

Interim Report GYA North South Interdisciplinary Grant 2019/2020¹

29 November-29 December 2019

Ibrahim Sidi Zakari visited the Helmholtz Centre for Environmental Research(UFZ)², in Leipzig(Germany) where he collaborated with Robert Lepenies and Lisa Herzog. The team also collaborated with local researchers in the field of environmental politics, statistical modeling and urban sociology.

Main activities and outcomes :

- Inter and multidisciplinary meetings around the problem of air pollution, its impact on health, recruitment of volunteers for crowdsourcing activities as well as the optimal sample size
- Discussions around the issue of data collection, validation, processing of data from citizen science initiatives and their management (copyright, administration and usage)
- Data analysis (taking into account methods based on GIS and allowing spatio-temporal analyses; to this is added the statistics on psychological tests).
- Comparison of technologies (fixed and mobile stations, intelligent sensors)
- Use of multi-agent simulation as a means of comparison between empirical data and estimates provided by the models.
- Visit to the computer visualization and environmental simulation center
- Participation in two capacity building webinars on multi-agent modeling and reduced complexity models for air quality
- Development of air pollution maps
- Littérature search
- Use of Netlogo modeling and simulation software (sensitivity and robustness analysis)
- Discussions with the main managers of open source platforms for publishing air quality data (example of sensebox and RAMP), in particular aspects relating to the use of their API in the Nigerien context.
- We were also able to acquire 6 latest generation flow 2 type pollution sensors capable of measuring ultrafine particles such as PM₁. This will allow us to do tests locally for scaling up in the very short term.

04-06 February 2020

Participation to the IEEE International Conference on Natural and Engineering Sciences for Sahel's Sustainable Development Impact of Big data application on society and environment. Ouagadougou (Burkina Faso) <https://ewh.ieee.org/conf/ibase/2020/>

¹ <https://globalyoungacademy.net/activities/interdisciplinary-grant-2019-20-citizen-science-for-reducing-exposure-to-urban-air-pollution/>

² <https://www.ufz.de/>

A paper entitled «*Bridging data gap for understanding emerging issues in Niger: challenges and opportunities in the era of smart cities and smart villages*» will appear in the proceedings of the conference.

January-April 2020

-A paper entitled « *Harnessing the potential of real-time data analysis and statistical modeling for mapping exposure to air pollution* » is in press for the journal *Advances and Applications in Statistics*.

-Travel Grant for participation to AfriqAir capacity building workshop on air quality monitoring in Kigali (Rwanda). This workshop has been postponed due to COVID-19.

-Participation (with a talk) in a workshop on „Democracy and knowledge: between expertocracy and populism“ at the Bavarian Academy of Sciences in Munich, Germany (https://badw.de/fileadmin/events/2020/725/Demokratie_und_Wissen.pdf)

-Contact to the initiative <http://www.worldwidegeneration.co>, which aims at improving SDG reporting; exploring possibilities of collaborations with the GYA

