

## **Report on one day Workshop**

**on 'Extreme Weather Events With Reference to Telangana State',  
jointly organized by Telangana State Development Planning Society (TSDPS) and Indian  
Meteorological Society (IMS) Hyderabad Chapter**

**on 22 March 2017**

**at Dr. Marri Channa Reddy Human Resource Development Institute, Jubilee Hills,  
Hyderabad – 500033**

The one day workshop on 'Extreme Weather Events With Reference to Telangana State', was jointly organized by Telangana State Development Planning Society (TSDPS) and Indian Meteorological Society (IMS) Hyderabad Chapter on 22 March 2017 at Dr. Marri Channa Reddy Human Resource Development Institute, Jubilee Hills, Hyderabad – 500033. The workshop was financially supported by TSDPS with nominal contribution from IMS Hyderabad chapter.

The workshop was aimed at " bringing together weather forecasters, disaster managers, administrators, planners, media, experts in allied fields like climate change, agriculture etc on to one platform" in addition to creating awareness among general public on extreme weather events that commonly occur in Telangana.

The Brochure which describes the workshop is attached at Annexure-I.

The Program Schedule of the work shop is attached at Annexure-II.

Broadly, the workshop was conducted 10 am to 5 pm in 3 sessions i.e. Inaugural session, Technical Session-I and Technical session-II and concluded with a Valedictory session. **Shri S. Niranjan Reddy**, Vice Chairman, Telangana State Planning Board was the Chief Guest of the program with **Dr. Y.V.N. Krishna Murthy**, Director, National Remote Sensing Centre (NRSC) as Guest of Honour. The valedictory session was chaired by Shri B.P.Acharya, Spl Chief Secretary, Govt of Telangana.

Around 200 participants with expertise in diverse fields from various Telangana Government Departments (Revenue, Health, Planning, Agriculture and Disaster Management), Scientific and academic institutions are participated. Some of the organizations represented include: India Meteorological Department (IMD), INCOIS, Central Research Institute for Dry land Agriculture (CRIDA), National Remote Sensing Centre (NRSC), Professor Jayashankar Telangana State Agricultural University (PJTSAU) and Academesions from University of Hyderabad, JNTU, GITAM, VBIT and domain experts from various fields, Research Scientists, IMS members and Media. List of participants attached at Annexure-III.

## Gist of Speeches/Talks

### Inaugural Session:

**Shri K. Hanumantha Rao**, Chairman, IMS Hyderabad Chapter welcomed the august gathering on the occasion of State level workshop on 'Extreme Weather Events With Reference To Telangana State'. He explained in brief about the workshop and available advisory services in the state as well as in the country.

**Shri S. Niranjan Reddy**, Vice Chairman, Telangana State Planning Board in his address expressed his great pleasure to participate in the workshop as Chief Guest for which TSDPS and IMS is jointly organizing the workshop which is the first in State level organized on unusual weather conditions such as heat wave, droughts, urban floods etc. occurring over Telangana State during the few years. Telangana State being the semi-arid zone having extreme weather conditions of hot weather during the summer and cold conditions during the winter, particularly over north Telangana. He emphasized on use of advanced technology in timely forecasting unusual weather conditions over the state and warning the public and farmers in take the precautionary measures in prevention of loss of life and property. He highlighted the Telangana Governments initiatives to maintain the greenery and water bodies with the Haritha Haram and Mission Kakatiya projects to preserve the nature. He also emphasizes on conservation of nature and re-orientation of planning to preserve the vegetation and forest area which will help in prevention of pollution and minimize the unusual weather conditions. Chief Guest also suggested IMS should take lead role in promoting the greenness and should go to filed level to educate the public, beyond Government initiatives, being an independent science society.

