Proceedings

Webinar on Heat Waves in South Asia

6th June 2021

Organized by:

South Asian Meteorological Association (SAMA), India Meteorological Society (IMS)-Jaipur Chapter and South Asia Heat Health Network (SAHHIN)

This document is an outcome of the Webinar organized by SAMA, IMS and SAHHIN on Heat Waves in South Asia on the occasion of World Environment Day 2021 on 6th June 2021

Acknowledgment

We express our gratitude to everyone who has contributed to the Webinar on "Heat Waves in South Asia" organized by the South Asian Meteorological Association (SAMA), India Meteorological Society (IMS)- Jaipur Chapter, and South Asia Heat Health Network (SAHHIN).

We acknowledge and thank keynote speaker Prof. Dileep Mavalankar, Director IIPH Ahmedabad; Co-Chairs Ms. Sujata Saunik, Additional Chief Secretary, Government of Maharashtra, Dr. L.S. Rathore, Former Director General, Former DGM, India Meteorological Department, Mr. Ahmed Rashid, Deputy Director General Maldives; Lead Speakers Dr. S.C. Bhan from IMD, Dr. Md. Abdul Mannan, Meteorologist In-Charge, SWC, Bangladesh Meteorological Department, and Dr. Lakshmi Kumar, SRM University, and speakers from member countries. We are thankful to Shri P.N. Rai, Member Bihar SDMA, for his valuable comments in the concluding Session.

We are immensely thankful to the Prof. Someshwar Das, Convener, SAMA, Prof. Rajesh Kumar, Chairman, IMS- Jaipur and organizing committee members for providing valuable support in organizing the Webinar.

We also want to thank Prof. Jyoti K. Parikh, Executive Director, IRADe for her guidance and IRADe team members Ms. Ananya Bhatia, Research Associate, and Ms. Nimisha Jha, Senior Research Analyst, for their support in drafting the seminar proceedings.

Prof. Ajit Tyagi
Chairperson, SAMA

Mr. Rohit Magotra
Convener, SAHHIN & Deputy Director, IRADe

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SAHHIN acknowledges support of International Development Research Centre, Canada and Global Heat Health Information Network for supporting the forum.

South Asian Meteorological Association (SAMA)

Webinar on Heat Waves in South Asia

On the Occasion of World Environment Day 2021

Keynote Presentation

Speaker: Prof. Dileep Mavalankar
Director
Indian Institute of Public Health, Gandhinagar, India

Title : Climate change, Heatwaves and Lessons from Heat action plans in India

Date : 6 June 2021, Sunday
Time: 10:00 AM IST (04:30 UTC)

Join us for live talk on SAMA YouTube Channel
South Asian Meteorological Association - YouTube

Lead Presentations

Dr. S. C. Bhan
IMD, India

Dr. Rohit Magotra
IRADe, India

Dr. Md. Abdul Mannan
BMD, Bangladesh

Dr. T.V. Lakshmi Kumar
SRM IST, Chennai, India

South Asian Meteorological Association is a professional non profit organization for the promotion of Meteorology and allied sciences and their application for the safety and well being of the citizens and sustainable development.

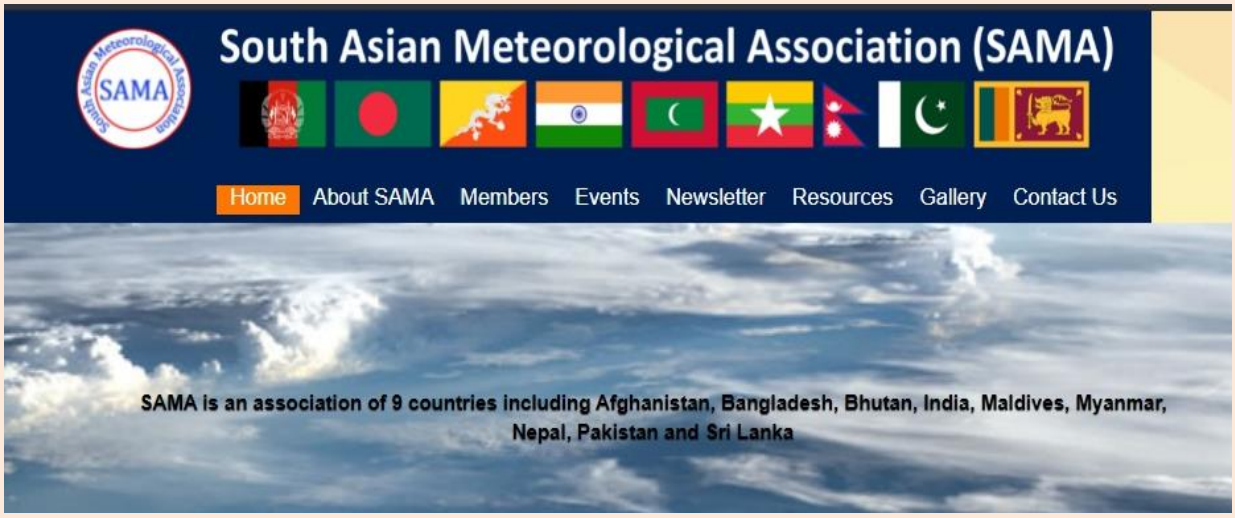
For more details, contact: Prof. (Dr.) Someshwar Das (sama03aug@gmail.com)

