Sustainable Community-based Health Management in a Wild Meat Livelihood System of Central Africa

Context: In the socio-ecosystem of the Congo basin region, wildlife is a major source of edible proteins for the rural and urban human populations and wild meat production is paramount to the socioeconomic and nutritional wellbeing of disadvantaged communities living within or close to forested areas. However, the sustainability of wild meat production is threatened by rising levels of animal harvests due to human demographic growth and a rising demand for animal products. In addition, actors of wild meat value chains are at high risk of exposure to zoonotic diseases. 72% of emerging zoonotic diseases are considered to have originated from wildlife since the middle of the 20th century[1]. This exposure to infectious diseases is exemplified by several Ebola virus epidemics that were originally caused by the manipulation of carcasses of apes and duikers[2]. The effective control of epidemics of animal origin will heavily depend on the capacity of the state and communities to implement reliable disease surveillance and rapid response instruments as well as safe practices of wildlife hunting, manipulation and consumption[3]. However, health interventions that limit or change the interactions of humans with animals can have a substantial impact on people's subsistence and well-being in wild meat livelihood systems[4,5], justifying a community-based participatory approach to address this question. The proposed PhD takes place in a wild meat livelihood system of Gabon where a community-based zoonotic disease surveillance system and a participatory action plan for preserving the wildlife population are already being carried out.

Objectives: The objective of this PhD is to evaluate the socioeconomic viability and sustainability of diseases prevention and surveillance schemes that limit the exposure of populations to zoonotic diseases in the context of a wild meat livelihood system of Gabon, located in Central Africa. The candidate will evaluate the process of engagement of actors of the identified livelihood system in the adoption of production and consumption practices and surveillance and early response mechanisms that contribute to the health of the socio-ecosystem by reducing the risk of disease emergence.

Methodology: The candidate will use tools of economics and participatory action-research[6] and to develop suitable data collection and learning tools with three objectives:

(1) Evaluate the level of adoption of safe production practices and the participation of communities to a participatory zoonotic disease surveillance system, identifying the obstacles to their effective engagement and solutions to improve it.
(2) Engage communities in a process of identifying surveillance and management strategies of zoonotic diseases and safe practices of wild meat production that are effective and acceptable for all actors of the wild meat livelihood system. The candidate will assess the benefit of experimental games as a scientific tool for analysing the decision of actors and as a social learning tool for engaging communities.
(3) Build and establish an economic model to assess and compare the cost-effectiveness of alternative zoonotic disease surveillance systems but also their impact on the livelihood of hunter communities and the preservation of wildlife.

Thesis committee disciplines: Socioeconomics; community engagement, experimental economics, econometrics, epidemiology, one health sciences

References

1. Jones, K. E. et al. Global trends in emerging infectious diseases. Nature 451, 990-993, doi:10.1038/nature06536 (2008).
2. Leroy, E. M. et al. Multiple Ebola virus transmission events and rapid decline of central African wildlife. Science 303, 387-390, doi:10.1126/science.1092528 (2004).
3. Watsa, M. & Wildlife Disease Surveillance Focus, G. Rigorous wildlife disease surveillance. Science 369, 145-147, doi:10.1126/science.abc0017 (2020).
4. Saylors, K. E. et al. Market characteristics and zoonotic disease risk perception in Cameroon bushmeat markets. Social science & medicine 268, 113358, doi:10.1016/j.socscimed.2020.113358 (2021).
5. Guenin, M.J., De Nys, H.M., Peyre, M., Loire, E., Thongyuan, S., Diallo, A., Zogbelemou, L., Goutard, F.L., 2022. A participatory epidemiological and One Health approach to explore the community's capacity to detect emerging zoonoses and surveillance network opportunities in the forest region of Guinea. PLoS Negl Trop Dis 16, e0010462.
6. Pouliquen, A., Mapeyi, G.A.B., Vanthomme, H., Olive, M.M., Maganga, G.D., Cornelis, D., Lebel, S., Peyre, M., Delabouglise, A., 2024. An experimental game to assess hunter's participation in zoonotic diseases surveillance. BMC Public Health 24, 342.
7. Cornélis, D., Vigneron, P. & Vanthomme, H. Vers une gestion durable de la chasse villageoise. Diagnostic approfondi du département de Mulundu et recommandations stratégiques. SWM Programme. (FAO, CIRAD, CIFOR et WCS, Rome, 2022).

Candidate profile:

- Training: Master degree or equivalent in one of the following fields: agriculture, health or environmental economics, applied mathematics or statistics, veterinary public health, epidemiology
- Aptitude to conduct research in rural areas and engage with rural communities
- Proficiency in data processing, statistical analysis or modelling with R, stata, or python
- Willingness to live abroad aver long periods abroad in a tropical environment
- Ability to work in an interdisciplinary environment
- Languages: very good command of spoken and written French, good command of spoken and written English
- Level B driver license is an advantage for conducting field work

Work conditions:

The PhD candidate will integrate the ASTRE research unit of CIRAD, and will benefit from a unique interdisciplinary environment, with a diversity or profiles of researchers (Virology, ecology, epidemiology, anthropology and economics) working together to improve emerging and endemic infectious disease management at the interface between animals and humans.

The PhD candidate will be located in Franceville, Gabon, for a duration of one to two years, in order to complete the field work. The candidate will occupy the CIRAD office of the Centre Interdisciplinaire de Recherche Médicale de Franceville (CIRMF) and will interact with researchers from CIRMF and CIRAD collaborating either in the health surveillance activities or in the sustainable wildlife management program (SWM) conducted in the same study site with hunter communities. The second part of the PhD will be in Montpellier, at CIRAD, campus international de Baillarguet.

The candidate will have the opportunity to attend several trainings in relevant disciplines all along his PhD, will publish scientific articles in peer-reviewed journals and will present his work in at least one international scientific conference.

Application process: we will receive applications until the 16th of June, 2024. Please send the following documents: curriculum vitae, copies of BSc and MSc educational records, master thesis report, a motivation letter including names and contact details of two references. Please send your application file to Alexis Delabouglise: alexis.delabouglise@cirad.fr. Short-listed candidates will be invited for an interview.