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BRIEF ON THE IMPACT OF CURRENT MEASURES TO ADDRESS POOR AIR QUALITY IN IDENTIFIED PRIORITY AREAS, THESE INCLUDES THE EFFICACY OF MONITORING, AND THE IMPACT OF REGULATIONS AIR QUALITY STATUS – SOUTH AFRICAN WEATHER SERVICES

31 August 2020

1. INTRODUCTION

The purpose of this brief is to provide the Select Committee on Land Reform, Environment, Mineral Resources and Energy with background information on the South African Weather Services (SAWS) mandate and the air quality monitoring work as outlined in legislation. The brief further highlights areas that Members need to seek clarity on or better understanding to assist in their oversight role, as this is the first Committee's interaction with the South African Weather Services.

2. BACKGROUND

The South African Weather Service (SAWS) was established in accordance with the South African Weather Service Act (Act No 8 of 2001)[1], is mandated national meteorological service. The SAWS vision aims to develop "A WeatherSMART Nation" wherein citizens and institutions are able to use quality and reliable weather and climate-related data provided by the organization to enhance the quality of their lives and build resilience to extreme weather events and mitigate climate change impacts[2].

The SAWS aims to provide useful and innovative weather, climate and related products and services by enhancing observational data and communications networks, effectively developing and managing talent in the sector, enhancing collaborative partnerships and effectively disseminating weather services products to the users, utilising cutting-edge technology to convert data into meaningful products and services for risk mitigation, advancing the science of meteorology, research and relevant applications, and enhancing fiscal discipline and resource mobilisation to ensure sustainability[3].

Figure 1 below depicts that SAWS organizational structure that indicates the various divisions and broad categories services they render. The SAWS is an accredited national research institution providing meteorological services and climate-related research for wide range of

[1] See: SAWS (2001)
[2] See: SAWS (2020)
[3] Ibid

applications, such as health, aviation, agriculture and many more, including air quality research and monitoring over priority areas in South Africa[4].