**Dr. Y.V.N. Krishna Murthy**, Director, National Remote Sensing Centre (NRSC) in his inaugural address explained that with the availability of advanced high resolution Satellite data more and more information is available on unusual weather conditions prevailing over the State. NRSC already supporting the Telangana Government in the their flagship programs such as Haritha Haram, Mission Kakatiya, Bhagiratha and asserts management to monitor the progress and evaluation of these programs using high resolution Satellite data. He presented the detailed information on present and future satellite data available for disaster management and to support early warning system in case of any unusual weather conditions.

At the end, **Sri Shaik Meera, CEO, TSDPS** proposed formal vote of thanks.

## **Technical session-I**

During this session, Dr. Y.V. Rama Rao, TSDPS, Hyderabad chaired the session and Dr A. Sravani, IMD, Hyderabad acted as rapporteur. Total 6 technical papers were presented during pre lunch session.

### **High Impact weather events and IMD services in real-time weather forecast and warning, Dr. (Mrs) K. Nagaratna, Scientist, IMD Hyderabad.**

Dr (Mrs) K. Nagaratna explained the various types of operational weather forecasts issued by IMD in day-to-day such as nowcast /forecast for thunderstorm/hailstorm, short range forecast for heavy rainfall events during the monsoon, heat wave warnings during the summer and medium range forecast for agricultural operations. These forecasts are issued using advanced observation network from surface, Radars and Satellite data and products including the advanced numerical model forecasts. In addition, IMD also issues weather warnings to state disaster management authority in case of adverse weather conditions for necessary action. During the discussing Dr Nagaratna informed that IMD is going to provide comfort index and data during this summer season for the benefit of public.

### **TSDPS role in Weather data collection and services, Shri S. K. Meera, CEO, TSDPS**

Telangana state development planning society (TSDPS) was established by the Planning Department, Government of Telangana to continue the services of existing hydro – metrological projects in Telangana after AP reorganization act 2014. It established 855 Automatic Weather Stations (AWS) across the state and collects weather data on hourly basis. It creates and archives a data base of weather information. It makes real-time analysis, forecast and dissemination of rainfall and temperature data/geospatial maps at micro level (10 km resolution) useful for disaster as well as management of agricultural/irrigation/allied activities. The mandal/village level data used for Water resources management and weather based crop insurance (WBCIS) for the benefit of farmers. It carries out pilot projects, conduct or coordinates research in emerging and critical areas of State's Economic and Social Sectors and urban flood, climate change impacts. Analyses the data and it generates State Mandals and Villages wise types of climate change impacts and disaster and prepares Disaster Mitigation plans and integrates them with the regular planning process at State, Districts, Panchayat levels. It also involved in R&D, Training & Capacity building & risk evaluation. The products of TSDPS are available at [www.tsdp.telangana.gov.in](http://www.tsdp.telangana.gov.in). Recently, TSDPS Regional Coordinating Officers (RCOs) were appointed in erstwhile district headquarters to supervise day-to-day monitoring the Quality of AWS data and maintain proper environmental conditions and TSDPS is installing 60 more AWS at new mandals where AWS are not available.

## **Heat Wave alert for Telangana State, AP and Orissa - Sri Siva Sai Krishna, ECSA, NRSC/ISRO.**

Dr Siva Sai Krishna explained that recently they have developed Heat Alert system based on ISRO AWS stations temperature data to issue daily heat wave watch for Telangana, Andhra Pradesh and Odisha states for day1, day2, day3 forecast and tested for the last 5 years based on IMD issued heat wave warnings and these products are available on 'Bhuvan' web portal of ISRO. They are also working on new project to develop Comfort Index based on temperature and humidity which provides a physically based relationship to the human body's core temperature.

## **Long term Agriculture performance and drought vulnerability in present and future climate in Telangana – Prof. P.S. Roy, University of Hyderabad**

He explained the long- term (150 years) Climate Anomaly in Telangana. It shows a slight increase in rainfall anomaly and an increase in long-term maximum temperature anomaly from 1970 onwards. He also explained, 67% of agriculture area in India is rain-fed and 63% in Telangana. Any failure of the monsoons result in below-average crop yields drought conditions over the state. He emphasized, in all climate change scenarios of IPCC, the intensity of agriculture drought vulnerability will significantly increase. This significant finding can help in taking a-priori steps for adaptation and mitigation.

