

**Indian Meteorological Society, Chennai Chapter
Newsletter Vol.17, Issue No.1, Jun 2017**

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Dr.B.Geetha

From the Chairman's Desk...

Dear members of IMS Chennai chapter and readers of BREEZE,

Following are the activities of the chapter since the release of the previous issue of BREEZE dated December 2016 (Vol.16, Issue 2) in March 2017.

(i) A Local Council meeting and an Annual General Body meeting were held on 04th July 2017 to appraise the members regarding the annual activities and expenditure incurred during the year 2016-17.

(ii) Based on a lengthy discussion on the *Draft Constitution* circulated by IMS (National) during a special general body meeting held on 27th July 2017, our Chapter's inputs have been sent to IMS (National).

(iii) In response to a notification by the IMS (National) regarding IMS Awards for research publications during the years 2015 and 2016, research papers published by our Chapter members have been nominated.

(iv) Chapter members have submitted extended abstracts for presenting in INTROMET-2017 proposed to be held at Ahmedabad during Nov 2017.

(v) In an effort to propagate the theme of World Meteorological Day -2017: "*Understanding Clouds*", amongst the student community, a Meteorological Science Festival, METFEST-'MUGIL' was organised under the joint auspices of IMS Chennai Chapter and Regional Meteorological Centre, Chennai for school and college students during August 2017. Seven events were conducted for various categories of students on 19th and 28th August 2017 on various topics related to understanding clouds and water cycle at the premises of Regional Meteorological Centre, 6, College Road, Chennai 600 006. The programme was a grand success with enthusiastic participation by the student community. Our sincere thanks to our revered senior members who served in the selection committees and contributed significantly for the success of the programme. A report on the METFEST-'MUGIL' is included in this issue.

(vi) Based on the recommendation of a selection committee, the first prize winner in the METFEST-'MUGIL' UG science category has been nominated for the INTROMET-Students' Event to be held at Ahmedabad during Nov 2017.

We got informed that IMS(National) proposes to conduct elections for the National council through e-voting. Available list of email IDs of life members of the Chapter has been provided to IMS(National). However, the list is not yet complete, due to non-availability of the email IDs of some of the members. We request all life members to kindly intimate their email IDs to us (if not done so far) for providing the same to HQ.

Finally, we express our sincere thanks to our members who have contributed articles for this issue of BREEZE. For timely release of the next issue of BREEZE we appeal to the members to contribute more articles early.

With best regards

S.B.Thampi, Chairman, IMS Chennai Chapter, Chennai

Dated: 10th October 2017

Life Membership details of IMS-Chennai Chapter (as on date): 148

Disclaimer : The Editor and IMS Chennai Chapter are not responsible for the views expressed by the authors.

WHAT IS A DROUGHT?

by

S. RAGHAVAN

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Tamil Nadu (TN) is said to be experiencing the worst “*drought*” since 140 years. The reference to 140 years is to the famine of 1876-77 called in popular parlance in Tamil as “*Dhaathu Karuppu*” as the name of that year in the Tamil Calendar was “*Dhaathu*”. The famine affected Madras Presidency (of which Tamil Nadu was a part) as well as other parts of peninsular India. The famine had severe consequences allegedly partly because the then administration reduced the expenditure on relief and a huge amount of grain was exported despite the shortage within the country¹.

“*Drought*” is understood in the public mind as a deficit of rainfall and it is also defined as such in some general dictionaries of the English language. The word drought is also used in that sense in many publications of India Meteorological Department (IMD) including the famous “Floods and droughts” diagram of Dr. L.A. Ramdas in the 20th century. The IMD’s Glossary (available on IMD Pune website) does not define drought.

The rainfall figures for the northeast monsoon season for Tamil Nadu for October-November-December (OND) for 2016 and 1876 are as below². In both cases TN received about a third of the normal.

Year	Actual rain (mm)	Normal rain (mm)	Departure (%)
2016	168.4	442.0	-62
1876	163.5	457.0	-64.5

The data of 1876 are said to be based on 20 rain gauge stations in the Tamil Nadu part of the Madras Presidency. Thus there was deficit of rainfall. **But is that by itself drought?**

The Australian Bureau of Meteorology (on its website) defines Drought as “Prolonged absence or marked deficiency of precipitation (rain)”.

But the UK Meteorological Office website says “there is no generally accepted definition of exactly what a drought is. This is a reflection of the multi-faceted nature of droughts and their wide range of impacts”. It goes on to say “A drought’s slippery definition means it is sometimes easier to refer to them by their causes or impacts:

- hydrological drought - refers to a lack of water in all parts of the water cycle
- meteorological drought - determined by the number of days without rain
- agricultural drought - focuses on the amount of water in the soil
- socioeconomic drought - a lack of water means that demand for an economic good exceeds the supply”.

In other words the impact on citizens is in the form of scarcity of water due to various reasons not just below-normal rainfall.

The American Meteorological Society’s (AMS) Glossary (Glickman 2000, also available on the AMS website) defines drought as “A period of abnormally dry weather sufficiently long enough to cause a serious hydrological imbalance”. It also adds that “Drought is a relative term” meaning that the agricultural and hydrological factors have to be considered.

The National Oceanic and Atmospheric Administration (NOAA) of the USA defines drought as (see its website) “Drought is a deficiency of moisture that results in adverse impacts on people, animals, or vegetation over a sizeable area. NOAA together with its partners provides short- and long-term Drought Assessments”. Some States in the USA are said to have their own definitions.

Thus the NOAA definition of drought as a “deficiency of moisture” appears to be more comprehensive than the others.

Why is the definition important? In a recent article on “Defining Hazards”, Bertrand and Shafer (2017) argue that “if a problem is not accurately specified, then solutions may not fully address the issue. Second, with different sources used for these definitions, it makes transferability from one jurisdiction to another more difficult. Finally, having a variety of definitions may impede the review process”

In India, the water problem is dealt with by various Central and State Agencies which do not see the problem the same way. If drought is seen only as a deficit of rainfall it is taken to be an act of God and desperate crisis control measures are taken after the event such as drilling wells, transporting water over long distances or even cloud seeding. Monetary relief is given to affected people of the areas declared as drought-affected. This declaration often depends only on the rainfall of the area. Even here the statistics differ from the National computation (by the IMD) and the States’ computation as the number of rain gauges considered and their spatial distribution is often different. We have come across people, who should know better, adding up the rain amount in all the gauges in an area and presenting it as the rainfall of that area! Also, these figures do not take account of the temporal distribution of rain during the farming season. The impact of the percentage deficit of rainfall may differ from one area to another. The rainfall figures are used for claiming or allotting funds and here socio-political considerations enter. Hence it can even be suggested that to the classification given by the UK Meteorological Office another genre called “*Political drought*” can be added!

