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QWeCI

**Quantifying Weather and Climate Impacts on Health in
Developing Countries**

**M5.3a: Workshop on common observing
strategies**

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Duration: 42 months

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Coordinator of milestone :
Evolution of milestone

CSE
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Project co-funded by the European Commission within the Seventh Framework Programme (2007-2013)		
Dissemination Level		
PU	Public	PU
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

By bringing together scientists from different disciplines, including those involved with public health and animal health, the QWeCI project will contribute to a better understanding of linkages and mechanisms between disease transmission, disease diffusion, epidemics, and climate/environment variability and changes. It will start to lay down the foundation for the development of early warning systems to assist with epidemic reduction/prevention. Today, West Africa is an important region for studying climate impacts on public health and animal health.

Whatever the field study, you need to have a strategy on data collection in situ, the number of collection points, what is being collected, how these data are being collected and the analyses that are being carried out...

This document is giving the common observing strategies in the WP 5.3 pilot project sites in QWeCI. The main components about the common observing strategies have been discussed on June 22th, 2010 just after the Liverpool kick-off meeting. In fact, when the Senegalese delegates come back from Liverpool, a debriefing meeting has been hosted by CSE and among the discussed points; the common observing strategies and fields protocols have been highlighted. CSE (*Centre de Suivi Ecologique*), DSV (*Direction des Services Vétérinaires*, The National Livestock Service), IPD (*Institut Pasteur de Dakar*), NMCP (National Malaria Programme Control; *Programme National de Lutte contre le Paludisme*) and UCAD (University Cheikh Anta DIOP of Dakar). Just to remind that the Science partners are CSE, IPD and UCAD and the Stakeholders are DSV and NMCP.

1- WP 5.3 Study area

The study will be carried out in an area of 15 km of radius centred on the Barkedji village (14 ° 47'-14 ° 53'W, 15 ° 13'-15 ° 20'N). This area belongs to the Sahelian bio-geographic domain characterized by a short rainy season (from June to October) and a long dry season (November to May) with annual rainfall ranging from 300 to 500 mm. Through EU FP6 AMMA and other funding the different microhabitats have been classified within the study area. Among them, are a large number of temporary ponds, which are at the same time breeding and resting habitats of many mosquitoes. Some of them remain, throughout the rainy season and will be the main source of water for people and livestock. The Barkedji site is one of the famous Environment and Health Observatories in Senegal. IPD have worked on the Barkédji site since 1990, and this Observatory has been the study area of several research projects.

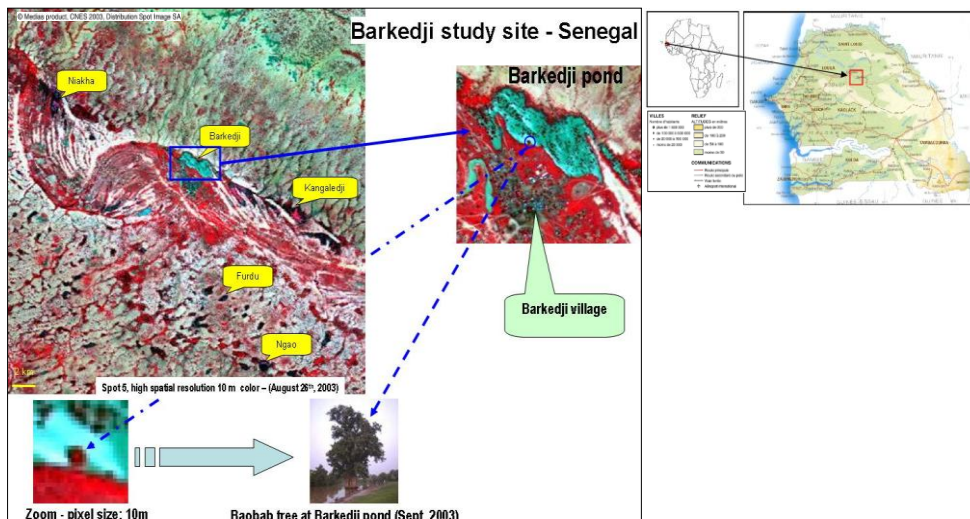


Figure 1: The Barkedji site, area of study for AMMA WP 3.4. The small red square outlines the studied area, covered with ponds, and within the Ferlo region.

