**N°P3-L8**

Integrated territorial analysis of the risk of dissemination of the 2021 epizootic outbreak of highly pathogenic avian influenza in Grand-Bassam.

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HIGHLIGHTS: (i) Low (**10%**) social network density ; its centrality corresponded to **departmental** and **national** veterinary services, with **high** (**60%**) transdisciplinary ; **(ii) HPAI mortality** was linked to environmental (**ARA**, **PM**) and breeding-related factors (**Tradit. Mode**, **Guinea fowl**) ; **(iii) Risk criticality** was **very high** (**64%**).
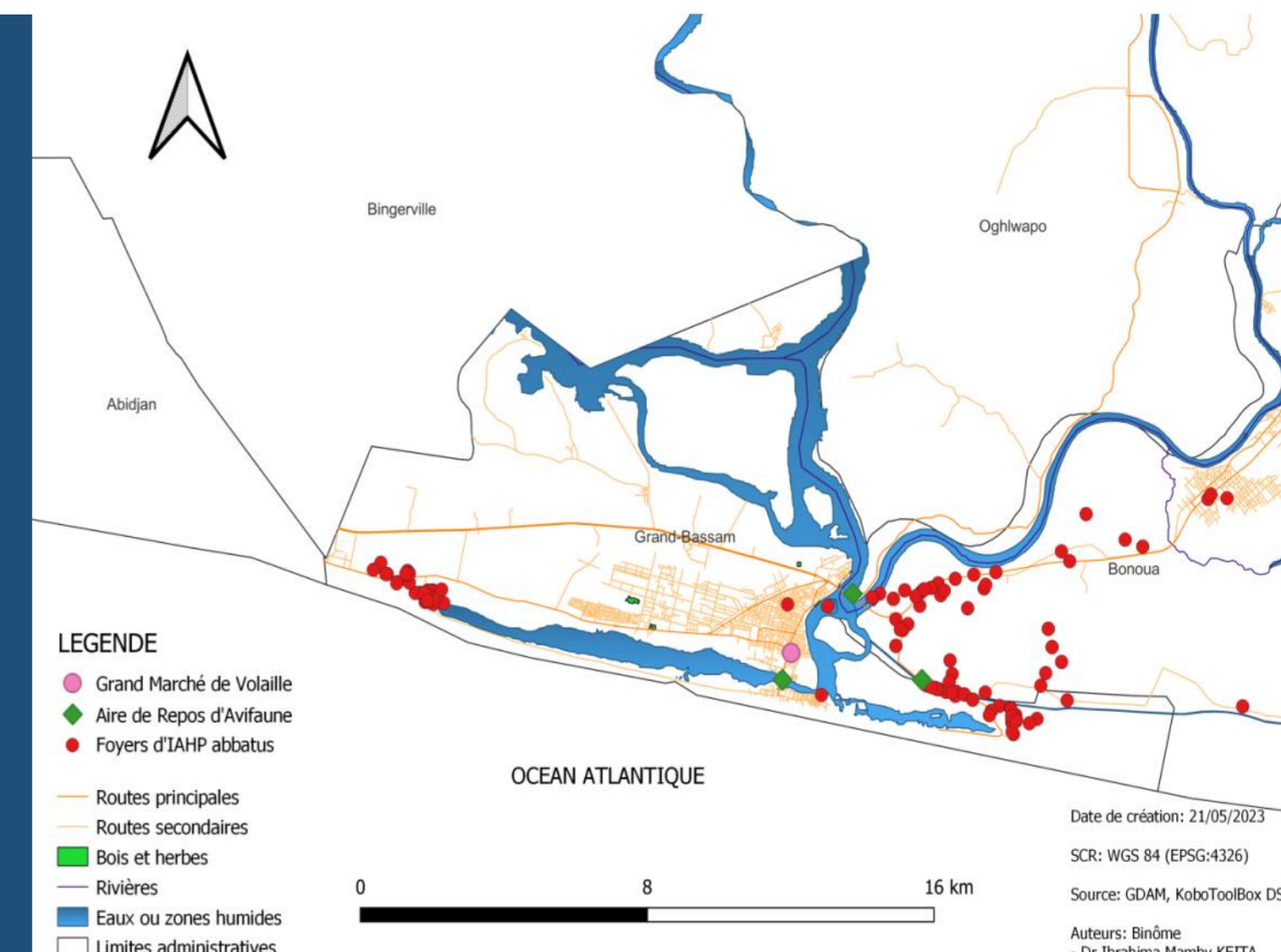
1- BACKGROUND

