



## Profile for Doctoral Position

### Research framework

**Work-Package: "Environmental and social dynamics of risk"**

**Heads:**

**Franck LAVIGNE** – LGP: *Laboratoire de Géographie Physique* (UMR 8591)

**Julie VALLÉE** – *Géographie-Cités* (UMR 8504)

### Position description

**"Reconciling Risk Management and Exploitation of Cultural Heritage: The Angkor Site"**

**Research Proposal:**

A major tourism site in Southeast Asia, notably since its inclusion on the UNESCO World Heritage list in 1992, Angkor is currently faced with a number of societal and environmental risks.

These risks are first anthropic in nature, notably due to its designation as a world heritage site (Thibault, 1998; Esposito, 2012) that caused twofold demographic pressure. This is manifest by the spread of the city of Siem Reap (pop. nearly 200,000) towards the classified site following the boom in tourist hotels (Siem Reap/Angkor Urban Observatory, 2010); and by population growth among people living within the classified site (Hauser-Schäublin, 2011).

Environmental risks, arising partially from demographic pressure, come from a certain number of actions that generate considerable uncertainty as to the structural stability of the edifices (Hydratec, 2012). On the scale of the classified site, canals and reservoirs are elements of a hydraulic system that maintain constant soil humidity, the only guarantee of survival for temples built on loose ground (Groslier, 1974, 1979; Pillot, 2008; Bourdonneau, 2010). Yet, the lack of maintenance tends to dry the soil, which seems to be sinking under the weight of the temples, weakening the archeological structure. The hydraulic system is in the process of being restored under the auspices of APSARA (a Cambodian body created at the request of UNESCO to manage the classified site); in turn, this is at risk of running up against a phenomenon throughout the catchment basin—erosion. Indeed, because of biomass needs (heating and lumber), deforestation seems to be speeding up on the Kulen mountain range that stands over the site (Hydratec, 2012). This is causing permanent soil erosion and threatening landslides, which would be catastrophic for the heritage site (André *et al.*, 2008a & b) and all of the associated economy if a major event were to happen.

How then can heritage classification, touristic draw and the preservation of the stability of the ground and archaeological sites be reconciled on the regional and local scales? How can a



population that earns its living from tourism be able to protect its jobs, investments and environment? These are the general questions that the doctoral student should attempt to answer.

**In order to allow the administrators to better manage the paradox between protecting the site and exploiting this heritage, this thesis aims to: (1) draw up a report on the current natural and anthropic risks weighing on Angkor; and (2) propose actions to mitigate these risks, taking a clearly systemic and (if possible) multi-disciplinary approach.**

The doctoral student will be asked to set up a methodology based on: in-depth field work in physical geography and satellite image processing to model the erosion on the Kulen mountains; a detailed map of the hydrographic network upstream from the site and the hydraulic network within the site, notably by creating a GIS; and surveys of managers and the populations that utilize the site and the Kulen mountains on a daily basis.

Modeling of water flows could then be compared to climate variations in order to understand how the hydrosystem and ground behave based on the monsoon and its inter-annual variability. Later, the doctoral student will integrate demographic pressure variables into the models in order to propose possible ways to mitigate this risk.

## Planned collaborations

He/she will work with the members of the "Environmental and social dynamics of risk" Work-Package and in mixed research units (UMRs) directly with the thesis co-directors.

*Pôle de Recherche pour l'Organisation et la Diffusion de l'Information Géographique – UMR 8586 PRODIG:*

- Gilles ARNAUD-FASSETTA, Professor, University of Paris Diderot: hydro-geomorphologist specialized in hydrosystems and hydrosystem dynamics, with an interest in hydraulic modeling; geoarcheologist with an interest in past societies in relation to their environment.
- Emilie LAVIE, MCF University of Paris Diderot: specialist in artificial hydrosystem management issues (drainage networks, irrigation, drinking water) and water pollution. At the interface between human geography and environmental geography in developing countries.

*Laboratoire de Géographie Physique – UMR 8591 LGP:*

- Franck LAVIGNE, Professor, Paris 1 Panthéon-Sorbonne University: Geomorphologist, natural risks, Asia.

