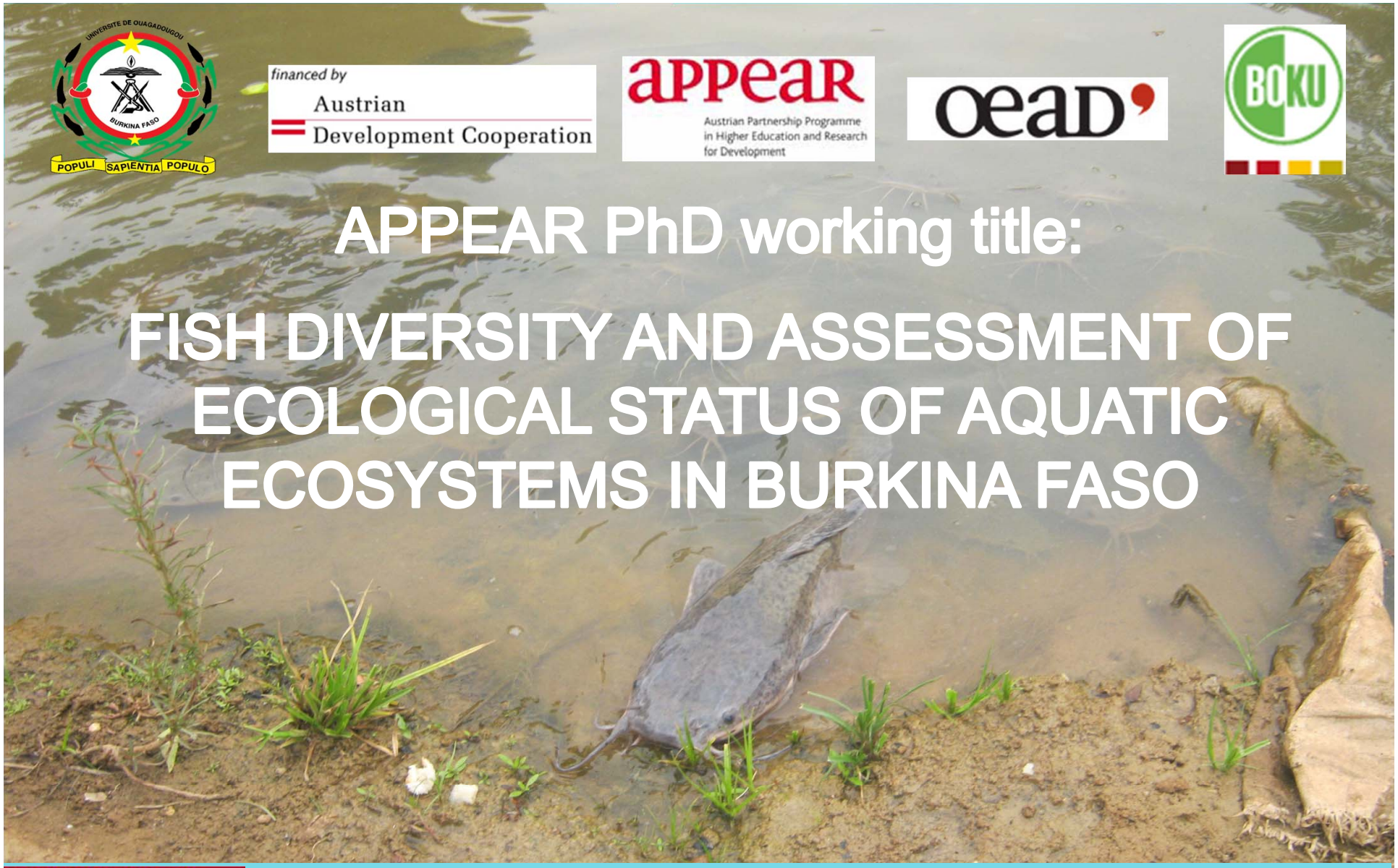


financed by Austrian Development Cooperation

APPEAR Austrian Partnership Programme in Higher Education and Research for Development

OeAD

BOKU

APPEAR PhD working title:

FISH DIVERSITY AND ASSESSMENT OF ECOLOGICAL STATUS OF AQUATIC ECOSYSTEMS IN BURKINA FASO

SUSFISH pêche-eau

Kommandan MANO, MSc

BOKU Vienna and Univ. of Ouagadougou

23 07 2013

OUTLINE

INTRODUCTION

METHODOLOGY

PROGRESS

Expected results

INTRODUCTION 1/6

- Freshwater ecosystems (lakes, rivers ...) represent usefulness various natural areas with high biological richness

- Historically they are exploited for many activities without sufficient consideration to their value and their future.
  - ✓Dams creation
  - ✓Agriculture activities
  - ✓Livestock
  - ✓Fishing