Inaugural Session

Welcome Address by AVM (Prof.) DrAjitTyagi, Chairman SAMA

Prof. Ajit Tyagi welcomed all the participants, key stakeholders on behalf of SAMA, Indian Meteorological Society (IMS)- Jaipur Chapter and SAHHIN. He cited examples of heatwaves in Europe, 2003 & 2018; Russia, 2010; South-Asia, 2015highlighting that heatwaves are multidimensional both in space and time. He emphasized that regional aspects must be considered and we address the forecast and monitoring at the regional scale. Since the future projections indicate that the intensity and frequency of heat waves will only increase in the future, we have to be ready for impacts. This will require Heat Action Plans (HAP) at the National, State, city and also at ward level.

After formally launching the SAMA website, Dr. Tyagi shared its unique characteristics. He mentioned that SAMA is an association of meteorologists and other experts from nine countries including Afghanistan, Bangladesh, Bhutan, India, Maldives, Myanmar, Nepal, Pakistan and Sri Lanka. SAMA has more than 130 members till date and its membership is increasing. An Advisory Committee (AC) of SAMA is formed including members from all the countries. The activities of SAMA are guided by the AC. The vision of SAMA is Sharing Knowledge of Weather and Climate without Borders. The mission of SAMA is "Meteorology for the sustainable development of the region".



Dr Someshwar Das, convener, SAMA coordinated the Webinar

Remarks by Dr Rajesh Kumar, Chairman, IMS, Jaipur Chapter

He welcomed everyone highlighting activities of SAMA since its inception in August. He explained that heat waves will be common even after achieving the 1.5-degree target. He added that the past two decades have been the hottest in this century. Heatwaves have become an important area of study and we need to work on how to reduce the impacts and come up with solutions to control the warming.

Remarks by Mr. Rohit Magotra, Deputy Director IRADe & Convener, SAHHIN

In his address Mr. Magotra shared that urbanisation is key driver of degradation of ecosystem. It is estimated that by 2030, almost 70 % of the population will be based in cities. Urbanization is driving dilapidation of the ecosystem as well as the ecosystem services. Henceforth, efforts are required for restoration of biodiversity and ecosystem in the cities.

Since 2020, South Asia Heat Health Initiative (SAHHIN), hosted at IRADe, has been established as a complementary node of Global Heat Health Information Network (GHHIN) supported by World Health Organization (WHO) and World Meteorological Organization (WMO). He stated that India established many state and city Heat Action Plans to reduce the mortality and associated mortality resulting from heatwaves. He thanked the collective work of NDMA, IMD, IIPH and many other partners due to which India established many state and city HAPs. IRADe supported by International Development Research Centre (IDRC), is working with the cities of Delhi, Rajkot and Bhubaneswar to develop ward level HAPs. The important lessons from India can be taken to South Asian cities for future preparedness of the South Asia region.

Keynote Presentation

Climate change, Heatwaves and lessons from Heat Action Plans- Ahmadabad Heat Action Plan in India

Prof. Dileep Mavalankar, Director, Indian Institute of Public Health (IIPH), Gandhinagar, India

In his address he highlighted that increase in average temperature, duration, frequency and intensity of heat waves along with increased night temperature have been the prominent impacts of changing climate. He stated that dehydration, kidney related diseases, respiratory diseases, heat cramps and heat stroke are some of the health impacts due to heat waves. Other impacts also

include increased urban fires and forest fires along with air pollution. In order to protect people in heat wave strategies could include keeping the home cooler, staying out of the heat, staying hydrated and protecting from direct sun. Presenting a case study of Ahmedabad in May 2010 when the temperature reached 47 deg C on 21st May, he stated that 800 excess deaths were reported in 1 week and there were 1344 excess deaths as compared to the average deaths during the same time in 2009 and 2011. The city of Ahmedabad responded with the first Heat Action Plan in the year 2013, first of its kind in South Asia. It draws from the learning from HAPs from the USA and Europe and is the first Threshold-based HAP. It has four main components

1. Early Warning System and Inter-Agency Emergency Response Plan,
2. Public awareness & community Outreach,
3. Capacity building of medical professionals, and
4. Reducing heat exposure and promoting adaptive measures.