## **Impact of climate change in Agriculture - Dr. G. Srinivas, Director (Research), Professor Jayashankar Telangana State Agricultural University (PJTSAU)**

Explained about the preparation of quality agromet advisories by keeping in mind about weather sensitive operations, crop growth phases, crop calendar, past weather and forecasted weather etc. He explained the change of rainfall and temperature trends during the last decade. It shows the Maximum and Minimum temperatures have shown increasing trends compare to recent decade. Rainfall shown decreasing trend in most of the districts except Warangal and Khammam. On dependability of rainfall during the Monsoon season, the studies shows September month shown more dependable rainfall compared to June, July. He emphasized on use of climate resilient agricultural practices to overcome the changing temperature, rainfall trends over Telangana. Sowing should be done by adopting sowing rule as receiving of 50-60 mm cumulative rainfall in light soils, 60-75 cumulative rainfall in heavy soils after onset of southwest monsoon to get better germination and optimum plant stand.

## **Climate change: Recent trends over India with specific reference to Telangana State – Dr. K. Ashok, University of Hyderabad**

Dr Ashok discussed on the climate change in India in the last 4-5 decades based on observational studies. His studies suggest that the Indian temperatures, be it the maximum or minimum or the daily mean, have been consistently increasing across the nation since

last few decades. The result is consistent with such an increase in many parts of the globe. The increasing temperatures are attributed to the increasing anthropogenic activities. The rainfall over India, however, shows a moderate decreasing trend, and such a decreasing trend is prominent in states such as Kerala and Chattisgarh, as seen across results from several observational datasets. He also explained that the observational analysis of area-weighted IMD climate datasets from 1970 – 2014, derived from stations in Telangana show that the maximum and minimum temperatures have been perceptibly increasing since 1970s, though the summer temperatures (March-May) do not exhibit any such trends. The summer monsoon rainfall also apparently has been decreasing since 1970s, which conforms to the decreasing rainfall trends. He also show that, for the recent 3-4 decades, the climate drivers such as ENSO Modoki affect the Kharif crop production in Telangana and AP despite the recent weakening impact of the canonical ENSOs on the Indian summer monsoon rainfall.

## **Technical session-II**

During this session, Dr. K. Ashok, University of Hyderabad chaired the session and Dr Srinivas, NRSC, Hyderabad acted as rapporteur. Total 8 technical papers were presented during post lunch session.

### **1. Urban flooding with respect to Hyderabad city by Shri. Krishan, S.E, GHMC**

The speaker indicated that the GHMC facilitates clearing of most of the stagnations are cleared within ½ hr to 1 hour during urban flood episodes. Actions are taken by identifying vulnerable localities and deploying teams to support these areas by following the preliminary disaster management plan. Every year drains are desilted as pre monsoon activity. As per Shri Kishan, Last year, 5.24 lakh cubic meters were desilted from drains, and the expected desilting to be carried out during 2017 is about 6.09 lakh cubic meters lakh cubic meters.

### **2. Preparedness of Telangana State Govt., for ensuing summer season by Smt. Sada Bhargavi**

Ms. Sada Bhargavi described Telangana State Govt.'s approach towards Disaster Management - from Preparedness to Rehabilitation and reconstruction through mitigation, prevention, response, rescue and relief for Unseasonal Rains/Hailstorms/Thunder storms, Heat waves, Drought/Drinking water scarcity and Fire Accidents/Forest fires, etc. Also presented action plan for preventive measure undertaken, response and rescue operations

and final relief for unseasonal rains, Hails/ thunderstorms and preparedness for Heat wave precautions.