INTRODUCTION 2/6

- Recently, climate change and strong anthropogenic pressures jeopardize more and more aquatic organisms and water resources survival

- Presently, preserve these environments and their living ressources is a challenge for sustainable management

- Achieve this challenge need a good understanding of aquatic ecosystem and it organisms functioning

INTRODUCTION 3/6

- Like other ecosystems, functioning in aquatic one is characterized by the interaction between its organisms and their biotic and abiotic environment (Begon, 2006)

- Thereby ecosystem monitoring encompasses environmental variables, matter and organisms that it composes

INTRODUCTION 4/6

- Ecologist regarded fish as relevant biological element to evaluate aquatic ecosystems health (Karr, 1981).
  - ✓Relevant roles in the food web in aquatic ecosystems
  - ✓Its large size
  - ✓Its relatively long-lived

- In the light of the above improve knowledge on fish is also a challenge for scientist

INTRODUCTION 5/6

- Through Africa several recent studies on fish diversity and water quality are done (Hecky R. E. et al., 2010,Spreitzer M. L. et al., 2011; Deines A. M. et al., 2013)

- Whilst in Burkina Faso less studies are done on fish and it use to assess aquatic ecosystem (Ouédraogo R., 2010, Melcher et al., 2011)
- This study aims to characterize Burkina Faso fish communities and their habitat

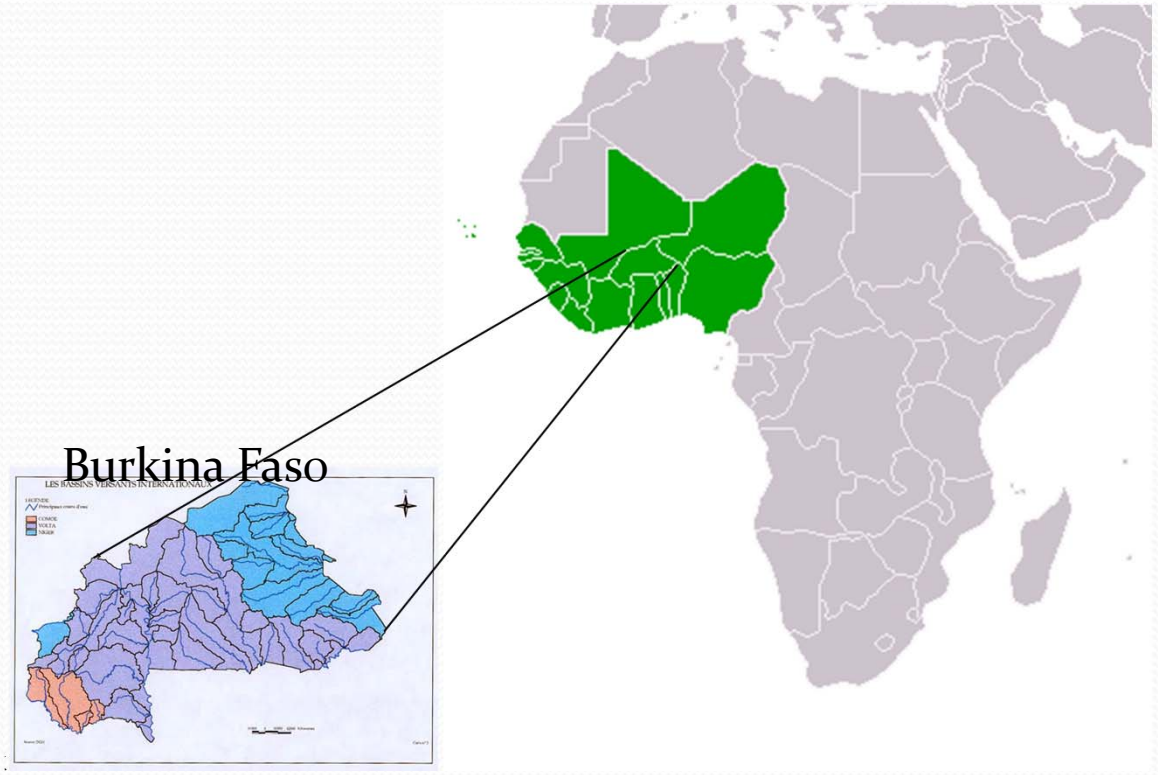
INTRODUCTION 6/6

- The specific objectives are:
  - ✓Assess fish communities and publish the distribution of each species
  - ✓Assess the effect of habitat parameter on species richness, abundances and diversity
  - ✓Analyze anthropogenic pressure impacts on fish
  - ✓Develop method to assess freshwater heath within arid countries using fish assemblage

