

PUBLISHED RESEARCH ON AIR QUALITY IN AFRICA: A RESULT OF ENVIRONMENTAL LEGISLATION AND RESEARCH INFRASTRUCTURE

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Air pollution is the second leading risk factor for death in Africa, following malnutrition (WHO, 2019). This continent has endured the most severe consequences of air pollution and its global health impacts. Between 1990 and 2017, there was a 60% increase in deaths attributed to air pollution in Africa (Rees et al., 2019). In 2019, this resulted in 1.1 million deaths on the continent (WHO, 2019), with approximately 700,000 premature deaths annually in sub-Saharan Africa (Bauer et al., 2019). The concentration of PM_{2.5} in African countries is ten times higher than the WHO recommended levels (WHO, 2021). Air quality studies are limited in Africa (Mahesh et al., 2022). It is crucial to assess the current state of knowledge on air quality in Africa and its evolution over the last decades.

The present study focuses on identifying and quantifying existing research gaps in air quality studies across the five regions that the UN divides the African continent (North Africa, Southern Africa, Central Africa, East Africa, and West Africa). This will allow for the prioritization of areas lacking information for future research.

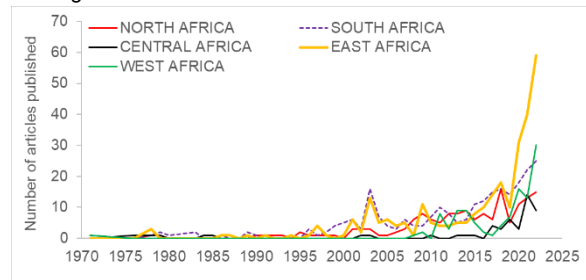
The search was conducted using two digital platforms: Science Direct and Web of Science. It covers records from the earliest available data up to the year 2022. Based on the data obtained, an initial analysis was performed to illustrate the evolution of the number of publications in each region from 1971 to 2022. Subsequently, statistical analyses were carried out to explore the relationship between publications and factors such as the existence of atmospheric monitoring stations, legislation, and universities across different regions.

The regions of Southern Africa and East Africa have the highest volume of publications during the studied period, with a total of 248 and 245 articles, respectively. On the other hand, the Central Africa region has the lowest number of publications (50 articles). West Africa and North Africa have registered a total of 111 and 158 publications, respectively. The first African publications date back to 1971 in Southern Africa and West Africa (Fig. 1). Additionally, in 1978, at least one article was published in each of the five regions. East Africa and Southern Africa have achieved an outstanding number of publications in 2022, with 59 and 30 articles published, respectively.

Among the 54 African countries, only seven have continuous monitoring stations, predominantly located in South Africa, which stands as the sole country in the region with a comprehensive and well-organized air quality monitoring program (Amegah and Agyei-Mensah, 2017). Furthermore, just 19 African nations have implemented legally enforceable standards to improve air quality. Each of the five African regions has seen at least one country adopt air quality-related guidelines. While certain countries have specific regulations like South Africa's Air Quality Act 39 of

2004, others tackle this concern through diverse environmental laws.

Figure 1. Evolution of articles published on air pollution in the five regions of Africa from 1971 to 2022.



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