Last year Revenue (Disaster Management) Department, Government of Telangana brought out 'Drought management manual for Telangana State-2016' and 'The Telangana State heat wave action plan-2016' for necessary action plan to be taken up by various departments in preparedness and mitigation during the drought conditions and summer season.

### **3. Activities of UNICEF for Disaster Management by Dr. M. Rajaram**

Dr. Rajaram elucidated the impact of disasters on children and women in India. He presented extensive details were given on the impact of disaster on children and women. Statistics for the period 2000-2016 presented. He presented relevant statistics for the period 2000-2016: In five major natural disasters 17,671 children lost their lives, an equal number of children was injured -19,466 schools were destroyed. UNICEF- Hyderabad Field Office working closely with DM Department and MCR-HRDI to strengthen the capacity of key stakeholders in the development disaster management plans, workshops and seminars related to DRR.

### **4. Flood Disaster Management Support NRSC - G Srinivasa Rao Head, DMS Division NRSC / ISRO**

Role of Remote Sensing (RS) and space technology was brought out by the speaker. A multitude of Indian remote sensing satellites are involved in supporting the disaster management for India. He elaborated upon the various training programs conducted by the ISRO for various organizations on utilization of RS data for a better disaster support. The speaker highlighted the support from ISRO to the Telangana Government through an example; maps of Low Lying areas vulnerable to floods are generated and given to TS police department during 2016 floods over Hyderabad. He also stated that the NRSC/ISRO Provides flood inundation model outputs for public through BHUVAN.

### **5. Space Technology for Disaster Mitigation and Management by Dr. G. S. Reddy ADG TRAC**

Dr. Reddy explained the advantages of space technology in supporting the disaster management. The TRAC has generated useful products such as a flood map for Godavari River, flood inundation maps for Khammam district , Nala (Canal) encroachment area maps for GHMC, Ground water prospective map of TS, Recharge structures for Mahaboobnagar Dist., Mandal wise drought assessment, etc., which are of potential critical importance in management and administration of the various administrative units. Also presented that NRSC prepared maps of low lying areas vulnerable to flood drain and provided to Police

department during 2016 flood in Hyderabad. Also discussed on the data availability and model outputs of urban flood in Bhuvan portal of ISRO.

#### **6. Drought - Monitoring and Management- P VIJAYA KUMAR & CH SRINIVASA RAO Project Coordinator (AICRPAM) & Director CRIDA, HYDERABAD**

Dr. Vijay Kumar of CRIDA showcased the newly developed a Moisture Adequacy Index (MAI) for Drought classification. The Mandals were categorized based on a Drought Severity Index (without considering irrigated area) for united AP. In this context, the CRIDA has developed a ranking software using historical data for prioritization of Mandals.

#### **7. Health Care during Hot Weather Conditions - Dr. U Ramakrishna**

The speaker stressed upon understanding various nuances and issues associated with outdoor heat exposure related illness and environmental factors, which contribute to the risk of heat-related illness. He provided some helpful tips for safely working in the heat conditions, and measures to avoid Heat Exhaustion or Heat Stroke.

#### **8. Experience of Cloud Seeding Operations for Mitigation of Drought Conditions in Telangana and Rayalaseema – Prof. B.Venkateswara Rao, JNTU**

Prof. Rao explained about the pioneering cloud seeding experiments over various parts of world and India, and discussed on the efforts that were taken by the united AP in identification of rain shadow region and dynamical seeding of clouds taken-up during SW and NE monsoon periods, and lessons learned.

**Wrap Up:** During the session Dr Rama Rao summarized the workshop inauguration and technical session's deliberations by the speakers and expressed gratitude to the speakers for sparing their valuable time in participating and highlighting the issues related to the extreme and unusual weather conditions over Telangana state.

