

PROJECT of THESIS

KPAN Tokouaho Flora

*PhD Student in Tropical Ecology,
University Félix Houphouët-Boigny (Ivory Coast)*

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Topic

Influence of climate change on Amphibian
community composition in Taï National
Park (TNP)
(Ivory Coast)

Outline

- ❖ CONTEXT and JUSTIFICATION
- ❖ RESEARCH QUESTION
- ❖ OBJECTIVES
- ❖ METHODOLOGY
- ❖ OUTCOMES
- ❖ EXPECTATION INTERNSHIP

Context and justification (1/4)

➤ **Amphibian are threatened worldwide**

(AmphibiaWeb 2008, Stuart et al., 2008).

Main reasons responsible:



✓ Habitat loss, degradation and conversion (**Suart et al., 2004, Ernst et Rodel, 2005; Hillers et al., 2008**)



✓ Diseases, such as chytridiomycosis (**Daszak et al., 2003**)



✓ Overexploitation (**Kusrini et al, 2005; Mohneke et al, 2009**)

✓ Climate change (CC) (**Carey et Alexander, 2003; Corn, 2005**), a likely potential further threat for amphibian₄

Context and justification (2/4)

➤ **Difficult to assess the impact of climate change on amphibian species**

▪ **Biologically**

- ✓ Lack of information concerning how amphibians face climate change in african tropical habitats (**Hirschfeld et Rödel, 2011**)

▪ **Historical level**

- ✓ Availability of relevant primary data (references).



Unfortunately, such data are scarce and sometimes unavailable.

Context and justification (3/4)

- **CC are effective in West Africa** (Roudier et al., 2011; Obasi et Uwanekwu, 2015)
- **In Ivory Coast, CC is observed in the Tai National Park (TNP)**
 - ✓ CC impacted Chimpanzee reproduction (**Kühl et al., 2012**)
- **Unfortunately, We have any information on the impact of climate change on amphibian communities composition of TNP.**
- **For a better understanding of this impact on biodiversity, it is important to carry out studies on several biological models including amphibian.**

Contexte et justification (4/4)

➤ Why Tai National Park?

- The last significant bloc of primary tropical forest in West Africa.
- Biosphere Reserve since 1978
(Lauginie, 2007).
- CC observed in this park
(Kühl et al., 2012)
- **Availability of references data:**
 - ✓ Amphibian community composition over 10 years (**Rödel, 2000; Rödel & Ernst, 2004; Ernst & Rödel, 2005; Ernst et al. 2006; Hillers et al. 2008**)
 - ✓ Climate data since over 30 years (**Boesch, 1978 ; Boesch et Boesch, 1983 ; N'Guessan et al., 2009**)



Research question

What is the impact of climate change on the amphibian community composition in Tai National Park?

Project tasks

➤ **Main objective**

Study the influence of climate change on amphibian community composition in Tai National Park.

➤ **Specific objectives**

- ✓ Assess the diversity and abundances of amphibian in different forest habitats (exactly the same investigated by previous studies);
- ✓ Measure environmental and climate parameters of the study sites;
- ✓ Evaluate changes in amphibian composition since 1999, including data from this study;
- ✓ Determine the most relevant environmental and/or climate factors that affect amphibian.

Methodology (1/3)

