



Indian Meteorological Society, Chennai Chapter

NEWSLETTER

Vol. No.22, Issue No.2, Dec 2022

Editorial Board

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Members : Dr.Y.E.A. Raj, Dr.B. Geetha and Dr. K.V. Balasubramanian

Contents :

S.No	Title		Page No
1	Message from the Chairman	T.V. Lakshmi Kumar	3
2	Editor's Desk	R. Nallaswamy	4
3	Local council of IMS Chennai Chapter		6
4	Protecting the ozone layer	A. Jayaraman	7
5	Agro-meteorology, Climate change and Climate Smart Agriculture (CSA)	K. Raja	9
6	Connection of Black Carbon Aerosols to the rainfall over Chennai	V. Arunima et al	13
7	Improving the Rainfall Distribution Mapping over Space	O.M. Murali	15
8	பற்றுச் சூழல்	E.R. Sukumaran	19
9	World Meteorological Day quotes	R. Nallaswamy	23
10	Events' details organized by IMS CC during July to Dec 2022		24

Message from the Chairman.,

I am happy to see that the issue of Dec 2022 is being released. During the last six months, IMS CC has actively organized the seminars by involving the renowned scientists and academia with a great participation of students and research scholars from various colleges and universities. The articles written by the authors in this issue are very much interesting in the context of learning science. I am very much thankful to them for their valuable contribution.

I congratulate the editorial team of Breeze for their efforts in bringing out this issue.

I request all the IMS members and readers of the Breeze newsletter to write their views and suggestions to us for further improvement.

I also take this opportunity to inform you that I have represented the IMS Ordinary General Meeting that was held during TROPMET 2022 at IISER Bhopal on 1st Dec 2022.

Thank you very much,

Yours sincerely,



Dr. T.V. Lakshmi Kumar
Associate Professor
SRM Institute of Science and Technology, Kattankulathur

Editor's Desk :

Dear Esteemed members, greetings to you all.

As mentioned in the Chairman's message the Breeze Issue Vol 22 Issue 2 due in Dec 2022 is being released and uploaded on the IMSCC website.

I am happy to share the activities after the last issue with added enthusiasm. IMSCC proceeded with actions decided in Local council.

1.The Scientific lecture on the interesting topic "Clean Energy Resistance and Role of Meteorological Data" was delivered on 25th August 2022 at Regional Meteorological Centre Chennai. The talk was delivered by Dr.K.Balaraman, Director General of National Institute Of Wind Energy (NIWE) Chennai. A very informative talk which is needed in the present situation of searching for renewable energy to save our Earth from Climate Change disasters likely. The lecture was well received by IMS members IMD Scientists Faculties and students of famous educational institutions Loyola College, Women's Christian College, Anna university and SRM University.

On this occasion a book titled "The 4th Umpire Weather and Cricket " written in Tamil by IMS Member Mr.E. R.Sukumar Rtd Meteorologist was released by Dr.Y.E.A.Raj Former DDGM RMC Chennai and Past Chairman of IMSCC

2.A webinar was arranged on 16th Sept 2022 in connection with World Ozone Day. The lecture was delivered by Dr.Achuthan Jayaraman Former Director NARL-ISRO on the topic "Protecting Ozone Layer".The participation by various scientific institutions and accadmicians. The famous IGCAR arranged for special view to their organisation. Dr.T.V.Lakshmikumar Chairman IMSCC was the Moderator .

3.A Scientific Lecture was delivered on 25th Nov 2022 by Prof. R.R.Krishnamurthy HOD of Applied Geology and Director of University of Madras Guindy Campus Chennai on the most usefull topic "Coastal Management with reference to Natural Disasters"

The interactive session was very educative.

On request from the Faculties and Students I as the Secretary gave a brief talk on Weather ,Climate, Natural disasters especially on Tropical Cyclones and the activities of India Meterological Dept.

The programme was well attended by Faculties Students from Anna University SRM University Ethiraj College for women Chennai INSCC members and IMD Scientists

A press release was issued to the media.

The famous news daily The Hindu published in their e-paper about the special talk.

4.The Chairman took special interest and first time IMSCC issued e-participation Certificates to the Faculties and Students which was appreciated by institutions

5.IMSCC participated in all the webinars arranged periodically by IMS National Council.

6.A New Year 2023 Greetings card was prepared and sent to all the members.

7. On invitation from Madras University Guindy Campus I participated in their programmes

(a) Inauguration of a division in the Applied Geology Dept and had the opportunity to interact with the respected Vice Chancellor of University of Madras.

(b) A Scientific Lecture by an internationally reputed Scientist Prof. Alexander V. Babanin, Prof of Ocean Engineering, Director, Centre for Disaster Management and Public Safety Department of Infrastructure Engineering, Faculty of Engineering and Information Technology, The University of Melbourne Victoria, Australia.

I had the golden opportunity to interact about the Role of Ocean data in Meteorological forecasting.

8. On my request Dr. Kesaveni Muthiah, Director Ocean Dept Anna University, Dr. Rajesh Katyal Additional Charge DG NIWE and Dr. S. Soundarrajaperumal Executive Director i/c Tamilnadu Science and Technology Centre Chennai agreed to be in the list of probable resource persons.

My sincere thanks to the Chairman and his research scholars, Ashok Williams and Bharath J who were helpful in bringing out this issue of Breeze.

I appreciate those who sent articles for this issue Editorial board

I request all the members to take active participation in the activities with valuable suggestions to maintain the prestige of IMSCC.

With thanks and Regards.



R. NALLASWAMY.

Local Council of IMS Chennai Chapter
2022 -2024

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Protecting the Ozone Layer

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It is well known that the ozone layer in the earth's atmosphere absorbs the ultraviolet radiation emitted by the Sun and protects all life forms on Earth. If there is a reduction in the ozone concentration the UV dosage at the earth's surface will increase causing sunburn, skin aging, DNA damage, immune suppression, genetic mutations, abnormal cell proliferation which can lead to carcinogenesis. In 1970, Prof. Paul Crutzen published a paper in the *Quart. J. R. Met. Soc.*, on "The influence of nitrogen oxides on the atmospheric ozone content" pointing out for the first time the possibility of catalytic destruction of ozone in the stratosphere by nitric oxide (NO) and Nitrogen Dioxide (NO₂). Later, in 1974, Molina and F. Sherwood Rowland co-authored a paper in the journal *Nature* highlighting the threat of CFCs to the ozone layer in the stratosphere. Chlorofluorocarbons are manmade substances, widely used as refrigerants and chemical propellants in form industries. These discoveries were initially disputed by chemical manufacturers and chemical industries involved with the production of CFCs.

Following the prediction of possible ozone depletion at the stratospheric level, several scientific organizations around the world conducted balloon, rocket and satellite-based measurements to obtain the vertical distribution of ozone concentration. In India, IMD was involved in the ozone measurement by using Dobson ozone spectrophotometer and by using balloon borne ozone sondes. ISRO used rocket borne UV photometers for obtaining the ozone profile up to about mesospheric altitudes. No appreciable ozone depletion was found until 1985 when a long-term decrease in stratospheric ozone over Antarctica was found and published in *Nature* by Joseph C. Farman and his co-authors working at The British Antarctic Survey. They categorically stated in their paper, "assessments of the effects of human activities on stratospheric ozone using one dimensional models for 30°N have suggested that perturbations of total ozone will remain small for at least the next decade. Results from such models are often accepted by default as global estimates. The inadequacy of this approach is here made evident by observations that the spring values of total ozone in Antarctica have now fallen considerably". It is interesting to note that NASA had already launched Nimbus 7 satellite in October 1978, which was a low altitude earth orbiting satellite and carried the Total Ozone Mapping Spectrometer (TOMS) to obtain the total column ozone values around the globe. However only after the publication of springtime ozone loss over the Antarctic in 1985, the satellite data over the Antarctic were analysed and published in *Nature* in 1986 confirming the springtime Antarctic ozone decrease.

