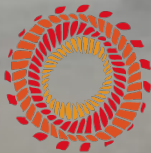


# Fact Sheet on Particulate Matter Pollution in Port Harcourt, Rivers State



**APC**  
ASSOCIATION FOR  
PROGRESSIVE  
COMMUNICATIONS



Media Awareness and Justice Initiative (MAJI)  
Website: [www.majinigeria.org](http://www.majinigeria.org)  
Email: [support@maji.org.ng](mailto:support@maji.org.ng)

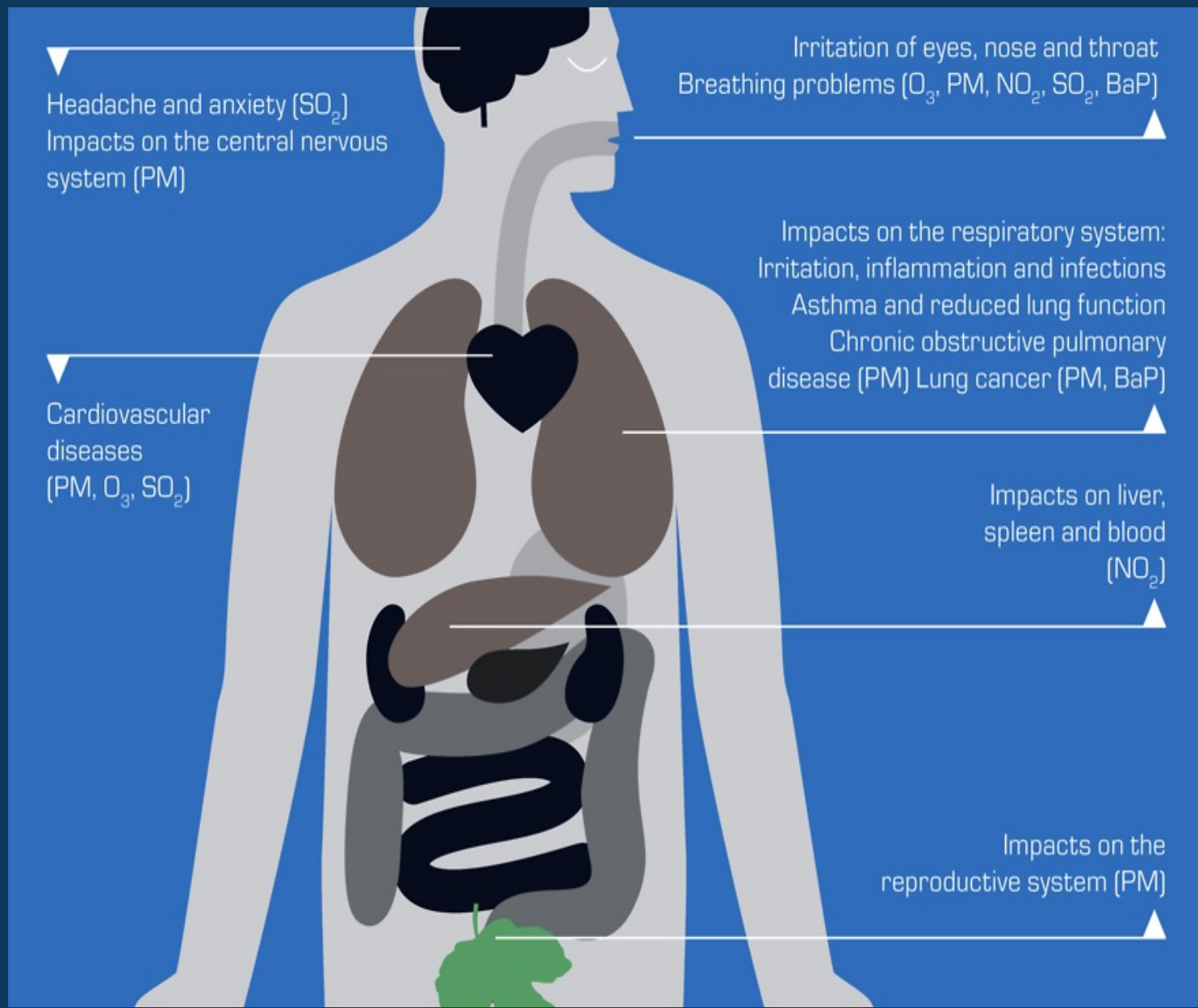
### Air Pollution in Rivers State?