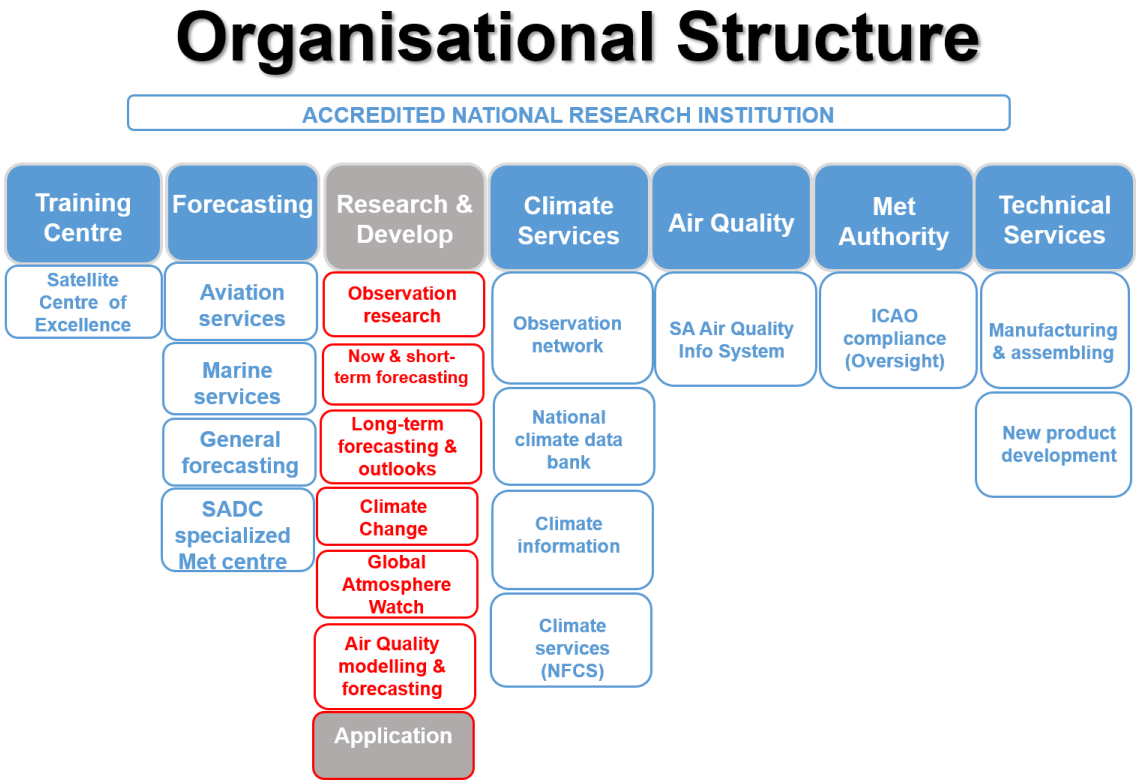

Figure 1 SAWS organizations structure

In South Africa, healthy environment in this case none harmful breathing air is ensured in the Republic's Constitution, in terms of Section 24, and the National Environmental Air Quality Act (AQA, 2004), of which charge Government to ensure this right to South Africans. To ensure this, several spheres of Government monitor the state of air quality across the country at over 130 fully automated air quality monitoring stations (Figure 2). These stations monitor a range of pollutants including ozone (O3), particulate matter (both PM10 and PM25), carbon monoxide (CO), sulphur dioxide (SO2), and oxides of nitrogen (nitrogen dioxide NO2, and nitric acid NO), lead (Pb), hydrogen sulphide (H2S), black carbon (elementary carbon) and meteorological parameters[5].

[4] Ibid
[5] Gwaze and Mashele (2018)

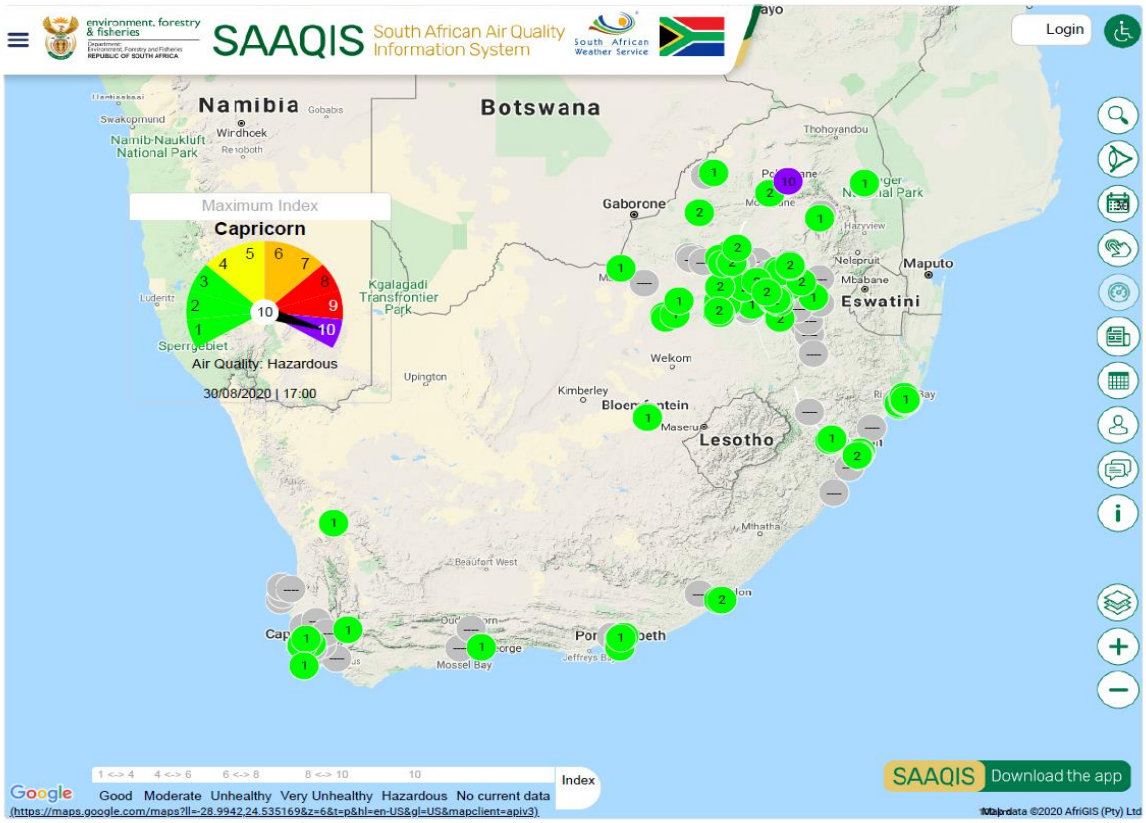

Figure 2 Weather Services Air Quality Monitoring Stations, providing hourly measurements via online platform[6]

