

 <p><b>TTMS</b> TRINIDAD AND TOBAGO METEOROLOGICAL SERVICE</p>	<p><b>Trinidad &amp; Tobago Meteorological Service</b> METEOROLOGICAL SERVICES DIVISION, PIARCO Telephone: 1-868-669-5465/3964   Fax: 1-868-669-4009 Email: <a href="mailto:DirMetTT@gov.tt">DirMetTT@gov.tt</a>   Website: <a href="http://www.metoffice.gov.tt">www.metoffice.gov.tt</a></p>	<p><b>MEDIA RELEASE</b> Page 1 of 5</p>
---	--	---

**Date: February 25, 2026**

## **MEDIA RELEASE**

**The Impacts of Saharan Dust on the Caribbean Region – Mr. Shakeer Baig (Doctoral Candidate)  
– Director, Trinidad and Tobago Meteorological Service (TTMS).**

### **Introduction**

Each year, vast plumes of mineral dust originating from the **Sahara Desert** in northern Africa traverse the Atlantic Ocean and reach the **Caribbean Basin**, profoundly influencing regional environmental, climatic, and public health conditions. This geophysical phenomenon—centered on the **Saharan Air Layer (SAL)**, an elevated, hot, dry, and dust-laden atmospheric layer—represents one of the most significant natural aerosol transport processes on Earth, with implications ranging from air quality and visibility to aviation safety, respiratory health, and broader climatic patterns.

---

### **1. Origins: The Sahara and Dust Formation**

The Sahara Desert, spanning over **9 million km<sup>2</sup>**, is the world's largest source of mineral dust. Strong surface winds, driven by large-scale desert heat and atmospheric circulations, mobilize fine soil and mineral particles from the desert surface—particularly from regions such as the **Bodélé Depression** in Chad, as well as parts of Mauritania, Mali and Algeria. These winds entrain dust into the atmosphere, initiating the dust's long-range journey.

Once airborne, dust particles become embedded in the SAL—a **hot, dry atmospheric layer** that frequently overlies cooler, moisture-rich layers over the tropical North Atlantic Ocean. Within this layer, dust aerosols are transported westward by prevailing trade winds, travelling thousands of kilometres across the Atlantic Ocean to reach the Caribbean.

---

### **2. Atlantic-Ocean Transit: How Dust Reaches the Caribbean**

The westward movement of Saharan dust is primarily facilitated by easterly trade winds and strong low-level jets such as the **Caribbean Low-Level Jet (CLLJ)**. During the peak transport season—typically from **March to October**—these atmospheric circulations carry dust aloft at altitudes between **1,500 and 4,500 metres** above the surface, allowing plumes to persist and propagate across the entire Atlantic basin.

 <p><b>TTMS</b> TRINIDAD AND TOBAGO METEOROLOGICAL SERVICE</p>	<p align="center"><b>Trinidad &amp; Tobago Meteorological Service</b></p> <p align="center">METEOROLOGICAL SERVICES DIVISION, PIARCO Telephone: 1-868-669-5465/3964   Fax: 1-868-669-4009 Email: <a href="mailto:DirMetTT@gov.tt">DirMetTT@gov.tt</a>   Website: <a href="http://www.metoffice.gov.tt">www.metoffice.gov.tt</a></p>	<p align="center"><b>MEDIA RELEASE</b> Page 2 of 5</p>
---	---	--

The journey across the Atlantic generally spans **5–10 days**, and satellite observations have documented dust plumes that extend over **thousands of kilometres**, sometimes reaching the Gulf of Mexico, the southern United States, and beyond. Extreme events, such as the 2020 “Godzilla dust cloud,” have exhibited exceptionally high dust loadings, making transatlantic travel even more pronounced.

---

### 3. Quantifying Transatlantic Dust: Annual Transport Estimates

Saharan dust transport is an enormous global-scale process. Estimates from atmospheric research indicate that the Sahara emits anywhere from **136 to 222 teragrams (Tg)** of dust into the atmosphere annually, with a significant portion carried westward over the Atlantic.

For context:

- **1 teragram (Tg) = 1 million metric tonnes.**
- Annual Saharan dust exports to the Atlantic alone may approach **hundreds of millions of tonnes.**
- In simpler terms, the Sahara can mobilize dust on the order of **0.1–0.2 gigatonnes (Gt) per year** across the Atlantic.