Since 2016, Rural and urban communities in Rivers State have been plagued by particle (soot) pollution popularly called "Black Soot".

Contributory factors include gas flaring and venting, internal combustions from heavy duty equipment and artisanal refining<sup>1</sup>.

### Impacts

The human health and environmental consequences are diverse, thereby posing as a severe public health risks and environmental challenge affecting rural and urban communities of Rivers state<sup>2</sup>.



### What is Particulate Matter?

PM is the term given to a mixture of solid and liquid droplets in the air. There are three main levels of particulate matter namely

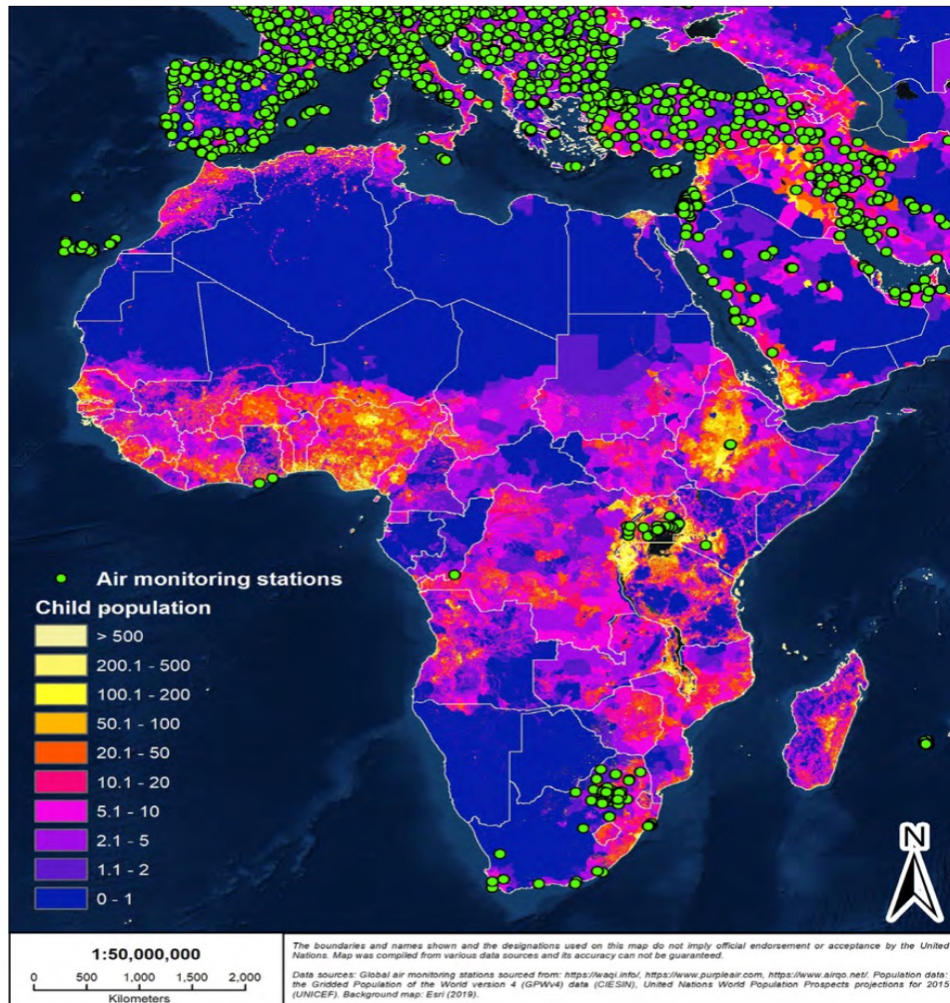
**PM<sub>10</sub>** – Inhalable particles with diameters 10 micrometers and smaller