Located in **south-east Ivory Coast** as shows in **Figure 1**, Grand-Bassam contributes to the Ivorian economy through the **poultry industry** and **tourism**. It hosts **avifauna resting areas (ARAs)**, which periodically receive migratory birds that are often **reservoirs** of highly pathogenic avian influenza (**HPAI**), and a **poultry market (PM)** where compliance with **biosecurity measures** is inadequate. Using a **One-Health approach**, a **territorial** analysis of the **risk** of the 2021 epizootic outbreak **spreading** to Grand-Bassam was carried in **2023**.
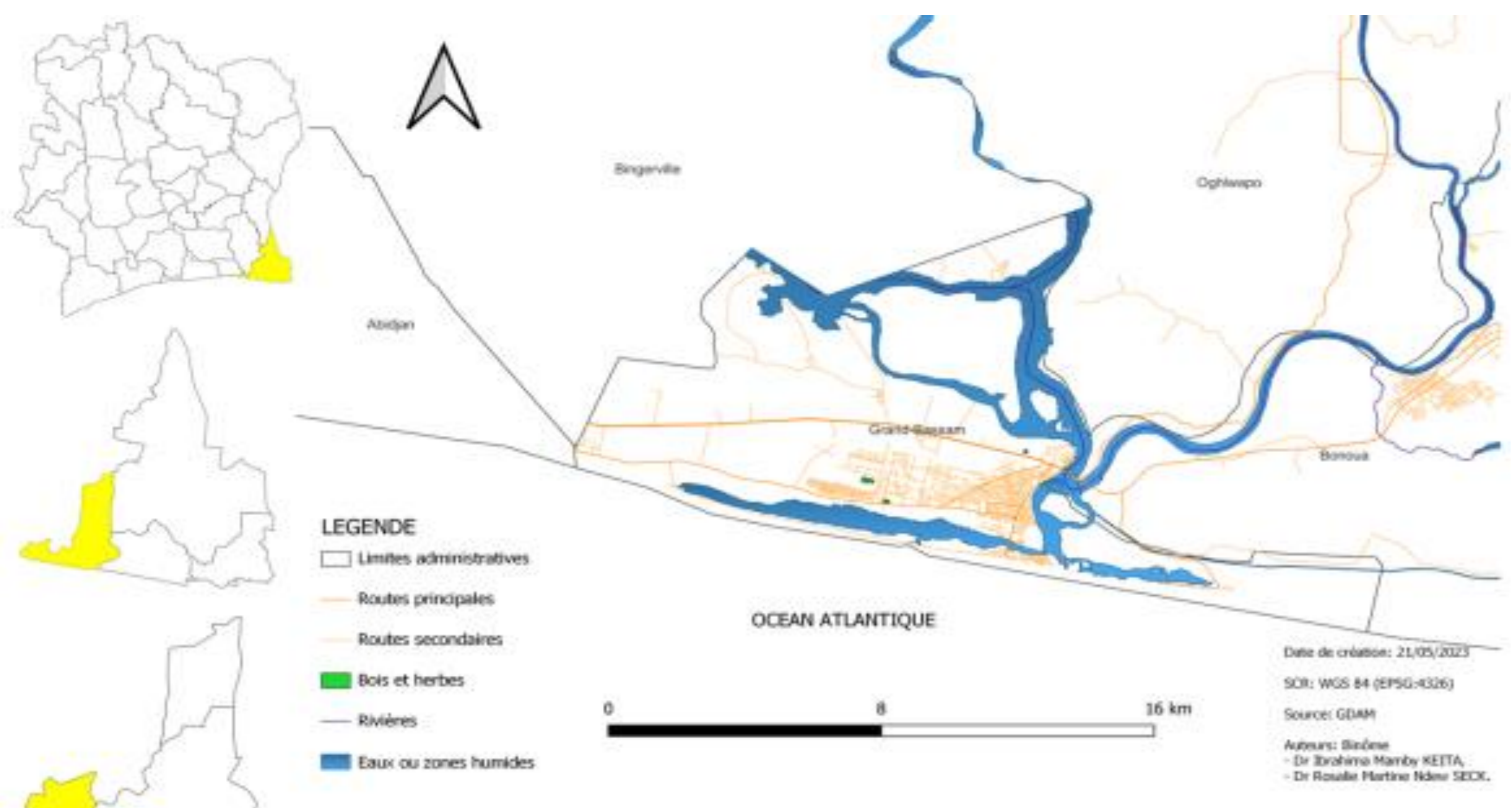