On the other hand, considering the water management problem holistically will encourage proactive planning and action over longer periods. Many of the people who are dealing with water management do not seem to appreciate that there are large year-to-year variations of rainfall and long term planning is necessary.

Protecting and maintaining water bodies and wetlands which store water from the monsoon rains for the whole year, facilitation of ground water recharge and reduction of runoff and rain water harvesting on a large scale, changes in irrigation techniques and cropping patterns and prevention of environment-unfriendly activities, are some of the actions which can be taken .

The IMD has recently brought out studies of the rain water harvesting in two States, Madhya Pradesh and Maharashtra (IMD, 2016a,b) which show the enormous scope for systematic storage of water by this means.

Several individuals and organisations in dry regions such as Rajasthan and Interior Karnataka have taken advantage of this and have operated over small areas by way of improving water storage, construction of small check dams improving ground water recharge and thereby decreasing evaporation and have successfully converted these areas into green oases amid the generally dismal picture. Replicating these over larger areas is not a technical problem but a socio-political one.

Precautionary actions within a season depending on conditions as they unfold, inputs are available to State governments from the IMD in their Agromet Bulletins and the National Agricultural Drought Assessment and Monitoring System (NADAMS) of the Indian Space Research Organisation. But the optimum use of these inputs in a time-bound manner does not seem to take place.

Formulation of a proper definition of drought taking account of all factors in its impact on agriculture and other activities understandable to all organisations involved may help prepare effective drought preparedness plans. Meteorologists have an important role to play in this.

References

Bertrand D. and M. Shafer, 2017, Defining Hazards, Bull. Amer. Meteor.Soc. 98, 4, pp 659-663

Glickman T.S., (Ed.), 2000, "Glossary of Meteorology", 2nd Edition, Amer. Meteor. Soc, 855 pp.

IMD, 2016a : Rainwater Harvesting Potential for different locations in the state of Madhya Pradesh, Met Monograph No.ESSO/IMD/Hydrology/02(2016)/20.

IMD 2016b, Rain water harvesting potential for different locations in the state of Maharashtra, Met Monograph No.: ESSO/IMD/Hydrology/03(2016)/21.

Note

¹: [Mr. A.K. Sen Sarma has expressed the view that the Bengal famine of 1943 was also a tragedy brought about by the British administration ("Tragedy of 1943" Statesman Calcutta, 27 and 28 October 2005)]

²: I am indebted to Dr. Y.E.A. Raj and Dr. S. Balachandran respectively for the data of 1876 and 2016

MEMORIES OF CLOUD SEEDING OPERATION AT CHENNAI

by

R.G. SUBRAMANIYAN

Director (retd.), India Meteorological Department

The theme “Understanding Clouds” was chosen for celebration of World Meteorological Day on 23 March 2017. As a veteran meteorologist, I attended the celebrations at RMC Chennai like many other retired colleagues from IMD. Listening to the special lecture on “Cloud Seeding Operations” by Dr. Thara Prabhakaran, Scientist-E from IITM, Pune a senior friend in the audience wondered about the sweeping changes in cloud seeding technology. The casual remark was enough to take me to nostalgic reminiscences of my involvement in cloud seeding operations undertaken way back in 1984.

In 1984, Tamil Nadu Government started the cloud seeding operation in the catchment area in Chennai (then Madras), feeding the three reservoirs -- Poondi, Red Hills and Cholavaram. The cloud seeding operations were undertaken thrice in 1984, 1985 and 1986 in the months of June, July and August when more convective clouds developed over Chennai. I was on deputation with Tamil Nadu Government from 10.8.1984 to 28.2.1986 when the cloud seeding operations were taken up. The whole project was managed by Madras Metropolitan Water Supply and Sewerage Board. Mr.S.Srinivasan was designated as Officer on Special Duty and he was in charge of the project. M/s Atmospheric Incorporated from California, USA conducted the operation. Piper Aztec, twin engined aircraft was used in the cloud seeding mission. Mr. Walter Snell was the Meteorologist from Atmospheric Inc. who trained me in 1984. The pilot was Mr. Michael Holehouse in 1984 while in 1985 and 1986 it was Mr. Michael Douglas.

Fundamentals of cloud formation

Our gaseous atmosphere consists of 78% by volume of nitrogen and 21% by volume of oxygen, other gases constitute remaining 1%. Water vapour may vary up to 3% and this only produces cloud, rain and associated phenomena. Almost all our atmospheric phenomena like clouds, rain etc. are concentrated in the troposphere, although sometimes strong cumulonimbus clouds have been noticed which grew up to 60,000 feet in vertical extent, penetrating into the stratosphere.

As soon as air becomes saturated condensation commences into droplets around condensation nuclei. However, in very clear air, it is possible for the water vapour to exceed the saturation value. This is called super saturation. Ice changes into water at 0°C but water does not necessarily change into ice at the same temperature. The freezing of water into ice depends upon ice forming nuclei. So in a cloud, for want of ice forming nuclei, small droplets of water forming cloud may, sometime, exist as liquid water at temperatures below 0° C. Such water is said to be super cooled.

For cloud formation, moist air, cooling of air usually by ascending motion, particles to assist water vapour to condense into drops are needed. If the atmosphere is perfectly clean and dust free, no cloud will be formed! The duration of time that a cloud is in existence before it will produce rain is of the order of about 20 minutes. It is essential to seed the cloud when it is growing. When the cloud has reached the mature stage no amount of seeding will produce any beneficial effect.

Cloud Seeding

Weather modification or Cloud Seeding is the intentional treatment of individual cloud or storm system for the purpose of achieving beneficial effect without harming people or environment. These programmes include, artificial rain making, suppression of snow, fog, hail and devastating winds from severe storms. In the artificial rain making programme, convective clouds like cumulus and cumulonimbus are seeded.

Monitoring the clouds using ground based radar

The radar meteorologist has to scan the target area to find out potential clouds for seeding and instruct the pilot accordingly. A 3 cm (X Band) portable weather radar was used for locating the seedable clouds in and around the target area. The ground based radar is indispensable as this alone will be able to give an estimate of cloud heights and also pin-point position of cloud systems, especially during night sorties. The radar meteorologist keeps radio contact with the pilot during seeding flight. Radar operation also helps us to notice the change in the seeded clouds and the development and decay of cells around the area of operation.