**PM<sub>2.5</sub>** – Fine Inhalable particles with diameters 2.5 micrometers and smaller

**PM<sub>1.0</sub>** – Extremely fine Inhalable particles with diameters 1.0 micrometers and smaller<sup>3</sup>

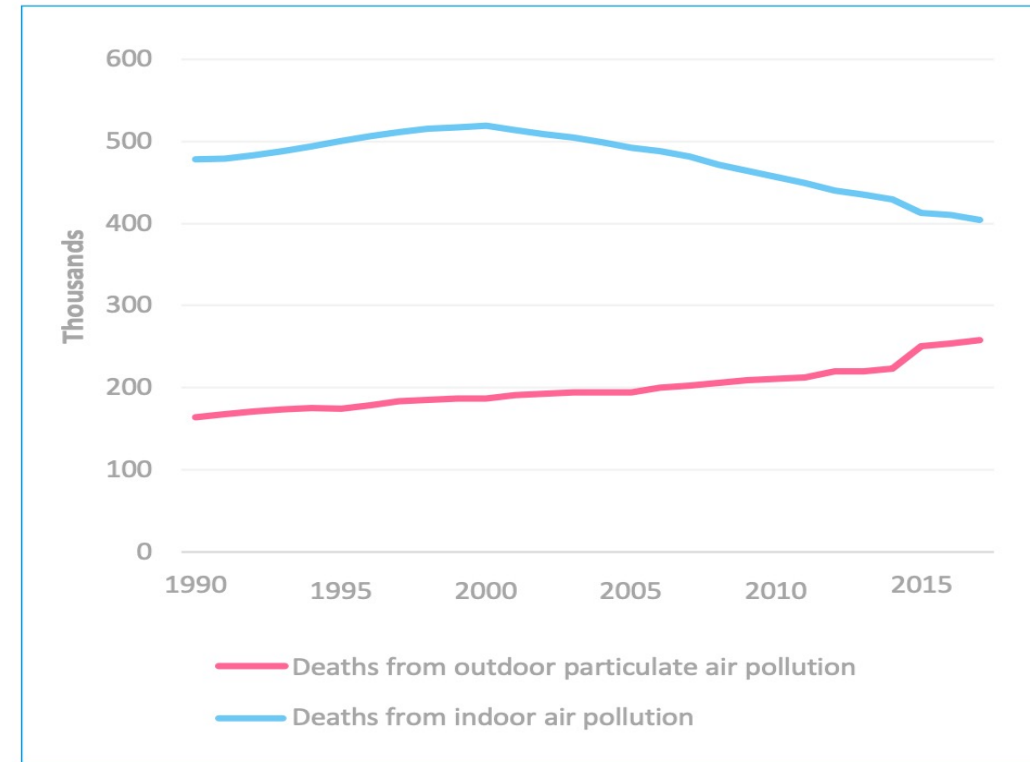
Particulate Matter Impacts on Human Health

**Figure 3: Air pollution monitoring in Africa**



**Figure 4: In Africa, deaths from indoor air pollution are declining whereas deaths from outdoor air pollution are increasing**

Absolute number of deaths attributed to ambient (outdoor) air pollution, and to household pollution from cooking and heating (1990-2017) <sup>4</sup>