Discovery of the springtime ozone depletion and confirmation that it is caused due to manmade CFCs led to the formation and adoption of the Montreal Protocol, which is an agreement to cut CFC production and take necessary steps towards the worldwide elimination of CFCs from aerosol cans and refrigerators use. The original [Montreal Protocol](#) was agreed on 16 September 1987 by 56 countries and entered into force on 1 January 1989. Currently 16th September is celebrated as World Ozone Day around the globe. The Montreal Protocol has undergone eight revisions, in 1990 (London), 1991 (Nairobi), 1992 (Copenhagen), 1993 (Bangkok), 1995 (Vienna), 1997 (Montreal), 1998 (Australia), 1999 (Beijing) and 2007 (Montreal). The Royal Swedish Academy of Sciences has decided to award the 1995 Nobel Prize in Chemistry to Paul Crutzen, Germany, Mario Molina and Sherwood Rowland, USA for their work in “atmospheric chemistry, particularly concerning the formation and decomposition of ozone”.

Adoption and strengthening of the Montreal Protocol has led to reductions in the emissions of CFCs. The Intergovernmental Panel on Climate Change (IPCC) in its review in 2005 concluded, “based on ozone observations and model calculations that the global amount of ozone has now approximately stabilized. Although considerable variability is expected from year to year, including in polar regions where depletion is largest, the ozone layer is expected to begin to recover in coming decades due to declining ozone-depleting substance concentrations, assuming full compliance with the Montreal Protocol”. However, assuming full compliance with the Montreal Protocol has been challenged by Dhomse and co-workers in their paper, “Delay in recovery of the Antarctic ozone hole from unexpected CFC-11 emissions” published in *Nature Communication*, December 2019. They report that, “The recently discovered increase in CFC-11 emissions of $\sim 13 \text{ Gg yr}^{-1}$ may delay recovery. So far, the impact on ozone is small, but if these emissions indicate production for foam use much more CFC-11 may be leaked in the future. Assuming such production over 10 years, disappearance of the ozone hole will be delayed by a few years, although there are significant uncertainties. Continued, substantial future CFC-11 emissions would delay Antarctic ozone recovery by well over a decade”.

Another important issue is that Hydrofluorocarbons (HFCs) which replaced CFCs are now widely used in air conditioners, refrigerators, aerosol spray cans, foam production etc. While these chemicals do not deplete the stratospheric ozone layer, they have high Global Warming Potential, up to about 14,000. Their continued usage is expected to add up to 0.4°C to global warming by the end of the century. Realizing this fact, United Nations Environment Programme adopted a legally binding accord (the Kigali Amendment, October 2016) to phase out hydrofluorocarbons (HFCs) in an amendment to the Montreal Protocol. Accordingly, Chemical manufacturers are asked to phase down the production and use of HFCs. This is bound to affect the refrigeration industry.

Recent covid pandemic has highlighted the importance of establishment and maintaining of Cold chain, a low temperature-controlled supply chain with uninterrupted series of refrigerated production, storage, and distribution of vaccines, along with associated equipments and logistics, to reach out the remotest interiors of the country. Refrigeration is also essential to preserve and extend shelf life of products, such as fresh agricultural produce, seafood, frozen food, and chemicals. Phasing out of HFCs necessitates more R&D and new innovations in refrigeration technology.

Agro-meteorology, Climate change and Climate Smart Agriculture (CSA)

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Agro-meteorology is an applied science which deals with the relationship between weather/climatic conditions and agricultural production. The word 'Agro-meteorology' is the abbreviated form of Agricultural meteorology. It deals with the study of physiological conditions of the plants or animal's environment. It also studies the relationship between crop production and the surrounding climatic conditions and includes horticulture, animal husbandry, forestry and others. The study of agricultural sciences is incomplete without the incorporation of agro-meteorological knowledge and information.

In the late 1870s, the International Meteorological Organization (redesignated as World Meteorological Organization) began to discuss the application of meteorology to agriculture and forestry. At the beginning of the 20th century, research in agricultural meteorology focused on increasing the profitability of farming. In the 21st century, instead, the main goal of agricultural meteorology is to ensure food security and guarantee sustainability.

Climate change and extreme weather events, such as recurrent droughts or floods, are among the main challenges faced by 21st century agriculture. All over the world, farming communities need to adapt to a changing climate. At the same time, they are confronted by the necessity to increase food availability for a growing population, and also to ensure a sustainable use of natural resources.

In the first half of the 20th century, agrometeorological studies considered climate a fixed entity but sustainability issues were not a priority. However, climate change and extreme weather events, such as recurrent droughts or floods, are among the main challenges faced by 21st -century agriculture.

Agrometeorological services have become essential because of the challenges provided by increasing climate variability and associated extreme events as well as climate change, all of which affecting the socio-economic conditions, especially of developing countries.

In this sense, agricultural meteorology has become very different from what it was a century ago. In the current agenda of agricultural meteorology, high priority is there in promoting a climate-smart agriculture that can ensure food security in an age of climate change, but also guarantee agricultural sustainability and reduce or remove greenhouse gas emissions.

All over the world, farming communities need to adapt to a changing climate. Climate change and extreme weather events also threaten farmers in industrialized countries and they are posing new challenges to research and application in agricultural meteorology.

Like many other branches of weather and climate research, agricultural meteorology is also increasingly becoming a computational science, where models and simulations are as important as field research.

CLIMATE-SMART AGRICULTURE (CSA); A pathway to poverty alleviation, food security, and climate adaptation and mitigation:

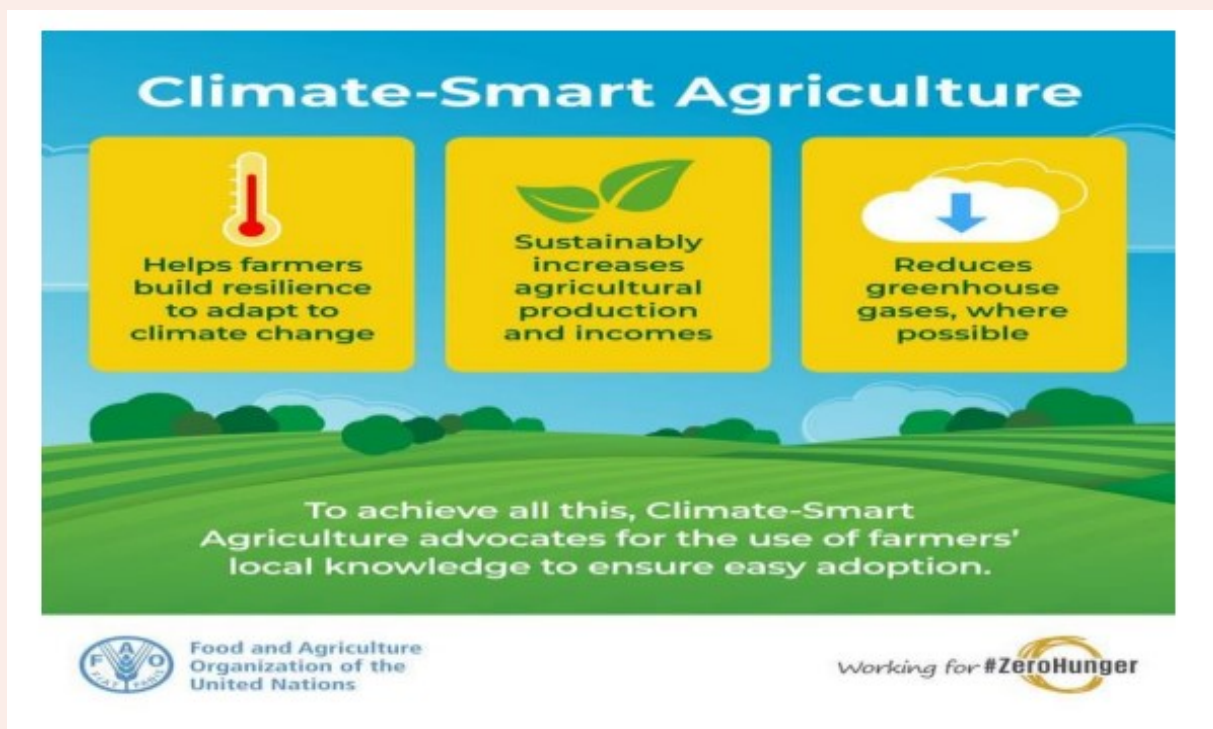
To alleviate some of the complex challenges posed by climate change, agriculture has to become “climate smart”. Climate-smart agriculture (CSA) is an integrated approach to managing landscapes-cropland, live-stock, forests and fisheries—that address the interlinked challenges of food security and climate change.

