

**Joint French-South-East Asia Research and Training initiative**

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



**Internal Call for small proposal**

**Year 2013**

<b>Project responsible</b>	Prakaijan Nimkingrat, Nematologist, Lecturer at Khon Kaen University
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<b>Title</b>	Introduction to the characterization of soil nematodes, an important soil bio indicator
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<b>LMI partners (French)</b>	Cecile Villenave, IRD, UMR ECO&SOLS Free living nematode's specialist
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<b>LMI partners (Asian)</b>	Khon Kaen University (host the training)

<b>Others Partners</b>	
Western Countries	Stephane Bellafiore: IRD, LMI RICE, UMR 186 Plant resistance to Bio aggressor
Asian Countries	

Type of support	Amount (€)
<b>Deadline (14 th of February)</b>	
Student support	
Student research expenses	
Student mission	
Support to project building	
Collective training expenses	4000
Mission (exploratory, support)	
Field support	
Exploratory project	
Beside project support (link to a bigger one)	
Equipment	
Others	

**Asian Countries involved (put an x)**

Thailand	Vietnam	Laos	Others
X	X	X	

**Working package involved (put an x)**

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 s
	X		

### **General context of the proposal**

**Why do we need bioindicators?** Despite the important environmental issue in the South East Asian area (global warming, flooding, soil degradation), there is lack of specialist on soil ecology able to monitor the environmental impact of these anthropogenic disturbances. Thus, assessing the impact of land use changes on soil sustainability involves the development of reliable soil physical and biological indicators, which constitutes the global objective of this collective training.

**Are Nematodes a good soil indicator?** Soil organisms develop close relationships with their environment and can thus provide information about the general soil functioning because of their sensitiveness to the perturbations and stresses suffered by the soils (pollution, climatic variations, physical state of the soil, etc.). Because of their abundance (> 10 per g of soil), their presence in all types of soil and their sensitivity to soil water quality (they live in the film of water that surrounds soil particles), nematodes are considered as one of the best indicator of soil perturbations

**Importance of this training in the context of LUSES?** This training will help to organize a community of soil scientist at the regional scale interested in the monitoring of soil quality. It will focus on the characterization of soil nematodes, a recognize but very poorly studied bio-indicators of soil in SEA. This training will help the Asian scientists to determine easily some key parameters (nematodes abundance, main trophic group, etc.) and will introduce them to some new molecular technics for assessing nematodes diversity. It will base mostly on simple and not costly methodologies, which could be used in all the countries involved in the LMI LUSES.

### **Objective of the proposal**

1. Demonstrate the ecological importance of soil nematodes in soil functioning.
2. Learn simple methodologies to assess soil nematode abundance (extraction of nematodes from the soil matrix) and discover nematode trophic diversity (morphological observation).
3. Introduce the trainee to the new molecular technics of nematode identification.
4. Build a scientific network on the assessment of soil quality index in the different agrosystems studied by PPR SELTAR and LMI RICE and LUSES.

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

- Collective training at a regional scale are one of the main feature of the LMI LUSES
- The training will involve students originated from all the regional institutional partners of LUSES (Vietnam, Thailand and Laos)
- The reinforcement of a scientific community link to study of soil biodiversity under different land uses constitute one of the main objective of LUSES
- One of the objective, based on of this training, is to implement in the near future a small nematology lab in Laos with the help of KKU.
- This training will promote the interaction with another LMI (LMI RICE) due to the participation of Stephane Bellafiore

### Project description (one page maximum)

The training will last 5 days (from the 8 to the 12 of July 2013)

Day 1: morning: Theoretical introduction to the study of soil nematodes

Afternoon: Field work: how to samples soil for nematodes studies

Day 2: nematodes extraction involving basic laboratory methodologies

Day 3: introduction to molecular technics (DNA extraction, PCR with ITS markers and electrophoresis)

Day 4: Counting of nematodes and beginning step of fixation

Day 5: Fixation, density measurements and morphological observations.

**Methodologies used:** basic tools such as plastic bottle, tissues lab, plastic funnel, glass jars, small lab equipment's (sieves, pipet, small glassware etc.) and binocular magnifier. All these equipment's will be provide by the KKU University.

### Budget description including identify amount budget from co -funding if it is available

The total Budget is 12.500 €.

The requested budget to the LMI corresponds to 25% of the total cost.

	Budget required	Designation
<b>PPR Seltar</b>	4000	For regional trainies accomodations and traveling expenses
<b>KKU</b>	2500	Training facilities, scientific and basic molecular equipment ie. Microscope (10 to 12), stereo microscope (10 to 12) PCR and two staff as resource persons as well as two post graduate students to join the course.
<b>LMI LUSES</b>	4000	Mission and accomodation of C. Villenave, participation to lab expenses.
<b>LMI RICE</b>	2000	Mission and accomodation of S. Bellafiore (from Vietnam), Trip and accomodations for two vietnam students.