Effect of Cloud Seeding

A large cumulus cloud may contain something like ten million tons of water vapour, about one tenth of which could fall as a shower of rain. For cloud seeding to be successful it is necessary that the water and energy are available from natural sources and an unstable state must exist to which some form of trigger action may be applied. Thus seeding of the clouds at the proper time and place can produce rain.

Silver iodide is the most efficient and convenient nucleation agent for cold cloud seeding. It can be prepared in the form of a smoke consisting of particles of average mass about 10^{-16} gm. As soon as a cloud is seeded using silver iodide, the ice nucleation releases enormous amount of latent heat. This makes the cloud more buoyant, causing it to grow larger, thereby efficiently processing more water for larger time period than would have occurred without seeding. This release of heat also will increase the updraft. Mostly base cloud seeding is done when there is a good updraft in a cumulus cloud.

Criteria for cold cloud seeding

When the cloud seeding aircraft reaches the area of cloud development, the following general criteria must be met before treating the cloud :

In the case of cumulus clouds:

- a) The cloud must contain super cooled liquid water at -10°C or warmer.
- b) Cloud diameter must be greater than 2 km.
- c) Cloud thickness must be greater than 3000 metres.
- d) Updraft velocity must be greater than 1.5m/sec.
- e) Cloud base altitude must be less than 2500 metres a.g.l.

Cold Cloud seeding operation at Chennai

In the cloud seeding operation taken up in Chennai during 1984, potentially seedable cumulus clouds were identified. Two types of silver iodide candles were used. One was an end burner, consisting of silver iodide and other chemicals. This was used for cloud base seeding and penetration seeding. When ignited, this released 20 grams of silver iodide smoke and burnt for about 7 minutes. The second one was an ejectable flare which was composed of the same chemicals as end burner. This one released 10 grams of silver iodide smoke and burnt for about 20 seconds. This was generally released into cloud tops at an altitude of about 20,000 feet, when the updraft in the cloud was weak. Both types of candles were carried on either

side of the body of the aircraft attached to a frame fitted to the wings. They were ignited using an electrical circuit by operating the switches on the control panel of the aircraft. Normally the aircraft carried 10 numbers of ejectable flares and 10 numbers of end burners.

Limitations and shortcomings of the operation

- i) Being a small aircraft, Piper Aztec plane needed refuelling after 1.5 to 2 hours of flight. On one occasion we had good seeding conditions. When the aircraft came for refuelling to continue its operation, it was grounded due to the visit of the President of India, the next day!
- ii) As foreigners were involved in the seeding operation over the catchment area of the reservoirs, an IAF officer always accompanied in the aircraft, as per Government of India rules. Sometimes this posed problem when the IAF officer arrived late due to protocol delays and this affected the seeding operation. A better coordination between the pilot, the meteorologist and the IAF officer is necessary for successful operation.
- iii) On one occasion the pilot returned without seeding stating that the clouds have glaciated tops. As the ice formation has commenced no seeding was done.
- iv) Once the cumulonimbus cloud development was very good, reaching a height of 9 km. When seeded this cloud group reached a height of 18 km!
- v) Radar was kept in one of the rooms of Madras Flying Club. During VVIP movement work was hampered.
- vi) Wind shear at times cut the seeded cloud. This resulted in the top and bottom sections of the cloud moving in opposite direction and the seeding was not effective.
- vii) A seeded cloud has to stay in the catchment area for a long time to produce sufficient rain due to seeding.
- viii) It is not possible to prove that a cloud seeded would have produced the same quantity of rain without seeding.
- ix) The rain increase by seeding operation at best may produce a 10% increase in rainfall.
- x) During extreme drought conditions cloud seeding may not be effective.
- xi) The cost effectiveness of the operation has to be assessed by the Government Agencies concerned.

Acknowledgment. The assistance given by Ms.B.Amudha in preparing this article is gratefully acknowledged.

HOMAGE

Our respectful homage to Late Shri R.G.Subramaniyan, a senior member of IMS Chennai Chapter who passed away on 7th September 2017 at the age of 78 yrs. We gratefully acknowledge his contributions to the science of *Meteorology* till the end. May his soul rest in peace.

TRYST WITH SEVEN ISLANDS , MUMBAI MONSOON..

by

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July 1988, when I first set foot on the city of seven islands...so much was going through the mind after hearing a lot about the city known for fast, furious and hectic pace of life.. One can call it "Chaos unlimited".. Amongst all these, the majestic & magnificent (Seven) city will keep you engrossed , will make you realize that life is indeed an ordeal and drive away whatever laziness one may possess. No question of "*stand at ease*"... "*Attention*" is heard loud and clear wherever you look.

Often heard "survival of the fittest" is no joke by any means.. Often said, if you can survive the initial 3 months, you can take a deep breath and feel a slight sense of belonging and find a way to march ahead....

To move from a place which sees a rainfall period in "*EMIs*" (northeast monsoon) and to see a place where rains (southwest monsoon) are nothing but "*Down Payment*" I felt like a businessman with a broad smile counting currency.. May be monsoon too has a direct correlation with the commercial capital as it just flows..be it money or monsoon rains.. Two reverberating sounds what I heard almost day in and day out was "Ek, dho, Teen, chaar, Paanch , Chey, Saath, aat, noww, duss, gyaarah, baaraah, therahh and the monsoon Raaga all over again and again ...

You are bound to get a casual glance if seen wearing a leather footwear and almost a certain confirmation of a new comer trying to jump puddles ...

July & August, yes, it doesn't rain...it pours, yes pours in the real sense.. first year, found these unusual, amiss and asked myself, why and how does it rain so much...Obviously, these frantic thoughts fade away soon after few years and you feel " Ohhh its just similar to sun daily rising in the east..

Amidst this regularity, you still see mankind jumping in joy, that euphoric feel on the first monsoon showers that grace the vast expanse of the city..

Its some years now. Can still hear the monsoon raaga nice and clear even without a Dolby atmos head set.