Later, cool roofing was also added by the AMC (Ahmedabad Municipal Corporation) in 2017. As a result, a significant decrease in heat-related mortality was observed after implementation of the HAP and an estimated 1190 deaths were avoided as compared to the earlier scenarios without the HAP. This was later adopted by other Indian cities. Since 2019, the Government of India (GoI) is working with 100 cities and 23 states to develop HAPs.

Concluding his presentation he elaborated on the key lessons for a successful HAP which are: improvement of administrative and health and political leadership, stakeholder engagement, facilitation by local and national institutions, learning and adaptation of HAPs developed in other countries, setting up SOPs and making HAP part of Disaster Planning for states, Importance of recording and analyzing the causes of deaths, mortality and morbidity, the measurement of process of implementation and impact of mortality and morbidity, adequate funding and linkages with agencies. He further mentioned that there are several issues and challenges like many administrators fail to see the environment and health linkages, and the connection between mortality-morbidity and rising temperature is not understood. The environment health departments are not prioritized, the cool roof program implementation is not fully adopted by planners, architects, civil engineers, lack of research and data at local levels is there. He concluded by adding that this is just the beginning of Climate Change and the worse is yet to come so we must start preparing for the next 80 years.

Session 1: Lead Presentations

Chair: Ms. Sujata Saunik, Additional Chief Secretary, Govt. of Maharashtra

Co-Chair: Dr. L.S. Rathore, Former DGM, India Meteorological Department

Ms. Sujata introduced the panelists and highlighted the work of Government of Maharashtra's Public Welfare department, she stated that the department has adopted the Green Building Code and all the buildings have a heat adaptation system including Cool roofs. She emphasized that India ranks 7th most vulnerable country due to Climate change according to the Global Climate risk index report released in 2021. In addition to its climate impacts, there are implications of Climate change in terms of livelihood, productivity, rising deaths, and sheer economic burden among different sections of the society. The Heat Action Plans should consider aspects of citizen-science needs; community outreach; use of local knowledge to cope with extreme heat. The role of Civil societies and technical institutes is important to undertake research and create awareness.

Dr LS Rathore explained that Heatwaves is a complex subject as the heatwave characteristics are changing very fast due to several factors like increased concentration of Greenhouse Gases, ocean temperature, increased Ultra Violet intensities, neglect of the environment and biodiversity.

Heat Wave Early Warning and Management system in India and possible South Asian collaboration

Dr S.C. Bhan, Scientist 'F', India Meteorological Department

In his presentation Dr. Bhan provided a detailed account of the heat wave scenario and trends in India and South Asia. He highlighted that the intensity, duration and spread of heatwaves is increasing primarily due to GHGs, land use changes, increased urbanization and poor housing conditions has increased exposure of a larger section of the population to outdoor warmer environment. This has resulted in very significant heat wave events in the recent past in many parts of the regions such as northwest India and South Pakistan. The warm nights and high humidity are additional issues in North-West India and South Pakistan. In India, observed trends show that the annual mean temperatures have increased at a rate of 0.61 C in 100 years. This is very similar to the global temperature rise. He contended that in India in 2019 first heat related death occurred in March as heat waves are setting in early. These are also increasing in duration and intensity. While explaining the duration of heat waves, he explained that the heat waves in India come in spells of

5-6 days normally and can even go up to 15 days, as noticed in some cases. In India the Heat Wave Early Warning System and Forecasts are based on numerical weather prediction models by using "Get, Set & Go" Heat Wave Early Warning System for different temporal scales. Based on these, an outlook is prepared for Mar-May issued on the last day of February. The Central, State and District agencies review the HW preparedness coordination based on the seasonal outlook. This outlook is revised at the end of March for April-June. The forecasts for weekly maximum - Minimum temperatures and rainfall are issued once a week out for the next four weeks. This helps the health system and other concerned departments review their level of preparedness in case a heatwave is predicted. Actual warnings for heat waves are issued up to 5 days in advance with different colours assigned to different combinations of duration and severity. He elaborated on how IMD coordinates with the states to make the heatwave warnings more effective (temporally and spatially sensitive) and about the support mechanisms needed for the people to adapt which includes measures such as circulation of Early Warning Systems of the Medium range through websites, emails, TV, radio, press, Government, Indian Meteorological Association, Red Cross, Agromet Field Units, social media; color-coded warnings based on severity and duration of the heatwave; impacts on the various sectors and vulnerable populations; and suggestive actions are included. Similar bulletins for districts are also issued by state meteorological centres. Considering the success of the Ahmedabad Heat Action Plan, the NDMA and IMD coordinated with various stakeholders and states and came out with the first National Guidelines for the management of heatwaves in the country which were first issued in 2016 by NDMA and were later revised in 2017 and 2019. The guidelines covered information on preparing a heatwave action plan, early warning and communications, dealing with heat-related illness and roles and responsibilities for managing heat waves. After these measures, fewer deaths were reported after 2015 despite an increase in Heatwave events. The system has a well-designed heat wave related death reporting and is backed by continued in season discussions, concerted education/ awareness campaigns through various outreach modes. There is much work that needs to be done in the improvement of model predictions and diagnosis, addressing the user's requirements for product generation and information communication. Some of the current work carried out by IMD on heat mitigation includes daily impact-based heat warning bulletins, extended outlook for the next 2 weeks, seasonal forecast outlook, interactive maps, the normal relative humidity for peak months, station wise threshold of maximum Temperature among other information. IMD continuously improves