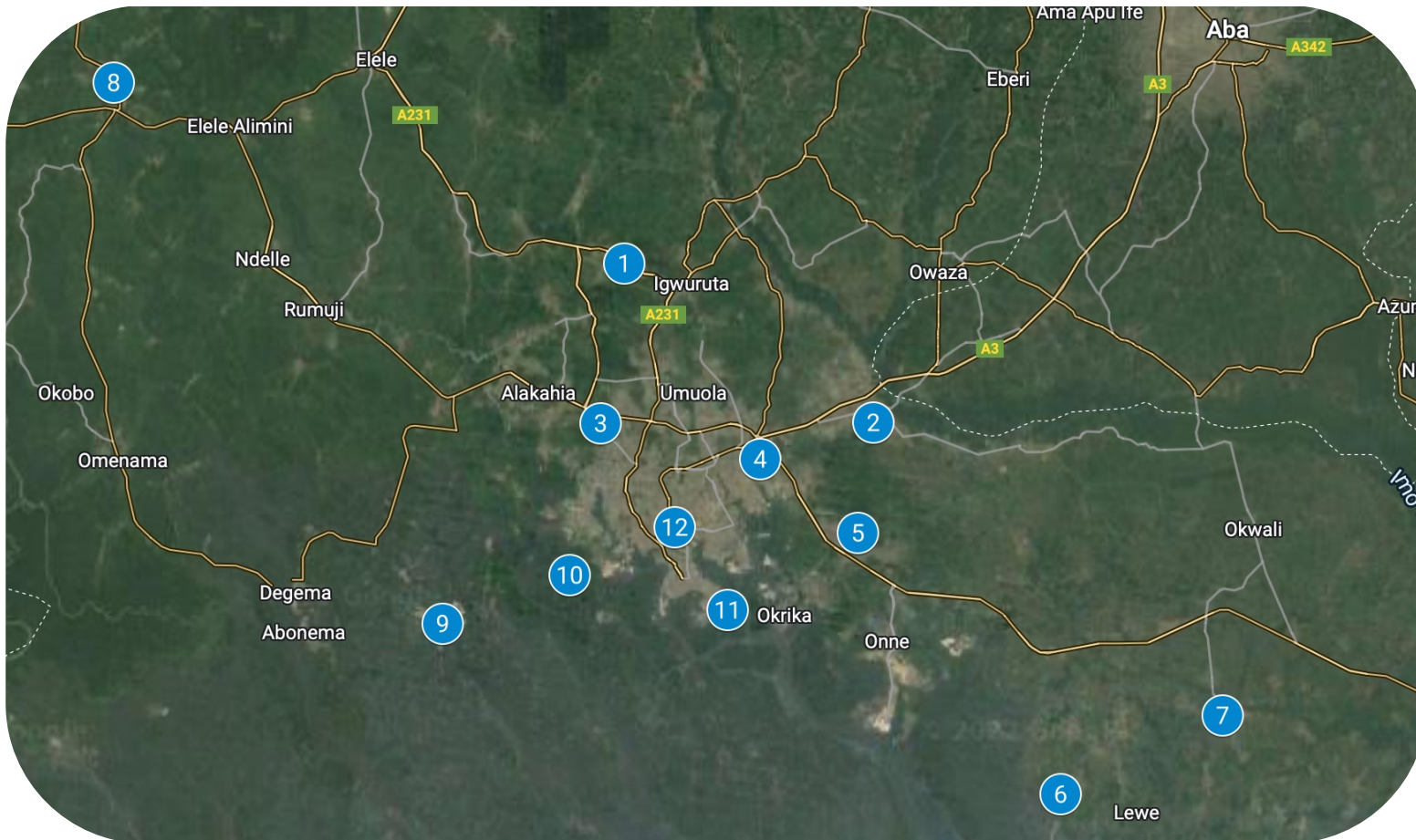


**Source:** Institute of Health Metrics and Evaluation (IHME), Global Burden of Disease (GBD), 2017

**Note:** 'Deaths from outdoor air pollution' is defined as the absolute number of deaths by region attributed to ambient (outdoor) air pollution of particulate matter (PM). 'Deaths from indoor air pollution' is defined as the annual number of premature deaths attributed to household air

## METHODOLOGY FOR COLLECTING THE DATA

With Support from Association for Progressive Communications (APC), French Embassy in Nigeria and the Open Culture Foundation (OCF), the Media Awareness and Justice Initiative (MAJI) deployed a fully decentralized air quality sensor network and data analysis portal to collect, document and analysis real-time air quality readings in 15 communities in Rivers state. The Map below shows the deployment spread which covers upland and riverine based communities