Fig 1: Senegalese NAPAMR M&E' intervention logical framework.

2- METHODS

❖ **Study Type:** Mixed, cross-sectional, retrospective and **analytical** survey

❖ **Study Period:** Concerning **2021 epizootic incident** at **Grand-Bassam**

❖ **Study Data management:** It consisted of:
  ➢ **Data collection and entry:** Document reviews and Data base exploitation (Quantitative), Individual interviews (Quantitative & Qualitative) by guides set-up on Microsoft Excel® and using **recorders**
  ➢ **Data analysis:** First, Actors **Mapping** and **Social Network Analysis** on Kumu.io ; Then Multiple binary **logistic regressions** with Excel® & STATA® Software ; **Risk Assessment** used above analysis outcomes
  ➢ **Results presentation:** Tables (Dynamic-Cross) and Graphics (**Maps**)

❖ **Ethical Considerations:** Biosafety, Anonymity & Regulatory Framework (*DSV-MIRAH*) Compliance: Central & Local Authorizations was obtained

4- CONCLUSION

Preventing the HPAI **risks of spreading** requires a focus on **central** social network **actors** as well as **environmental** & **breeding factors**.

3- RESULTS

Territorial governance identified **density (0.1)** & response social network **centrality**, namely **departmental (87%)** and **national (50%)** veterinary services directorates. **Prefecture** and **Farms** accounted for **18%** (centrality), while **Chiefdoms** accounted for **9.5%** (**Figure 2**).