the process by understanding user's information needs and utilization patterns. He also suggested that the outlook of the heat waves in the South Asia region done by IMD can also be made available to the other South- East Asian Countries.

Climate Adaptive Heat Action Plans

Mr. Rohit Magotra, Deputy Director, IRADe, New Delhi

He stated that 2011- 2020 has been the warmest decade and Climate Change frequency, duration and severity of heatwaves has increased during the last 50 years. The health impacts of heat are more severe in urban areas, wherein the heat stress-induced deaths in 2100 are estimated to be about 85 per 100000 globally and above 100 per 100000 in lower-income groups. The lost productivity from heat stress at work, particularly in developing countries, is expected to be valued at 4.2 trillion USD per year by 2030. He shared that IRADe reviewed Heat Action Plans in South Asia and found that though there are more than 100 cities in India which have Heat Action Plans but in other South Asian countries, Karachi is the only city that has a heat action plan, so there is a dire need for HAPs for South Asian cities. Several coastal South Asian cities need HAPs due to the deadly combination of humidity as well as the temperature. He explained the broad methodology of Climate Adaptive Heat Action Plan work carried out by IRADe that has these components- Climatological variations in summers, climatology assessment and climate projections, records of heat-related Mortality and Morbidity, development of Thermal Hotspot Maps, Vulnerability mapping, Vulnerability Hotspot maps. The climate and gender sensitive Heat adaptation and mitigation strategies were developed on the basis of these components. In the implementation of HAPs role of stakeholder engagement is an important component and engagement is the key. To enable this, capacity building and sensitization of the stakeholders must be included. The Draft Heat Stress Action Plan prepared should be shared with the community and stakeholders to take their feedback and upon finalization, further dissemination and outreach activities are to be carried out. It is important to assess the geographic variability in heatwave vulnerability which forms the basis for planning appropriate targeted adaptation strategies. Thermal hotspot maps for Delhi, Bhubaneswar and Rajkot, were developed by IRADe and results captured the spatial variation of temperature within the cities, including ward wise impact of factors like Housing, Water Supply, electricity, ventilation, heat wave awareness, access to health care and overall cumulative ward vulnerabilities across the study areas. The study also included heat wave impact on wage loss, productivity loss and its associated risks of heat stress. The

adaptation and mitigation measures include the awareness campaigns, mitigation measures on how to keep the local environment and individual cool, early warning communication systems, medical preparedness and monitoring and analysis.

IRADe conducted several state/city workshops to train the medical practitioners for sensitization towards heat stress adaptation. He shared information about SAHHIN and urged the participants to join the forum and also help prioritize the activities of the forum. The details of the forum are available on the website https://climateandcities.org/.

Heatwaves and their impacts in Bangladesh

Dr Md. Abdul Mannan, Meteorologist In-Charge, SWC, Bangladesh Meteorological Department

He gave an overview of heat waves in Bangladesh. Using the definition of heat wave by the Bangladesh Meteorological Department which is when the Maximum temperature is more than 36 Degree C and the departure of at least 2 degrees C from Normal Temperature is observed for Maximum temperature for three days and covers at least 10000 sq. KM with three synoptic stations in the vicinity. He pointed out that the country has experienced long duration heat waves since 2014. Changes in the surface wind direction, relative humidity and certain other meteorological factors can lead to such events of Heatwaves. In the last three years Bangladesh has made progress in heat wave monitoring and provides thresholds at National, District and sub-district levels. Sharing the average maximum temperature and highest maximum temperature for the period 23-30 April 2021, he highlighted that extreme Southwestern region, Central districts and Rangamati-Sitakunda regions in Bangladesh are most impacted by heat waves. Similarly, the Heat index has been calculated for all the BMD stations in Bangladesh. Bangladesh has also introduced a simulation on Heat Wave Early Action Piloting in collaboration with Bangladesh Red Crescent Society (BDRCS), German Red Cross (GRC) and Red Cross Climate Centre. These agencies are looking forward to deploy their knowledge and expertise to do a pilot study on Heat Waves. The objectives of the study will be to develop triggers and thresholds and to identify the impact of heatwaves on the vulnerable population of Dhaka. He mentioned that forecast based financing on extreme floods and cyclones are successfully implemented. The Heat Wave early action in Dhaka has been carried out by the BDRCS for collecting socio-economic and demographic information of the vulnerable population, and awareness activities have also been carried out. In conclusion,

he stated that Bangladesh is becoming more vulnerable to heat waves every year and activities for the management of Heat waves are being carried out.