Outside LabEx:

Marie Françoise ANDRE, Professor of Geography, IUF Member, Blaise Pascal University (Clermont-Ferrand), UMR GEOLAB 6042: geomorphologist specialized in erosion issues on archeological sites;

- ⇒ Took part in the **Impact of Deforestation on Deterioration Acceleration of the Stone on the Angkor Site (2006-2013)** program: UNESCO Label Program – International Coordinating Committee for the Safeguarding and Development of the Historic Site of Angkor – partners:



*Ecole Française d'Extrême-Orient, Musée Guimet, APSARA National Authority, Köln Universität, Chinese Academy of Cultural Heritage.*

Emmanuel REYNARD, Professor of Geography at the University of Lausanne, geomorphosite specialist. Former Chair of the Geomorphosite Working Group of the International Association of Geomorphologists (IAG/AIG) (2001-2013).

Contact could be made with the École Française d'Extrême Orient (EFEO [the French School of Asian Studies]).

Pôle Image could work with and support the doctoral student for the mapping aspects of the work.

## Required skills and abilities

Post-graduate Master's degree (Master 2) in one of the following fields:

- preferably in physical geography and/or environmental applied geomatics;
- possibly history, sociology or (environmental) archeology. Knowledge of hydrologic and geomorphologic processes is necessary, notably to assess erosion risks.

The candidate must have had initial experience in the area of environmental management and/or past and current cultural heritage. Research experience (a few months to several years) in developing countries will be strongly appreciated, especially if this work includes surveys of populations or administrators.

A sincere desire to act as an integral part of a research group working in the field of environmental geography (the interface between physical geography and human geography) is crucial to the successful completion of this thesis.

Good people skills will be necessary to develop outside collaboration (partner laboratories and other French (e.g. the EFEO) and foreign institutions ultimately associated with this doctoral project), in particular during interviews with UNESCO staff. Strong research ethics (field work in constant contact with the local population) are desired.

It is understood that the candidate should know how to use the following tools and methods: mandatory in geomatics (GIS, remote sensing, mapping), potentially in qualitative surveys (interviews with field stakeholders) and modeling.

Good command of the English language (work with UNESCO and in the area of tourism) is indispensable. The doctoral student may be asked to study the basics of the Khmer language during the doctoral program.



# Laboratoire d'Excellence Dynamiques Territoriales et Spatiales

Cluster of Excellence *Territorial and Spatial Dynamics*

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contact@labex-dynamite.com

Additional information	
<b>Contract start date</b>	01/09/2016 or 01/10/2016 (as desired)
<b>Length of contract</b>	3 years
<b>Host laboratory</b>	<p><b>Laboratory Name:</b></p> <p><b>PRODIG</b>  <b>2, rue Valette, 75005 Paris</b></p> <p><b>Possible Thesis Supervisor(s):</b></p> <p><b>Gilles ARNAUD-FASSETTA</b></p>
<b>Assigned University</b>	<p>University of Paris Diderot</p> <p>Doctoral School of Economics, Environment, Society, Civilization, Critical Thinking, Political and Social Practices – (Doctoral School ED 382)</p>
<b>Net monthly remuneration</b>	approximately € 1 350 (additional teaching assignments possible) <sup>1</sup>
<b>Contact</b>	<p>contact@labex-dynamite.com</p> <p>gilles.arnaud-fassetta@univ-paris-diderot.fr</p>

## Recommendations for the candidate(s):

### Recruitment procedure and schedule:

- **The application must be submitted electronically by application form** (<http://www.form-labex-dynamite.com/doc/en/>). It must demonstrate that the candidate fulfils the requirements indicated in the position profile (specified tasks and skills).

The application will include:

- a description of the doctoral project (2 to 5 pages maximum) indicating the theoretical basis of the research, the tests to be carried out on empirical materials, the methodology to be used, a feasibility report and project schedule;
- curriculum vitae;

<sup>1</sup> depending on the host establishment.



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- transcript of higher education record for first year of masters studies (*Master 1*) and the first semester of research masters (*Master 2*);
- a letter of recommendation from the supervisor of the research master's thesis;
- a letter confirming the forthcoming defence of the candidate's master's thesis (prior to **31 August 2016**).

It is recommended (but not mandatory) for the candidate to establish contact with the potential thesis supervisor in advance.

- **The deadline for the submission of applications is 4 May 2016 (inclusive).**

*For your information: When the deadline for applications has passed, the LabEx DynamiTe will contact the potential director(s) of the potential host unit(s) and will add one letter of invitation to the application.*

- The candidate(s) appointed following the evaluation of the applications and interviews (which will take place during the week of 13 June 2016) will be informed of the results of the application process from 20 June 2016.