ACM Costa Rica: program in Language, Culture and Environment  
San Jose, Costa Rica  
Fall Tentative Syllabus

Biodiversity, Sustainability and Food Security in Costa Rica

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Introduction
Costa Rica is a Central American country with a surface area of 51,100 km² (size of West Virginia), a length of 464 km in a direct line and an average width of about 190 km. It is bordered by the Pacific Ocean to the west, the Caribbean Sea to the east, Nicaragua to the north and Panama to the southeast. Costa Rica (and Central America) has been considered a bridge between South and North America due to being geographically joined. Costa Rica was the meeting place for various indigenous cultures; but most of them were decimated by the arrival of the colonizers. Today, the country has around 4,600,000 inhabitants, with an average life expectancy among the highest in the American continent.

Its position geographically allowed the movement of many species of flora and fauna; its numerous tropical ecosystems have resulted in extensive adaptive radiation of species. As such, Costa Rica is considered to be one of the countries that has the greatest level of biodiversity worldwide for its size. In fact, Costa Rica is part of the Mesoamerican hot spot for biodiversity. This wealth of biodiversity has resulted from the variety of tropical climates in the country, its hilly terrain, and its position as land bridge between the Americas (north and south).

Unfortunately, we are seeing an unprecedented loss of biodiversity at the global level, especially in the tropics. The loss of tropical biodiversity is due to many causes: a) increase in human population, b) increases in income of its human inhabitants, and its consumption of natural resources, c) economies dependent on the exploitation of natural resources, d) lack of long-term planning, e) etc. Less than 25% of the original forests of Central America exist today, with the greatest loss of forests in the past 50 years. Deforestation increases the sedimentation in the water reservoirs built for hydroelectric power, which results in an increase in costs to eliminate the sedimentation, reducing the life of the dams. Soil erosion also results in a loss of agricultural productivity. Marine ecosystems such as coral reefs and mangroves have been destroyed by the overexploitation, development of land in coastal areas, water contamination by agricultural chemicals and climate change.

To ensure the protection and management of biodiversity, it is necessary that a country (and every human being) do more than simply declaring and managing wildlife areas. In this sense, Costa Rica has a national sustainable development plan and plans to be "carbon neutral" before the year 2021. In addition, Costa Rica has many things in its favor to become a "sustainable" country, including: (a) there is not yet human overpopulation, b) much of the biodiversity still exists and is protected, c) there is no army and little of the national budget is devoted to the defense, d) there is a system of national public education, and (e) there is a universal program for public health. On the other side, however, there is an increasing amount of pressure on national resources. The "consumerism" that exists in the United States, Europe, and other developed countries is threatening Costa Rica.

Environmental problems and their solutions occur within the socio-economic-political framework of the country, although global processes also affect them. Costa Rica is facing tremendous challenges in addressing issues such as: a) evaluating natural resource status and understanding the reasons behind their
This course will examine these issues, where conservation efforts have received international acclaim. We will explore biodiversity in Costa Rica and the role that sustainable practices play in its conservation. An emphasis will be put on how the issue of food security and how its presence or absence relates to environmental and human health in the country. We will explore the impact of agriculture, food production, water, goods (garbage), power, and carbon (energy, transport) in Costa Rica. Finally, we will study the impact of climate change, one of the greatest dangers to the biodiversity and humanity. The course will be a collection of lectures, discussions, films, readings, and field trips. The class will meet two times per week for 1.5 hours.

**Learning Goals**

1) Learning about biodiversity in Costa Rica and its relation to socio-economic aspects, political, historical, environmental and cultural;
2) Learn about sustainable development policies in Costa Rica;
3) Understand the role that food security plays in ecosystem and human health;
4) Carry out an internship (volunteer) related to the natural resources in a rural area;
5) Carry out a research project on a topic related to the conservation of natural resources in Costa Rica and share it with the other students.

**Course evaluation (100 pts.)**
The students will be assessed through the following activities:

1) Opinion papers: 2 x 5 pts. (10 pts.)
2) Presentation of opinion papers: 2 x 5 pts. (10 pts.)
3) Rural volunteer project (25 pts.)
   - Pre-departure presentation on location/project (5 pts.)
   - Written Report on volunteer experience (10 pts.)
   - Oral report on volunteer experience (power point) (10 pts.)
4) Research Project (40 pts.)
   - Outline: 3 pts.
   - First draft: 7 pts.
   - Final draft: 20 pts.
   - Oral Presentation: 10 pts.
5) Course participation (15 pts.)

**Description of course assessment**

1) **Opinion papers:** Students will be required to write 2 opinion papers (2-4 pages in length), each discussing topics presented in class. The opinions of topics presented must be backed up with a minimum of three references, at least two of which are primary sources (peer-reviewed or text).

2) **Presentation of opinion papers:** Students will prepare a 10-15 minute presentation (PowerPoint) of their chosen topic/opinion to present to the class.