Mumbai Monsoon magic. The everlasting pride and feel. You got to experience it.. yes.. Monsooneess.. not just awesomeness

METEOROLOGICAL SCIENCE FESTIVAL, METFEST ‘MUGIL’ – A REPORT

Under the joint auspices of Indian Meteorological Society, Chennai Chapter (IMSCC) and Regional Meteorological Centre, (RMC) Chennai a meteorological science festival (METFEST) ‘MUGIL’ was organised for school and college students in August 2017 on the theme of World Meteorological Day (WMD) 2017 – ‘*Understanding Clouds*’. Seven events – (i) Painting competition for VI-VIII standard students, (ii) Quiz competition for IX-X std students, (iii) Presentation of models / exhibits for XI-XII std students, (iv) Oral presentation for B.Sc students (v) Weather photography for B.A/B.Sc/B.Com students, (vi) Oral presentation for M.Sc/B.E/B.Tech students and (vii) Presentation of working models / schematic animations for M.Sc/B.E/B.Tech students spread over two days – 19th Aug 2017 and 28th Aug 2017 on various topics related to understanding clouds and water cycle were conducted at the premises of Regional Meteorological Centre, 6, College Road, Chennai 600 006. Events under (ii), (iii) and (vii) were team events of 2 participants per team.

50 students from schools and colleges in and around Chennai participated in the 7 events held on 19th and 28th August 2017. The detailed programme of the events conducted alongwith the topics chosen for each event is presented in *Appendix-1*. Before the start of the two events on Day-1 (19.08.2017), an inaugural session was held at 10:00 IST under the chairmanship of Dr.N.Jayanthi, Additional Director General of Meteorology (ADGM) (Retd.), India Meteorological Department (IMD) and Immediate Past chairman of IMSCC. Students who participated in the painting and quiz competitions, their accompanying teachers / parents and a few members of IMSCC attended the session.

Each event was organised under the guidance of a three member advisory-cum-selection committee. Dr.N.Jayanthi, Prof. M.S.Narayanan, Shri V.K.Raman, Dr.S.R.Ramanan, Shri P.S.Kannan, Ms.B.Amudha and Shri B.A.M.Kannan of IMSCC / RMC Chennai served in these expert committees. Prizes were adjudged by the selection committee members. Dr.K.V.Balasubramanian, Secretary, IMSCC served as the floor manager.

Three prizes – *First*, *Second* and *Third* were given for each event. Consolation prizes were also given wherever recommended by the judges. Participation certificates were given to all other participants. The list of prize winners is furnished in *Appendix-2*.

Prizes were distributed during the valedictory function held at 16:00 IST of 28th August 2017. The valedictory function was presided by Dr.S.Balachandran, Scientist-F, looking after the current duties of Deputy Director General of Meteorology, RMC Chennai. Shri Sivasakthi Balan, Principal of KRM Public School, Chennai was the guest of honour for the occasion. Dr. N.Jayanthi, Dr.S.Balachandran, Dr.S.R.Ramanan, Shri V.K.Raman and Shri Sivasakthi Balan addressed the students, teachers and parents during the occasion. Shri Sivasakthi Balan, the guest of honour, welcomed the initiative of IMS and IMD in organizing this programme and complimented them for taking up this important societal responsibility of educating the students in the field of their professional expertise through varied activities. Shri Seetharaman, teacher, Government Higher Secondary School, Arumbakkam, Chennai gave feedback on the usefulness of the programme in creating awareness and generating enthusiasm amongst the participating students in learning about the clouds and their impacts. Ms. P.Reshma Devi, III-yr B.Sc (Phy) student from Women’s Christian College, Chennai thanked the organisers for providing an opportunity for students to get exposed to the fascinating science of meteorology. The programme came to an end with vote of thanks by

Dr.B.Geetha, Joint Secretary, IMS Chennai Chapter. A few photographs taken during the events are presented in *Appendix-3*.

Appendix-1

METFEST 'MUGIL' - PROGRAMME

S.No	Event & Venue	Category of students	Topic	Schedule of event
Day-1: 19-Aug-2017, Saturday				
1	Painting competition – Conference Hall 1	VI-VIII Std	Types of clouds and related weather impacts	19-Aug, Saturday, 10:30-12:00 IST
2	Quiz – Conference Hall 2	IX-X Std	Types of clouds and related weather impacts	19-Aug, Saturday, 10:15-12:30 IST
Day-2: 28-Aug-2017, Monday				
3	Presentation of Exhibits / Models- Conference Hall 2	XI – XII Std	(i) Depict physical processes involved in cloud formation (any type of cloud) OR (ii) Role of clouds in water cycle	28-Aug, Monday, 14:30-15:30 IST
4	Oral presentation (Tamil/Hindi/Eng) Conference Hall 1	UG (Science stream)	(i) Cloud formation in tropical region OR (ii) Cloud monitoring and precipitation measurements through Remote sensing	28-Aug, Monday, 10:15-11:15 IST
5	Weather Photography - Conference Hall 1	UG (Arts /Science/ Visual communication)	Clouds & Lightning	28-Aug, Monday, 14:30-15:30 IST
6	Oral presentation (Tamil/Hindi/Eng) Conference Hall 1	PG-Basic Science / UG-Engineering	(i)Role of clouds in earth's radiation budget OR (ii) Cloud seeding experiments in India	28-Aug, Monday, 11:30-13:00 IST
7	Presentation of Working models / Conference Hall 2	PG-Basic Science / UG-Engineering	(i) Lightning in thunderstorm cloud OR (ii) Cyclone cloud structure OR	28-Aug, Monday, 14:30-15:30 IST

Appendix-2**List of Prize Winners**

1. PAINTING COMPETITION for VI-VIII std students			
PRIZE	PARTICIPANT	CLASS	SCHOOL
FIRST PRIZE	AHAAN RAY	VIII-D	D.A.V.BOYS SENIOR SECONDARY SCHOOL, Gopalapuram, Chennai-86.
SECOND PRIZE	N.M.POOJA	VIII-C	DAV GIRLS SENIOR SECONDARY SCHOOL, Gopalapuram, Chennai-86.
THIRD PRIZE	S.SRIDEVI	VIII-D	P.S.SENIOR SECONDARY SCHOOL, Mylapore, Chennai-4
CONSOLATION PRIZE	S.V.MIHIR	VIII-B	SRI SANKARA SENIOR SECONDARY SCHOOL, Adyar, Chennai-20.
CONSOLATION PRIZE	M.MADHUMITHA	VIII -E	CHENNAI GIRLS HIGHER SECONDARY SCHOOL, MH road, Chennai-11
CONSOLATION PRIZE	P.PRIYADHARSHINI	VII-H2	GOVERNMENT HIGHER SECONDARY SCHOOL, Arumbakkam, Chennai-106
CONSOLATION PRIZE	P.NITHISH	VIII-B	GENERALE CARIYAPPA HIGHER SECONDARY SCHOOL, Chennai-93.

