notebook as a critical part of the learning on this course. Some of the key methodologies and techniques are described below. Specific days and assignments for the field research will be assigned.

The questions and format in the Field Research Notebook will be more extensive and detailed.

Northern Thailand Species Identification

This activity will introduce you to a variety of species that are utilized by communities in Northern Thailand.

There are many species in Northern Thailand that are used for food, fiber, construction, medicine, or for ceremonial purposes. A number of these also have a market value. Traditionally people would grow these or gather products from the forests and fields surrounding their homes.

In this activity you will identify eight species you find and understand their role in the community and ecosystem. Throughout your time you will have opportunities to ask local people about the plants and animals in their surrounding environment. They will help you identify various species and provide information on their usage, and preferred habitat. You will combine this local knowledge with your own illustrations in the Plant ID pages to create a useful catalogue of these plants. You will need to ask a variety of people and make your own observations to complete the Plant ID pages. Cite all sources of information (informant and location). Plant identification should include the common name in English, the common name in the local language (Thai or Karen, etc.), and the scientific name as well where available from the field guides.

Information to be recorded will include:

- Use (food, medicinal, other) and specify what is used (leaves, fruit, bark, etc.)
- Ecological context / placement in the garden / forest / field
- Propagation
- Care
- Harvest
- Sketch of leaf / flower / fruit (as appropriate) including context if needed

Polyculture Survey

In this activity you will examine the different ways Thai farmers and households utilize polyculture (mixed species farming) in their farms and gardens. The use of polyculture cultivation can have numerous benefits including more efficient use of space, the exploitation of beneficial relationships between organisms, and weed and pest control, to name a few. The activity will show you how polyculture farming and gardening benefits farmers and households.

Identify at least **three examples** of polyculture through observation and interviews with farmers, gardeners, or local experts. Complete an entry in your Field Notebook for each example of polyculture, and include a sketch of relationships and placement as appropriate.

- Names of the plants or animals
- Context (garden, farm, food forest, etc.)
- Relationship between organisms
- Use/benefits

Field Transect

Farms and fields are very diverse. One good way to capture this diversity is to complete a transect — a study of diversity along a specific line. For this activity you will use a 20 meter transect line to do your survey. Working in groups of 3-4 students:

- Place your transect line to capture maximum diversity
- Record all plants directly along the transect line
- Record any other organisms (insects, etc.) that you observe in and around your transect
- Sketch of placement of transect line in context
- List of plants along transect line
- List of other organisms in/around transect line

Agroforest Transect

Agroforests are characterized by density and diversity. Like the Farm Transect, this will use a 20 meter transect line to do your survey. Working in groups of 3-4 students:

- Place your transect line to capture maximum diversity
- Record all plants directly along the transect line, including trees directly adjacent to the transect line
- Record any other organisms (insects, etc.) that you observe in and around your transect
- Sketch of placement of transect line in context
- List of plants/trees along transect line, noting approximate hight in meters
- List of other organisms in/around transect line

Seed Origins and Seed Saving

Seeds and their control is a critical part of food sovereignty. Sourcing and saving seeds is an essential part of farming and gardening. Farmers utilize a number of strategies to locate, buy, trade and save seeds. Some seeds are purchased, some traded with others, and some saved either on the farm or from locally managed seed banks. Record at least **3 types of plants** and where the seeds come from.

Animal Integration

Animals have always played a critical role in agriculture including in nutrient cycles, crop waste disposal, up-cycling of inedible waste, labor, pest control, and more.

- What animals have you observed in and around the farm?
- What are their roles / how are they used?

Farm Survey and Map

Farms, especially for small holders in the tropics, often have a specific layout to aid in crop production and harvest. **Draw and annotate a map of the farm**, noting each area and what it is used for.

Fresh Market Survey

Fresh markets are a feature of most communities in Asia. The focus of this study is the *origin* and *price* of products in the market. Choose 8 agricultural products and list what they are, where they are from, their price, and what they are used for.

Village Survey

The use of space and the built environment tells us a lot about a community. Use the space below to **draw and describe observations** about the village, including housing (common features), infrastructure (roads), and other observations.

Organic Fertilizer and Compost

On-farm production of fertilizer and compost is a critical part of organic farming and sustainable food production. **Describe and illustrate** the process of organic fertilizer production below.

