



## **CIEE Dakar, Senegal**

**Course name:** Environment and Development in Senegal and Sub-Saharan Africa (English)  
**Course number:** ENVI 3102 SGSM  
**Programs offering course:** Language and Culture  
**Language of instruction:** English  
**U.S. Semester Credits:** 3  
**Contact Hours:** 45  
**Term:** Spring 2020

### **Course Description:**

Africa is vulnerable to the highly temporal and spatial climate variability. According to historical records and recent projections, many droughts or exceptionally high rainfall seasons marked the climate trends over the low-income economics of Sub Saharan Africa. In many West African countries, development policies are still largely dependent to natural resources exploitation (water, arable lands, forestry, energy, etc.). Recently, environment and development issues tend to be more and more centralized on urban areas. The rapid increase of urban population with 45% of African population living in big cities - with poor urban functions and planning - have brought new challenges on the desk of policy makers. Beside global climate issues, African Nations are facing various environmental problems (lack of sanitation, water supply, garbage collection and disposal). For the recent 40 years, important economic investments have been made in coastal regions (major cities are often located on seashore). Such position makes many countries development largely dependent on environmental variability, which affects all productive sectors and natural resources dependent livelihoods. The increase in the demand of ecosystem services in connection with rapid population growth has accelerated the degradation of natural habitats and ecosystems and increased vulnerability of local populations. This class will introduce students to the climate change challenge and the specific environmental problems faced by communities living in urban and suburban areas. A specific emphasis will be put on drought and water supply issues, these a level rise and the vulnerability of coastlines, sanitation and garbage management. Upon completion of this course, students should be able to understand and describe major environmental issues faced by African nations on the road to sustainable development but also to summarize the current political choices and their limitations.



**Keywords:** Africa, Climate Change, Development, Physical environment; Impacts, Vulnerability, Mitigation, Adaptation strategies.

### **Learning Objectives**

The course aims at giving not just information and skills for understanding particular environmental problems in Senegal/Africa, but also to develop some methods for identifying and analyzing environmental problems through an integrated approach called holistic interdisciplinary paradigm.

The course will try to answer the following questions:

What is climate change? What is the current stage of scientific debate and evidence about climate change? What are major challenges in Africa, in Senegal? Are the actions taken by the government and local communities to address climate change related challenges? What are the positive aspects and limitations of current political choices in relation to water resources and garbage management? Beside climate change which environmental questions are affecting the most the development options of African nations? Who are the actors and what are their roles? What are the barriers? What are the priorities in reaching sustainable development?

Some basics, including the following, will be provided and discussed:

Presentation and description of main characteristics of Africa's physical environment  
An outline of Major Environmental challenges  
The impacts of climate change in Africa  
Analysis of development sectors affected (water supply, agriculture, garbage management, tourism, etc.)  
The strategies and community responses  
Strategies and structural responses  
Barriers to adaptation

### **Course Prerequisites**

Students enrolled in the course are not required to have a particularly extensive background in environmental science, but should have some general scientific and social knowledge of issues relevant to the topic.

### **Methods of Instruction**

After few introductory lectures, the instructor will give more time for exercises and interactions for broader brainstorming from students. Personal research will be encouraged through presentation preparations and fieldwork reporting (group work).

- Analysis of scientific papers
- Discussions on key issues



- Guest speaking sessions
- Case Studies
- Slides from the instructor for comment and discussion
- 3 Field trips (Mbeubeuss; Diama et Gandiole; Parc Delta du Saloum)

### **Assessment and Final Grade**

- Class participation (20%)
- Reports of personal research / Video Topics (20%)
- Oral presentation of individual work (15%)
- Assignments (15%)
- Fieldwork reports: (30 %)

### **Course Requirements**

The course requires classical activities such as readings, presentations and in-class workshops, and will put a big emphasis on field visits and the making of video topics on specific environmental issue. The idea is to be very factual and straightforward in environmental problem description in situ.

- **Fieldwork reports** (each student will present a written report describing the visited site and the main environmental issues presented as well as potential solutions)
- **Reports of personal research** (students will be encouraged to undertake personal research on any environmental issue of their interest and produce an analysis based on course material, scientific papers, interviews, fieldwork, etc. The personal research will be presented during class hours)
- **Video Topic** (the making of a short film of about 10 minutes up to 30 minutes of analysis on a specific environmental issue in Africa. It may consist of a series of interviews or reflection with the power of image and sounds.)
- **Assignments** (two or three assignments will be given to students as test papers. This will consist in an analysis of scientific papers, test-questions related to a specific topic already reviewed in class or introduced through a supporting paper.)
- **Class participation** (a grade will be allocated to each student depending on their level of attendance and participation to the class activities).