2. QUIZ COMPETITION for IX-X std students			
PRIZE	PARTICIPANTS	CLASS	SCHOOL
FIRST PRIZE	P.PRANITH	X-C	SRI SANKARA SENIOR SECONDARY SCHOOL, Adyar, Chennai-20.
	PRITHVI KIRAN	X-D	
SECOND PRIZE	R.APARNA	X	DAV GIRLS SENIOR SECONDARY SCHOOL, Gopalapuram, Chennai-86.
	DEVIKA RAMANUJAM	X	
THIRD PRIZE	VARUN BALAJI	X-E	P.S.SENIOR SECONDARY SCHOOL, Mylapore, Chennai-4
	V.VIGNESH	X-E	
CONSOLATION PRIZE	S.LOKESH	IX-H2	GOVERNMENT HIGHER SECONDARY SCHOOL, Arumbakkam, Chennai-106
	T.KISHORE	IX-H3	

3. PRESENTATION OF MODELS / EXHIBITS: XI-XII std students			
PRIZE	PARTICIPANTS	CLASS	SCHOOL
FIRST PRIZE	SAI KRITHIKA	XII-C	SRI SANKARA SENIOR SECONDARY SCHOOL, Adyar, Chennai-20.
	R.SHARMILA	XII-C	
SECOND PRIZE	S.THIRUMURTHY	XI-A3	GOVERNMENT HIGHER SECONDARY SCHOOL, Arumbakkam, Chennai-106
	R.SATHISH RAJAN	XI-A3	
THIRD PRIZE	SAKTHI SHIVANI	XI	DAV GIRLS SENIOR SECONDARY SCHOOL, Gopalapuram, Chennai-86.
	S.K.HARITHA	XI	
CONSOLATION PRIZE	L.RAAGAVAN	XI-B1	GENERALE CARIYAPPA HIGHER SECONDARY SCHOOL, Chennai-93.
	S.SATHISHKUMAR	XI-B1	

4. ORAL PRESENTATION by B.Sc students

PRIZE	PARTICIPANT	CLASS	SCHOOL
FIRST PRIZE	P.RESHMA DEVI	III B.Sc (Phy)	WOMEN'S CHRISTIAN COLLEGE, Chennai.
SECOND PRIZE	S.SRIJA	II B.Sc (Phy)	STELLA MARIS COLLEGE, Chennai.
THIRD PRIZE	P.MADDOOMITHA	III B.Sc (Phy)	ANNA ADARSH COLLEGE FOR WOMEN, Chennai
CONSOLATION PRIZE	S.SATHYAVANI	III B.Sc (Phy)	WOMEN'S CHRISTIAN COLLEGE, Chennai.

5. ORAL PRESENTATION by B.A/B.Sc/B.Com students

PRIZE	PARTICIPANT	CLASS	SCHOOL
FIRST PRIZE	P.JENCY SEBATINE	III B.Sc (Phy)	ANNA ADARSH COLLEGE FOR WOMEN, Chennai

6. ORAL PRESENTATION by M.Sc/B.E/B.Tech students

PRIZE	PARTICIPANT	CLASS	SCHOOL
FIRST PRIZE	T.YOGESH	III - EIE	RMK ENGINEERING COLLEGE, Thiruvallur district.
SECOND PRIZE	M.PADMINI	I M.Sc (Phy)	WOMEN'S CHRISTIAN COLLEGE, Chennai.
THIRD PRIZE	S.AICEVARYA DEVI	M.Sc (Maths)	WOMEN'S CHRISTIAN COLLEGE, Chennai.
CONSOLATION PRIZE	T.KESAVARTHINI	I M.Sc (Phy)	WOMEN'S CHRISTIAN COLLEGE, Chennai.

7. PRESENTATION OF WORKING MODELS: M.Sc/B.E/B.Tech students

PRIZE	PARTICIPANTS	CLASS	SCHOOL
FIRST PRIZE	A.SAKSHI JOSHI	II M.Sc (Phy)	WOMEN'S CHRISTIAN COLLEGE, Chennai.
	S.S.MADHUVANTI	II M.Sc (Phy)	

Appendix-3

A few Photographs taken during METFEST-MUGIL

DAY-1: 19.08.2017

Under the joint auspices of

Indian Meteorological Society, Chennai Chapter

and

Regional Meteorological Centre, Chennai

METFEST MUGIL
*Meteorological Science Festival
 For School & College Students
 On the Theme:
 Understanding Clouds*

Day-1: 19-Aug-2017

Event-1	Event-2
Painting Competition	Quiz Competition
VI-VIII std students	IX-X std students
Conference Hall-II Regional Meteorological Centre, Chennai -6	Conference Hall-I Regional Meteorological Centre, Chennai -6
10:30 – 12:00 IST	10:15-12:30 IST