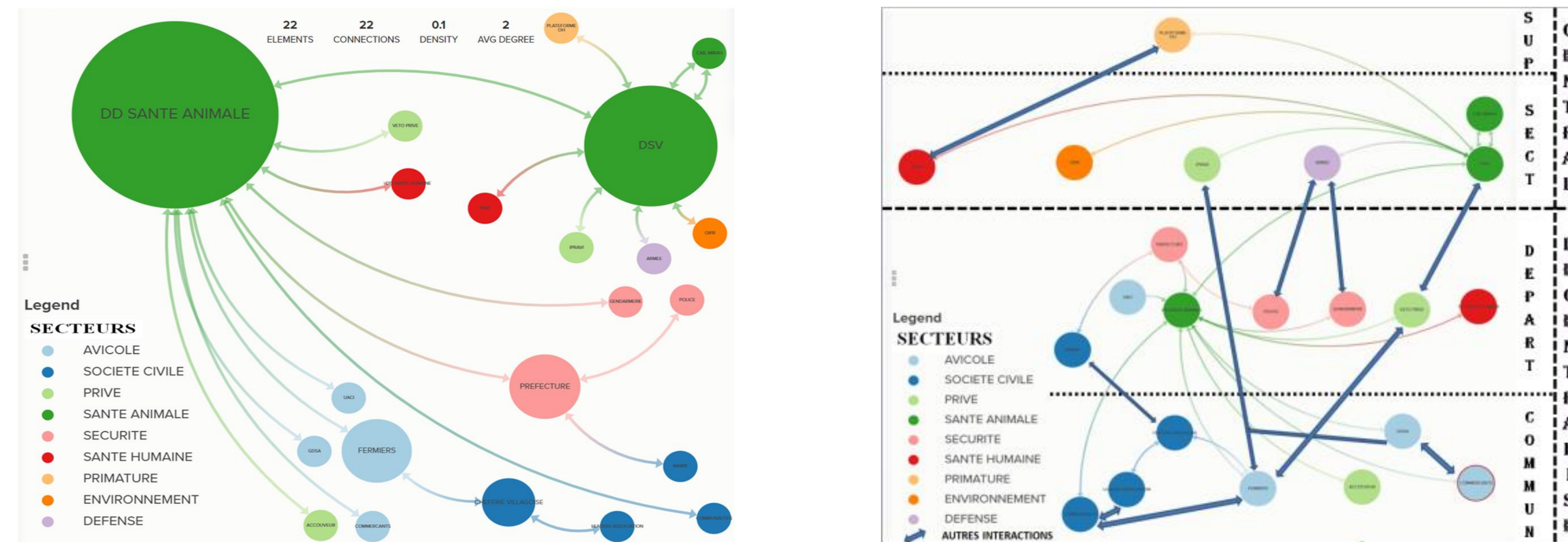

Fig 2: Key-stakeholders mapping by centrality (**Left-2A**) & Origin level in response system (**Right-2B**).

Multivariate analysis highlighted, in the **Table I** and **Figure 3**, links between **HPAI mortality notification** and: **(i) Environmental** risk factors as **ARAs$_{\geq 10km}$** p<0,027 & **PM$_{>15km}$** p<0,000 ; **(ii) Breeding** risk factors as **Traditional mode** p<0,007 & **Guinea fowl$_{\geq 85ind}$** p<0,000.

Tab I: Associated factors to HPAI death reporting.

Mortality linked to HPAI	OR [Confidence interval]	p Value
Distance from Poultry market		
[0-10]	REF.	
]10-14]	1.142 [0.332-3.932]	0.833
]14-Plus]	88.979 [12.022-658.574]	***0.000
Distance from Avifauna Rest Area		
[0-10]	REF.	
]10-Plus]	0.157 [0.03-0.808]	**0.027
Breeding mode		
Modern + Semi Modern	REF.	
Traditional	0.148 [0.037-0.586]	***0.007
Guinea fowl		
No Guinea fowl	REF.	
[1-84]	2.499 [0.324-19.245]	0.379
]84-Plus]	9.519 [2.761-32.816]	***0.000
Ducks		
[0-3]	REF.	
]3-Plus]	1.258 [0.355-4.458]	0.722
Geese		
[0-38]	0.234 [0.004-13.252]	0.481
]38-Plus]	REF.	
Constant	0.554 [0.184-1.673]	0.295