## **Weekly Schedule**

### **Week 1:**

#### **Session 1:**

A- First contact: Students and teacher introducing themselves. Collecting students expectations from the course.

B- Evidence. Review: What is climate change? What is adaptation to climate change? The current debate surrounding climate change issue across the world?

#### **Session 2:**

A- Description of Main Characteristics of Africa's Physical Environment from North to South and East to West (mentioning some specificities). Reading is provided.

B- Presentation of General Historic Environmental Climatic Conditions in Africa before Climate change.

**Reading:** <https://www.int-res.com/abstracts/cr/v17/n2/p123-144/>

**Assignment:** Referring to news from Medias and personal information, give a comparative perception related to Historic Environmental situation in Africa and nowadays climate conditions. (written)

### **Week 2:**

**Session 1:** Today's global major environmental challenges in Africa.

**Session 2:** How the economic development is strongly related to physical environment and natural resources management particularly in Africa.

**Assignment** based on class brainstorming and discussion for participation around how some sectors triggering development may be affected by environmental impacts .(oral)

### **Week 3:**

**Session 1:** Description and analysis of few environmental issues: How climate change is affecting water resources across the continent? A case study of Lake Chad Basin?

**Session 2:** The Sahel belt and the shift of isohyets towards the south? What were the main causes behind these major environmental changes?

What are the drivers of such tremendous change in the Sahel Region?

**Assignment:** Spot and analyze the main causes related to climate change which led to those changes.( Refer to scientific evidence mentioned in the course)



## **Week 4: Rural visits**

Assignment 1: Compilation of both visual and oral videos with interviews of different residents and landscape visibility.

Assignment 2: Presentation of individual written report with description of the site and its main environmental issues and potential solutions as proposals.

## **Week 5:**

### Session 1:

What are the vulnerabilities? Identifying the populations layers the most vulnerable; their location and conditions. Classification in socio professional groups.

### Session 2

We will plan a participatory community workshop to share information and collect local knowledge about impact on the community. (Guest speaking sessions included)

Assignment: Synthesize analyzing the causes and impacts of those environmental changes on vulnerable populations' livelihood. (written paper)

## **Week 6:**

Session 1: Field visit: Wakhinane Nimzat suburb (coastal area in the filaos belt)

Community adaptation for various sectors: garbage management, water, forest resources, agriculture, etc.

Session 2: Research on adaptation concepts in practice. Present arrange of potential community-based adaptation measures.

Reading: Adejuwon, J., Azar, C., Baethgen, W., Hope, C., Moss, R., Leary, N., Richels, R., Ypersele, v.J.-P., 2001. Overview of Impacts, Adaptation, and Vulnerability to Climate Change. Chapter 2, Climate Change 2001, p.30.

Assignment: Oral report group work presentation with PowerPoint images and interviews with populations about their strategies of mitigation and adaptation to both sea rising and filaos deforestation.(proposals about solutions)

## **Week 7:**

Session 1: Ask for feedback; gain local knowledge and get a sense of the direction the African community wants to go in. Start the buy-in process. Conduct a baseline survey.

Session 2: Using an integrated communicative and analytic approach, identify the



goals and aspirations of communities facing such damageable changes to imagine and sort out potential solutions and build a baseline survey.

**Assignment:** (group work) Class presentation: Expose the local communities' knowledge related to their strategies of adaptation meant to reach specific goals, and your personal vision about the whole, and your solutions based on holistic and pertinent justifications

### **Week 8:**

Session 1: Spotting goals for solutions to adaptation.

Establish goals for an adaptation project. Research solutions to the community's special problems.

Session 2: Matching community's goals to adaptation according feedback.

Use the community feedback and the baseline results to incorporate adaptation tools into your project. Incorporate your refined strategies into your project.

**Assignment:** team work presentation of the main community's identified goals and the adaptation tools including practical and relevant activities.

### **Week 9:**

Sustainability. Plan and organize ideas to develop a community-based team.

Session1: Raising incentives in the community for building a sustainable community-based team.

Session 2: Matching the team organization to the community's hierarchical dynamic.

Implement relevant approaches for building trust between community members and partners.

**Assignment** : Class participation: Open discussion about building a sustainable community-based team working on specific clearly identified goals, creating strategies to incite individuals' commitment.

**Reading:** Building and Maintaining Trust in a Community-Based Participatory Research Partnership

### **Week 10: Break**



### **Week 11:**

Session 1: Prepare a project that uses appropriate knowledge transfer techniques.

Session 2: Partner with experts in the adaptation strategies you intend to offer to the community. Gap analysis of existing adaptation projects.

Reading: MEPN-Sénégal, 2006. Programme d'Action National d'Adaptation aux changements climatique du Bénin (PANA Sénégal). 84 p.