Inauguration



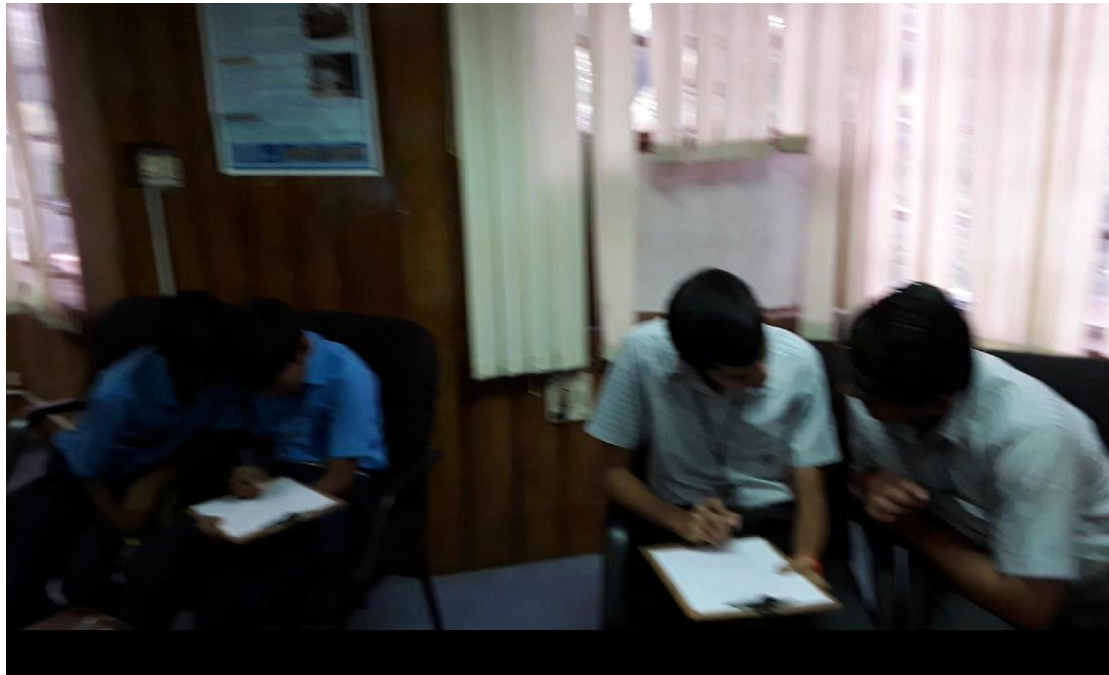
During the painting Competition







Quiz Competition in progress







DAY-2: 28.08.2017



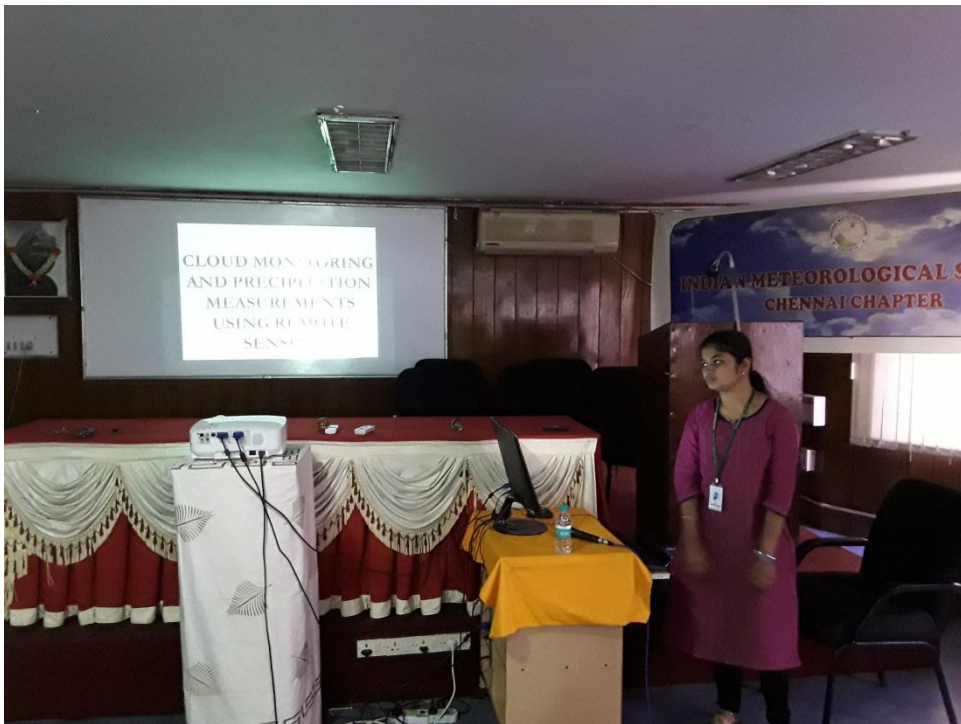
DAY-2: 28-AUG-2017 - EVENTS

28-Aug-2017 FN		28-Aug-2017 AN		
Event-1	Event-2	Event-3	Event-4	Event-5
Oral Presentation	Oral Presentation	Models / Exhibits	Weather Photography	Working models/ Animations
B.Sc students	M.Sc/B.E/B.Tech	XI-XII std	B.A/B.Sc/B.Com	M.Sc/B.E/B.Tech
Conference Hall-I RMC, Chennai -6	Conference Hall-I RMC, Chennai -6	Conference Hall-II RMC, Chennai -6	Conference Hall-II RMC, Chennai -6	Conference Hall-II RMC, Chennai -6
10:15 IST	11:30 IST	14:30 IST	14:30 IST	14:30 IST