Even this large figure represents only a fraction of the Sahara’s total dust emissions—models suggest total Saharan emissions worldwide could approach thousands of teragrams annually, reinforcing the Sahara’s status as a dominant player in the Earth’s mineral dust cycle.

---

## 4. Impacts on the Caribbean Region

### a. Air Quality and Human Health

Saharan dust plumes carry fine particulate matter (**PM<sub>2.5</sub>** and **PM<sub>10</sub>**), which can significantly degrade air quality as they disperse over the Caribbean. Particulate matter in this size range can penetrate deep into the lungs, exacerbating respiratory conditions (such as asthma, chronic obstructive pulmonary disease, and bronchitis), particularly among children, older adults, and those with pre-existing health vulnerabilities.

Historical epidemiological studies have linked Saharan dust events to **increased paediatric asthma admissions** and other respiratory complaints in Caribbean locations such as **Trinidad & Tobago** and **Grenada**, underscoring the tangible public health impacts of dust transport.

 <p><b>TTMS</b> TRINIDAD AND TOBAGO METEOROLOGICAL SERVICE</p>	<p align="center"><b>Trinidad &amp; Tobago Meteorological Service</b></p> <p align="center">METEOROLOGICAL SERVICES DIVISION, PIARCO Telephone: 1-868-669-5465/3964   Fax: 1-868-669-4009 Email: <a href="mailto:DirMetTT@gov.tt">DirMetTT@gov.tt</a>   Website: <a href="http://www.metoffice.gov.tt">www.metoffice.gov.tt</a></p>	<p align="center"><b>MEDIA RELEASE</b> Page 3 of 5</p>
---	---	--

## b. Visibility, Aviation, and Transportation

Saharan dust frequently reduces visibility across the Caribbean, creating **hazy skies causing natural sunlight to be obscured at times and degraded visual conditions**. Low visibility not only affects everyday travel and coastal navigation but can also pose safety challenges for **aviation operations**, particularly during take-off and landing phases at airports and may even result in the grounding of aircrafts operating by visual flight rules.. This haze is caused by the scattering and absorption of sunlight by dust particles suspended in the lower atmosphere.

## c. Air Quality Indices and Public Health Advisories

Dust outbreaks are often accompanied by elevated levels of airborne particulate matter, which can exceed **World Health Organization (WHO)** air quality guidelines. Regional health agencies including the Environmental Management Authority (EMS) here in Trinidad and Tobago regularly issue **advisories urging sensitive populations to remain indoors**, utilise indoor air filtration, and take precautions when outdoors during high dust periods.

## d. Climate and Weather Interactions

While Saharan dust contributes to poor air quality, it also influences tropical weather systems. The hot, dry air associated with the SAL can suppress **tropical storm formation** by creating **stable, dry layers** that inhibit convective development—a factor that may reduce hurricane frequency or intensity during peak Saharan dust seasons.

## 5. Scientific Sources and Ongoing Research

Saharan dust transport research spans decades, incorporating satellite observations, aircraft campaigns, and ground-based air quality measurements. Key studies in **Atmospheric Chemistry and Physics** detail the mechanisms driving extreme events, such as the June 2015 trans-Atlantic dust outbreak, and their radiative impacts on regional climate and air quality.

Other peer-reviewed publications have examined the chemical and biological composition of dust, revealing potential pathways for transporting metals, persistent organic pollutants, and even microorganisms across continents, with consequences for ecosystems and human health alike.

## 6. Historical Context: Severe Dust Events in Trinidad and Tobago

Over the past two decades, Trinidad and Tobago has experienced several **pronounced Saharan dust episodes** that have triggered visible haze layers, worsened air quality, and increased emergency room visits for respiratory conditions. A 2005 study in *International Journal of Biometeorology* documented

 <p><b>TTMS</b> TRINIDAD AND TOBAGO METEOROLOGICAL SERVICE</p>	<p><b>Trinidad &amp; Tobago Meteorological Service</b> METEOROLOGICAL SERVICES DIVISION, PIARCO Telephone: 1-868-669-5465/3964   Fax: 1-868-669-4009 Email: <a href="mailto:DirMetTT@gov.tt">DirMetTT@gov.tt</a>   Website: <a href="http://www.metoffice.gov.tt">www.metoffice.gov.tt</a></p>	<p><b>MEDIA RELEASE</b> Page 4 of 5</p>
---	--	---

associations between African dust clouds and elevated paediatric asthma admissions in **Trinidad**, highlighting the public health burden of these events at local healthcare facilities.

