SAFAR - System of Air Quality and Weather Forecasting and Research

SAFAR or System of Air Quality and Weather Forecasting And Research is an initiative to measure the air quality of metropolitan cities. It is an important topic for the UPSC exam environment section. In this article, you can read all about SAFAR, who developed it, who operates it and how it works.

What is SAFAR?

SAFAR stands for **S**ystem of **A**ir Quality and Weather **F**orecasting **A**nd **R**esearch. It is a country-wide initiative with an objective to provide location-specific information about the air quality on a real-time basis. It is currently operationalized in metros Delhi, Pune, Mumbai and Ahmedabad.

- It is targeted at the public at large to spread awareness about the harmful effects of air pollution and bad air quality, and also its environmental ill-effects.
- SAFAR not only monitors air quality, but also forecasts the quality of air.
- The system was developed indigenously by the Ministry of Earth Sciences and the Indian Institute of Tropical Meteorology (IITM), Pune.
- It is implemented by the IITM and the India Meteorological Department (IMD), but comes under the Earth Sciences Ministry.
    - The IMD (started implementing after one year of operation of SAFAR) operates and maintains the system. It collects data and sends it to the IITM for processing.
    - The supercomputer housed at the IITM processes and disseminates the data in the form of simplified and colour-coded information.
- The project evolved from the requirement to evaluate the air quality during the Commonwealth Games (CWG), New Delhi, in 2010.
    - The target beneficiaries were sportspersons (especially athletes, who breathe in ten times more air) for whom air quality information is helpful in determining the effect it has on their physical prowess.
- Before SAFAR, there was no way of knowing the air quality 2 - 3 days ahead in the metro cities.
- Apart from providing information on billboards about air quality, SAFAR also offers information on the weather conditions, ultraviolet radiation, and emissions in the cities.
- Not only the general public, hospitals and other research agencies can also use the data provided by SAFAR on digital display boards and its web portal for their own use and research, for instance, to research on the rise of the number of bronchitis cases in an area.
- The World Meteorological Organization has recognized SAFAR as a prototype activity on the basis of the high-quality control and standards maintained in its implementation.

Data provided by SAFAR

1. Air quality forecast (1 to 3 days in advance)
2. Location-specific UV index information
3. Weather forecast (1 to 3 days in advance)
4. Emission scenario

Know more about the Air Quality Index (AQI) in the linked article.

The SAFAR process is illustrated in the following image:

SAFAR Impact

SAFAR is proving to have a positive impact on the lives of people in the cities in which it is now implemented.

- Availability of information relevant to improving public health: The processed information which is converted into a user-friendly format is made available to the public in three forms: Digital display boards across the city; Web portal; IVRS
    - This information is helpful to monitor the impact of poor air quality on one's health.
    - One of the biggest achievements of SAFAR has been the identification of wind-blown dust (suspended dust) as the major source of particle pollution in Delhi.
- Timely information about extreme weather conditions: This helps disaster response authorities to mitigate the adverse effects of severe weather conditions.
- Input for studies on environmental issues and health risks: The information available from SAFAR is used not only by the public, but also by researchers for studies on the environment and related issues. Hospitals have been using this data to complement their own research.
- Improvement in crop yields: SAFAR has been used to evaluate the impact of ozone, particulate matter and sulphur dioxide on vegetation and this has helped in crop yield improvement.
- Issuing health advisories: Information from SAFAR has been utilised to issue health advisories warning the public about the increased levels of particulate matter and other air pollutants.
- Steps for a better environment: Initiatives such as Bharat I and II compliance measures, the transition to CNG, shifting industries to outskirts of cities, etc. are based on information that is sourced from a variety of sources, one of them being SAFAR.

Challenges and Way Forward

Although starting with Delhi and then Pune, SAFAR has now been operationalised in other metropolitan cities also, there is a need to study the possibilities of taking it to rural regions of the country. There is also the question of the sustainability of the model in other parts of India. Nevertheless, the SAFAR system is an innovation that has proven its efficacy in public health as well as in disaster management and mitigation strategies.