3) **Rural volunteer project:** Students will spend four weeks carrying out volunteer work in a rural area. The student will work with the professor to determine the best place and project. Each student is required to communicate with the professor each week to discuss work, impressions and any concerns or needs. In addition, each student must write a report (4-6 pages) on the work they carried out, insights and lessons learned. Upon return to San Jose, students will prepare a 10-minute PowerPoint presentation to share their experience with the class.
4) **Research Project:** Each student will write a final research paper on a topic directly related to the class (example: political ecology, biodiversity, system of wilderness areas, activism, consumers, health, ecological footprint, water, energy, transportation, recycling, food, ecological economics). The topic must be discussed and agreed upon with your instructor. The paper should be 6 – 10 pages in length and should include the following sections:

- **Title:** Describe the project in specific terms. For example, instead of "environmental education around the Carara National Park", a more specific title would be "Impact of the environmental education of school children, their parents and members of the community: a study of intergenerational learning and cross-community"

- **Introduction:** Students should review relevant literature (minimum 6: articles, books or book chapters, reliable websites, etc.) on the question under investigation. The introduction should include: (i) question or hypothesis: what is the question or hypothesis; (ii) the importance of the project: what value will this research project have to readers; and (iii) objectives of the project.

- **Methodology:** How will information be collected and analyzed in order to answer the question or test the hypothesis? Possible methods include bibliographic research, interviews, observations, or a combination. The methodology must be very descriptive and detailed for the reader to understand.

- **Results/Discussion:** This will be a fundamental part of the work where is results are presented and discussed. Bibliographic citations will be necessary to support the discussion. The differences/contrasts between countries or regions can be emphasized. For example, environmental policies to achieve neutrality in the emission of carbon of different countries can be examined.

- **Bibliography:** Your final paper must include a bibliography. Specific guidelines will be provided.

5) **Course participation:** Coming to class prepared and participating in course discussion is an integral part of the learning process. As such, students are expected to be active participants.

**Possible research topics: Environmental issues important to study in Costa Rica**

- Environmental and social impact on the conversion of rice paddies with irrigation toward the cultivation of sugarcane in Guanacaste.
- Comparison of the environmental and social impacts of cocoa beans, pineapple, and bananas in the Caribbean.
- Environmental and social impacts of livestock production practices during the past 25 years in Costa Rica.
- Impact of fishing on a large-scale vs. artisanal fishermen on the coast.
- Environmental and social impacts of an increase in the production of energy by geothermal sources (the same in the production by wind).
- Environmental impacts, social and political climate of global change on ecosystems of Costa Rica.
- Potential environmental impacts of the arrival of the lionfish (Asian) to the reefs of the Caribbean of Costa Rica.
- Potential consequences of the recent modification of the Wildlife Act, which prohibits sport hunting.
- Environmental and social impact on the nesting of sea turtles in areas of high trafficking of illegal drugs.
- Current situation and future of fishing for shark fins in the waters of Costa Rica.
- Environmental impacts and social potential of the planting of transgenic crops in Costa Rica.
- The impact of increased consumption of fast food on the environment.
- Organic farming and farmer’s markets: is there a sustaining market?
- The status of agricultural biodiversity of indigenous species
### Calendar (16 weeks-32 session)

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
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<tbody>
<tr>
<td>Thursday August</td>
<td>Course introduction, What is biodiversity?</td>
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<tr>
<td>Tuesday August</td>
<td>Costa Rica as a biodiversity hotspot: fauna</td>
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<tr>
<td>Thursday August</td>
<td>Costa Rica as a biodiversity hotspot: flora</td>
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<tr>
<td>Tuesday September</td>
<td>Management of Conservation Units</td>
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<tr>
<td>Thursday September</td>
<td>Threats to biodiversity</td>
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<tr>
<td>Tuesday September</td>
<td>Endangered species</td>
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<tr>
<td>Thursday, September</td>
<td>What is sustainability and is it possible?</td>
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<tr>
<td>Tuesday, September</td>
<td><strong>Opinion paper 1 presentations</strong> and discussion. Paper due by class time.</td>
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<tr>
<td>Thursday, September</td>
<td>Pre-departure presentation on location/project</td>
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**Rural stay**

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<tr>
<th>Date</th>
<th>Activity</th>
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<tr>
<td>Tuesday October</td>
<td><strong>Presentation of experiences in the Volunteer/Internship in Conservation</strong></td>
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<tr>
<td>Thursday October</td>
<td>Food security 101</td>
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<tr>
<td>Tuesday October</td>
<td>History of Food 1: Early Ag to GMOs</td>
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<tr>
<td>Thursday October</td>
<td>History of Food 2: Factory farming and food processing</td>
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<tr>
<td>Friday October</td>
<td>Film: Food Inc. Reading: Pollen, M. 2009. Food Rules (Drop Box/Google site)</td>
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<td>Tuesday November</td>
<td>Agricultural biodiversity and the Organic movement</td>
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<tr>
<td>Thursday November</td>
<td>The true cost of food: the environment and health</td>
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<tr>
<td>Tuesday November</td>
<td><strong>Opinion paper 2 presentations</strong> and discussion. Paper due by class time.</td>
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<tr>
<td>Thursday November</td>
<td>Climate Change in Costa Rica and at the global level</td>
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<tr>
<td>Tuesday November</td>
<td>Our ecological footprint: energy, garbage, water Reading: <a href="http://www.myecologicalfootprint.org">www.myecologicalfootprint.org</a> (calculate your ecological footprint in the USA and Costa Rica)</td>
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<td>Thursday November</td>
<td>Is Costa Rica a global model for conservation?</td>
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<td>Tuesday November</td>
<td><strong>Final project presentations</strong></td>
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<tr>
<td>Thursday November</td>
<td>End of Semester; Thanksgiving lunch</td>
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### Bibliographic Resources

ACM Course Anthology