Strategies to Prevent (STOP) Spillover

Arsène MOSSOUN Mossoun
amossoun@afrohun.org

Mapping of areas at high risk of zoonotic pathogen transmission and disease monitoring at the human-wildlife interface in the District des Montagnes, in Côte d'Ivoire

Mossoun Arsène MOSSOUN[1], Ellélé Marius Aimé YAPI[1], Hyppolite N'da DIBI[2], Euloge Bolaty KOUASSI[2], Tizié Thierry ZAN-BI[1], Arlette Dindé OLABY[1], Landry Gossé GOKOU[1], Danièle Olga KONAN[1], Tristan BURGESS[3], Bruno GHERSI[4], Hellen Janetrix AMUGUNI[4], Diafuka SAILA-NGITA[4]
1: AFROHUN, 2: CURAT, 3: Center for Wildlife Studies, 4: Cummings School of Veterinary Medicine, Tufts University

Introduction/Background

- in Côte d'Ivoire, STOP Spillover approach to surveillance is multisectoral, risk-based and Human-Animal-Environment interface focused. Interfaces are areas with known intense interactions between humans, animals and the environment and characterized by a potential spillover of zoonotic pathogens.
- Zoonoses are diseases that can be transmitted between animals and humans, such as Ebola, Marburg, Lassa, avian influenza, COVID-19 and even Mpox.
- The District des Montagnes is a region known for its high bushmeat consumption and also borders Liberia and Guinea, countries where Lassa fever is endemic and which have recently declared Ebola virus disease outbreak.
- Very few studies exist on the bushmeat value chain and the interactions that take place at the interfaces.
- To establish effective surveillance at key interfaces, we decided to document and study the dynamics of ecosystem components at the Human-wildlife value-chain by providing a GIS tool for mapping Human-Wildlife interaction interfaces
- The area of the study was the District des Montagnes

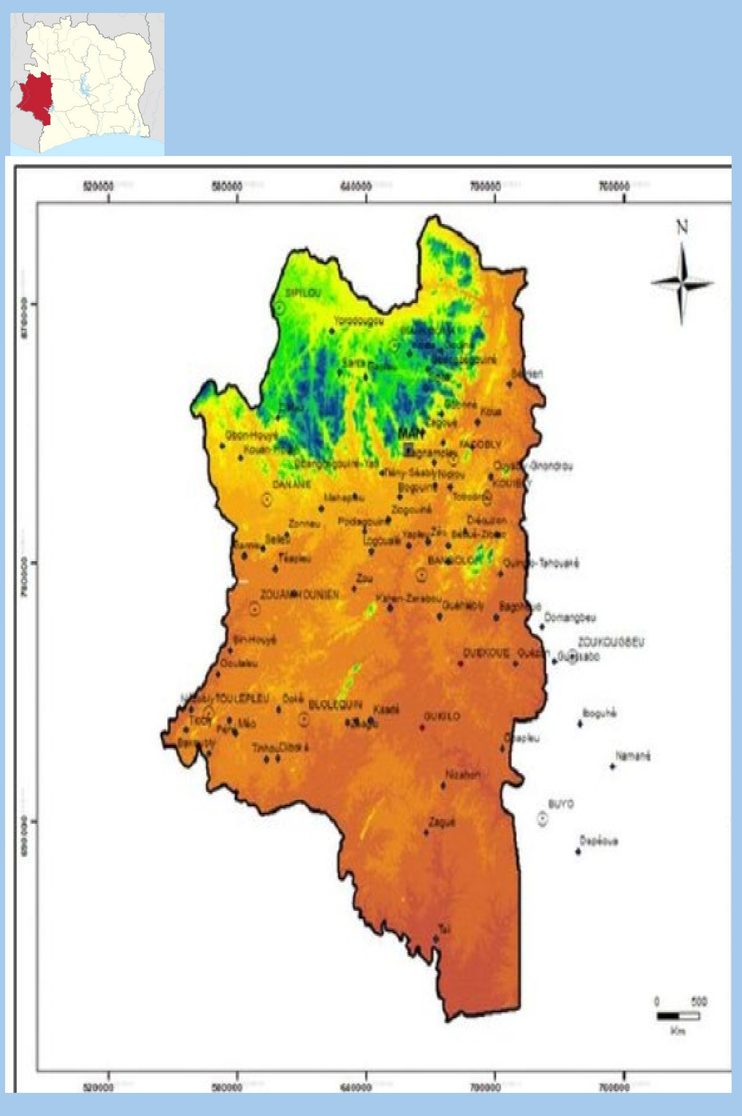

Figure 1: Map of the District des Montagnes (in red)

Methods

Data collection

- We collected data from government entities in the human and animal health, the environment, national parks, and central government agencies through a questionnaire.
- Data collected included the physical environment, wildlife parks, forests, and human presence.