## **Valedictory Session**

The valedictory session was held under the Chairmanship of **Shri B. P. Acharya, Special Chief Secretary to Government, Planning Department, Government of Telangana** and Members Shri K.H. Rao, NRSC & Chairman, IMS Hyderabad Chapter, Dr. (Mrs) K. Nagaratna, IMD, Hyderabad, Shri SK Meera, CEO, TSDPS, Dr G. Sreenivasa Reddy, ADG, TRAC, Shri A. Sudershan Reddy, Director, DE&S and Smt Sada Bhargavi, Special Commissioner, Disaster Management and Dr K. Ashok, Associate Prof., UoH participated.

The Chairman in his address complimented TSDPS and IMS in organizing this workshop at state level, which will be extremely useful for planning, adaptation and mitigation strategies for the coming summer season. He explained that at presently TSDPS collecting weather data from 855 AWS located at 10 km resolution over the entire state and Department of Economics and Statistics (DE&S) collecting manual rainfall data from 459 mandals independently. He emphasized on integration of all observational weather data collected by TSDPS, DE&S and IMD to make a single quality controlled rainfall data source to the government to support in decision making process. Regarding the increasing extreme weather events in the climate change scenario, he emphasizes, IMS as a society which is working as an independent body, can conduct awareness programs to educate the public and government officials at district level on basic issues related to the unusual weather conditions and in taking a-priori steps for adaptation and mitigation. Chairman also suggested that the outcome of this workshop to be circulated/ informed all the district collectors.

At the end of discussion, the workshop recommendations are finalized.

(SHAIK MEERA)  
Chief Executive Officer  
TSDPS

(K. HANUMANTHA RAO)  
Chairman  
IMS Hyderabad Chapter

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Anexure-I : Recommendations and Action points.

Annexure-II : Workshop Brochure

Annexure-III : Program Schedule

Annexure-IV : Photographs

Annexure-V: List of Participants



## **Recommendations and action points**

### **for strengthening of preparation and popularization of districts/mandal level advisories on Extreme Weather Events and development of feedback mechanism etc.**

1. Development of real-time Quality Control procedures and validation of AWS data studies. (Action: IMD, TSDPS, NRSC, UoH)
2. Preparation of integrated TSDPS, DE&S and IMD mandal rainfall data sets and making single data source for official use for Agriculture and disaster management. (Action: IMD, TSDPS, DE&S)
3. Heat wave prediction methods and validation studies to be taken up by operational and research centres. (Action: IMD, TSDPS, NRSC and UoH)
4. IMS should coordinate to conduct awareness campaigns in collaboration with IMD, TSDPS, Disaster Management and NGOs. (Action: DM, IMD, TSDPS, IMS)
5. Message to public or at local mandal level dissemination of this information through media/ visual presentation to be planned and community participation. (Action: DM, IMD, TSDPS, IMS)
6. Good amount of AWS data is available from different sources ( IMD- TSDPS , DST and ISRO) where ever available these data to be normalized, and converted to a common data format i.e BUFR94 for use in NWP models. IMS should support this activity by coordinating with the concerned research institutes/ academia. Analysis to be carried by the academic institutes if necessary TSDPS will support any such activity. (Action: DM, IMD, TSDPS, IMS)
7. Two/ three good article may be presented/ published in the media during this summer. (Action: DM, IMD, TSDPS, IMS)

(SHAIK MEERA)  
Chief Executive Officer  
TSDPS

(K. HANUMANTHA RAO)  
Chairman  
IMS Hyderabad Chapter

## Workshop Brochure



### WORKSHOP ON EXTREME WEATHER EVENTS WITH REFERENCE TO TELANGANA

Date:- 22<sup>nd</sup> March, 2017

Venue:- Dr. MCRHRD Institute,  
Road No.25, Jubilee Hills, Hyderabad 500033,  
India



Organised by:

Telangana State Development Planning Society  
and  
Indian Meteorological society

#### Telangana State

Telangana State is a semi-arid zone and has a predominantly hot and dry climate. The area covered by the Deccan Plateau is characterized by hot summers with relatively mild winters. It is prone to various disasters such as heat wave, thunder storms, hail storms, drought during the summer months (March-May), heavy rains and floods during the monsoon season (June-September). Climate change in terms of rainfall variability is considered to be the greatest challenge.