Comparative Soil Assessment

Building healthy soils is one of the core practices of regenerative agriculture. This activity is a rapid assessment of soil quality and health.

You will do a rapid assessment of soil quality in three places: organic polyculture farm, agroforest, and a commercial (chemical) mono crop.

1. Selection: Choose a place to study that will be reasonably representative of where the soil is healthiest — under crops, plants, etc.
2. Size and depth: Mark with a central point and then dig a circle 20 cm in diameter to a depth of 20 cm (this will be pretty big!)
3. Quality assessment: As you dig note any changes in color, moisture, and texture as you dig deeper. Note depth where you see changes in color, moisture, and texture.
4. Soil organisms: As you dig, put the soil on the plastic square and separate it to observe, count, and sketch any soil organisms (insects, worms, etc.)

Dairy Farm Nutrient Cycle

Ruminant animals can play a key role in nutrient recycling. The propose of this field activity is to explore the role small-scale dairy farm plays in recycling nutrients. Using observation and interviews with the farmers, complete the following activity.

Create a list of that the dairy cows are eating. Next to each item explain what each item is and whether it is agricultural waste, a food processing byproduct, food humans can't eat (i.e. grass), or if it is food humans can eat (are the cows eating agricultural products that would otherwise be eaten by humans). Use the data to complete the next section.

Draw a diagram of inputs (grass, forage, etc.) and outputs (dairy, manure, soil, etc.) at the farm.

Illustrate and describe the process the farmers use for treating the cow manure including a description of the byproducts created through the processes.

Coffee, Cacao, and Cannabis Cash Crop Practicums (3)

The purpose of this activity is gain a fuller understanding of coffee, cacao and cannabis as a cash crops in Thailand including the biology and ecology of the plants, farming and post-harvest processing, and the economic role to small and medium-scale farmers. This practicum also provides you with an excellent context to examine existing and potential sustainable and regenerative farming practices and principles used in coffee production. You will learn about these crops through farm visits, processing facility visits, and discussions with farmers and experts.

To complete this activity you will be asked to draw and identify the plant, chart out the farming and processing methods, and answer discussion questions. You will complete the activity using your first-hand observations while in the field and your discussions from farmers and experts.

Shop Ethnography

The focus of this activity is to understand the end users of the three key commodity crops we study (coffee, cacao, and cannabis), how it is sold, how cafes/shops/dispensaries work as a business, as well as how single commodities (coffee beans, cacao, or cannabis) can be processed and used in a variety of end products (e.g. espresso, pour-over coffee, chocolate bars, chocolate drinks, CBD, edibles, etc.).

At each location sit and observe the surroundings, study the menu, layout, customers, overall atmosphere, and prices. Talk with staff about their experience. In the case of marijuana dispensers, you can observe and chat with staff or customers but may not purchase products.

Attendance Policy
Students are expected to be on time and attend all classes. If you are ill or otherwise need to miss a class, please inform your instructor or teaching assistant.

Academic Integrity
Academic integrity is essential to a positive teaching and learning environment. All students enrolled in ISDSI courses are expected to complete coursework responsibilities with fairness and honesty. Failure to do so by seeking unfair advantage over others or misrepresenting someone else's work as your own can result in disciplinary action.

Scholastic Dishonesty
Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering forging, or misusing an academic record; or fabricating or falsifying data, research procedures, or data analysis. Within this course, a student responsible for scholastic dishonesty can be assigned a penalty up to and including an "F" or "N" for the course. If you have any questions regarding the expectations for a specific assignment or exam, ask.

Grading Standards

Letter grade	Score or percentage	Description
A	93–100	Achievement that is outstanding relative to the level necessary to meet course requirements.
A-	90–92	Achievement that is significantly above the level necessary to meet course requirements.
B+	87–89	Achievement that is significantly above the level necessary to meet course requirements.
B	83–86	Achievement that is significantly above the level necessary to meet course requirements.
B-	80–82	Achievement that meets the course requirements in every respect.
C+	77–79	Achievement that meets the course requirements in every respect.
C	73–76	Achievement that meets the course requirements in every respect.
C-	70-72	Achievement that is worthy of credit even though it fails to meet fully the course requirements.
D+	67-69	Achievement that is worthy of credit even though it fails to meet fully the course requirements.
D	60-66	Achievement that is worthy of credit even though it fails to meet fully the course requirements.
F	0-59	Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an Incomplete.