More recent dust outbreaks in 2024 and 2025 prompted air quality and health advisories from the **Caribbean Public Health Agency (CARPHA)**, reflecting ongoing concerns about the respiratory impacts of elevated Saharan dust levels—particularly on vulnerable populations such as children, the elderly, and those with chronic cardiopulmonary diseases.

---

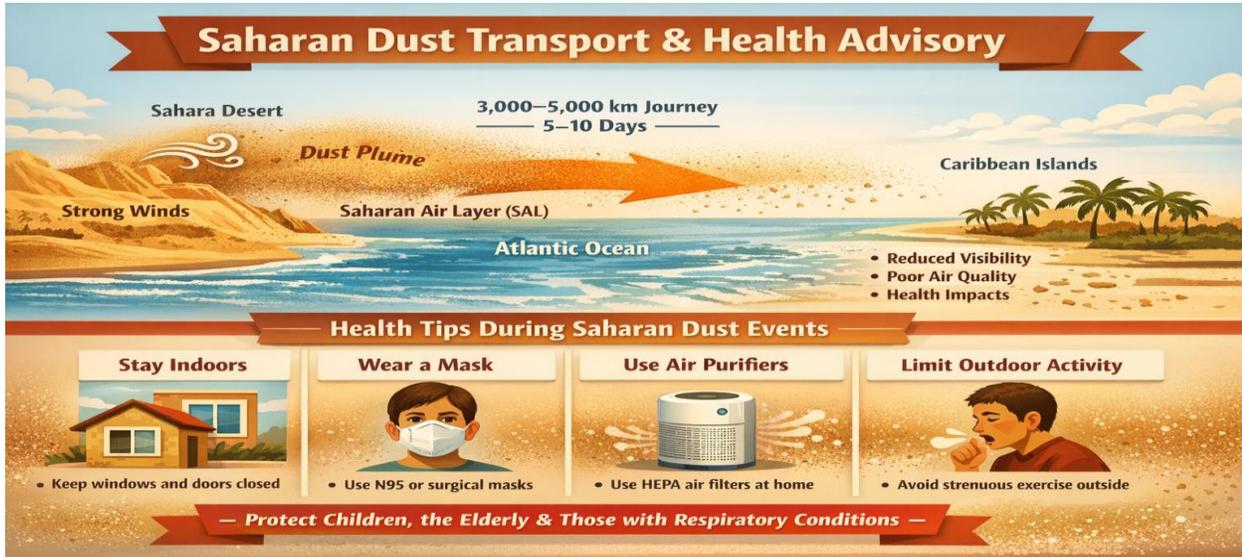
## 7. Conclusion

The annual trans-Atlantic transport of Saharan dust (*see figure 1*) represents a major geophysical and climatic phenomenon with **wide-ranging impacts** on the Caribbean region. From degraded air quality and health risks to reduced visibility and aviation challenges, Saharan dust events underscore the interconnected nature of global atmospheric systems. Continued scientific monitoring and public health preparedness are essential to mitigating risks associated with dust outbreaks while enhancing our understanding of their roles in climate dynamics and ecosystem processes.

The **Trinidad and Tobago Meteorological Service (TTMS)** will continue to closely monitor Saharan dust activity across the Atlantic Basin using satellite imagery, atmospheric models, and regional observational networks. The TTMS remains committed to providing timely advisories and scientifically accurate information to the public, aviation stakeholders, and national authorities to ensure preparedness and to safeguard health, safety, and economic activities during periods of elevated dust concentrations.

The public is strongly encouraged to pay close attention to official updates issued via the TTMS website – [www.metoffice.gov.tt](http://www.metoffice.gov.tt) our social media platforms, and the TTMS Mobile App for real-time information, health guidance, and impact-based forecasts related to Saharan dust and other weather related events

	<p style="text-align: center;"><b>Trinidad &amp; Tobago Meteorological Service</b></p> <p style="text-align: center;">METEOROLOGICAL SERVICES DIVISION, PIARCO Telephone: 1-868-669-5465/3964   Fax: 1-868-669-4009 Email: <a href="mailto:DirMetTT@gov.tt">DirMetTT@gov.tt</a>   Website: <a href="http://www.metoffice.gov.tt">www.metoffice.gov.tt</a></p>	<p style="text-align: center;"><b>MEDIA RELEASE</b> Page 5 of 5</p>
---	---	---



**Figure 1.** *Showing the pathway of the Annual trans-Atlantic transport of Saharan Dust and suggested Health Tips during Saharan Dust Events.*

END.