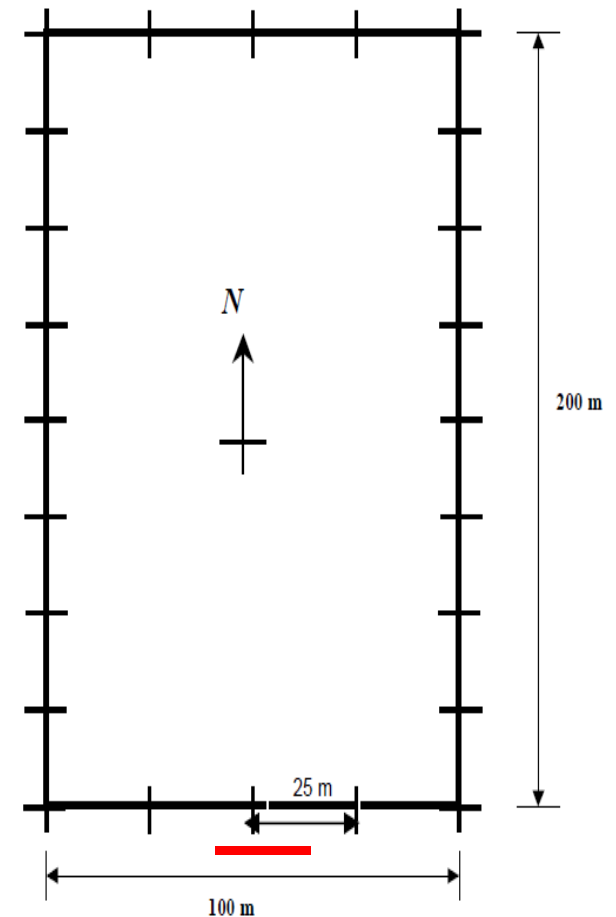
➤ Selection of sites and design of sampling units

▪ Standard method of sites selection

- ✓ Selection of the same sites investigated during previous studies (**Rödel & Ernst 2004; Ernst & Rödel 2005, 2006, 2008; Ernst et al. 2006; Hillers et al. 2008**).

▪ Designing of sampling units

- ✓ 10 transects within TNP (length of 600m/transect) re-establish (6 in primary forest, 4 in secondary forest) (**Rödel et Ernst, 2004**).
- ✓ Re-establish various transects (10) (length of 600m/transect) in forest fragments outside of the park (**Hillers et al, 2008**).
- ✓ Subdividing each transect length of 600 mn in 25 m subunits (24 subunits/transect).



Methodology (2/3)

- **Habitat characterization within each sub-unit** (Rödel et Ernst, 2004)
 - **Environmental Parameters**
 - ✓ Vegetation density, edaphic parameters, diameter at breast height (dbh), availability of water.
 - **Climate Parameters**
 - ✓ Humidity, temperature, pluviometry

- **Sampling methods** (Rödel et Ernst, 2004)
 - **Standard visual sampling method**
 - A daytime and at night.
 - **Acoustic sampling methods**
 - Only night

Methodology (3/3)

➤ **Sampling effort**

▪ **Sampling period**

- ✓ Intensive field periods of five months in the rainy season (June to October for two years).

▪ **Sampling section**

- ✓ Each transect will be visited twice a month (a daytime tour and a night tour).

➤ **Analysis of data**

- ✓ Mantel-tests,
- ✓ Non-metric-multidimensional-scaling (NMDS)
- ✓ General linear Model (GLM)

All analyzes will be relialized by statistic package R.

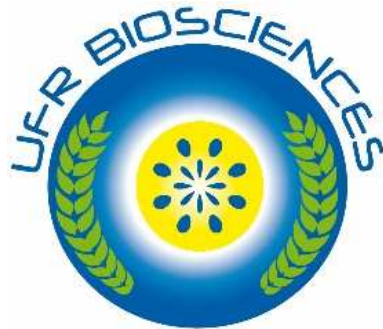
Outcomes

- ✓ Amphibian community composition in different forest habitats known;
- ✓ Climate and environment parameters determined;
- ✓ Climate and/or habitat factors that affect amphibian community composition determined;
- ✓ Species specific sensitivity to climate change determined
- ✓ Level of the species sensitivity to climate change evaluated;

Expectation internship

- ✓ Meet the experts of my study field;
- ✓ Clearly identify amphibian species of my samples;
- ✓ Learn modern methods that identify Amphibian more precisely;
- ✓ Obtain literature (field guide) that will help me easily to identify taxonomic groups;
- ✓ Obtain literature that will help me to better understand issues dealing with climate-change and amphibian.

Acknowledgements



Belgian National Focal Point to the Global
Taxonomy Initiative





**Thank you for
your attention**