### Air Quality Sensors Installed



#### AIRNOTE Air Quality Sensors

The installed air quality devices were fitted with a [PMS7003](#) digital and universal particle concentration sensors which can be used to obtain the number of suspended particles in the air

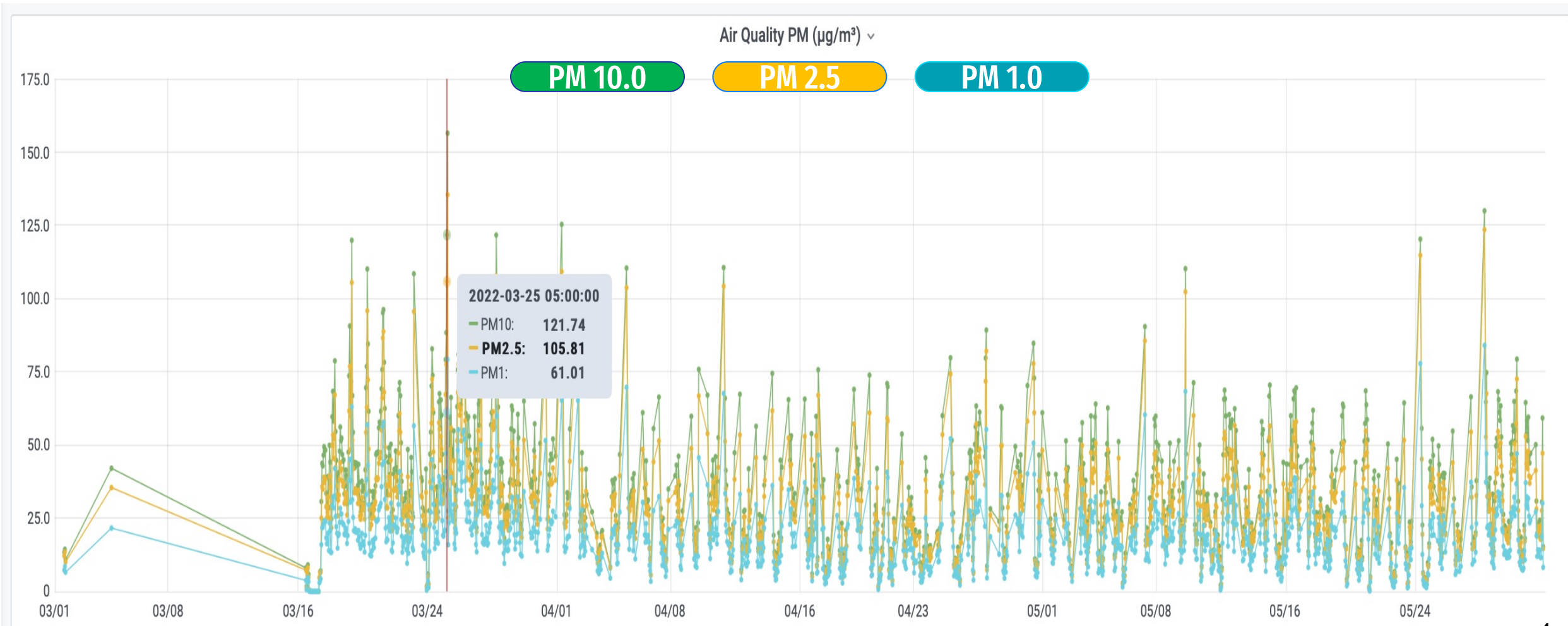


#### MAPS 6.0 Air Quality Sensors

This version of air quality sensors used Raspberry PI single board motherboards, fitted with Plantower PM 2.5 Sensors for the detection of suspended particles in air