METHODOLOGY

STUDY AREA

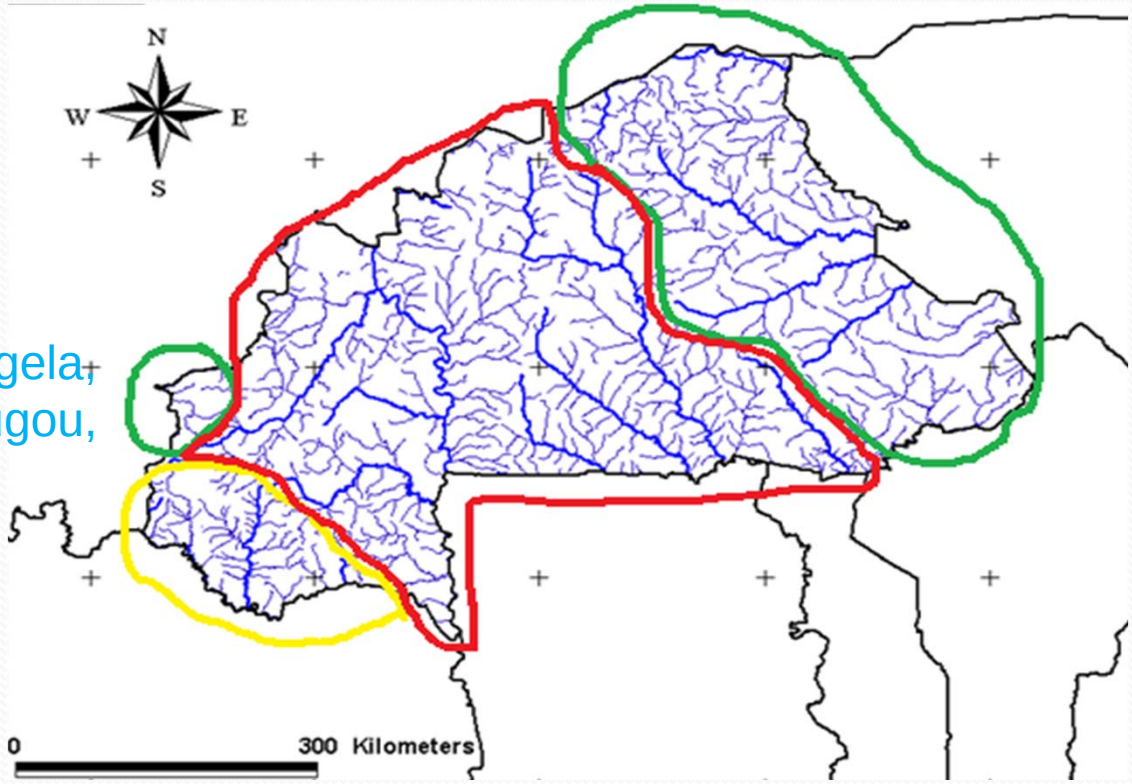
landlocked in the central part of West Africa between the latitudes 09°20' & 15°03' N and the longitudes 02°20' E & 05°03' W



situation of study's country and the river catchments as defined by the water strategy (GIRE-BF, 2000a)

SELECTED SITES

COMOE
Lera, Karfegela, Moussodougou, Tingrela



NIGER
Yacouta
Dori
Higa
Tapoa

VOLTA
Bam,Sika,Koulinéré
Bagré, Zagré,Badnogo,
Nazinga,Sourou, Boromo,
Boura ,Kou, Ziga, Koubri

STUDY METHOD

Fish sampling

Gillet fishing

Cast net fishing

STUDY METHOD

Fish sampling

Electrical fishing in a channel

Electro-fishing

STUDY METHOD

Fish sampling

- After sampling, fishes are sorted into species according to *Paugy et al. 2003* and counted.
- Their total and standard length measured to the nearest millimeter.

STUDY METHOD

- Questionable fishes are preserved in alcohol 70% and send to the laboratory for further identification.
- Even, some samples of fish are brought in alcohol 70% to the laboratory as proof.