Food and Agricultural Organization (FAO) of the United Nations defines CSA as “agriculture that sustainably increases productivity, enhances resilience (adaptation), reduces/removes Green House Gasses (mitigation) where possible, and enhances achievement of national food security and development goals”.

FAO coined the term CSA in the background document prepared for the 2010 Hague conference on Food Security, Agriculture and Climate Change. The CSA concept was developed with a strong focus on food security, for now and the future, including adaptation to climate change.

Climate Smart Agriculture (CSA) is an integrative approach to address the interlinked challenges of food security and climate change, that explicitly aims for three objectives:

1. Sustainably increasing agricultural productivity, to support equitable increases in farm incomes, food security and development;
2. Adapting and building resilience of agricultural and food security systems to climate change at multi-



CLIMATE-SMART AGRICULTURE GOALS



Use sustainable practices to
increase productivity



Strengthen resilience and
adaptation to climate change



Reduce greenhouse gas emissions
and enhance carbon stocks

Fig courtesy: solidaridadnetwork.org

India is slowly adapting to climate-smart techniques of farming which will help to change the environment of India and reduce greenhouse gases from agriculture practices.

In India, the Maharashtra Project for Climate Resilient Agriculture, is one of the largest CSA projects the World Bank has financed to date, is estimated to yield climate change improvements of US\$386 million. As of June 2020, 3,09,800 project beneficiaries have adopted climate-smart agriculture practices, and 56,602 hectares of land have benefitted from improved irrigation and drainage technologies.

Since 2014-15, India has had a National Mission for Sustainable Agriculture (NMSA) to promote climate-friendly agriculture. On the private sector front, companies like ITC, Mahindra and a few others have spearheaded the CSA approach in rural India and this has been largely successful.

India's Integrated Agro-meteorological Advisory Service (IAAS) program is one of the largest agrometeorological information programs in the world. IMD took over leadership of the IAAS in 2007 and launched a District-level Agrometeorological Advisory Service (DAAS) in 2008, with the aim of providing relevant weather information and management advisories at a district scale across the country.

The agricultural advisories currently reach some 2.5 million smallholder farmers across India. Studies have shown that farmers receiving IAAS advisories have yields 10-15% higher and costs 2-5% lower than farmers not receiving the advisories, largely as a result of using more modern agricultural production technologies and practices, better irrigation and pest and disease management, and improved post-harvest technologies. Since it started in 2007, the service has had an estimated economic impact of more than USD 10 billion.

According to the Ministry of Agriculture, the government is taking various smart agriculture initiatives such as:

- Crop yield prediction model using Artificial Intelligence (AI): In 2018, the National Institution for Transforming India (NITI Aayog) partnered with IBM for developing a crop yield prediction model using AI. This helps in providing real-time advisory to farmers.
- AI sensors for smart farming: The Indian government has partnered with Microsoft for empowering small-holder farmers in India. The partnership seeks to increase the income of the farmers through greater crop yield and superior price control using AI sensors. The partnership would help boost the adoption of AI in farming.
- Drones for monitoring soil and crop health: The government has launched a project, Sensor-based Smart Agriculture (SENSAGRI), involving six institutes. In this project, drones would be used for smooth scouting over land fields, for collecting precious information and transferring the data to farmers on a real-time basis. The project would be funded by institutes such as Ministry of Communication and Information Technology (MCIT), Department of Electronics and Information Technology (DEITY), Information Technology Research Academy (ITRA) and Indian Council of Agricultural Research (ICAR).

Smart farming is much more efficient than the traditional methods of farming. Smart farming, which involves the application of sensors and automated irrigation practices, can help monitor agricultural land, temperature, soil moisture, etc. Moreover, smart farming can help integrate digital and physical infrastructures which would benefit small farmers.

CSA can include innovations such as agro-advisory services and weather insurance, solar water pumps, community-based & on farm water management; adaptive varieties of crops, breeds and seedbanks; sustainable livestock management, integrated nutrient management using biogas and minimum tillage.

Some of the key initiatives taken towards climate resilient agriculture:

Initiatives like PM Krishi Sinchayee Yojana (Agri productivity), PM Fasal Bima Yojana (Agri Insurance), Soil Health Card, Paramparagat Krishi Vikas Yojana (Organic farming), National Agriculture Market (e-NAM) and other rural development programmes are positive interventions.

The World Bank Group (WBG) is currently scaling up climate-smart agriculture. In its Climate Change Action Plan, the World Bank committed to working with countries to deliver climate-smart agriculture that achieves the triple win of increased productivity, enhanced resilience, and reduced emissions.

Connection of Black Carbon Aerosols to the rainfall over Chennai

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In the present work, we study the relationship between aerosol and atmospheric processes causing rainfall. The Aerosol optical depth (AOD) obtained from MODIS (Moderate Resolution Imaging Spectroradiometer) Terra and Aqua satellite, Black Carbon (BC) mass concentration from Aethalometer (AE-31) along with the rainfall from IMD (Indian Meteorological Department) and Lower Tropospheric Stability (LTS) from radiosonde observations, Outgoing Longwave Radiation (OLR) from ERA5 have used in this study. We used time series analysis, Wavelet Coherence (WTC) technique and Principal Component Analysis (PCA) to study the objectives. The study have been carried out for the north-east monsoon (October - December) of 2011 to 2019 over SRM IST location (12.81°N, 80.03°E). Our results show that i) a connection of aerosol with the atmospheric stability and thus cause the rainfall, ii) more dependence of LTS on rainfall compared to OLR, which is a proxy of convection and iii) BC aerosol show 14% of variability in rainfall over the study location.

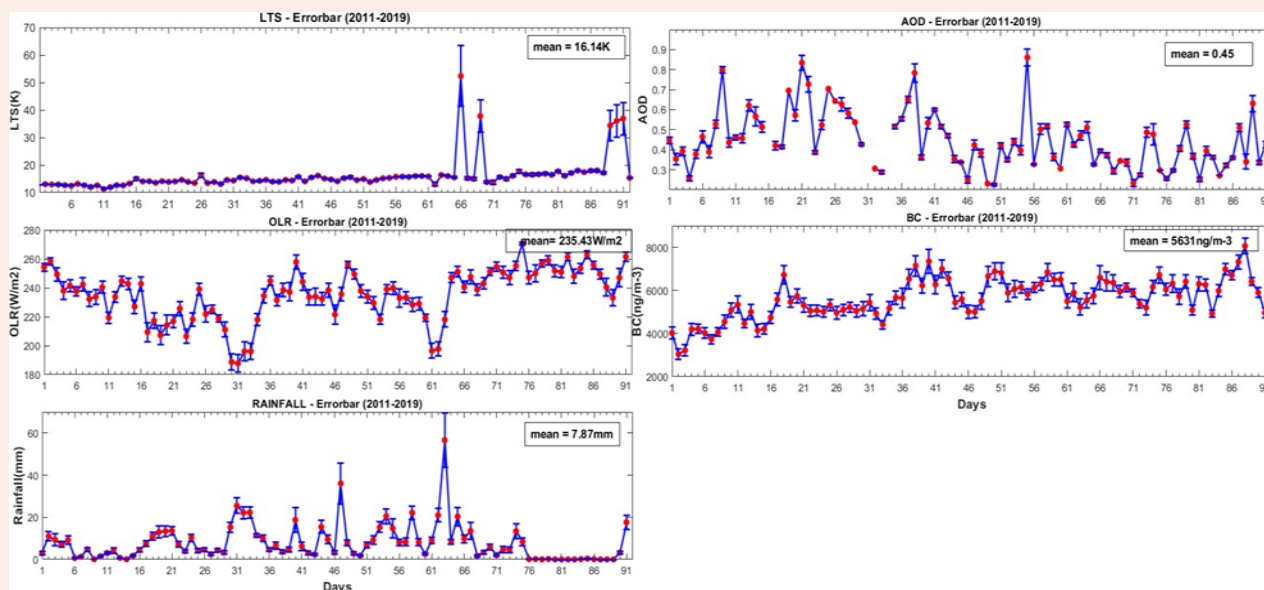


Figure 1. Time series plots of LTS, OLR, AOD, BC and Rainfall during the NE monsoon of 2011 to 2019

LTS is ranging between 10K and 20K these days. In the case of OLR, the amount is extremely high. However, AOD has shown a lot of variances throughout time. The amount of black carbon in the atmosphere these days is extremely high. The right bottom shows the mean value of each parameter during the last 92 days. The charts clearly demonstrate how the points differ from the mean value.