Heat extremes over India in the changing climate scenario

Prof. Dr. T.V. Laksmi Kumar, Atmospheric Science Research Lab, SRM IST, Chennai

He elaborated that Arctic warming has a large scale connection to Indian Heatwaves. He explained the Quasi-Resonant Amplification (QRA) Impact on extreme weather events which can be linked to several disasters worldwide. The QRAs are responsible for the extreme high and low temperatures in the Northern Hemisphere. He shared the study in which the Indian heat waves of 2010, 2013 and 2015 were captured to show a relation with QRA. The presentation also covered projections of heat stress over India and its associated work performance in RCP 4.5 and 8.5 climate scenarios. An analysis of the decline in work performance due to heat stress was also shared. Decline in work performance is reported especially in the coastal regions of India.

Dr. Rathore emphasized that communication of early warning needs to be followed and implemented. This requires a local action plan and inter-agency coordination along with policy intervention, education and awareness. At the end of the day, each individual is responsible to cope up with the heat stress impacts so education and awareness are of crucial importance.

Session 2: Presentations from Member Countries

Chair: Mr. Ahmed Rasheed, Deputy Director-General, Maldives Meteorological Service

Co- Chair-Mr. Muhammad Riaz, Director General, PMD

Mr. Rasheed commented that heatwave is a prevalent climate-related natural hazard and a silent disaster and adversely affects the health, livelihood and productivity of the people. South Asia is a hotspot for heatwaves and related incidents.

Country Presentation - Afghanistan

Mr. Sikandar Osmany, Afghanistan Meteorological Department

He gave an overview about Afghanistan where the temperature varies on average from -10 ℃ in winters to 34 ℃ in summers with extreme reaching as high as 49℃ in the desert regions and as

low as -25 ℃. He informed about the wide variations in Maximum and minimum temperatures and the methods being used in Afghanistan for predictions.

Country Presentation - Bangladesh

Dr Fatima Akhtar, Assistant Professor, Department of Meteorology, University of Dhaka

She highlighted that Bangladesh is prone to strong Thunderstorms in the pre-monsoon season (March-May) every year. She cited an example of the convective storm of April 4, 2021 which damaged the agriculture sector largely. The WRF model captures the unprecedented storm, though simulation has some spatial and temporal biases. The formation of the storm was underneath the westerly trough and low-level anticyclonic circulations over the central and northeastern part of the country shifted southeastwards. As a result, heat shock occurred in this event due to low humidity, high temperature, intrusion of dry warm air, existing prolonged heatwave, dry land with less rainfall and high vapour pressure decline. The High Temperature remained for a long time and created a heat wave condition in Bangladesh.

Country Presentation - Bhutan

MrSaroj Acharya, Engineer, Weather and Climate services Division, NCHM, Bhutan

He highlighted that the months of June, July and August are the hottest and temperature reaches more than 36 degrees C in many parts of Bhutan. Giving an example of the Lunana region, in 2019, he showed that high temperatures in April, May and June led to the excessive melting of glaciers causing a partial breach of the main lake on Thorthormi glacier on 20th June 2019. The incident is a lesson for sudden impacts of temperature rise which can cause glacial lake outburst, flood hazards in the future. Hence, monitoring of the temperature and related incidents is very crucial to predict such future incidents.

Country Presentation - Myanmar

Mr. Win Maw, Deputy Director, Department of Meteorology & Hydrology, Myanmar

He discussed that Myanmar faces numerous hazards throughout the year. Temperature rose to 47.5 Degree C in Chaukon May 8, 2020. In Myanmar, the temperature is rising every year drastically. More than 20 stations observed a new maximum temperature record in 2021. The Department of Meteorology and Hydrology, Myanmar will work in close collaborations with SAMA and other member countries and actively participate in heat management.