2- Brief background of studies on Rift Valley Fever (RVF) and Malaria at the Barkedji site

2.1) Rift Valley Fever

In Senegal, many mosquito species (*Aedes sp.* and *Culex sp.*) as well as humans and livestock (Fontenille et al.1998; Diallo et al., 2000) have been found of being infected with RVF virus. The epidemiological role of these mosquitoes species involved in RVF transmission cycle is complex.

RVF epidemics in Senegal (Diallo et al., 2005), do not seem to follow the same relationships as that over East Africa. During the rainy season the abundance of mosquitoes over the Ferlo is linked to dynamic, vegetation cover and turbidity of temporary and relatively small ponds. Research has led to the development of vulnerability maps based on the dynamics of the pond size, the distances over which the infected mosquitoes seek blood meals, i.e. the flying range of mosquitoes, their aggressiveness, and the localisation of villages and cattle pounds around ponds (Lacaux et al., 2007; Tourre et al, 2008; Ndione et al, 2008).

2.2) Malaria

Several studies were carried out on malaria vectorial transmission in many bio- geographical areas in Senegal as part of program targeting its epidemiology or vectors bioecology. These studies to date have not feed into in country operational systems that are leading the fight against malaria.

This village is located in the Sahalian transmission profile characterized by a seasonal transmission during the short rainy season. The presence of temporary ponds which remain almost the only sources of water until January in the area and which dynamic is completely under rainfall control constitutes the local ecological characteristics which influence locally the interrelationships between the vectors, parasite and hosts.

3- Field activities

For field activities, we are monitoring:

- Water ponds level in Niaka, Ngao, Furdu and Kangaedji ponds (see photo 1) in Barkedji area;
- Rainfall thanks to a device of 10 raingauges stations and 2 automatic weather stations located in Niakha (4.2 km in the north-east of Barkedji and in Belli Boda, around 8km in south-east of Barkedji) and around ponds (photos 2, 3, 4, 5 and 6);
- Water quality data (pH, conductivity, temperature...);
- Entomological data collection;
- Clinical malaria data surveillance;
- Clinical livestock survey data will be collected through sentinel and transhumant herds;
- Other veterinary investigations:
 - * census and camps georeferencing;
 - * georeferencing of livestock parks;
 - * date of arrival for transhumants;
 - * distance between camps in relation with ponds;
 - * evaluation of the livestock density around ponds;
 - * evaluation of the human population density.

DEM data collection operation is planned for the dry season to complete and update data gathered during the AMMA project. If it's possible, this activity will be conducted for the entire area study, 15x15km.



Photo 1 : Limnometric scale installation Niaka pond



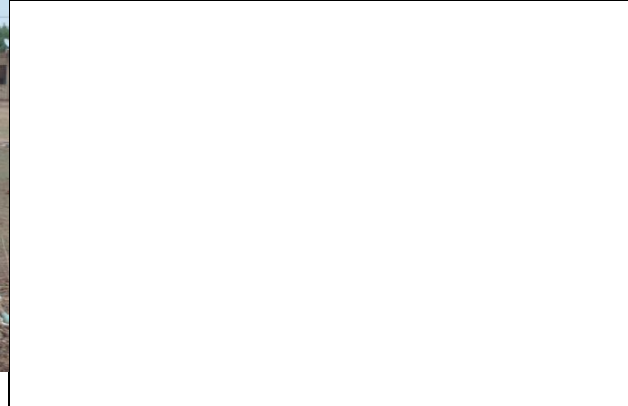
Photo 2: Starting up of raingauge station in Barkedji



Photo 3: Raingauge station in Barkedji



Photo 4: Raingauge station in Barkedji



Photos 5 et 6: Niakha Basic weather station set up in October 2007. A same Basic weather station like this one will be set up in Belli Boda (South-east of Barkedji) in August 2010