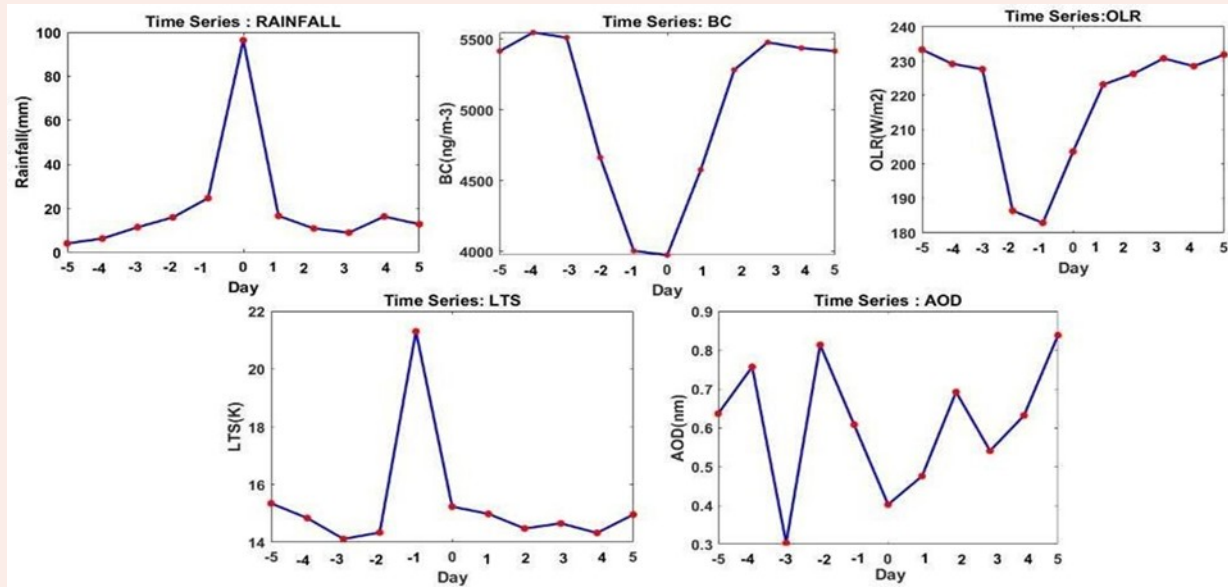
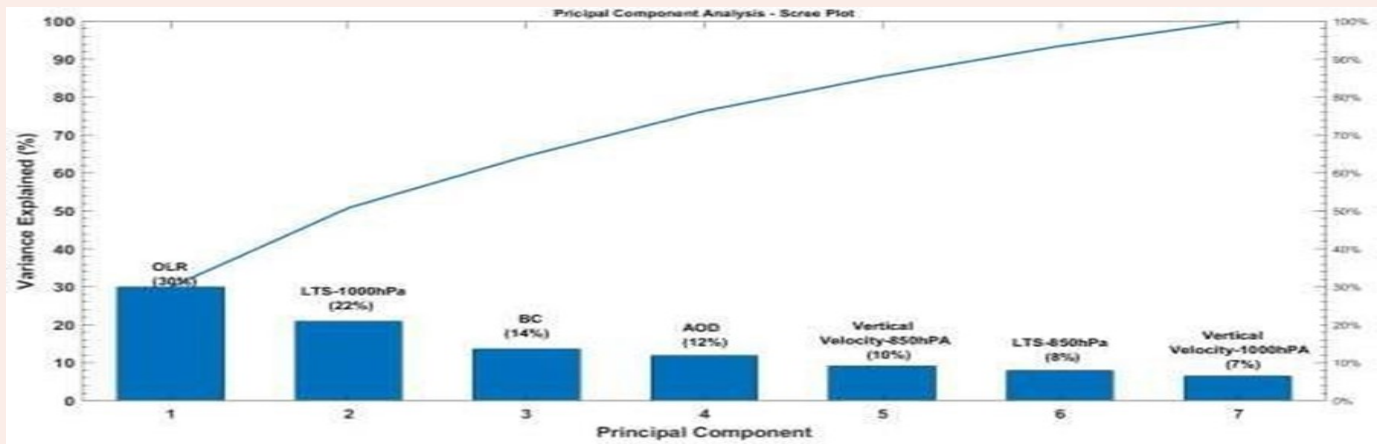


Figure 2: Time series showing the average of BC, OLR, LTS, AOD and Rainfall during the prior rainy days and later rainy days

In the OLR time series it showing a negative peak conversely LTS is showing a positive peak 1 day prior. AOD is very less in an amount in the rainfall day. Also, one day before the monsoon day AOD value seems to be very high. This may be because of scavenging and may also be due to someother reason. Likewise in the case of BC is very low in the atmosphere in the time of rain.



Here seven (7) parameters are taken; OLR, AOD, BC LTS at two different pressure levels and Vertical velocity at two different pressure levels. In this scree plot first component-OLR is showing almost 30 percentage of variation. And the second parameter LTS at 1000hPa is showing 22 percent variation. So, it can be said first two components are showing half of the variations. In the case of Black Carbon, it is showing 14% of variability. From this plot it is very clear that BC is affecting the rainfall distribution like the natural stability indices.

Improving the Rainfall Distribution Mapping over Space

O.M. Murali, Independent Geographer,
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Rain is the essence of life and knowing its geographical distribution assumes importance. The world dominated by human population in every continent and in large densities in major cities and towns, the precipitation as surface run-off over the impervious urban infrastructure result in unprecedented flooding in a short time interval. This results in huge damage to properties and sometimes loss of human lives. When we discuss about flooding, many geographic factors contribute to instant flood situation even for a moderate rainfall. High density compact settlement, blocked or narrow storm water drain, lack of open soil, underlying soil type, slope, absence of connected water bodies, reduced water bodies due to human encroachment and unplanned land use practices combined to play perfect in favour of rapid flooding, especially over the extended urban areas.

So, it is important to understand the rainfall distribution, amount of precipitation and intensity over space. Without knowing the spread, it will be difficult to bring in preparedness, rescue, relief and rehabilitation of the affected population. Here, an attempt has been made to understand the key factors to consider in knowing the distribution pattern of rainfall through scientific methods using GIS techniques.

To know the amount of rainfall in a given area, rain gauge stations are the prerequisites. We get 24 hour monitoring of key meteorological parameters from the rain gauge stations like rainfall, temperature, atmospheric pressure, wind speed and wind direction. The distribution of each rain gauge station is limited and highly variable in number over a city or at administrative level. So this can invariably generalise the extent of rainfall upon analysis which is correlated in direct relation to the nearest rain gauge station. The accuracy of rainfall distribution mapping improves when the rain gauge stations are fairly placed.

In the ideal situation, rainfall distribution is governed by the watershed. When the upper catchment areas of the watershed receive excess rainfall, it will have an impact at downstream areas by excess flow (flooding). This explanation brings in the need for having a strategically placed rain gauge stations in the upper catchments of any major and minor watersheds attached to a river. So, the rain gauge stations should be carefully planned after understating the micro watersheds of each area under investigation.

To give a representation, the extent of Chennai River Basin has been given along with the rain gauge stations. When we have the amount of rainfall of each rain gauge station, we can plot the rainfall distribution over space using interpolation techniques in GIS environment.

