



Two 2-year postdoctoral positions at IRD (Research Institute for Sustainable Development) and Météo-France on the impact of climate change on agricultural systems in New Caledonia, Vanuatu, French Polynesia and Wallis and Futuna.

The CLIPSSA 2021-2026 project.

CLIPSSA (Climat du Pacifique, Savoirs Locaux et Stratégies d'Adaptation/Pacific Climate, Local Knowledge and Adaptation Strategies) is a joint project developed by IRD (Institut de Recherche pour le Développement, <https://en.ird.fr/>), Météo-France (the French Meteorological Service, <https://meteofrance.fr/>) and AFD (Agence Française de Développement: <https://www.afd.fr/en>). It aims to accompany Vanuatu, New Caledonia, Wallis-and-Futuna and French Polynesia in drafting adaptation plans against climate change threats. CLIPSSA website: <https://clipssa.org/en>

Context

The South Pacific is made of a myriad of islands. Pacific island countries and territories (PICTs) are highly vulnerable to the effects of climate variability and longer-term changes. Even more than developed countries, these islands are highly vulnerable to the amount of precipitation that will dictate their water resources and they are deeply affected by a number of meteorological events ranging from extreme events (e.g. cyclones, heat waves, heavy rains etc.) to the impacts of large-scale phenomena such as ENSO (El Niño Southern Oscillation). All of these can cause major social, economic and ecological damage on land and in lagoons and on their ecosystems as many of the island countries' resources depend on their coral ecosystems.

At present, IPCC models do not possess the spatial resolution that can resolve the appropriate scales needed in the case of the many Pacific Islands countries, which are mountainous such as New Caledonia, the Vanuatu, French Polynesia and Wallis and Futuna archipelagoes. At present, we lack the critical information to understand the future climates of such islands in general and their impacts on sectorial activities. That, in turn, prevents public bodies from including the climate change risks in their long-term environmental policies, particularly in the many adaptation plans currently developed in these countries to face climate change. Among the top priorities identified by key actors during the CLIPSSA consultation workshop, the fate of key agricultural species, industrial or traditionally grown, on which the island countries build their food resources is a significant concern given the future climate and environmental changes.

These islands have always been confronted with regular environmental disturbances caused by sometimes violent meteorological events. To cope with climatic hazards, the inhabitants and public bodies have developed certain practices in the fields or

gardens to limit damage to crops (mulching, spacing crops, planting trees, etc.) or to limit the risk of damage and crop losses (diversification of species and varieties grown, spatial dispersion of growing sites, etc.). They have also adopted strategies to diversify food production activities (hunting, fishing) or access other resources to cope with major crop losses. The knowledge, know-how and interpersonal skills developed through their repeated interactions with the environment and acquired during the transmission and sharing processes are adjusted or created to adapt to the environmental constraints.

The aim of the proposed work is hence to understand how specific and key agricultural systems in these countries may evolve in the future taking into account island-scale future climate variables as well as the local practices and water use constraints.

Climate and local knowledge work in CLIPSSA

A climate scientists team have been gathered to look at future climates on these islands: 20-km atmospheric simulations using the Météo-France regional model ALADIN are underway to build estimates of the South Pacific regional future climates for the next 100 years. The dynamics of long-term and shorter-term variability such as El-Niño/Southern Oscillation to synoptic scales such as cyclones, droughts or enhanced precipitation, are explored in the present and future climates. Second, using the Météo-France AROME model work is also underway to dynamically downscale the previous 20-km simulations of the South Pacific down to ~2km resolution on the targeted regions of Vanuatu/New Caledonia, Wallis-Futuna and French Polynesia in order to understand how climate change can impact the atmospheric envelope of the islands, given the major orographic effects. That team interacts with a social science scientists team that identifies how local knowledge is shaping and adapting the agricultural systems to climate variabilities.

Proposed work on climate-agriculture-water nexus:

We open two 2-year postdoctoral positions to explore how the climate, environmental and social constraints will impact the fate of specific agricultural systems in a few key regions of New Caledonia, Vanuatu, Wallis and Futuna and French Polynesia. In concertation with country technical services, one postdoc will concentrate on key regions of New Caledonia and Vanuatu and the second postdoc will concentrate on key regions of Wallis and Futuna and French Polynesia. Each region has a diversified agricultural system (traditional – e.g, Yam, Taro and/or larger-scale agricultures such as pineapple, arboriculture etc.) and has been identified as key areas by consultation workshops with local public authorities. The two postdocs will work hand in hand to build models linking climate forcing in the present and the future to the identified agricultural species, taking into account other forces (e.g water resources, social constraints). The aim of the work is to understand the fate of such systems in the future via future maps of species distributions and recommendations for sustainable agricultural development to the public authorities and communities.

This in turn will participate to the National Plans (PNAs) for adaptation in face of climate change that the countries are currently trying to elaborate. The candidates will hence work in close collaborations with local authorities and agricultural services and institute, climate and social scientists.

Candidate requirements and applications

We are seeking young scientists with less than 3-year experience after PhD. The candidate should have good spoken and written English and French knowledge. The candidate should have a PhD in climate impacts, with a solid preference for previous experience in climate-water-agriculture modelling at regional scales and in the tropics. Candidates are expected to send a detailed CV and a motivation letter emphasizing the work aspects that he/she would like to develop within the framework described above.

Applications must be sent before **October 31th 2023** to:

fleur.vallet@ird.fr, Christophe.menkes@ird.fr, alexandre.peltier@meteo.fr,
agathe.drouin@meteo.fr, lola.corre@meteo.fr , sophie.martinoni@meteo.fr,
victoire.laurent@meteo.fr, catherine.sabinot@ird.fr

The position will ideally start in February 2024 in Nouméa, New Caledonia.

Working conditions and financial conditions

The candidates will be hired with a local contract by the IRD Centre of Nouméa in New Caledonia. They will regularly spend time with the partners in the targeted geographies in New Caledonia and Vanuatu for one postdoc and French Polynesia and Wallis-Futuna for the second postdoc. Depending on previous experience, salaries will range between 3600 and 3800€/month before tax deduction, depending on the candidate's experience. Travels between partners and countries are provided as well as participations to key national and international conferences.