IMPACT OF CLIMATE CHANGE AND ITS IMPORTANCE ON HUMAN PERFORMANCE

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PREFACE

Thermal comfort is that condition, which expresses satisfaction with the thermal environment. Alternatively, the zone of thermal comfort is the span of conditions where80% of sedentary or slightly active persons find the environment thermally acceptable. Whereas high temperatures and humidity provide discomfort sensations and sometimes heat stress. Therefore, the evaluation of the thermal sensation is often a crucial matter for outdoor working environments. Thermal sensation depends on the subject-environment heat transfer which is strictly related to subjective variables (metabolic rate and clothing thermo-physical properties) and four environmental variables (air temperature, mean radiant temperature, air velocity and relative humidity), according to the energy balance equation. Since long, the temperature-humidity index (THI), and the wet bulb globe temperature (WBGT) were used for evaluating heat stress levels; and the predictive mean vote (PMV) was used for evaluating human thermal comfort. The physiological effective temperature (PET) and the universal thermal climatic index (UTCI) were used for evaluating thermal comfort and heat stress as well; both being in the temperature scale. PET, a thermal index that gives an estimation of the thermal sensation, the corresponding heat stress level and the standard effective temperature (SET) index describes the relationship between thermal sensation and discomfort. Earlier studies reported that, increase in local ambient temperature during hot and humid seasons in the world could create unhealthy environments for people who are not able to protect themselves; both general living environments and working environments are affected. The risks of excessive heat exposure are greater in tropical developing countries where large work forces perform manual and heavy tasks for long periods under very hot and humid conditions with minimal access to cooling intervention; India, being a tropical country is no exception to it. Moreover, the agricultural work is most commonly seasonal, and during summer harvest, workers often spend long hours under hot and humid condition, performing arduous physical labour. Moreover, adverse thermal environment at work is further being aggravated by the phenomenon of global warming which is affecting all walks of our life, including living and working environments, and in the process creating health threats for millions of people worldwide. Over the last 100 years, the average temperature of the air near the Earth´s surface has risen by a little less than 1°C and it is estimated to go up further by 1.8 to 4.0 °C (estimated average 3.0°C) by 2100 AD depending on actions to limit GHG emissions. The human resources who are exposed to excessive heat in course of their livelihood earning, especially in low and middle income tropical countries, are at highest risk in respect of their health and wellbeing. India being a tropical country is no exception to it. The impact of rise in ambient

temperature is not confined to agricultural output; it has an impact on the work performance of human being associated with occupational activities in informal sector especially those carried out in the open under the sky particularly agriculture. Hence rise in ambient temperature, a major determinant of thermal aspect of working environment, may have some impact on the health status of the individuals working in the open – air non mechanized agricultural field daily for a considerable period of time. India is characterized by strong temperature variations in different seasons ranging from mean temperature of about 10°C in winter to about 40°C in summer season. The temperatures start to increase all over the country in March and by April central Indian land mass becomes hot with daytime maximum temperatures reaching about 40°C at many locations. And there are reports that physical work capacity and work-performance are getting affected due to adverse thermal conditions prevailing in the working environment in different occupations including agriculture.

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CONTENT

ABOUT THE EDITOR

Dr. Ayan Chatterjee, is currently working as Assistant Professor of School of Medical Sciences of Adamas University, Barasat, West Bengal, India, is having M. Sc. degree in Human Physiology from University of Calcutta with a first class. He obtained his PhD degree from University of Calcutta. He also has a Six-month Diploma in Social Work and Community Service from School of Social Work and Community Service, The National Council of Education, Bengal. He also successfully completed a Certificate course in Science Communication and Media Practice conducted by Indian Science News Association, Kolkata; the course is supported by DST, Government of India, and Vigyan Prasar. He has published 91 full length research papers; among them 41 [in peer reviewed Journals: 22 and in Book Chapter:17 and Conference Proceedings: 02] as first author in Peer Reviewed Journals (International and National), Conference Proceedings and as Book Chapters and also presented papers in International and National Conferences held at IIT Bombay, IIT Guwahati, ISI Kolkata, ISI Giridih, Jadavpur University, University of Calcutta, Vidyasagar University, IISWBM (Kolkata), NIT Jalandhar, Aligarh Muslim University, University of North Bengal, College of Engineering Trivandrum, Brainware University, Diamond Harbour Womens' University (Through Webinar), University of Gour Banga (Through Webinar). Dr. Ayan also published two (02) Books. He received Springer Sponsored Young Researcher Award for presentation of Papers at the 16th International Conference on Humanizing Work and Work Environment (HWWE 2018), Trivandrum, India. Also received Young Scientist Best Oral Presentation award for the presentation of paper at the second international conference on Environmental, Agricultural, Chemical and Biological Sciences (ICEACBS 2021). He also has teaching experience in Human Physiology, Biochemistry and allied subjects at Undergraduate, Postgraduate and Diploma level for 9.3 years. Also supervised sixteen (16) (All are original work) dissertations for Post Graduate students and fifteen (15) (Review Work: 08; Original work: 07) dissertations for Undergraduate students. He also served as Honorary Member- Editorial Board and Reviewer of different International and National peer reviewed Journals. Dr. Ayan appointed as an International Adviser in Research Publication for the organization of 1PHYSED.PH Training and Development Services, Philippines.

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