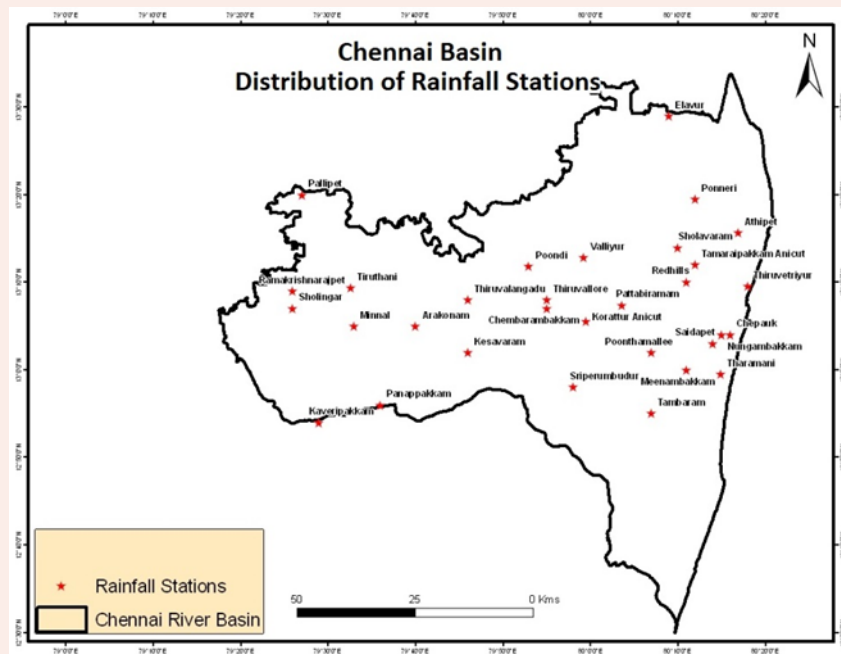


Figure 1: Chennai Basin with rain gauge stations - (Map compiled by the author)

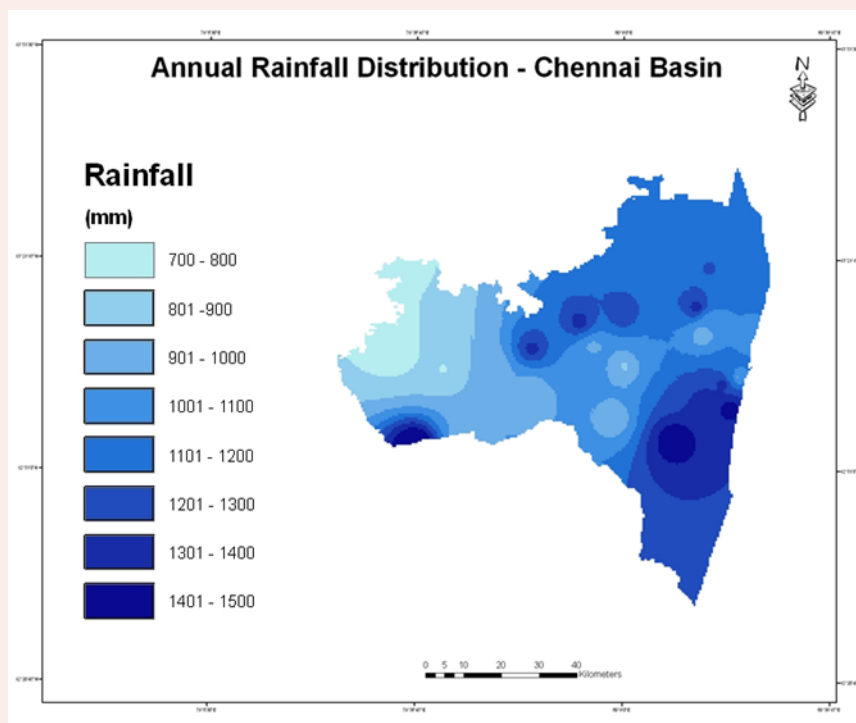


Figure 2: Annual Rainfall for Chennai Basin – (Map compiled by the author)

For the rainfall distribution analysis, inverse distance weighted (IDW) interpolation technique has been used. IDW explicitly makes the assumption that points that are located nearby are more likely to have similarity than those that are farther apart. To predict a value for unknown location, IDW uses the measured values surrounding the prediction location. The measured values nearest to the prediction location will have more influence on the predicted value than those located far away.

Here, the measured point has an influence that reduces with distance. The northern and southern parts of the Chennai Basin do not have appreciable rain gauge stations and this result in more generalisation from the nearest rain gauge station. In reality, this can have an impact and actual rainfall could have been more or less which is not reflected in the absence of rain gauge stations.

Second interesting factor which is considered here for attention is the area of influence of the rain gauge stations. This is yet another interpolation technique which gives the extent of actual area which can come under the direct influence of each rain gauge station with a definite boundary. Here, the Thiessen polygon method has been considered for this exercise. This method assigns weight at each gauge station in proportion to the catchment area that is nearest to that gauge.

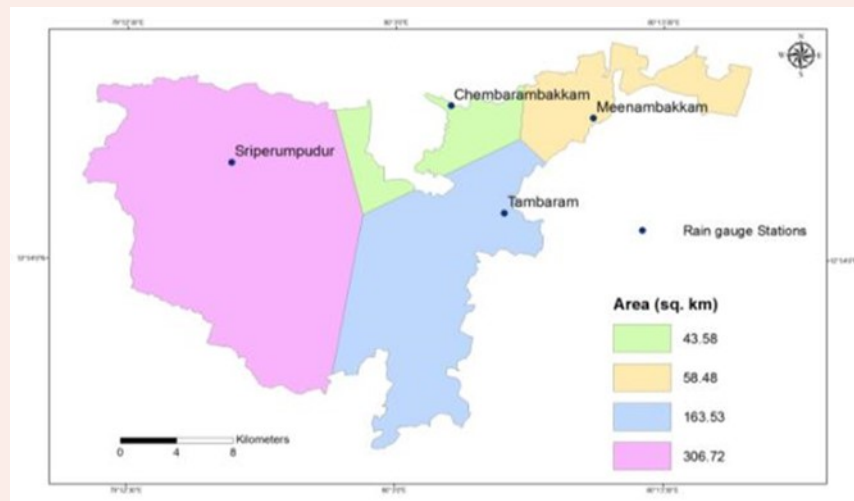


Figure 3: Area of Influence of rain gauge stations in Adyar sub watershed (Map compiled by the author)

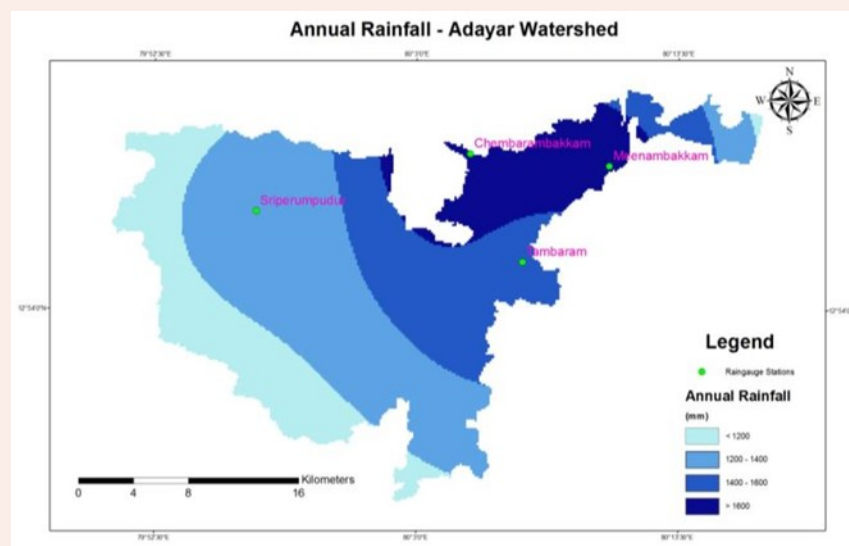


Figure 4: Annual rainfall distribution for Adyar sub watershed (Map compiled by the author)

Here again, a sample is done for Adyar sub-watershed. Four rain gauge stations were considered this interpolation exercise – Chembambakkam, Meenambakkam, Sriperumbudur and Tambaram. These four rain gauge stations fall within the sub watershed of the Adyar River.