STUDY METHOD

Physicochemical parameters sampling

- Sampling, we measure in the water : pH, oxygen, conductivity, temperature and the transparence with WTW Multi 340i Gear

STUDY METHOD

Anthropogenic pressures

STUDY METHOD

- To analyze fish communities
  - ✓Reference site: Nazinga
  - ✓Less impacted sites: Sourou, Boura
  - ✓Impacted sites: Koubri, Ziga, Loumbila

FIRST RESULTS

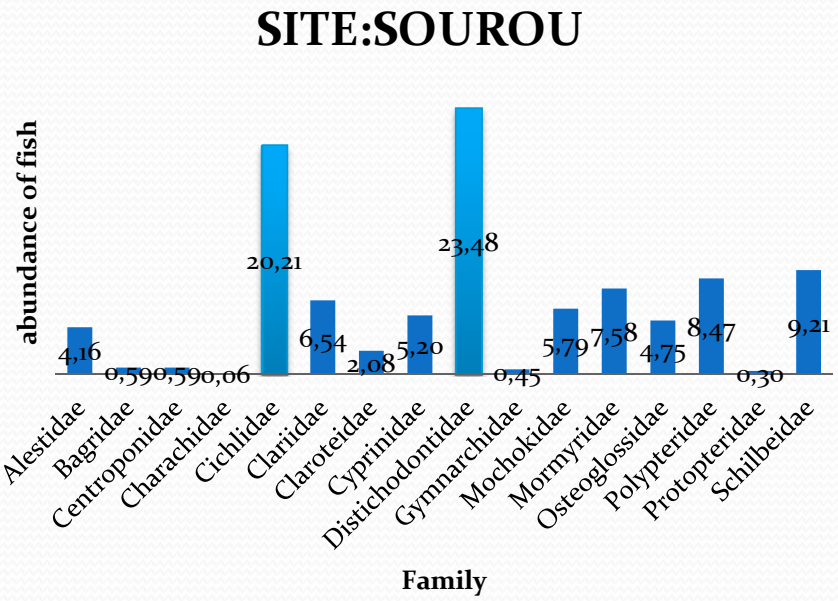
PROGRESSING

BAGRE	COMOE	NAZINGA
BOURA	KOUBRI	SOUROU
KOUGRI	LOUMBILA	ZIGA

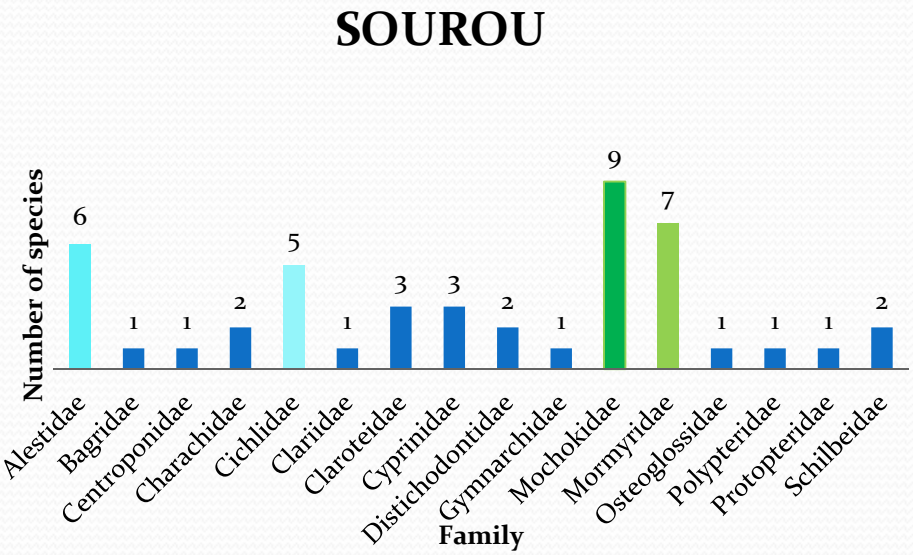
first results

Fish composition in SOUROU:

16 families, 47 species, 673 fish spécimens

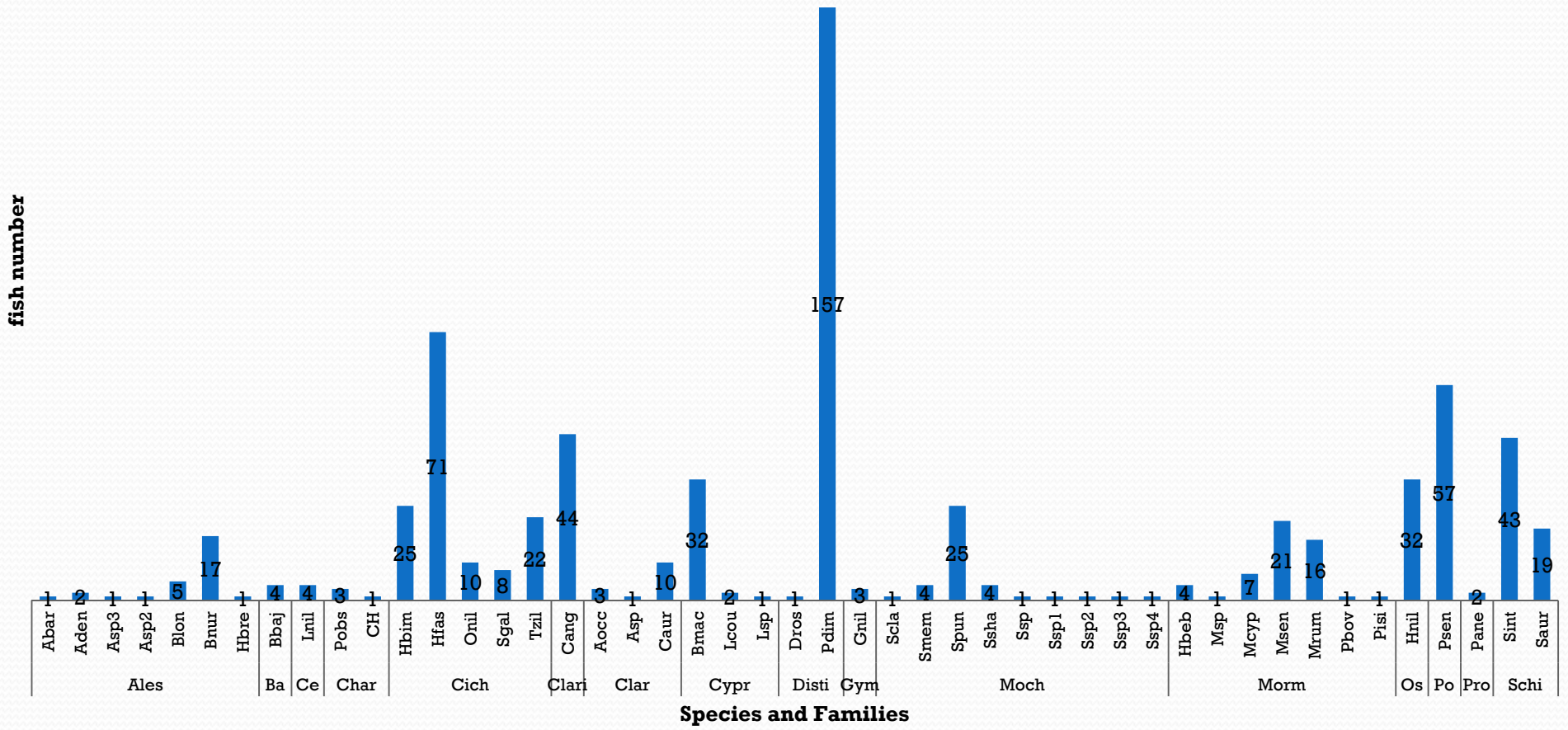


Fish abundance



specific Composition

first results

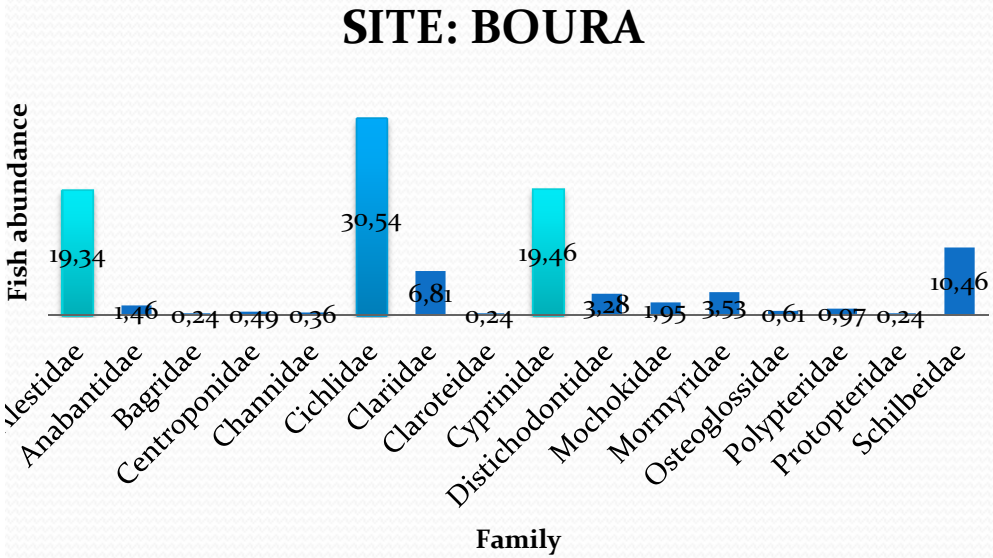


Fish composition

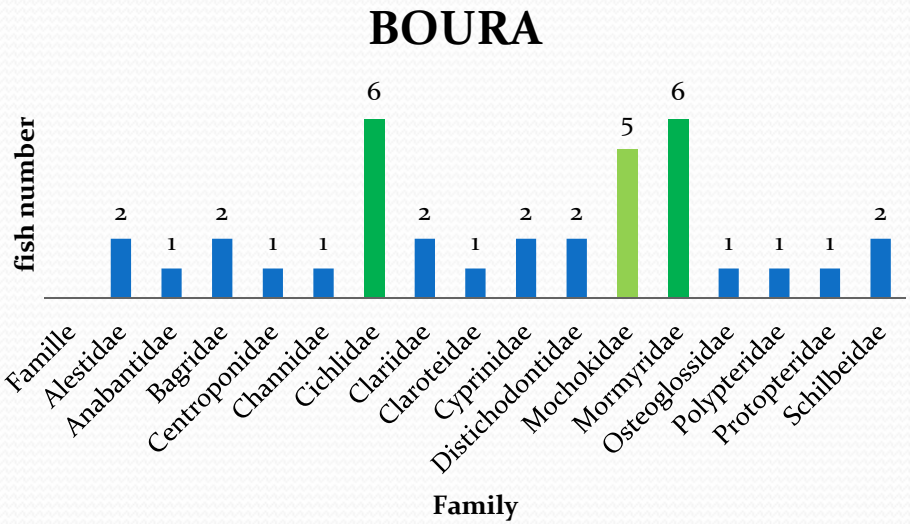
first results

Fish composition in BOURA:

16 Famlies, 36 species, 822 fish specimens

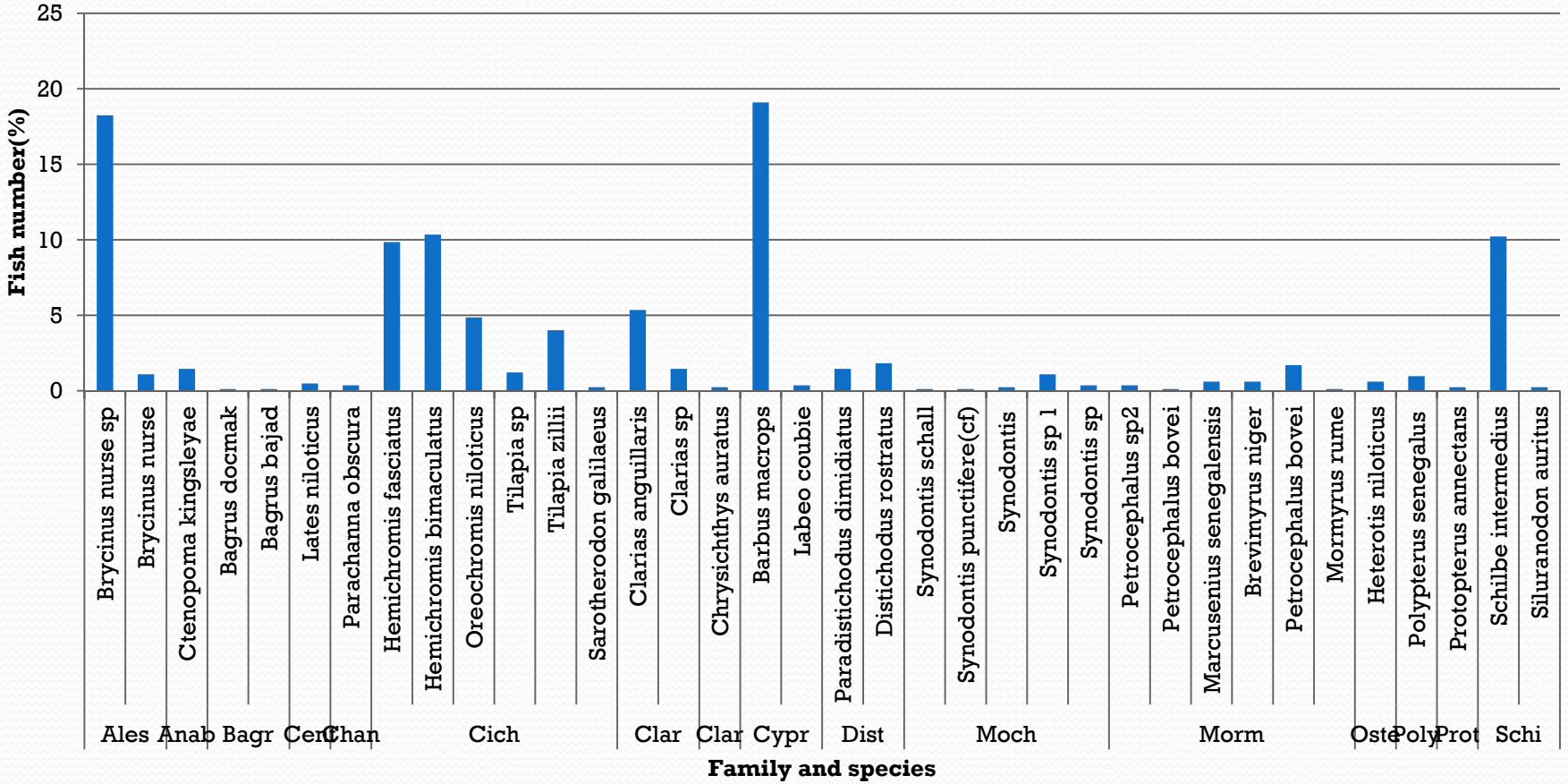


Fish abundance



specific Composition

first results