## Fact sheet on Particulate Matter Pollution in Port Harcourt – Data Collection from March to May 2022

Within the period of March to May 2022, the Media Awareness and Justice Initiative collected PM pollution readings from the devices installed across 15 identified locations in Rivers state. Data collected over this period have been analyzed and shows high levels of PM10, PM2.5 and PM1.0 pollution in various flash point areas across the state. The data pattern shown below shows 3 month PM pollution reading collected from Igwuruta community in Rivers state. You can observe sharp spikes indicating daily rises in pollution levels across the data shown. Data culled from the DATACAB online air monitoring portal <sup>5</sup>



# Fact sheet on Particulate Matter Pollution in Port Harcourt – Data Collection from March to May 2022

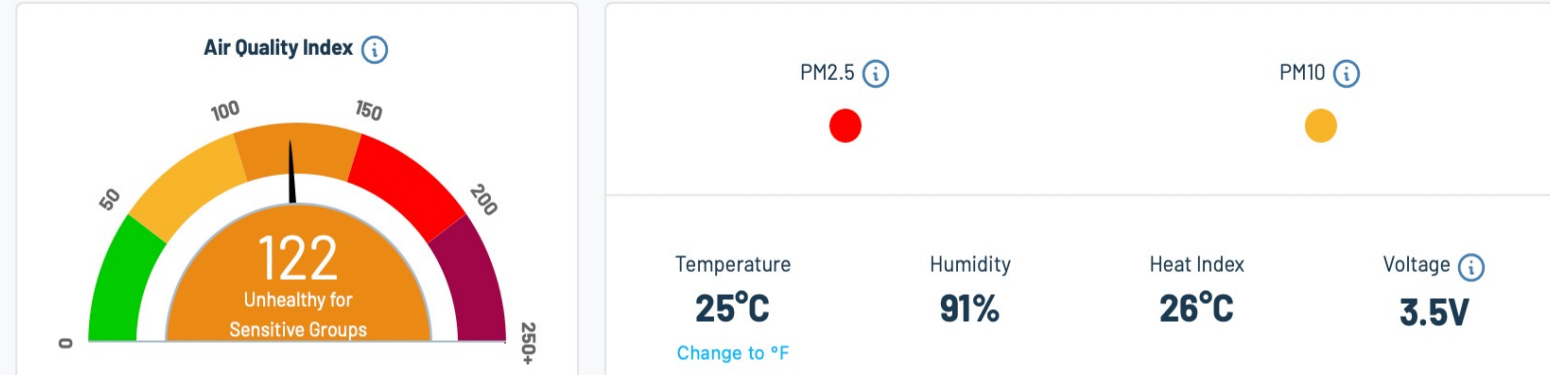
Data culled from the DATACAB website showed alarming PM levels in Bodo community with levels reaching 204ug/m<sup>3</sup> in May 2022.

Data collected on June 8<sup>th</sup> 2022 showed consistent high levels of 122ug/m<sup>3</sup> which have been identified to be very unhealthy for sensitive groups. Data used here is culled from the DATACAB air reading Website