GIS Tools Using

- ArcGIS software was used for mapping to develop maps documenting the dynamics of various components of the Human-Wildlife interface.
- First, determined and prioritized five index that assessed the intensity of human-wildlife interactions.
- The five variables were merged to create a multi-criteria spatial index representing intensity of potential human-wildlife interaction. The index was used to produce a synthesis map of human-wildlife interaction zones.

Summary of human-wildlife interaction indexes				
1/ Sale and consumption of wildlife	2 / Road length within a 5km radius of classified forests, parks, and reserves	3/ number of localities within a 5km radius of classified forests, parks, and reserves	4 / Level of infiltration of Classified forests, parks, and reserves	5 / Sub-prefectural population density within a 5km radius of classified forests, parks, and reserves
Code 1: Low 2: Medium 3: High	**Code** 10: Low 20: Medium 30: High	**Code** 100: Low 200: Medium 300: High	**Code** 1000: Low 2000: Medium 3000: High	**Code** 10000: Low 20000: Medium 30000: High

Addition of layers

STEP 1

Human-wildlife interface index table		
Low Code: 11111	Medium Code: 11112	High Code: 11113, 11131, 11132, 13113, 21123, 21211, 21213, 21213, 21232, 21322 21323, 21332, 21333, 22331, 22332, 23111, 23112, 23113, 23132, 23213, 31111, 31113, 31132, 31222, 31223, 31223, 31331, 31332, 32113, 33222
Reclassification code 1: Low 2: Medium 3: High		STEP 2

Figure 2: Process of merging the five Human-Wildlife interaction index

Results

- Man and Danané show the highest interaction between humans and wildlife,
- The center of the District des Montagnes including the departments of Bangolo, Zouan-Hounien, Blolequin and Toulepleu, has the lowest level of human-wildlife interaction.
- The northern and southern of the District des Montagnes have medium levels of interactions.

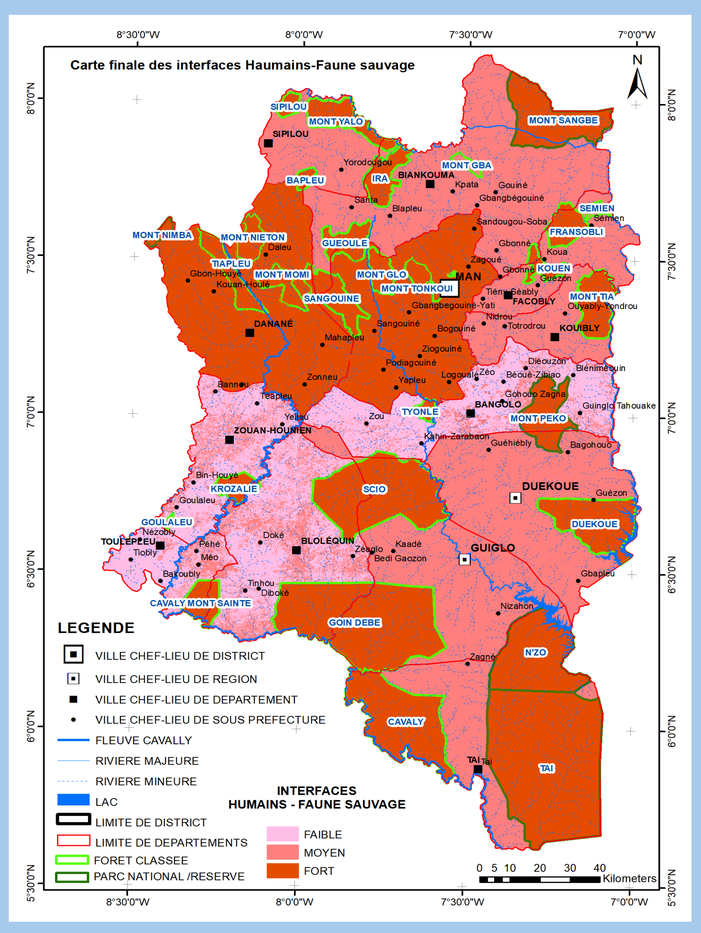

Figure 3: Synthesis map of human-Wildlife interactions

Conclusions

The maps have provided indications on areas where specific interventions to mitigate potential spillover are located. These are also areas where communication interventions should also focus. Anthropogenic activities putting pressure on wildlife habitats enabled by .roads and human settlements are factors to address and take into consideration to mitigate spillover.

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For inquiries:
diafuka.saila_ngita@tufts.edu
+243-81-230-4310