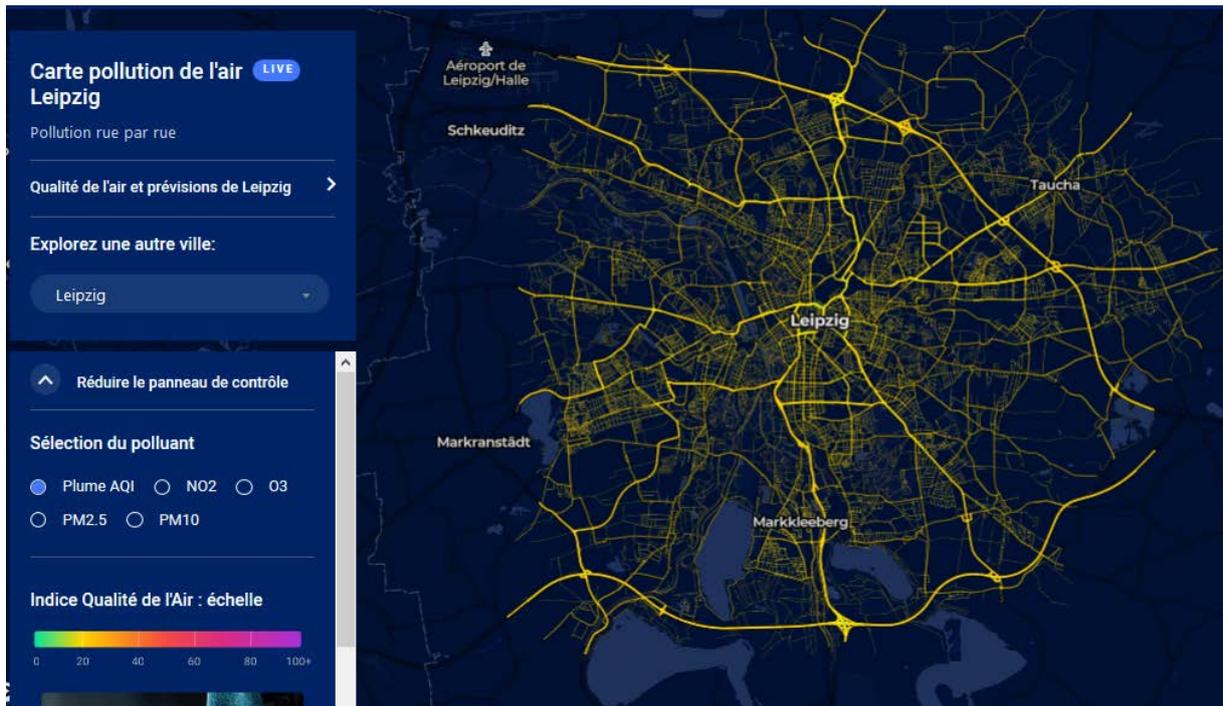
Future plans

-Plans for a paper on “The role of citizen science in deliberative democracies - a systemic perspective“

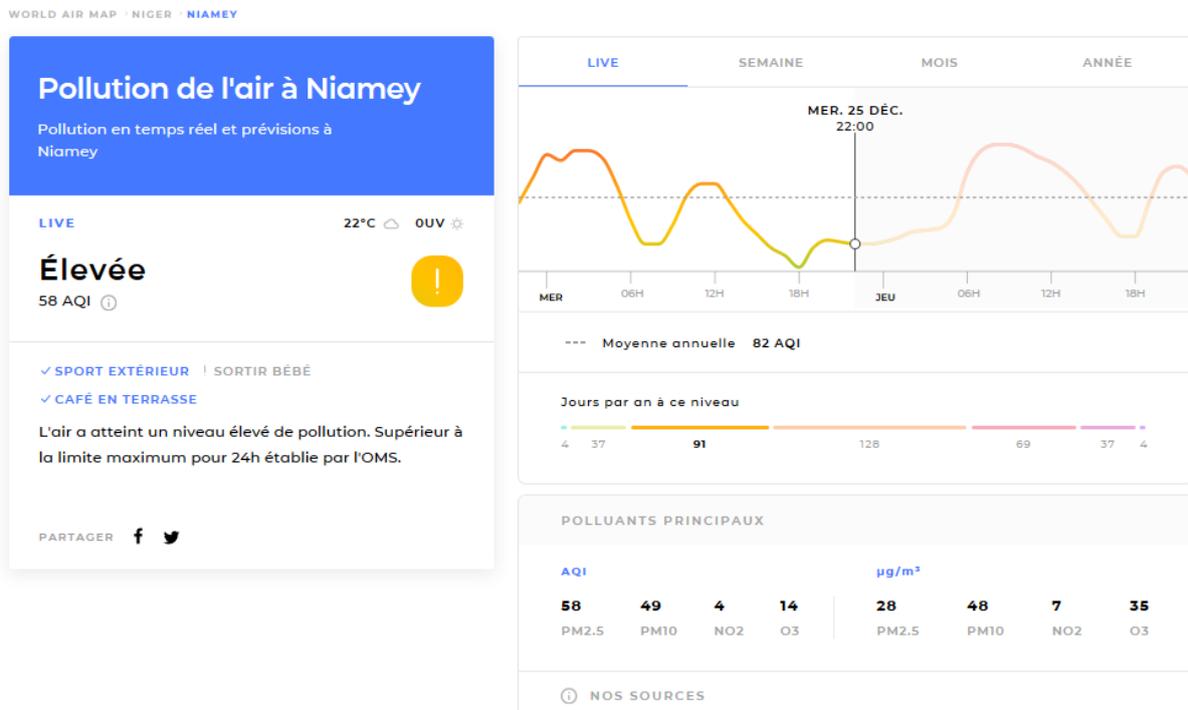
-Plans for a paper on “The role of citizen science in informing the SDGs - case study from Niger and Germany”

-Citizen engagement workshops in Germany and Niamey (Covid allowing).

-Investigating statistical modeling opportunities based on available air quality data.



Air pollution map (street by street) of Leipzig city



Air pollution in Niamey