The stations are located in areas with the highest density of people in order to measure human exposure to air pollution. The stations provide critical information to assess compliance with ambient air quality standards and to assess the impact of intervention strategies aimed at addressing air pollution. In addition, data from these monitoring stations also provide valuable information regarding the state of ambient air quality to which the citizens of the Republic are exposed[7].

Following the global spread of the SARS Novel Corona Virus of 2019 (COVID-19), Scientists have been conducting research to better understand environmental drivers on the observed spatiotemporal varied impacts of the COVID-19 disease (i.e. why some places have higher

[6] See: saagis (2020)
[7] Gwaze and Mashele (2018)

numbers of cases and deaths than others), in hopes to slow the spread of the disease. The following factors were found to partially explain this:

- Air pollution – long term exposure to pollutants such as fine particulate matter (often called PM2.5[8]), nitrogen dioxide (NO_2) and sulphur dioxide (SO_2) can reduce lung function and cause respiratory illness. These pollutants have also been shown to cause a persistent inflammatory response even in the relatively young and to increase the risk of infection by viruses that target the respiratory tract.
- Weather – a study in Indonesia found that a strong correlation between average temperature and COVID-19 pandemic[9]. Temperature ranges -6.28 °C and +14.51 °C were statistically estimated to be favourable range for COVID-19 growth, with 1ºC increase on temperature influential to decrease in growth rate[10].

A study in the Netherlands, suggests there is a direct correlation between the highly polluted areas and increases in cases of the disease, hospital admissions and death rates. The opposed is true in areas with low pollution levels[11]. Thus, improving air quality levels would reduce future infection rates, burden on hospitals and the death rates.

3. CONCLUDING REMARKS

- Members are drawn to the importance of air quality as it affects our well-being, of most recent importance is the link found to COVID-19 infections and Death rates. The oversight function of the Committee in this regard needs to establish if we have good coverage of air quality monitoring and what levels of air quality we have overall and seasonally. This will affect how COVID-19 is likely to change and what measure should be in place from the other sectors (such as Health, National Disaster Management, etc.) to mitigate and combat it.

- Figure 2 shows that the Air Quality Monitoring Stations are not evenly distributed or located across the country. In this regard, the Committee would benefit from the rationale or reasons behind the positioning of these Stations. Why these are Station not evenly distributed across the country.

- Members may consider asking why our air monitoring stations spatial coverage is not covering the whole Country uniformly and only in high density areas (such as town and cities), with industries across the country, to ensure healthy environment

[8] PM2.5 refers to atmospheric particulate matter (PM) that have a diameter of less than 2.5 micrometers, which is about 3% the diameter of a human hair. (Source: https://blissair.com/what-is-pm-2-5.htm)
[9] Tosepu et al. (2020)
[10] Sil and Kumar (2020)
[11] See: The Conservation (2020)

might regard information in the rural areas as well – owing to this right been stipulated in the Constitution.

- Further, South Africa has implemented the Carbon Tax of which is a giant step towards climate change mitigation and ensuring good air quality. Members may consider finding out from the Weather Services why South Africa has one greenhouse gas emissions (GHG) monitoring station based in Cape Point station is located in a nature reserve at the southern end of the Cape Peninsula, and none is regions associated with heavy GHG industrial activities (such as Mpumalanga and Gauteng).
    - What is been done to improve the monitoring of greenhouse gases emission such as Carbon? Has the entity considered improving their monitoring by incorporating other private air monitoring Stations?
    - Is or how SAWS see it self-contributing towards information that can aid in the enforcement of the carbon tax with regards to their air quality monitoring services?
- ***COVID-19 Impacts***
    - Studies presented in this brief have shown that there is a direct relationship between weather, air quality and spread of COVID19. In light of this, what role is SAWS playing in the combat of the spread of COVID19 initiatives across the country?

4. REFERENCES

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