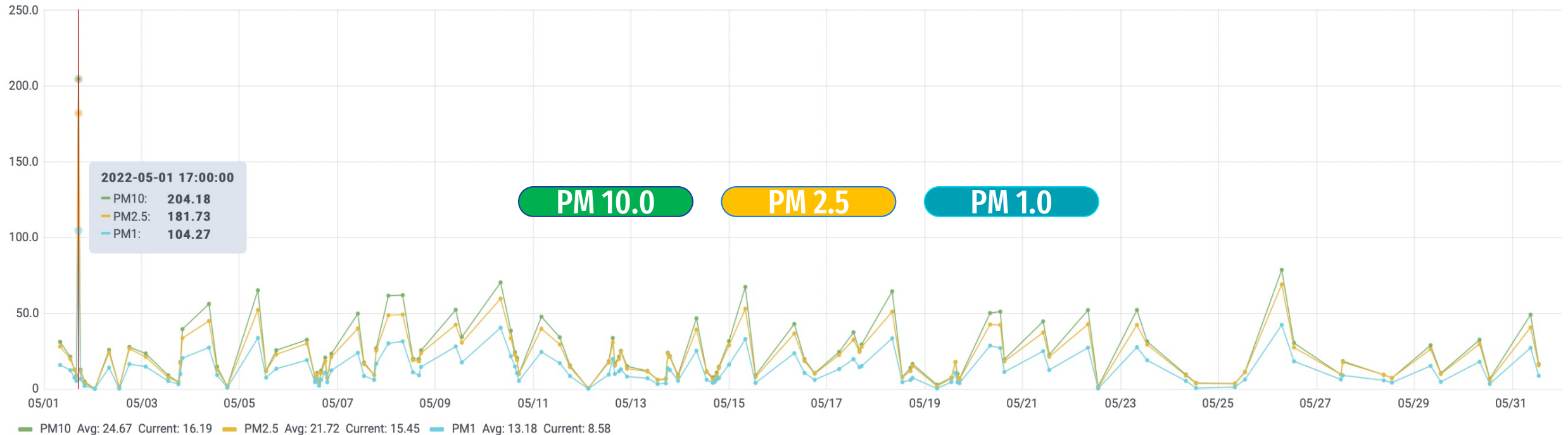
## Air Quality – BODO COMMUNITY - Gokana LGA

Courtesy of Safecast

Last Update: June 08 2022 at 9:12 am



Air Quality PM ( $\mu\text{g}/\text{m}^3$ )



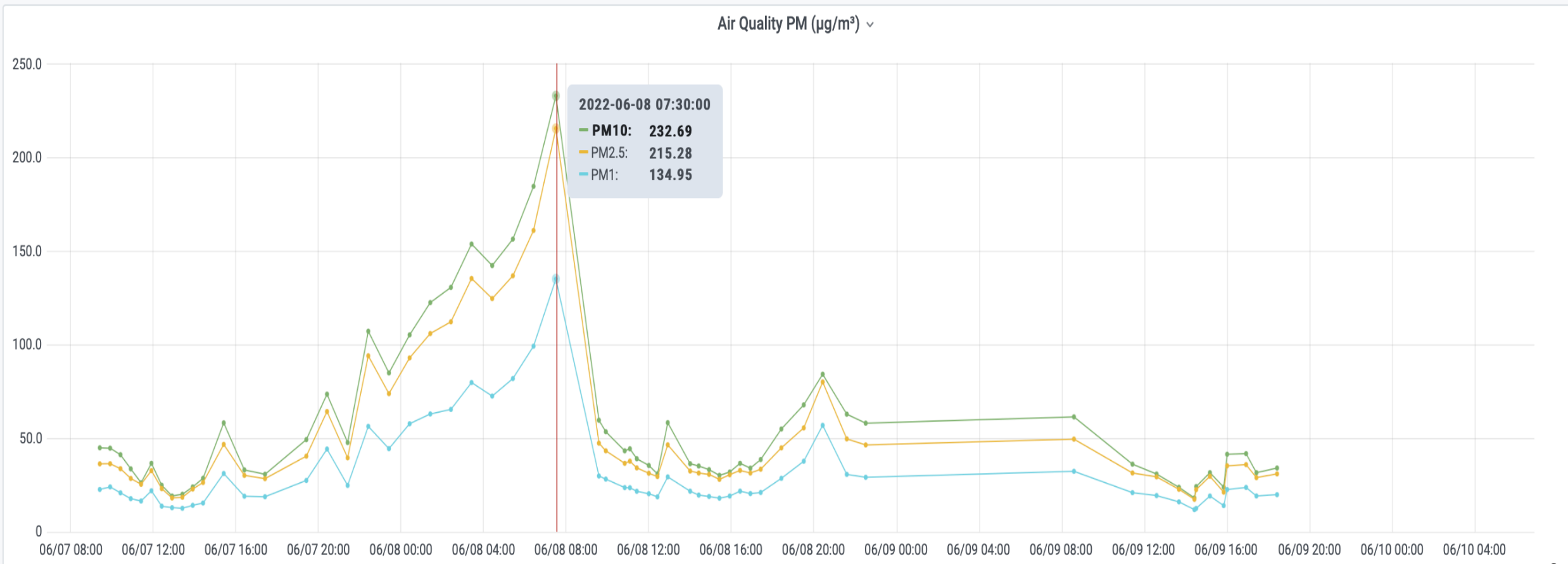
## Fact sheet on Particulate Matter Pollution in Port Harcourt – Data Collection in May 2022