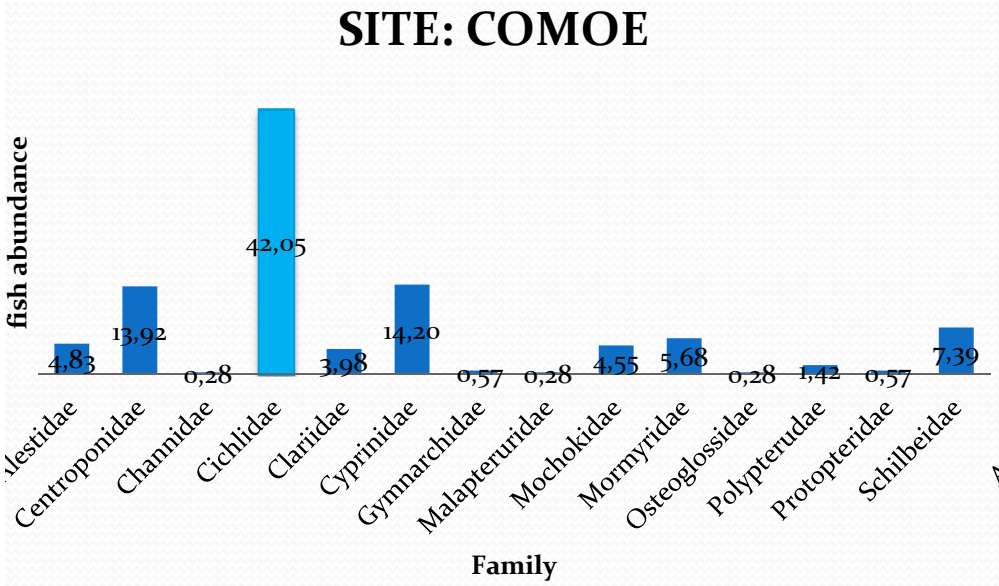


BOURA: Fish composition

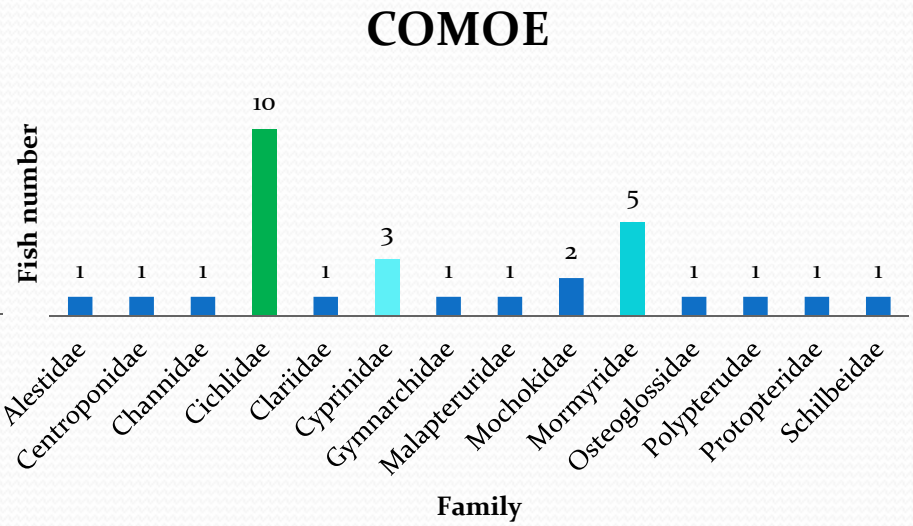
first results

Fish composition in COMOE:

14 Families,30 species, 352 fish specimens

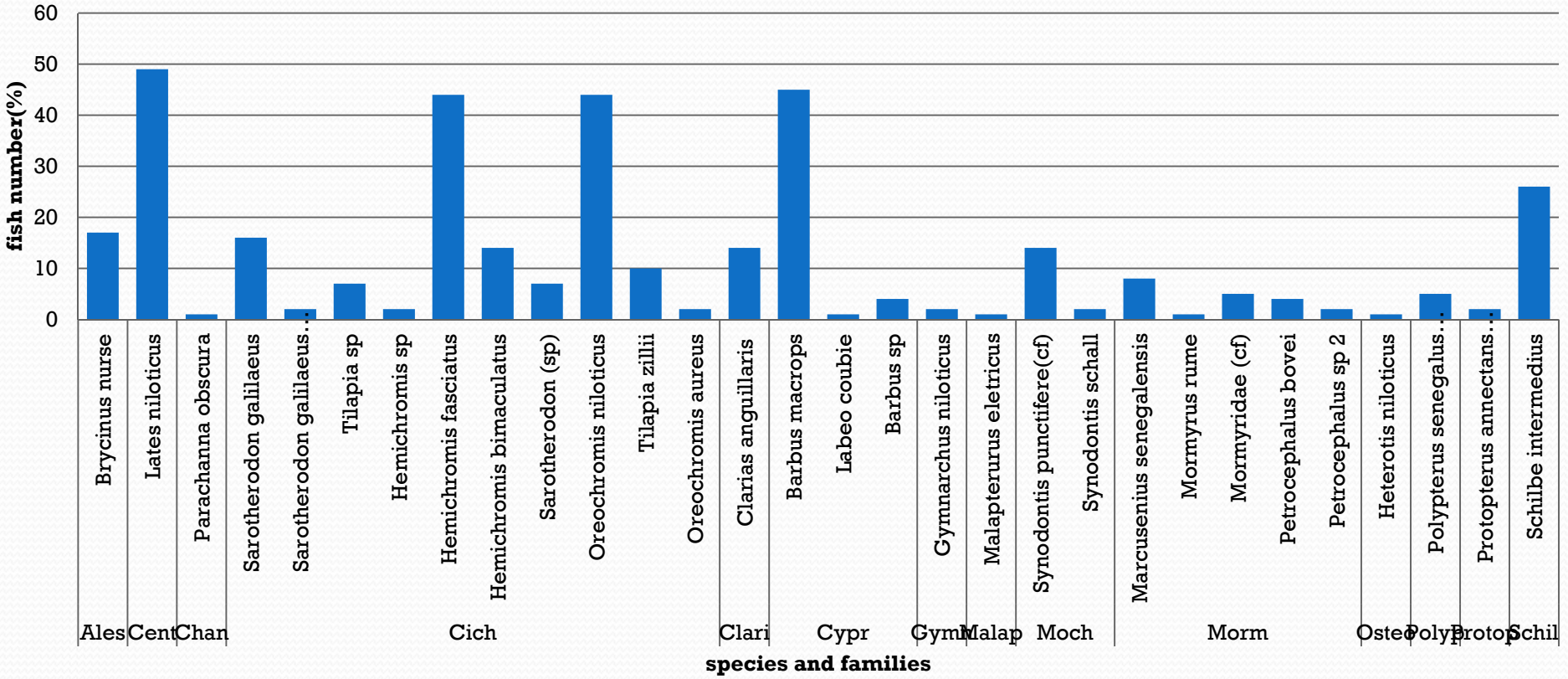


Fish abundance



specific Composition

first results



COMOE: Fish composition

EXPECTED RESULTS

- List of fish of Burkina Faso's rivers are available
- Effect of anthropogenic pressure is raised
- Fish species that indicate the health status of aquatic ecosystems of Burkina Faso are known
- And a fish base index (or protocol) is established to assess water quality in Burkina Faso

TIME TABLE

YEARS	BURKINA FASO	VIENNA
2012-2013	**July 2012-December 2012** **Fish sampling** **Treatment and identification** **January 2013-April 2013** **Treatment and identification** **Literature learning**	
		May-December 2013 **Literature learning** **Identification and data analysis** **Proposal submitted** **Courses** **Manuscript _1 preparing**
2013-2014		**January 2014-February 2014** **Courses** **Data analysis** **Manuscript _1 submitted at journal**
	March 2014-August 2014 **Fish sampling** **Identification, data analysis** **Manuscript _2 preparing**	
		September-December 2014 **Courses** **Identification and data analysis** **Manuscript _2 preparing and submitted**
2014-2014		**January- February 2015** **Data analysis** **Manuscript_2 submitted**
	March-August 2015 **Data collection** **Data treatment, analysis** **Thesis writing**	
		April-December 2015 **Data treatment, analysis** **Thesis writing** **Thesis submitted to studienkonat** **Final exam (Defense)**

NEXT STEPS

- Courses
- Identify questionable species
- Sampling in all sites during dry season (March-June)
- Data further analysis
- Thesis writing,Manuscripts writing and submitting
- Manuscript preparing: freshwater fish pattern in a land-locked and sub-arid country (Burkina faso)

THANK YOU FOR YOUR ATTENTION

12/03/2012