#### Nature of the Workshop

In view of its social relevance of the topics, TSDPS in collaboration with Indian Meteorological Society (IMS) Hyderabad Chapter is organizing One day Workshop involving all Stakeholders, officials from line department to discuss related issues to improve the quality, strength of dissemination of various weather advisories/warnings through multi channels, preparation and popularization of districts/mandal level advisories on Extreme Weather Events such as heat wave, heavy rains, urban floods, drought and thunder/hail storm for the benefit of public and agricultural operations, and development of earlier feedback mechanism etc.

#### Heat Waves



During the last 10 years, the frequency of severe heat waves and duration of heat wave spells have increased significantly. In spite of various measures taken by Government, 541 deaths due to sunstroke were reported in the year 2015 and 324 in 2016. The maximum deaths were recorded in Nalgonda, Khammam, Karimnagar and Mahabubnagar districts, where the temperatures have exceeded 47° C.

#### Heavy Rains



Heavy rains during September 2016 adversely affected the districts of Telangana and caused flash floods in Hyderabad city. Under the impact of rains, some tanks breached many standing crops were damaged.

#### Drought



Telangana has historically been prone to drought conditions. Based on last 5 years data, severe drought conditions prevailed in Mahabubnagar, Nalgonda, and RangaReddy where annual rainfall for Mahabubnagar is less than 500mm and Nalgonda 560mm where rain fed farming is not viable. During the last decade from 2001-2002 to 2011-2012, 5 out of 11 years experienced severe drought conditions with more than 50% of mandals declared as drought affected, which would impact not only water resources but also have a cascading effect on other dependent sectors.

#### Urban Flooding



Flash floods in urban areas occur due to heavy rain spells (> 20 mm/hour) in short periods due to localised weather phenomena like thunders storms, hail storms etc. During 21-22 September 2016 the situation was grim in some areas of Kukatapally, Miyapur, Nizampet, Qurtullapur, Moosapet, Begumpet, Alwal and other major residential and commercial suburbs of the city.

#### Thunder Storms



Thunder storms occur frequently in pre-monsoon season due to development of Cumulonimbus clouds when atmosphere is instable and sufficient humidity is available around. They are characterized by tall clouds, lightning and thunder, heavy rains, gale winds. May 5 2016 experienced severe thunderstorms that effected many parts of the Hyderabad city. The thunderstorms and Gale winds as strong as 150 Km/h uprooted trees and caused damage to property and loss of life.

#### Hail Storms



Hail storms also have similar characteristics of thunderstorms except that the Cumulonimbus clouds are more taller and violent than thunderstorm clouds and give solid or mixed precipitation. The heavy balls of ice cause severe damage to properties and agriculture/horticulture crops every year during the Mar-May months. On 8th Mar 2016, hailstorms caused damage to grape orchards due for harvest in Keesara of Medchal district. Sudden rains, left a trail of destruction in at least three districts of Telangana.

#### Brief on TSDPS activities

Telangana state development planning society (TSDPS) was established by the Planning Department, Government of Telangana to continue the services of existing hydro-metrological projects in Telangana after

AP reorganization act 2014. It established 855 Automatic Weather Stations (AWS) across the state and collects weather data on hourly basis. It creates and archives a data base of weather information. It makes real-time analysis, forecast and dissemination of rainfall and temperature data/geospatial maps at micro level (10 km resolution) useful for disaster management purpose as well as management of agricultural/irrigation/allied activities to create 'climate-smart Telangana'.

The mandal/village level weather data is actively used for Water resources Management and weather based crop insurance (WBCIS) for the benefit of farmers. It carries out pilot projects, conducts or coordinates research in emerging and critical areas of State's Economic and Social Sectors, Urban flood, climate change impacts.