Country Presentation - Nepal

Dr Indira Kadel, Senior Divisional Meteorologist, Dept. of Hydrology & Meteorology, Nepal

She explained the heatwave situation in Nepal where the Heat stresses (frequency of hot days and heatwaves) is increasing and requires further assessment. In Nepal, under a high emissions scenario, heat-related deaths in the elderly (65+ years) are projected to increase to about 53 deaths per 100,000 by 2080 compared to the estimated baseline of approximately 4 deaths per 100,000 annually between 1961 and 1990(WHO, 2016). The Department of Hydrology and Meteorology has recently started to inform the government and news media on short-range weather forecast when there is a persistent very high temperature (>40°C). There is an urgent need to establish/enhance the heatwave early warning system in Nepal including the assessment of casualty and damage; database of casualties and damages due to heatwave/hot days. For this purpose, collaboration with national/international organizations for the establishment of monitoring and Early Warning System and dissemination and integration of heatwave information in decision making, preparation of strategic action plans is required.

Country Presentation – Pakistan- Heatwaves in Pakistan

Mr. Nadeem Faisal, Director, CDPC, Pakistan Meteorological Department, Karachi

In Pakistan, heat-wave event starts from the month of May and extends up to September. These are more common in pre-monsoon months (May & June) in plains of the country. Seasonal analysis of heat index for entire Pakistan depicts that there is a significant increase in apparent temperature for about last few decades. Pakistan's maximum temperatures have warmed considerably with more warming in daytime temperatures than nighttime temperatures. Pakistan experienced its hottest recorded temperature of 54.0 °C on May 28, 2017, in Turbat. It was the fourth-highest temperature ever recorded on earth and the hottest reliably measured temperature ever recorded in Asia in the last 80 years. During the 3rd week of June, 2015 a severe heatwave struck Karachi. This heatwave caused over 1200 deaths. In May 2016 PMD established a heatwave early warning centre in Karachi. Based upon the analyses of global, regional and local meteorological conditions, PMD issues the risk of heatwaves. Heat-related health risks can be reduced through the systematic development of heatwave early warning systems These provide meteorological and/or climate prediction based information on the likelihood of forthcoming hot weather that may have an effect on health. This information can be used to alert decision-makers,

health services and the general public to trigger timely action to reduce the effects of hot-weather extremes on health.

Country Presentation – Sri Lanka- Heat Wave High-Temperature Effect in Sri Lanka

Ms Anusha Warnasuriya, Director, Department of Meteorology, Sri Lanka

She highlighted that extreme heat conditions occur during March, April and May. The future projections show that the warmer days will be on the rise in Sri Lanka. She explained the efforts of the meteorology department in issuing heatwave advisories. There will be a risk of Heatwaves / extreme heat in Sri Lanka in near future due to various problems of Global warming, increasing population, increasing urbanization and increased migration of people in urban areas.