### **Week 12:**

Sessions 1&2: The issue of knowledge, generation and sharing. Language barriers. Through youngster to elders.

### **Week 13:**

Session 1&2: Developing approaches to overcome culture; generation and language barriers in sensitization and information to build adaptive capacities.

Assignment: Imagine accurate and relevant different approaches of your own to overcome: Generation gap – culture difference – language barriers and non-justified suspicion when driving a project in an alien community.

### **Week 14:**

Session 1: Presentation of the research projects.

Session 2: Discussion and Debate in “Socrates Seminar” approach with Critical Thinking brainstorming.

### **Week 15:**

Session 1: Final remarks and finalization of the class project.

Session 2: publication and scientific proofing.

### **Week 16: Final Exams**

Written hard copy with an oral presentation as a synthesis of the different segments of the course in an analytic and holistic interdisciplinary paradigm.

## **Readings**



**NB: Some photocopies of additional literature will be available at the CIEE Center prior to the class.**

**Adejuwon, J., Azar, C., Baethgen, W., Hope, C., Moss, R., Leary, N., Richels, R., Ypersele, v.J.-P., 2001.** Overview of Impacts, Adaptation, and Vulnerability to Climate Change. Chapter 2, Climate Change 2001, p.30.

**Adger, W.N., Huq, S., Brown, K., Conway, D., Hulmea M. 2003.** Adaptation to climate change in the developing world. Progress in Development Studies, 3 (3):179-195.

**Adger, W.N., Brooks N., 2002.** Does global environmental change cause vulnerability to disaster?, CSERGE and Tyndall Centre for Climate Change Research, University of East Anglia, Norwich.

**Burton, I., Challenger, B., Huq, S., Klein, R.J.T., Yohe G., 2001.** Adaptation to Climate Change in the Context of Sustainable Development and Equity. Chapter 18, Climate Change 2001. IPCC, p. 36 p.

**Burton, I., Huq, S., Lim, B., Pilifosova, O., Schipper E.L. 2002.** From Impacts Assessment to Adaptation Priorities: the Shaping of Adaptation Policy. Climate Policy (2):145-159.

**Huq, S., Reid H., 2002.** Report of Adaptation Day at COP 8, IIED, Delhi, India.

**IPCC, 2001. Climate change 2001: Impacts, Adaptation and vulnerability.** A report of the Working Group II. Summary for Policy Makers. 18 p., IPCC, Geneva.

**Mbow, C., Mertz, O., Diouf, A., Rasmussen, K., Reenberg A. 2008.** The history of environmental change and adaptation in eastern Saloum–Senegal. Driving forces and perceptions. Global and Planetary Change, 64:210-221.

**Winograd M., 2006.** Concepts, cadres et méthodologies pour évaluer la vulnérabilité et les stratégies d'adaptation. C3D, ENDA, p. 32 p.

**Ziervogel, G., Bharwani, S., Downing T.E. 2006.** Adapting to climate variability: Pumpkins, people and policy. Natural Resources Forum (30):294–305.

**Malick GAYE & Seydou NIANG (2002):** Epuration des eaux usées et l'agriculture urbaine. Editions ENDA Dakar.

**Ludovic Schneider (2010):** Le développement durable Territorial. Editions AFNOR

**AFNOR (2010):** Stations d'Épuration et traitement de leurs boues. Editions AFNOR

**UNESCO (1997):** Qualité de l'eau de la nappe phréatique à Yeumbeul Sénégal. Etudes sur le Terrain. CSI Infos No.3, UNESCO Paris, 27 p.



**Service Techniques de l'Urbanisme (1989):** Memento sur l'évacuation des eaux pluviales. La Documentation Française. Paris 349 p.

**JICA (1993):** Etudes sur l'Assainissement de Dakar et ses environs. Rapport intérimaire. Tokyo 231 p.

**Dasyva S. (2001):** Les bas-fonds des sables dunaires de la région de Dakar. Potentialités agricoles et contraintes urbaines. Thèse de Doctorat/Université de Paris I Sorbonne 495p.

**Durand J. H (1995):** Arrêter le Desert, Techniques vivantes, PUF, Paris 416 p.

#### **NAPAS (downloaded from UNFCCC)**

MEPN-Bénin, 2008. Programmed'Action National d'Adaptation aux changements climatiques du Bénin (PANA Bénin). 81 p.

MECV-Burkina Faso. Programmed'Action National d'Adaptation aux changements climatiques du Bénin (PANA Burkina Faso). 84 p.

MEPN-Sénégal, 2006. Programmed'Action National d'Adaptation aux changements climatiques du Bénin (PANA Sénégal). 84 p.

MEA. Cape Verde. 2007. National Adaptation Program of Action on Climate Change (NAPA-Cape Verde). 40 p.