It Analyses the data and generates State, Districts, Mandals and Villages wise vulnerability maps for all types of climate change impacts and disasters and prepares Disaster Mitigation plans and integrates them with the regular planning process at State, District and Panchayat levels. It also involves in Research & Development, Training & Capacity building & risk evaluation

The products of TSDPS are available on [www.tsdps.telangana.gov.in](http://www.tsdps.telangana.gov.in).

#### Brief on IMS activities

The Indian Meteorological Society (IMS) is an Indian non-profit organisation that promotes the advancement, dissemination of knowledge, and the application of meteorology and related sciences.

The society was established in 1956 with head quarter at New Delhi. It has several branches called 'Chapters' functioning at various places. As of now there are fifteen chapters spread all over India and 'IMS Hyderabad Chapter' is one among these. IMS publishes a quarterly magazine called "Vayu Mandal" which carries research articles in the field of meteorology and allied sciences.

Any person interested in the objectives of society can become a member of this society by paying annual or life membership fees in the categories of Student Member/Annual Member/Life Member/ Institutional Member/Patron.

#### Objectives:

- Advancement of Meteorological and allied sciences;
- Dissemination of the knowledge of such sciences;
- Promotion of application of Meteorology and allied sciences to various constructive human activities, such as, agriculture and land uses, irrigation and power development, navigation of sea and air, engineering and technology, medicine and public health etc.

Website <http://imetsociety.org>

#### Participants

The workshop is expected to be participated by around 200 participants with expertise in diverse fields from various Telangana Government Departments, Scientific and academic institutions, India Meteorological Department (IMD), INCOIS, CRIDA, NRSC, PJTSAU and Academicians from University of Hyderabad, JNTU, GITAM VBIT, NGOs, domain experts, Research Scientists, IMS members and Media.

## Programme Schedule

**One day Workshop on 'Extreme Weather Events With Reference To Telangana State' 22 March 2017; Venue: Hall No. 1, Dr MCR HRD, Hyderabad.**

<b>Inaugural Session</b>	<b>Time</b>
Registration	09.00 – 10.00
Inviting guests on to the Dias	10.00 – 10.05
Lighting of the lamp	10.05 – 10.10
Welcome address Shri K. Hanumantha Rao, Chairman, IMS Hyderabad Chapter	10.10 – 10.15
Address by Dr. M. V. R. Sessa Sai, Dy. Director, Earth and Climate Science Area (ECSA), NRSC/ISRO.	10.15 – 10.20
Address by Chief Guest: Shri S. Niranjan Reddy, Vice Chairman, Planning Board, Government of Telangana State.	10.20 – 10.40
Key Note address by Guest of Honor: Dr Y.V.N. Krishna Murthy, Distinguished Scientist and Director, NRSC/ ISRO.	10.40 – 11.00
Vote of thanks – Shri Shaik Meera, CEO, TSDPS	11.00 – 11.05
High Tea	11.05 – 11.30

### Programme Schedule

<b>Technical Session-I: Charman:</b> Dr Y.V. Rama Rao, TSDPS and <b>Rapporteur:</b> Dr A. Sravani, IMD, Hyderabad	
High Impact weather events and IMD services in real-time weather forecast and warning – Dr. K. Nagaratna, Scientist, IMD Hyderabad	11.30 – 11.50
TSDPS role in Weather data collection and services – Shri S. K. Meera, CEO, TSDPS	11.50 – 12.10
Heat Wave alert for Telangana State, AP and Orissa - Sri Siva Sai Krishna, ECSA, NRSC/ ISRO.	12.10 – 12.30
Long term Agriculture performance and drought vulnerability in present and future climate in Telangana – Prof. P.S. Roy, University of Hyderabad	12.30 – 12.50