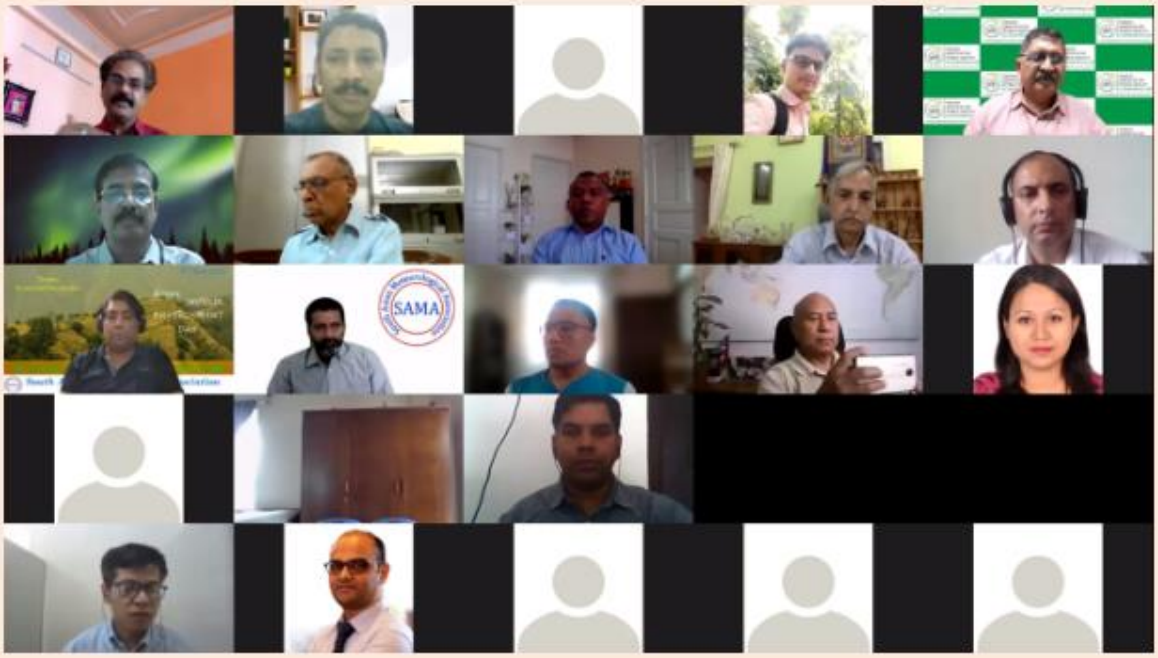
Closing Remarks

In his closing remarks, **Mr. PN Rai, State Disaster Management Authority, Bihar** thanked everyone for participation. He mentioned that there is a lot of knowledge available in India and the neighboring countries. This knowledge needs to be shared with all the people involved in the management of heatwaves and with the policymakers. For this a closer interaction is needed between the scientific community and people on the ground in states governments; district, sub-district levels. He emphasized that the heat wave is going to be a major disaster in the coming times. The Human cost of Disaster report published by UNDRR in 2020 says that 91 percent of extreme temperature-related deaths are due to heatwaves. The number of states affected by heatwaves in India has risen from 9 to 15 and now stands at 20 states in 2020, although the deaths have come down significantly due to the management of heatwaves by the government. In this regard, the Heat Action Plans have been a great success and there is a need to work on long term measures. However, there is a challenge of health data repository, mortality data is often available with gaps; but morbidity data is often not there. Another challenge is that all the state governments need to establish a robust health monitoring system and early warning dissemination system. There is a need for focus in rural areas also which are often left out in heatwave management. Heatwave management should be seen together with the management of other resources like water, ecosystem, droughts, forest fires. The government of Bihar's programme on 'Jal Jiwan Haryali' has worked on the rejuvenation of water bodies, traditional water bodies, tree plantation among others and it has been highly successful in rural areas. Summing up, he explained that more related

programs which work on reversing the effects of climate change in the long term adaptation programmes must be implemented.

Prof. Someshwar Das and Dr. Ajit Tyagi gave a vote of thanks to all the participants of the Webinar. The Webinar was attended by more than 90 participants

Webinar recording available at: https://youtu.be/5mNgDmTn4dE

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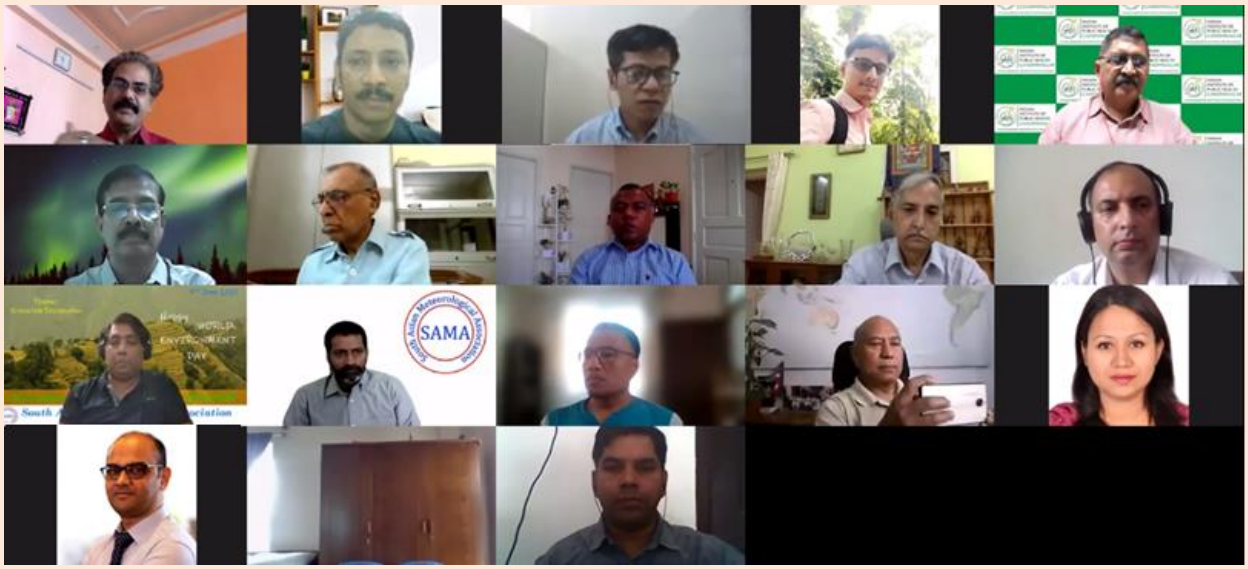
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Webinar Agenda

South Asian Meteorological Association (SAMA)

Webinar on Heat Waves in South Asia

Jointly organized by Indian Meteorological Society, Jaipur Chapter and South Asia Heat Health Information Network (SAHHIN)

6th June 2021, 10:00 AM – 01:15 PM (IST)

