



# IMPETUS Benin

## Livelihood Security, Water and Health

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### The Eminent Role of Water

- Water constitutes an integral component of human **livelihood security**.
- Many people's **economic activities** in central Benin depend on the utilisation of water, e.g. 70% of the population in the communes Tchaurou and Ouaké.
- However, **access to potable water** is not evenly distributed. A quarter of the population are extracting water from waterholes, thereof 63% of this group all-season. Thus, numerous people are forced to consume non-potable water. As a result, working potential is lost, health costs are increased, and a further consequence are high child mortality rates.
- The **lack of improved drinking-water supplies** and the disregard of water hygiene play a major role in the spread of **infectious diseases**.
- The **health of the population** is affected by water-associated diseases as **malaria**. In Sub-Saharan



Africa, the mosquito borne infectious malaria disease kills about 1 Million people. The malaria transmission is mostly restricted to the rainy season. **Climate change** is expected to affect the transmission level. Water management strategies might be more effectively used to combat malaria in the future.

### Interdisciplinary Challenges

- With an **interdisciplinary approach**, the research group focus on central issues of human action concerning livelihoods, water and health.
- A great number of socio-economic, anthropological, biological and medical **micro-studies** delivers a broad analysis spectrum. For example, studies on social and economic **water-handling** provide important information on local strategies of water, management practices and measures of water hygiene.
- For the first time for Benin** and neighbouring countries, a statistically representative and gender-sensitive survey on livelihood security and resource use provides detailed data on local strategies and perceptions.
- The **modelling of malaria spread** in Africa provides detailed data on the distribution, seasonality and variability of malaria.
- A detailed **database of all kinds of drinking water sources and analysis results** sheds light on the situation of hazardous drinking water constellations at village level.

#### Key questions

- What are the trends of population development and distribution?
- How does the population ensure its livelihood?
- Does climate change affect the malaria risk in Africa, e.g. in Benin?
- What are the common water management practices?
- Is the availability of safe drinking water assured?
- What are the risk factors for waterborne infectious diseases?

### Resulting Information Systems

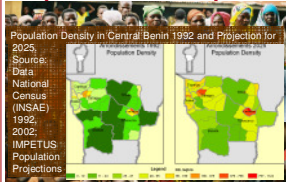
**LISUOC (Livelihood Security in Upper Ouémé Catchment)** provides the mentioned statistically representative, gender-aggregated data set on livelihood strategies in urban and rural areas as well as background information on water management and institutions. Moreover, it enables the user to realize demographic projections.

The combination of two detailed datasets of drinking water sources in the Upper Ouémé basin (**SIQeau** database since 2001, update 2008; **LISUOC/DGEau**-database) is the basis of the information system **SIQeau (Système d'Information Qualité de l'eau)**. SIQeau supports the user

to identify hazardous drinking water supply at village level, provides background information on drinking water quality, water hygiene and options on the prevention of waterborne diseases and measures in case of emergency.

The modelling of malaria and the projected malaria spread in Africa is illustrated in the information system **MalaRis** (The impact of climate change on **Malaria Risk** in Africa). The system further describes meteorological data from the Regional Model (REMO) and it incorporates a rich malaria archive on entomological and parasitological field studies.

### Population Development



### Some interrelated key factors

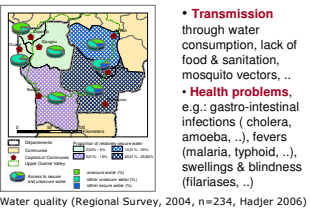
**LISUOC (Livelihood Security in Upper Ouémé Catchment)**  
Gender-sensitive information system on livelihood security, resource use, water management, institutional change and demographic projections

**Goal:** In close interaction with users, providing detailed data systems as manual for decision making

**Specific:** 1st statistically representative, gender-aggregated survey on livelihood security & resource use (22.260 km<sup>2</sup>: 7 communes, urban/rural); detailed background information on human acting; possibility to project demographic development until 2025; insider view on water management practices and conflict arenas

**User:** Communal Representatives, MCPD, UNDP, CeRPA, SH, GTZ, UAC, DED, Helvetas, Scientists

### Waterborne Diseases



**SIQeau (Système d'Information Qualité de l'eau)**  
Information system on supply and quality of drinking water in rural Upper Ouémé basin; including results of bacterial, viral and chemical drinking water analysis

**Goals:** Application of SIQeau as monitoring tool by persons in charge of drinking water quality, to identify villages in which the lack of safe drinking water supply endangers the inhabitants

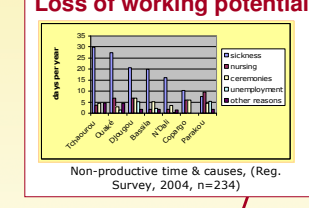
**Specific:** The situation of drinking water is highlighted through results of water analysis, Impetus- and SR-eau-databases of water supplies. Options for action emerged from examination about well restoration, water disinfection, storage of drinking water and analysis of all different types of water supplies in the region.

**User:** Communes, DGEau, SREau, SHAB, Helvetas, Caritas, WHO

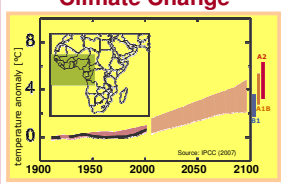
### Risk Strategies

- Networks:** Who is asked for assistance? Family enjoys top priority (75%). Neighbors & friends of same sex are asked in the 2nd place (n=839).
- Generalized **gift exchange** is virtually practiced by everybody.
- Reciprocity:** Women exchange more frequently higher amounts of gifts in shorter time intervals and with a higher rate of reciprocity.
- Credits & Saving:** 1/5 of the sample population drew a credit in the last 12 month, thereof 1/3 intra-familial. (n=839)

### Loss of working potential



### Climate Change



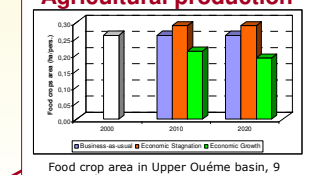
**MalaRis (Impact of climate change on Malaria Risk in Africa)**  
Information system on the malaria spread in Africa simulated by the Liverpool Malaria Model (LMM) (incl. climate change scenarios & land use & land cover projections)

**Goal:** Risk assessment of malaria transmission in Africa under a changed future climate

**Specific:** MalaRis first specifies the performed REgional Model (REMO) climate scenarios (A1B & B1) and furnishes information on the LMM. The system further describes the LMM present-day simulations (1960-2000) and malaria projections (2001-2050). A malaria archive provides excess to data and figures from malaria field studies.

**User:** WHO, MSP Cotonou, DDSP Borgou/Aiabori, CERMES Niamey, Scientists

### Agricultural production



**Further information and research highlights: See Atlas and P19**