Impact of climate change in Agriculture - Dr. G. Srinivas, Director (Research), Professor Jayashankar Telangana State Agricultural University	12.50 – 13.10
Climate change: Recent trends over India with specific reference to Telangana State – Dr. K. Ashok, University of Hyderabad	13.10 – 13.30
<b>Lunch</b>	<b>13.30 – 14.15</b>
<b>Technical Session-II: Charman: DrK.Ashok, UoHand Rapporteur:</b>	
Disaster Management preparedness and urban floods management in Hyderabad, Shri Kishan, SE, GHMC	14.15 – 14.30
Preparedness of Telangana Government for ensuing summer season - SmtSadaBhargavi, Special Commissioner, Disaster Management, Telangana	14.30 – 14.45
Activities of UNICEF for Disaster Mitigation - Dr M. Rajaram, DRR Officer, UNICEF, Hyderabad	14.45 – 15.00
Extreme flood events monitoring of Telangana State using remote sensing and GIS - Shri G. Srinivasa Rao, Head, DMSW, NRSC/ISRO	15.00 – 15.15
Space technology for disaster mitigation and management - Dr G. Sreenivasa Reddy, Additional Director General, TRAC	15.15 – 15.30
Drought - Monitoring and Management, Dr P Vijay Kumar, CRIDA, Hyderabad	15.30 – 15.45
Health Care during Hot Weather conditions-Dr. U Ramakrishna, Director of Public Health and Family Welfare representative, Hyderabad	15.45 – 16.00
Cloud seeding operations for Drought/Disaster Mitigation - Prof B. Venkateshwar Rao, JNTU Hyderabad	16.00 – 16.15
<u>Valedictory Session:</u>  Chairman: Shri B. P. Acharya, Special Chief Secretary to Government, Planning Department, Government of Telangana  Members: Shri K.H. Rao, Dr. K. Nagaratna, IMD, Hyderabad, Shri SK Meera, CEO, TSDPS, Dr G. Srinivas Reddy, ADG, TRAC, Shri A. Sudershan Reddy, Director, DE&S and SmtSadaBhargavi, Special Commissioner, Disaster Management	16.15 – 16.45
Wrap Up and Vote of Thanks by Dr. Y.V. Rama Rao, TSDPS	16.45 – 17.00
<b>Tea Break</b>	<b>17.00 – 17.15</b>

Photographs





## Annexure-V

### List of participants attended the One day Workshop on 'Extreme Weather Events With Reference To Telangana State' on 22<sup>nd</sup> March, 2017 at Dr MCR HRD, Hyderabad

S. No	District	Name and Designation	Name of the Office	Contact Number/Email ID
1	Adilabad	VSC Keshav Rao CPO	CPO's Office, Adilabad	9704956496 cpoadbd@gmail.com
2	Adilabad	Jiteender Reddy I/c D.P.O.	DPO Office, Adilabad	9849900031 dpo.adbd@gmail.com
3	Adilabad	Krishna Reddy JC	Collectorate, Adilabad	9502770131 jc_adbd@telangana.gov.in
4	Bhadradi Kothagudem	Balashowry CPO	Chief Planning Office	9849901394 cpoktdm@gmail.com
5	Bhadradi Kothagudem	Kiran Kumar DRO	Collectorate	7995571866 drobhadradi@gmail.com
6	Bhadradi Kothagudem	Venu Gopal DV&AH officer	District Veterinary & Animal Husbandry Officer	9440335586 dvahoktgm@gmail.com
7	Hyderabad	A.Balram CPO	Chief Planning Office	9849901549 cpohyderabad@gmail.com
8	Hyderabad	SatishChandra DRO	Revenue Department	9440815887 dro.hyderabad@gmail.com
9	Hyderabad	Dr. Padmaja DM&HO	DM&HO	9849902455 dmhohyderabad@gmail.com
10	Jagitial	Sarfaraj Ali farque Sub Collector (Metpally)		
11	Jagitial	G.Kanakaiah CPO	Chief Planning Office	9849951890 cpo.jgl@gmail.com
12	Jagitial	Smt. Sugandini DM&HO	DM&HO	
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