Programme

10:00 – 10:05 **Welcome Address** by **AVM (Prof.) Dr. Ajit Tyagi**, Chairman, SAMA

10:05 – 10:08 **Launching the website of SAMA** by **AVM (Prof.) Dr. Ajit Tyagi**, Chairman, SAMA

10:08 – 10:10 **Remarks by Prof. Rajesh Kumar,** Chairman, Indian Meteorological Society, Jaipur Chapter

10:10 – 10:12 **Remarks by Prof. Jyoti K Parikh**, Executive Director, IRADe, New Delhi

10:12 – 10:14 Introduction to the Keynote Speaker Prof. Dileep Mavalankar, Director, Indian Institute of Public Health (IIPH), Gandhinagar, India

10:14 – 10:34 **Keynote Presentation** by **Prof. Dileep Mavalankar**: **Climate change, Heatwaves and Lessons from Heat action plans in India.**

Session 1

Lead Presentations: Co-Chairs: Ms. Sujata Saunik, Additional Chief Secretary, Govt. of Maharashtra and **Dr. L.S. Rathore**, Former DGM, India Meteorological Department

10:37 – 10:52 **Dr. S.C. Bhan**, Scientist 'F', India Meteorological Department: **Heat Wave Early Warning and Management System in India and possible south Asian Collaboration**

10:52 – 11:07 **Dr. Rohit Magotra**, Deputy Director, IRADe, New Delhi: **Climate Adaptive Heat Action Plans**

11:07- 11:22 **Dr. Md. Abdul Mannan**, Meteorologist In-Charge, SWC, Bangladesh Meteorological Department: **Study on heat waves and their impacts in Bangladesh**

11:22- 11:37 **Prof. Dr. T.V. Laksmi Kumar**, Atmospheric Science Research Lab, SRM IST, Chennai, India: **Heat extremes over India in the changing climate scenarios**

11:37 – 11:47 Question & Answer session

Session 2

Presentations from Member Countries: Co-Chairs: Mr. Muhammad Riaz, Director General, PMD and **Mr. Ahmed Rasheed**, Deputy Director General, Maldives Meteorological Service

11:50 – 11:58 **Afghanistan** (**Mr**. **Sikandar Osmany**, Afghanistan Meteorological Department)

11:58 – 12:06 **Bhutan** (**Mr. Saroj Acharya**, Engineer, Weather and Climate services Division, NCHM, Bhutan)

12:06 – 12:14 **Maldives** (**Mr. Ahmed Rasheed**, Maldives Meteorological Service)

12:14 – 12:22 **Myanmar** (**Mr. Win Maw**, Deputy Director, Department of Meteorology & Hydrology, Myanmar)

12:22 – 12:30 **Nepal** (**Dr. Indira Kadel,** Senior Divisional Meteorologist, Dept. of Hydrology & Meteorology, Nepal)

12:30 – 12:38 **Pakistan** (**Mr. Nadeem Faisal**, Director, CDPC, Pakistan Meteorological Department, Karachi)

12:38 – 12:46 **Sri Lanka** (**Ms. Anusha Warnasuriya**, Director, Department of Meteorology, Sri Lanka)

12:46 – 12:51 Remarks by **ICIMOD** (**Dr. Ghulam Rasul**)

12:51 – 12:56 Remarks by **RIMES** (**Dr. G. Srinivasan**)

12:56 – 13:01 Remarks by **SDMA**, Bihar (**Mr. P.N. Rai**)

13:01 – 13:06**Vote of Thanks**: **Prof. (Dr.) Someshwar Das**, Convener, SAMA

About SAMA

South Asian Meteorological Association (SAMA) is a non-profit scientific society of nine south Asian countries including Afghanistan, Bangladesh, Bhutan, India, Maldives, Myanmar, Nepal, Pakistan and Sri Lanka engaged in promoting regional cooperation in the field of meteorology and allied sciences. For More details: https://southasianmet.org/

About IMS

India Meteorological is registered nonprofit society which works on the advancement of meteorological and allied sciences in all their aspects. It works on dissemination of the knowledge of such sciences both among the scientific workers and among the public and the application of Meteorology and allied sciences to various constructive human activities. For more details: http://imetsociety.org/

About SAHHIN

The South Asian Heat Health Information Network (SAHHIN) is an independent, voluntary, and member-driven forum of scientists, practitioners, and policy makers focused on improving capacity to protect populations from the avoidable health risks of extreme heat in a changing climate. Since 2020, SAHHIN is hosted at IRADe and is a complementary node of Global Heat Health Information Network (GHHIN) supported by World Health Organization (WHO) and World Meteorological Organization (WMO). SAHHIN is supported by International Development Research Centre, Canada. For more details: https://climateandcities.org/; https://www.irade.org/

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