For 2015, the highest recorded rainfall for Tambaram was at 494 mm and Anakaputhur which is located nearly 8 km away could have got a similar rainfall or slightly less than the highest recorded rainfall for 24 hours. Due to the release of water from the Chembambakkam Lake, the houses located very close to the Adyar river were completely inundated to nearly 10 feet of water (refer Figure 5). Though the flood height could not be seen but the made an impact on the floor of the house which could be clearly visible.

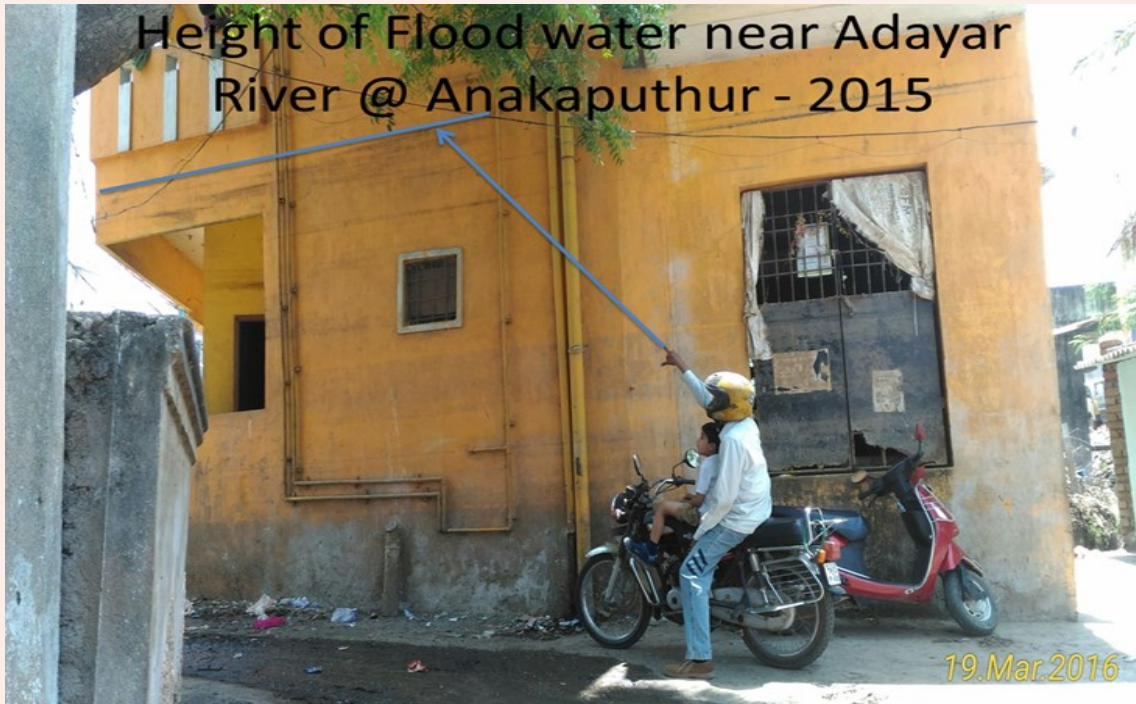


Figure 5: Decolouration (river sedimentation) due to flood inundation to over 10 feet at Anakaputhur (suburban of Chennai adjacent to the Adyar River) – 2015

Way forward

Having a balanced rain gauge stations in the catchments (upper and lower) of the major and minor watersheds (river basin).

Rain gauge stations to be set up after considering slope, relief and adjacency to major urban settlements to have improved accuracy of rainfall distribution mapping.

Interlinking of key water bodies (lakes, tanks) in the upper and lower catchments of a river can reduce the flood impact.

Periodic review of land use of major towns and cities to check encroachments in water bodies.

சுற்றுச் சூழல்

கோவை வானொலியின் வாயிலாக ஆற்றிய உரையில் சில துளிகள்

ஐன் திங்கள் 5ம் நாள் சர்வதேச சுற்றுச்சூழல் தினம். 1984 உலகச் சுற்றுச் சூழல் நாள். நிலம், நீர், காடுகள், பல்லுயிர் வாழ்நிலை தடங்கள் ஆகியவற்றை உள்ளடக்கிய நமது வாழ்க்கை ஆதார அமைப்பை பாதுகாக்க வேண்டும் என்றும், புத்திசாலித்தனமாக நிருவகிக்க வேண்டும். வறுமை நிலவும் பட்சத்தில் சுற்றுச்சூழலை மேம்படுத்த முடியாது. அதேபோல் அறிவியல் மற்றும் தொழில்நுட்பத்தை பயன்படுத்தாமல் வறுமையை ஒழிக்க முடியாது.

ஸ்டாக் ஹோம் மாநாடு - மறைந்த பாரதப்பிரதமர் இந்திராகாந்தி உரை

மழை பெய்கிறது ஊர் முழுவதும் ஈரமாகிவிட்டது. ஈரத்திலேயே நிற்கிறார்கள். ஈரத்திலேயே உட்காருகிறார்கள், நடக்கிறார்கள், படுக்கிறார்கள், சமையல், உணவு என சிரமப்படுகிறார்கள். உலந்த தமிழன் மருந்துக்கு கூட அகப்படமாட்டான் - பாரதியார்

சுற்றுச்சூழலை கட்டுப்படுத்த / பாதுகாக்க காரணிகள் என்ன?

காற்று மாசு, திடக்கழிவு தீராப்பிரச்சனை, நெகிழித்தடை? மனிதர்கள் ஏற்படுத்திய பேரழிவு, காட்டுத்தீ, கட்டுபாடற்ற பெருந்திட்டங்கள், நீர்த்துப்போக வைக்கும் சட்டத்திருத்தங்கள், காட்டைக் கொல்லுதல், அதிகரிக்கும் மக்கள் குரல், எரிசக்தி அதிர்ச்சி தராமல் இருக்க பணிகள்.

2016ஆம் ஆண்டு முதல் தூய்மையான நகரங்களுக்கு கவுரவப்படுத்தி விருதுகள் வழங்கப்பட்டது. தூய்மையான நகரங்களில் தொடர்ந்து வெது முறையாக மத்தியப்பிரதேசத்தில் **இந்தூர் மாவட்டம்** விருது பெற்று வருகிறது. குஜராத்தில் **சூரத்** 2வது இடம், மகாராஷ்டிராவில் **நவி மும்பை** 3வது இடம், டெல்லி 9வது இடத்தையும் பெற்றுள்ளது.

இந்தூர் தினசரி 1200 டன் கழிவுகளை கையாள்கிறது. மக்கும் குப்பை, மக்காத குப்பைகளை பிரிப்பதிலும், அதை முறையாக பயன்படுத்துவதிலும் மக்களும், அரசு நிர்வாகமும் 90 சதவீதம் வெற்றி பெற்றுள்ளார்கள். தினசரி 20 டன் கழிவுகளிலிருந்து 750-800 கிலோகிராம் வரை "பயோ" இயற்கை வாயு தயாரிக்கப்பட்டு நகரப் பேருந்துகளிலும், ஹோட்டல்களிலும் பயன்படுத்துகிறார்கள். மருந்துகள் முதல் உணவு சுவையூட்டப் பயன்படுத்தப்படும் பொருட்கள் வரை பல்வேறு மூலக் கூறுகளைத் தயாரிப்பதில், சுற்று சூழலுக்குப் பாதுகாப்பான வழிகளைக் கண்டறிந்ததற்காக ஜெர்மனியின் பெஞ்சமினிஸ்டுக்கும், ஸ்காட்லாந்தில் பிறந்த டேவிட் டபிள்யூசி மேக்மில்லனுக்கும், வேதியலுக்கான நோபல் பரிசு அறிவிக்கப்பட்டுள்ளது.