In May 2022, deployed air quality sensors across the 15 locations picked up huge PM pollution readings with levels reaching astronomic levels. Collected and analyzed data showed readings reaching over 200 $\mu\text{g}/\text{m}^3$ . Further analysis of the data collected showed patterns of high boosts in PM pollution levels across the installed the 10 sensor locations within the daily periods of 20:00HRS and 0730HRS. This pattern indicates that Particulate Matter releasing activities are operational within these timeframes across the various locations.

PM 10.0

PM 2.5

PM 1.0



# Data Analysis and Findings

Due to the flexibility and ease provided by the use of Artificial Intelligence on the [DATACAB website](#) for the crunching of big data into simplified forms, we can see PM pollution patterns, and have documented them below;



## PM Release Patterns

We have noticed data patterns across the air quality datasets collected from the 10 installed air monitoring sensors, showing constant spikes in PM pollution levels ( $60\mu\text{g}/\text{m}^3$  to over  $200\mu\text{g}/\text{m}^3$ ) during the late evenings and early morning time ranges.



## PM Pollution levels

The incoming air quality datasets from the 10 sensors show huge levels of PM pollution exceeding  $210\mu\text{g}/\text{m}^3$ , which is far above WHO recommended PM 2.5 levels of  $5\mu\text{g}/\text{m}^3$



## Increased Humidity levels

The increase in particulate matter pollution continues to contribute to the increasing impacts of climate change on people living in rural and urban communities of the Niger Delta region of Nigeria. We recorded high temperature levels reaching over  $35^\circ\text{C}$  and humidity levels reaching as high as 95%



## Public Health Risks

High PM pollution levels poses a very serious public health risk to the rural and urban communities, which could degenerate into a health crises if left unchecked. Children and vulnerable people are mainly at high risk of respiratory related illnesses, poverty and death.

# End Notes

1. Air Pollution in Rivers State - <https://www.mdpi.com/2076-3298/5/1/2/htm>
2. Impacts of Air Pollution - <https://education.nationalgeographic.org/resource/air-pollution>
3. What is Particulate Matter - <https://www.epa.gov/pm-pollution/particulate-matter-pm-basics>
4. Institute of Health Metrics and Evaluation (IHME) Global Burden Disease (GBD), 2017.
5. DATACAB online portal – [www.datacab.org](http://www.datacab.org)

# Support and Collaborations

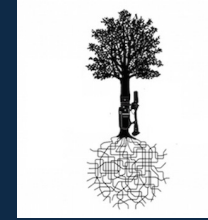
See more of MAJI work and the DATACAB portal via the following link  
DATACAB Portal – [www.datacab.org](http://www.datacab.org)



The French Embassy In Nigeria Under the PiSCCA innovative grant for CSOs supported the Media Awareness and Justice Initiative (MAJI) to develop the DATACAB environmental data analysis portal.



The Association for Progressive Communications (APC) supported the Media Awareness and Justice Initiative (MAJI) to acquire and deploy the air quality data monitoring sensors to 15 rural and urban communities in Rivers State, Niger Delta



The Media Awareness and Justice Initiative (MAJI) uses low cost technology to empower rural and urban communities for inclusive environmental protection and locally led Climate Change Adaptation. See our organization website @ [www.majinigeria.org](http://www.majinigeria.org)



The Open Culture Foundation (OCF) provided the Media Awareness and Justice Initiative (MAJI) with technical and equipment support to expand the coverage of the air quality sensing devices to 15 communities in Rivers State.