Oral Presentations





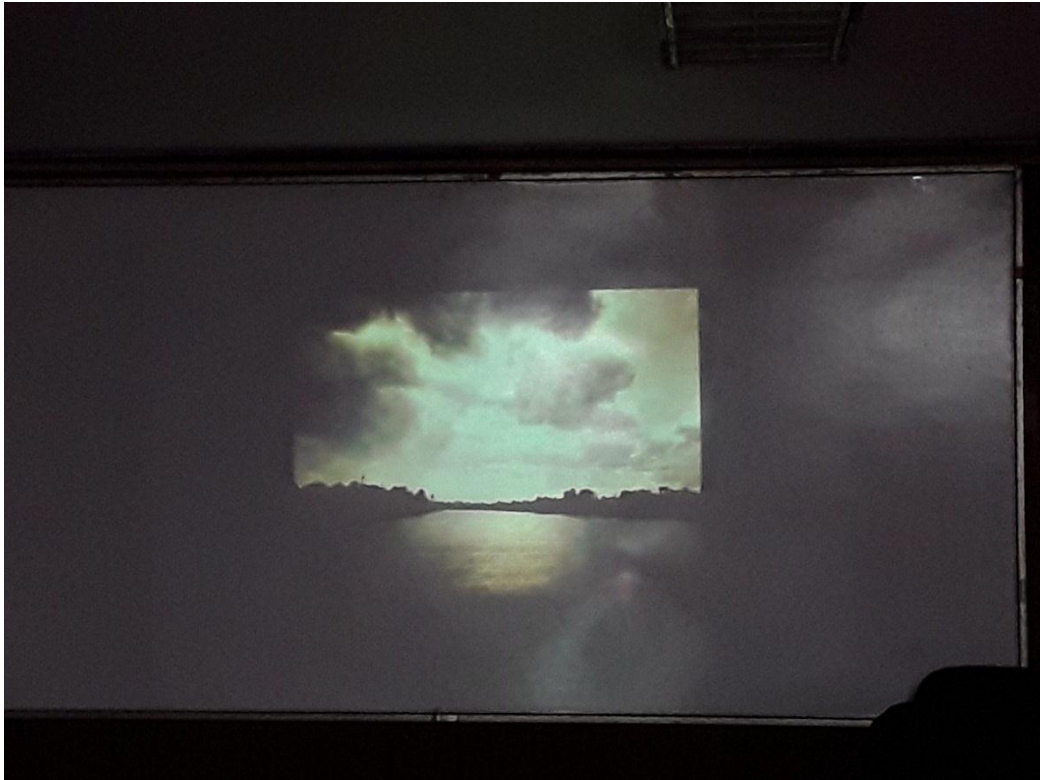






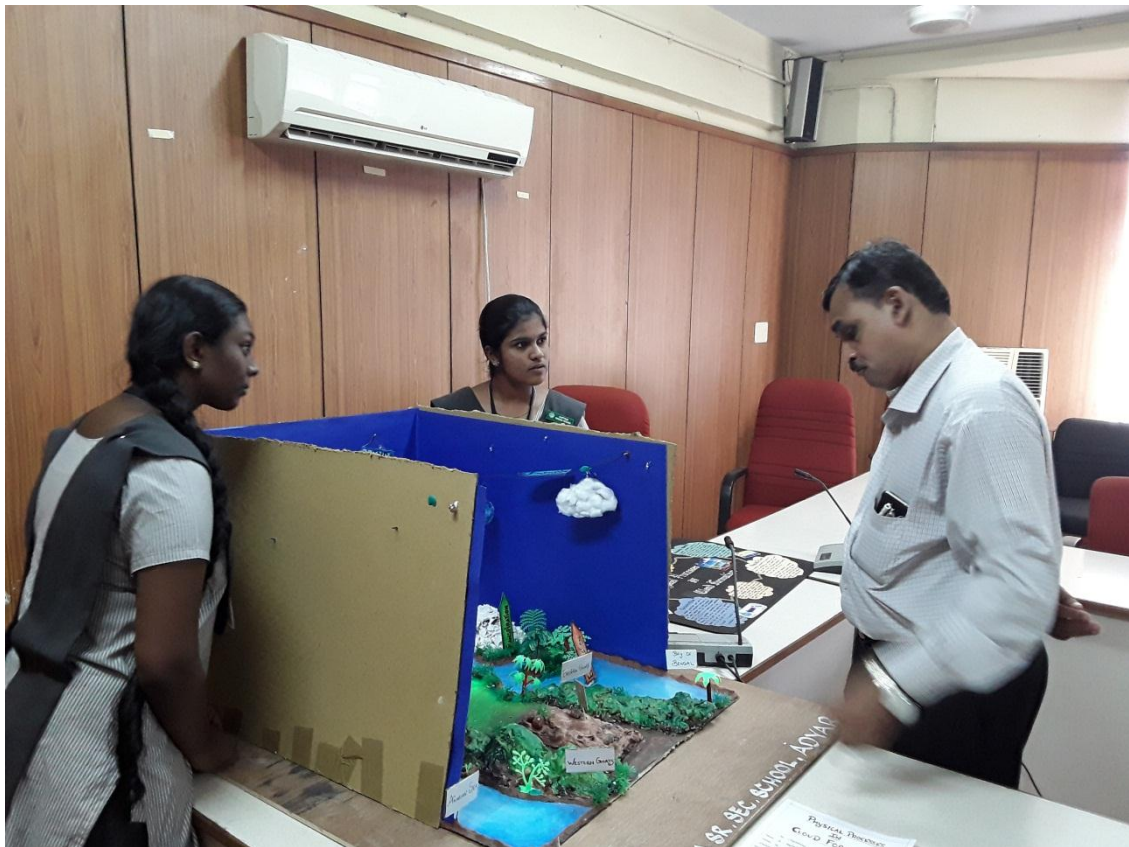


Weather Photography



Presentation of Models / Exhibits







Valedictory Function











Prize distribution



Feedback



PRIZE WINNERS



UPDATE FROM IMS – NATIONAL

Message dated 05th October 2017 by Dr.Ajit Tyagi, President, IMS

Dear Esteemed Colleagues,

Greetings.

IMS Annual General Body Meeting is going to be held on 6th October 2017 at Aranav Hall, Prithvi Bhawan, Ministry of Earth Sciences, Lodi Road, New Delhi. Please make it convenient to attend AGB and contribute in its proceedings. For the benefit of some of you who may not be able to attend AGB meeting because of other commitments, I would like to put before you actions taken since last GB meeting held on 18th December 2016 at Bhubaneswar. In the meeting 25 Points programme was presented (Minutes of the GB Meeting attached). With active support from NC Members, IMS Chapters and guidance provided by IMS Fellows and IMS Past Presidents substantial progress has been made in last ten months. Point wise status report is presented below for your perusal :

1. Membership Drive :

Four new chapters have been formed at Srinagar, Shimla, Shillong and Jaipur. Efforts are on to start IMS Coimbatore Chapter. 232 New Life members have been enrolled.

New Memberships under the Student, Institutional and Corporate Categories have been introduced. Efforts are on to have Institutional and Corporate Members.

2. College Chapters :

University/College Chapters have started at IIT Kanpur, Hyderabad University and S.R.M. University. Many Universities and Institutes have shown interest in starting University Chapters.

3. Public Awareness and Met Education Programme

A Pilot Public Awareness programme was organised in Udaipur Division of Rajasthan in association with UNICEF and Rajasthan Scout and Guide. Chapters have also organised Public Awareness Programmes

A formal programme 'Weather, Environment and Climate in School Education (WISE)' has been formulated. Proposal is with MoES for funding to organise WISE Programme for Teachers in different parts of the country.

4. IMS Diamond Jubilee Lectures :

IMS Diamond Jubilee Lectures from Prof Jagdish Shukla, Dr Kamal Puri, Dr Mohapatra DG ICAR and Drr Upendra Singh have been organised. Prof Kelkar delivered special WM Day Lecture. Lectures by Distinguished Scientists have been organised by many chapters as well.

5. Popular Book Series

With wholehearted support of senior IMS members, initiative to have popular book series on topics of general interest could be realised. Manuscript of following two books have been received

Indian Weather Satellites by Prof R.R. Kelkar

Numerical Weather Prediction by Dr D.V. Bhaskar Rao

Book on Monsoons by Prof. P.V. Joseph is at the final stage of completion

Shri Raghavan has been requested to write popular book on Weather Radars

Book on History of Meteorology was half way through at the time of the demise of Sikka saheb. Efforts will be made to complete it.

