

**Year of CfP: 2008 0802 - 021**

**Project title:** Impact of changing environmental and anthropogenic constraints on the diversity of asexually propagated crops: towards an international research proposal on yam agrobiodiversity

**Unit managing the project:** DIAPC (Diversity and Adaptation of Cultivated Crops) (CIRAD, IRD, INRA, Montpellier SupAgro, UMII)

**Project leader:** Jean-Louis Pham (pham(a)ird.fr)

**Countries involved in the project:** The Netherlands, UK, Guinea, Côte d'Ivoire, Ghana, Benin Togo, Nigeria, Cameroon, International

**Subthematic axes:** IPB-1 (Integrative Plant Biology 1: *Genetics and genomics, plant breeding, ecophysiology*), IPB-2 (Integrative Plant Biology 2: *Plant pests and diseases, integrated crop protection, population ecology*), STDI-1 (Socio-Technical Dynamics of Innovation 1: *Agri-environmental innovations, agri-ecosystems, resources management*),

### **Objectives:**

While yam is a very important crop for food security in Africa (which accounts for 90% of the total world production), the research dedicated to its improvement and its diversity conservation is poorly organized. The germplasm collections in Africa are generally understudied. No international network has actually been set up to address African crops and research has been conducted at limited geographical scales. The agronomic importance of the crop justifies the development of international initiatives which foster partnership among stakeholders at a large geographical scale.

The aim of this project is to prepare a research proposal on the impact of anthropogenic and natural environmental changes on the agrobiodiversity of vegetatively propagated crops. This project will then be submitted to an international call (European Union (EU), Biodiversa, Agence National de la Recherche ANR).

Crops need to adapt through natural or human-driven evolutionary processes to new environmental conditions, e.g. global warming, emerging pests or new agronomic objectives. The diversity of crops and their wild relatives is threatened by changes in the management of agroecosystems or the fragmentation of natural habitats which affects the interplay within the wild-cultivated complexes. *In situ* adaptation will have to happen with less genetic diversity, i.e. less material for adaptive changes. How can such adaptation happen for vegetatively-propagated crops, which do not benefit from the "innovation power" of genetic recombination? In simple terms, the diversity of vegetatively-propagated crops will inevitably be eroded because of genetic drift and farmers' decisions to discard varieties and only mutations will enhance genetic diversity. The reality is more complex, however. For a few root and tuber crops, studies demonstrated that sexual reproduction still plays a role in the dynamics of their diversity.

This study will look at how these complex processes interact, in order to develop scenarios on the evolution of agrobiodiversity of yam --a tuber crop of major importance for food security in tropical countries--in changing agroecosystems in Africa, and to help manage its conservation and use at a large geographical scale.

The project will bring together identified partners and resource persons to discuss the following:

- Main drivers of change in yam agrobiodiversity
- State of the art in spatial/landscape genetics, including the availability of asexually-propagated crops
- Phylogeny of yam relevant for genetic conservation objectives
- Evaluating the adaptive potential of yam
- Tools to integrate genetic, socioeconomic and environmental data
- Connecting these tools (databases, GIS) to modelling approaches

**Total Agropolis Fondation funding:** € 21,029 (travel expenses)

**Funding categorie(s):** Agropolis Fondation small grants (support to prepare applications for national and international calls for proposals)

**Project duration:** 15 November 2008 – 15 July 2009

**Keywords:** Yam – agrobiodiversity – crops