மரங்கள்

சீமைக் கருவேல மரங்கள் நச்சு மரங்களாகும். எந்த வறட்சியிலும் வளரக்கூடியது. பூமியின் அடியில் 75 அடி ஆழம் வரை தன் வேர்களை பரப்பி நீரை உறிஞ்சி, இலைகளை வாடவிடாமல் உறிஞ்சிவிடுகிறது. காற்றின் ஈரப்பதத்தையும், நிலத்தடி நீரையும் இழுத்து அந்தப்பகுதி முழுவதும் வறட்சியின் கோரப்பிடயில் பாழ்படுத்துகிறது. கிராமங்களில் இம்மரங்களை வெட்டி கரியாக விற்கிறார்கள். இம்மரங்கள் கரிய மில வாயுவை உற்பத்தி செய்து வெளியிடுவதால் சுற்றுப்புறக்காற்று மண்டலமே நச்சுத்தன்மையாக மாறிவிடுகிறது. இம் மரங்களில் பறவைகள் கூடுகள் கட்டுவதில்லை. பிராணிகள் மலடுகள் ஆகிவிடுகிறது. பிளமிங்கோ, பறவைகள் பருவகால மாறுதலுக்கேற்ப எந்த அறிவிப்புமின்றி இடம் பெயர்ந்துவிடுகிறது.

கரியமிலவாயு

உலகில் 40 சதவீதம் மின்தேவை நிலக்கரி எரிப்பதன் மூலம் பெறப்படுகிறது. இத்தகைய செயற்கையான கரிய மிலவாயு வெளியேற்றத்தால் 37 சதவீதம் எரிசக்தி துறையால் ஏற்படுகிறது. கரியமிலவாயுவின் வெளியேற்றம் பூமியின் வெப்பத்தை அதிகரிப்பதோடு உயிரினங்களுக்கும், சுற்றுச்சூழலுக்கும் பெரும் பாதிப்பை ஏற்படுத்துகிறது. விமானம், கப்பல், ரயில், தரை மார்க்கமாக செல்லும் வாகனங்களின் வாயிலாக 13 சதவீதம் அதாவது 114 மெகா டன் கார்பன் அளவுக்கு கரியமிலவாயு வளிமண்டலத்தில் கலந்துள்ளது. 1815ம் ஆண்டு இந்தோனேஷியாவில் ஏற்பட்ட எரிமலை கடந்த 10 ஆயிரம் ஆண்டுகளில் சக்திவாய்ந்த எரிமலை ஆகும். இதன் விளைவாக ஐரோப்பாவில் மட்டும் 2 இலட்சம் பேர் இறந்துள்ளார்கள்.

ஒரு நாளில் ஒருமனிதன் சுவாசிக்க உயிர்காற்று ஆக்ஸிஜன் மூன்று பிராணவாயு சிலிண்டருக்குச் சமம். ஒரு பிராணவாயு சிலிண்டரின் விலை ரூபாய்.700/= ஒரு நாளைக்கு ரூபாய்.2100/- நம்மைச் சுற்றியுள்ள மரங்களிலிருந்துதான் உயிர்காற்று கிடைக்கிறது. ஒரு அரசமரம் தன்னைச் சுற்றி ½ கிலோ மீட்டர் தூரத்திற்கு உள்ள பரப்பளவு தூய்மைபடுத்தி பிராணவாயு தரும் பணியைச் செய்கிறது.

கொசு

கொசு இரத்தத்தை உறிஞ்சும் ஓர் உயிரினம். தாவரங்களின் சாறுதான் கொசுக்களின் உணவு. ஒரு பெண் கொசு வயிறு நிரம்ப இரத்தத்தைக் குடித்துவிட்டால் அதன் சந்ததிகளின் 25 தலைமுறைக்கு தேவையான புரதம் கிடைத்துவிடுகிறது. மூக்கில் வெளிப்படும் கரிய மில வாயுவின் அளவு, சுவாசத்தின் எண்ணிக்கை மற்றும் மணம் போன்றவை கொசுவுக்கு உவப்பாக இல்லாவிட்டால் கடிக்காது. ஆண் கொசு ஒரு வாரம் வாழும். பெண் கொசு ஒரு மாதமே உயிருடன் இருக்கும். வாழ்நாளில் மூன்றில் ஒருபங்கு தூக்கத்திற்காக ஒதுக்குகிறோம். நல்ல தூக்கத்திற்கு மன அமைதி

தேவை. ஆஸ்த்மா, அலர்ஜி ஹைபர்டென்சன், கிட்னி புற்றுநோய், தொடர்ந்து வலி இருக்குமானால் தூக்கம் கெடும். நல்ல தூக்கத்திற்கு சுற்றுச்சூழல் சுகமானதாக இருக்கவேண்டும். கொரோனாவினால் 52 சதவீதம் இந்தியர்களின் தூக்கம் பாதிக்கப்பட்டுள்ளது.

கருவிகள்

வயல்களில் “டீரோன்கள்” மூலமாக பூச்சி மருந்துகள், உரங்கள் தெளிக்கப்படுகிறது. எந்தெந்த தாவரங்கள், எந்த நோயால் பாதிக்கப்படுகின்றன என அறியலாம். தொலைதூர கிராமங்களுக்கு பாதுகாப்பு மேற்கொள்ளப்படுகிறது. பெட்ரோலில் 10 சதவீதம் எத்தனால் கலப்புக்கான இலக்கை 5 மாதத்திற்கு முன்பே குறைக்கப்பட்டுள்ளது. 41 ஆயிரம் கோடி ரூபாய் அந்நியச்செலாவணி கையிருப்பு சேமிக்கப்பட்டுள்ளது.

மூளையில் “மையோ ஐயனோ சிட்டால்” என்னும் புரதம் இருக்கிறது. காற்று மாசில் உள்ள சில நச்சுப் பொருட்களால் மையோ ஐயனோ சிட்டால் அதிகம் சுரக்கிறது. இதனால் மூளையில் அழற்சி ஏற்படுகிறது. மனம் சார்ந்த மன அழுத்தம், மனச்சோர்வு, மனப்பதற்றம் போன்ற மனநலம் சார்ந்த பிரச்சனைகள் ஏற்படுகின்றன. இங்கிலாந்தில் உள்ள “நோட்டிங்காம் டிரெஸ்ட்” பல்கலைக்கழகத்தில் விஞ்ஞானிகள் காற்று மாசை 99 சதவீதம் கட்டுப்படுத்தும் புதிய கருவி ஒன்றை கண்டுபிடித்துள்ளார்கள். இக்கருவிக்கு “கிரையோ ஜெனிச்சண்டென்சர்” என காற்றில் பறப்பதை கட்டுப்படுத்தும்.

வானிலை குடைகள்

மழை வருவதை அரைமணி நேரத்திற்கு முன்பே சொல்லிவிடும் குடையை உருவாக்கியுள்ளார்கள். இக்குடையின் பெயர் “ஊம்ப்ரெல்லா” ஸ்மாட்போனின் வாயிலாக டவுன்லோடு செய்யலாம் 3.1 அடி உயரமுள்ள குடை “க்ளானிக்” 0.8 அடி உயரம் கொண்ட குடை “மாடர்ன்” என குறிப்பிட்டுள்ளார்கள். குடையில் சென்சார்கள் நேரம், வெளிச்சம், ஈரப்பதம், அழுத்தம், வெப்பநிலை போன்றவற்றை பதிவு செய்து அரைமணி நேரத்தில் தெரிவித்து விடும்.

பிளாஸ்டிக் ஒழிப்புக்கான சாலைபோடும் பணிகளுக்காக பிளாஸ்டிக் பயன்படுவதை கண்டுபிடித்தவர் இந்திய விஞ்ஞானி ராஜகோபாலன் வாசுதேவன். 1950 ஆம் ஆண்டு 7000 டன் மைக்ரோ பிளாஸ்டிக், 2500 டன் மேக்ரோ பிளாஸ்டிக் கழிவுகள் கடலில் கலந்துள்ளதாக ஆய்ந்துள்ளார்கள்.