Senior IMS Fellows/Members will be requested to write popular books on other subjects

6. National Workshop on Heat waves: Early warning and Preparedness ;

The workshop was organised on 27-28th March in Delhi. More than 100 delegates from majority of Heat wave affected states and central organisations participated in the Workshop. Workshop was inaugurated by Secretary, MoES. DG, IMD, Member NDMA and many experts delivered key note address. Proceedings of the Workshop have been prepared and put on IMS Website. Shri S.C. Bhan, Dr D.R. Pattanaik and Dr Soni played key role in the planning and organising the workshop.

7. Regional Workshops/Seminars

Regional Workshops/Seminars were organised jointly with IMD/IITM. Thanks to DG, IMD and Director IITM for their active support.

IMS Kolkata Chapter organised two day Workshop on Thunderstorm supported by the West Bengal Government. Hon Minister, Disaster Management inaugurated the Workshop. Credit for the success of the workshop goes to Dr Sanjib Bandyopadhyay and members of Organising Committee.

Workshop on Lightning and Extreme Weather was organised by IMS Pune Chapter. Dr Gopalakrishnan of IITM played key role in organizing the Workshop

IMS-IMD-UNESCO joint South Asian Conference on Early Warning for Disaster Risk Reduction in Agriculture is planned on 25th and 26th October 2027 at Agriculture University, Palampur, Himachal Pradesh

Other Regional Workshop on Winter Weather in the month of November is in planning stage.

8. Annual Seminar/Workshop/meeting by Local Chapters

It is heartening to note that many chapters organised Seminars/Workshops/Meetings and other events. Details of the same is available in the Annual Report of the Chapters. Pune, Chennai and Ahmedabad Chapters carried out major activities in the form of Mausam Utsav, MetFest Mugil etc. Majority of Chapters celebrated WM Day in a big way. Report on WM Day Celebrations is being brought out.

9. Vayumandal

It is great pleasure to share that due to sustained efforts of Chief Editor Prof S.K. Dash that backlog of Vayumandal has been cleared. Thanks are due to members of Vayumandal Executive Committee, Dr Kamaljit Ray and Shri Anand Sharma for their active involvement. The Committee could bring out three Volumes in Print (41(1&2) , 42(1), 42(2)) and 4 Volumes online (41(1&2) , 42(1), 42(2), 43(1)) and will be releasing the second volume for 2017 (43(2)) in November.

The committee applied for ISSN number for the Journal to replace the existing ISDN No. and also for Evaluation for NAAS scoring of Vayumandal for Impact Factor ,to be effective from 1.1.2018.

10. Industry Interaction ; With opening of membership under Corporate Category, IMS will be able to have interaction with industry. Some leading industries have shown interest in becoming Corporate Member.

11. Brainstorming Session on Aviation Met Services is planned in the month of December 2017.

12. Media Workshop is to be organised jointly with IMD.

13. 'Make In India' Conference' : Industry is being approached to organise 'Make in India' in the month of March 2018.

14. National Quiz on Climate Change : Proposal is with MoES for funding.

15. IMS Statements : Guidelines for preparing IMS Statements is under consideration.

16. Diamond Jubilee Fund for students and Young Researcher

A special Student Event is being organised during INTROMET. Travel and stay at Ahmedabad for one student selected by each chapter will be supported by the IMS. For long term funding proposal is being submitted to MoES.

17. Felicitation of Senior (80 years and above) IMS Members

IMS is centrally felicitating senior eminent members with IMS Life Time Achievement Awards. Life Time Achievement Awards have been bestowed to Late D.R. Sikka, Shri S.Raghavan and Prof P.V. Joseph.

All Chapters have been advised to senior IMS Members of their chapters during WM Day or any other important event organised by the chapters. Undersigned attended felicitation event

organised by IMS Kolkata Chapter at the time of inaugural function of Workshop on Thunderstorms.

18 and 19. Felicitation of Past Presidents and Meeting of IMS Fellows is being planned in the month of February/March 2018.

20. Developing Linkages with other National Professional Societies

MoU with Association of Agrometeorologists (AAM) has been agreed by both societies. General Body Meeting of Ocean Society of India (OSI) has agreed to have MoU with IMS. Efforts are on to have MoU with Indian Society of Remote Sensing (ISRS), [Indian Aerosol Science & Technology Association \(IASTA\)](#) and Eco Watch Institute.

21. Generation of Long term funding

It is expected Institutional and Corporate Membership will bring in long term funding. In addition, MoES and other Science Ministries will be approached for funding.

22. Coffee Table Book

Efforts are being made to bring out History of the IMS in the form of Coffee Table Book. Chapters and members are being requested to provide historical material including photograph available with them. I am happy to share that IMS Chennai Chapter has provided required inputs. All other chapters are requested to collate historical information about IMS for inclusion in the Coffee Table book.

23. Developing IMS Vision 2030

With valuable inputs provided by IMS Fellows, IMS Vision 2030 has been prepared and put on IMS Website. Printed copies will be sent to chapters.

24. Initiating Research Proposals and Outreach

Senior IMS Members working in Agromet have been requested to prepare project proposals for outreach by IMS Chapters/Members.

25. Diamond Jubilee Directory

Membership data base is being updated with help of IMS Chapters. Updated list of Members have been put on IMS Website where one could access it chapter wise. Online updating of personal profile is also being introduced.

26. Standing Committees

IMS has formed following three Standing Committees

Vayumandal

Public Awareness and Education

Research and Publication

27. IMS Constitution

Draft Constitution with inputs from chapters/members has been put on IMS Website. You are requested to study it and give your valuable comments before it is sent for voting to members

28. Electronic Voting

It is proposed to have electronic voting for the members whose confirmed email id is available with IMS Chapters for the 2018-2020 elections.

29. Online Payment of Membership fee/Registration Fee is in advance stage of implementation.

30. INTROMET 2017 (7-10 November 2017) being organized by IMS Ahmedabad Chapter and Space Application Center has evoked excellent response from International and National Scientific Community. Updates about INTROMET are available on <http://www.intromet2017.org/>

Looking forward to your continued support.

With warm regards,

Ajit Tyagi

**INDIAN METEOROLOGICAL SOCIETY
CHENNAI CHAPTER**

Email ID: ims.chennai6@gmail.com

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Chairman	:	Shri. S.B.Thampi Ph.No.044-28276752 E-mail : sb.thampi@imd.gov.in
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Treasurer	:	Shri N. Selvam Mobile: 94442 43536 E-mail : nselvam_kavi@yahoo.com

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