Joint French-South-East Asia Research and Training initiative

DYNAMIC OF LAND USE CHANGES AND SOIL ECOSYSTEM SERVICES (LUSES)

Internal call for small proposals

Year 2013

Title
Collective training on measuring water flows and balance within the "critical zone" of tropical agro-ecosystems of South East Asia

Project responsible	Henri ROBAIN (IRD Bioemco)

LMI partners (French)	• IRD UMR Bioemco and UMR GET

LMI partners (Asian)	• National Agriculture and Forestry Research Institute (NAFRI), Vientiane, Laos • Land Development Department (LDD), Bangkok, Thailand • Soil and Fertilizers Research Institute (SFRI), Hanoi, Vietnam

Others Partners	
Western Countries	
Asian Countries	• Royal Forest, Wildlife and Plant Conservation Department (RFWPCD), Bangkok, Thailand

Asian Countries involved

Thailand	Vietnam	Laos	Others
X	**X**	**X**	

Working package involved

WP1 Soil fertility and the dynamics of mineral nutrients	WP 2 Soil and water functional biodiversity	WP 3 Carbon storage in plant biomass and soil	WP4 Regulation of water flow and erosion
			X

Type of Project

	Amount (€)	**Purpose**
Collective training	**4,000 €**	(3 people per country)

General context of the proposal

Since about 2 decades, the tropical agro-ecosystems of South-East Asia are submitted to outstanding changes of farmers' practices following the combined pressure of population growth in rural areas and of the market's demands on cash and food crops. In the context of climate change, the impact of the land use changes on the hydro-bio-geo-chemical processes occurring in the "critical zone" (National Research Council, 2001) is threatening the sustainability of the novel practices. The "critical zone" which extends from the top of the bedrock up to the top of the canopy, is indeed the zone where surface water and groundwater are split, where the water resource forms and acquires its chemical composition and where polluting substances are mobilized. It is hence the principal source of all environmental negative or positive impacts on water resource resulting from Land Use and Climate Changes. In order to improve the management of water resource in South East Asia, there is a strong need for a better understanding of the transformations which are occurring in the critical zone. Such knowledge requires a detailed assessment of water fluxes at the Soil-Vegetation -Atmosphere interface using up-to-date and cost effective devices.

Objective of the proposal

The objective of the proposed collective training is to strengthen the knowledge of staff from national institutions in South East Asia in the field of hillslope and small catchment hydrology.
Four areas will be prioritized:
(1) stream discharge measurement (i.e. propeller and tracer-based methods);
(2) estimate of soil moisture (i.e. gravimetric and Time Domain Reflectometry methods);
(3) estimates of soil permeability (Wiltschut infiltrometer);
(4) and groundwater/stream water interactions (piezometric measurements and 2D electrical resistivity tomography).

This project targets an audience of scientists, engineers and technicians with basic knowledge in the field of environmental sciences.

Link with the LMI project (regional aspect, partnership, working package)

The training aims at strengthening the expertise of a regional network involving Laos, Thailand and Vietnam partners, in the field of water flows measurements and water balance estimates in the "critical zone" in tropical agro-ecosystems (linked to the WP4 of the LMI LUSES).
This proposal has been discussed during the "Capacity Building" session of the "Kick Off Meeting of LMI LUSE" recently held in Bangkok.

Beyond building the capacity of a regional network that will enable a better management of water resource at the scale of local communities (e.g. small watershed, village territory), the training aims at creating opportunities for South-South collaborations.

Project description (one page maximum)

The training will use the expertise of the Multi-Scale Environmental Change (**MSEC**) network members (i.e. NAFRI, RFD, SFRI and IRD), and will be held on the site of the Houay Pano observatory in Laos (10 km from Luang Prabang).

The training will last 5 days in optimal conditions for field measurements (mid October: end of the rainy season):

- Day 1 will be devoted to the reception of participants, a visit to the experimental site and some reminders on basic concepts;
- Days 2 and 3 will be devoted to 4 parallels field learning sessions following the 4 points mentioned above (the trainees will be separated in 4 groups which will follow each of the 4 sessions during half a day);
- Day 4 will focus on the data analysis and interpretation;
- Day 5 restitution and departure of the trainees.

Budget description

Item	**Amount (€)**	**Remarks**
• Travel expenses		
Thailand (3*300 €)	900 €	
Vietnam (3*200 €)	600 €	9 people (3 per country)
Laos (3*130 €)	400 €	
• Accomodation expenses		
9*5*40 €	1,800 €	
• Field expenses		
(Package)	300 €	Stationaries and local transportations
TOTAL	**4,000 €**	

Co-financing of an equivalent amount has been submitted to the call for projects of the PPR SELTAR. The project will be feasible in the absence of co-financing for a very limited number key partners involved in researches concerning the water fluxes in the “critical zone”, as the number of participants (trainees and trainers) would be limited to 9 people (i.e. 3 per country corresponding to 5 trainees and 4 trainers). Assuming PPR SELTAR co-financing would be accepted, the number of trainees could be increased to 14 people.

MSEC observatory in Lao PDR will insure the provision of the experimental site and related field instruments