

## **Estimation of Japanese Encephalitis transmission intensity in sentinel chickens in contrasted landscapes in Cambodia**

Supervisor : Dr V. Chevalier

### **Context :**

Japanese encephalitis remains the main cause of encephalitis in Southeast Asia. The role of pigs as amplifying host is proved. But the role of domestic birds remains to be investigated. Indeed, experimentally infected chicken and ducks have a high viremia, depending on their age ; the viremia peak decrease when age increase [6]. Young bird could thus act as amplifying hosts in pig free –or low pig density- areas [27A first study performed in Cambodia allowed to measure the JEV force of infection in piglets, in peri-urban and rural settings. This study showed that JEV is intensively circulating in both areas. A second study showed that chicken and ducks were exposed to the virus. The estimated seroprevalence (IHA test) rate ranged from 8 to 12% (n=691), without any significant difference between both species

The main goal of this work is to describe and compare the transmission dynamic of JEV in 3 chicken cohorts, in peri-urban, rural (mainly covered by rice fields) and mixt (rice fields and forest). Collected data will allow (i) an estimation of the Force of infection (ii) the calibration of a generic model built in the frame of a PhD (AO. Diallo) granted by SEAE (Southeast Asia encephalitis) et ComAcross (Companion Approach for Cross-sectoral collaboration in health risks management in SEA) projects.

Field activities will be granted by ComAcross and the student will benefit from existing collaborations, ie IPC virology and entomology units.

### **Methodology**

The study will start in January 2017, and will last 1 year.

Three cohorts of 100 one day-old chicks will be settled in 3 different ecological settings. They will be ring-tagged, and blood sampled every months, until seroconversion. Each month collected sera will be analysed by ELISA test (*Enzyme Linked Immuno Sorbent Assay*) for anti EJ IgG detection. At the end of the study, sera will also be tested for West Nile antibodies

This work will be combined with an entomological investigation aiming at identifying the main JE vectors, describing their population dynamics and measuring their feeding behavior.

### **Expected results**

Estimation of the force of infection of JEV on chicken.

Assumptions on the role of domestic birds in JE epidemiology

Integration of the measured parameter in JE transmission model on track (AO. Diallo)