சுத்தம், சுகாதாரம் நம் வாழ்க்கையில் உயர்வான நிலை உருவாக்க அனைவரும் இணைந்து செயல்படுவோம்.

ஈரா.சுகுமார்

வானிலையாளர் (ஓய்வு)

சென்னை வானிலை மையம், சென்னை-6

27.12.2022



World Meteorological Day 2023 Quotes

R. Nallaswamy, Regional Meteorological Centre, Chennai

- Wind, Earthquake, Fire Meteorology ,Seismology, Physics pass review, as we have been reviewing the natural forces of evolution The Lord was not in them. Afterwards, a stirring ,an awarening in the orgon of the brain, a voice which asks "What does thou here?"
(Sir Arthur Syanely Eddington)
- "Meteorology has never and been an apple of contention as if the violent commotions of the atmosphere induced a sympathetic effect on the minds of those who have attempted to study them"
(Joseph Henry)
- "Of all the departments of science no one seems to have been less advanced for the last hundred years than that of Meteorology
(Thomas Jefferson)
- "We have learned that there is endocrionogy of elation and despair ,a chemistry of mystical insight, and, in relation to the autonomic nervous system, a Meteorology and evenan astrophysics of changing moods"
(Aldous Leonard Huxley)
- "Perhaps some day in the dim future it will be possible to advance the computations faster than the weather advances and at a cost less than the saving to mankind due to the information gained. But that is a dream
(Lewis Fry Richardson)

Events organized by IMS CC during July to December 2022



**Indian Meteorological Society
Chennai Chapter**

cordially invites you to the seminar on

Clean energy transition and role of meteorological data

Speaker :
Dr. K. Balaraman
Director General
National Institute of Wind Energy
Chennai



25th August 2022 at 03.00 pm

Venue : Conference Hall 1, Regional Meteorological Centre, College Road, Nungambakkam, Chennai - 600006

For more details, contact : R. Nallaswamy, Secretary, IMSCC @ 9884656543 ; rns115@gmail.com



Dr. T.V. Lakshmi Kumar, Dr. K. Balaraman , Dr. Y.E.A. Raj and Mr. R. Nallaswamy (left to right)



Dr. B. Amudha presenting memento to Dr. Balaraman, NIWE



Chairman and Secretary of IMSCC with Dr. Krishnaveni, Ocean Department, Anna University



Photos with student participants in the seminar



Indian Meteorological Society Chennai Chapter

Invites you for an online talk on the occasion of
World Ozone Day
16th Sep 2022 at 03.00pm IST

Protecting the ozone layer



Expert speaker :
Dr. A. Jayaraman
Former Director
NARL, ISRO

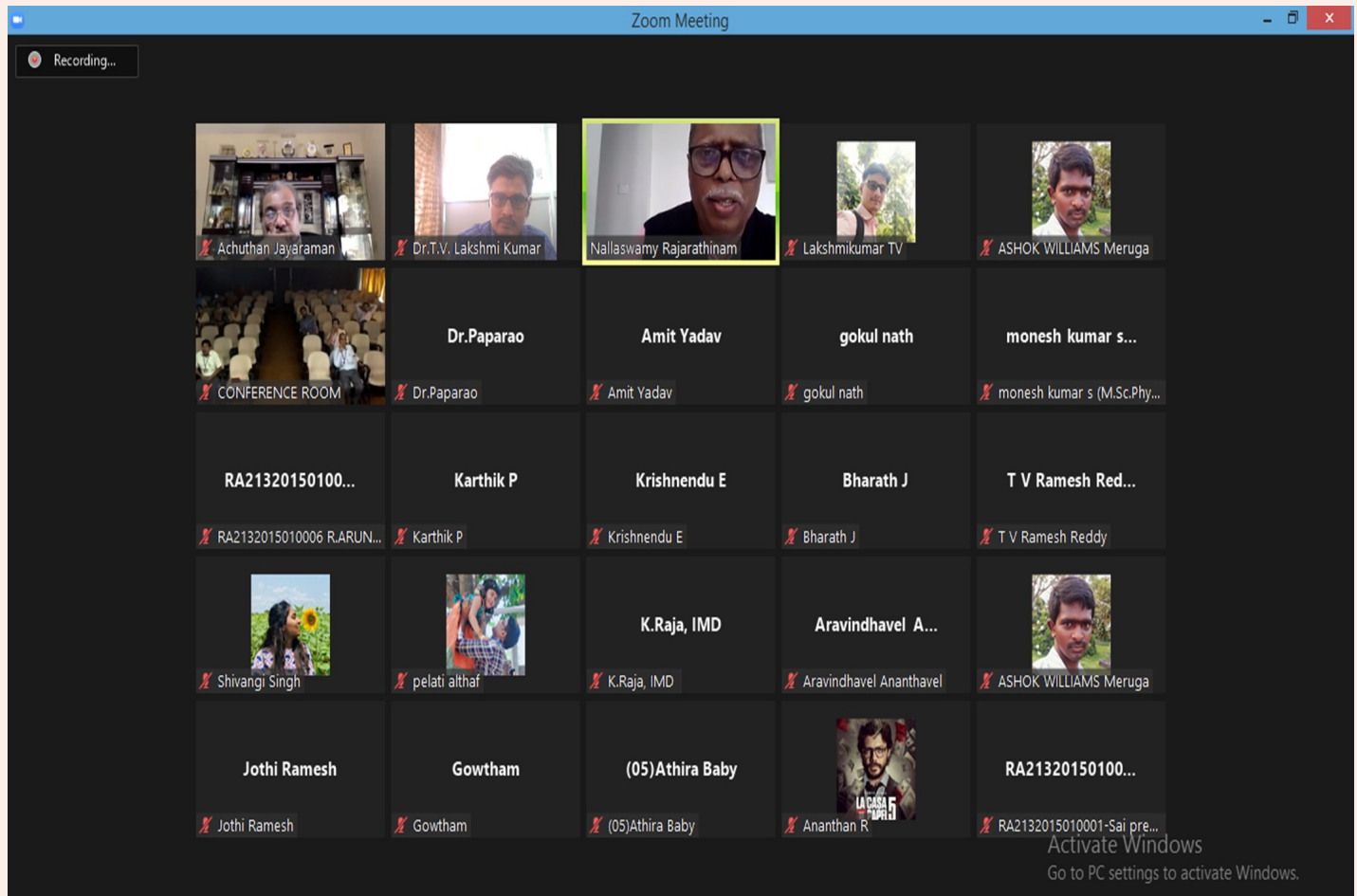


Meeting ID:
959 3766 7919

Passcode:
183661

Direct link : <https://zoom.us/j/95937667919?pwd=NnpiVm56RFllUkd3T1FGWUhzUnFHdz09>

*For more details, contact : R. Nallaswamy, Secretary, IMSCC @ 9884656543 ;
rns115@gmail.com*





Indian Meteorological Society Chennai Chapter

cordially invites you to the seminar on

Coastal Management with reference to natural disasters

Speaker :
Prof. R.R. Krishnamurthy
 Head, Dept of Applied Geology &
 Director – Guindy Campus
 University of Madras



25th November 2022 at 03.00 pm
Venue : Conference Hall 1, Regional Meteorological Centre,
College Road, Nungambakkam, Chennai - 600006

*For more details, contact : R. Nallaswamy, Secretary, IMSCC @ 9884656543;
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Inter-sectoral approach crucial for effective coastal management, says geologist

Mangroves and coral reefs acted as barriers against natural disasters while tools like remote sensing mapping enabled preparing scientific databases and action plans, says R.R. Krishnamurthy

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THE HINDU BUREAU

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An inter-sectoral approach is essential to meet challenges and improve coastal zone management. Tools like remote sensing and spatial technology played a significant role

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Dr. Y.E.A. Raj and Dr. T.V. Lakshmi Kumar with the students of SRM IST , Chennai at TROPMET symposium, IISER Bhopal during Nov 2022



Dr. T.V. Lakshmi Kumar, Chairman represented the IMS CC in the General Body Meeting of IMS at TROPMET 2022, IISER Bhopal