Obs.N°139 ; Global Signific.➔ Wald Chi² 40.734 & Prob>chi² 0.000 ; Calibrage➔ Hosmer & Lemeshow chi²(4)=6.20 & Prob>chi²=0.1848 ; Discr.Power ➔ RCO 0,7769 (Very good).
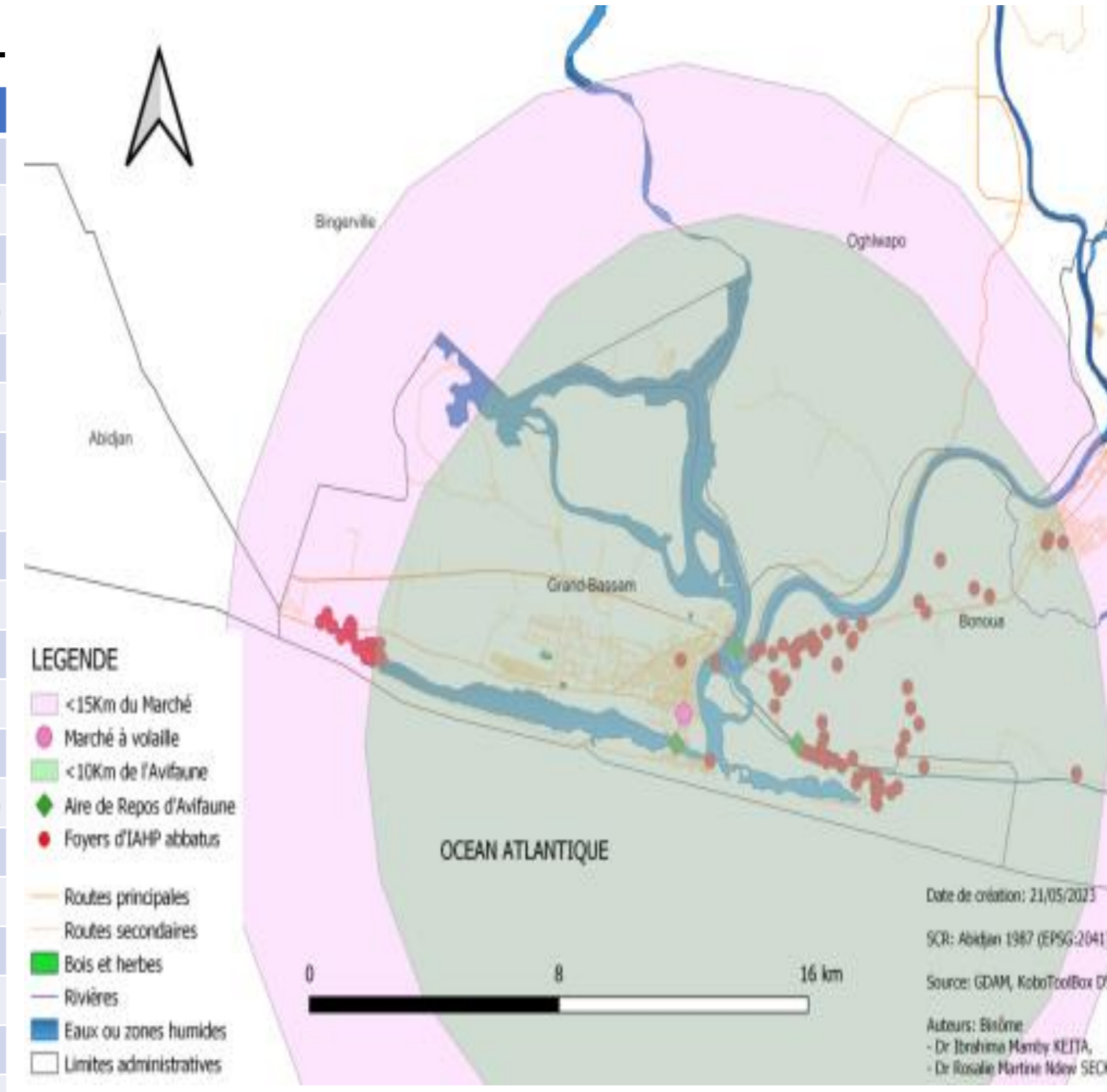

Fig 3: Epizootic clusters risk factors spatialization.

The **Risk assessement** of **HPAI spreading** in Grand-Bassam was very high with a **criticality** of **64%**

Indeed **probability** and **impact** was both quoted at **4 points**, thus the risk was quoted at **4x4=16** too

That's why **risk criticality** was **16/26=0,64** even **64%** as shown in the adjacent assessing **Table II**

Tab II: HPAI spreading' Risk assessement in G-B.

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