Prof. Susanta Lahiri. He is a renowned professor in Saha Institute of Nuclear Physics, Kolkata and the chairperson was Dr. Swapan Kole, Professor in the Department of Chemistry, AKPC College, Bengai, Hooghly. The lecture topic was, "150th Year of Periodic Table of Chemical Elements". Dr. S. Kole introduced the speaker in front of the audience. Prof. Lahiri told that periodic table of chemical element is a unique tool for prediction of appearance and properties of all matters and started his lecture in a very interesting way. He told the concept of Big Bang and Atom-Molecules followed by physics and chemistry. He stated the tale of three cities in Europe where three renowned scientists lived. They are Dmitri Ivanovich Mendeleev (1834-1907) who discovered first periodic table in 1869, Madam Marie Courie (1867–1934) who won Nobel Prize in 1911 for discovery of two elements (Polonium and Radium), and Moseley (1887-1915), who was the father of modern periodic table. Moseley's law provides first experimental evidence of Niels Bohr's theory. The concept of isotope in the first periodic table was not introduced. In 1898, Sir William Ramsay discovered four elements, Ne, Kr, Xe and Rn. The scientists filled the gaps in Mendeleev's periodic table. Dr. Lahiri told that the element hafnium was discovered in 1923 by Coster and Hevesy. In 1935, Nobel Prizes were awarded to Frédéric Joliot and Irène Joliot-Curie in recognition of their synthesis of new radioactive elements. In 1938, Enrico Fermi got nobel prize for discovery of radioactive element Tc. Prof. Lahiri mentioned that for discovery of different elements in periodic table time to time Nobel Prizes were awarded to the Scientists. Element 106 in periodic table, named Cbodium, was discovered with the name of a live scientist. He told that any chemistry must be performed on an 'atom-at-a-time' basis and mentioned the concept on 'SHE' Chemistry. Dr. Lahiri spoke that from 1981, Darmstadt era started and element from 107 to 110 in periodic table was synthesized by cold fusion as target is stable, but in hot fusion, target is radioactive. Then he told about the contribution of Saha Institute Nuclear Physics in periodic table and it was involved in TASCA group (that starts from element 112). Dr. Lahiri mentioned about different research works to discover elements in periodic table which are published in several reputed journals. He informed that Element 118, Og is named with the scientist Dr. Yuri Oganessiam and he is alive till now and element 120 may or may not be produced because of its heavy weight and after 120 there is no chance to get elements because the lack of surface tension of earth. Both the chairperson and speaker were felicitated by giving memento on behalf of ISEC.

After the lecture, participants were engaged in a general discussion on that day's lecture. Miss. Awisharya Biswas expressed her gratitude towards that day's lecture, specially to Prof. S. Lahiri to understand periodic table so easily by her. Prof. (Dr.) Santanu Das, the Secretary of ISEC expressed vote of thanks to all members who did their best for the success of the seminar. At the end, Dr. Uttam Das and Mr. Manas Kumar Saha sang songs respectively to entertain the audience in the hall.

Bandana Barman
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Report of One-Day National Seminar on "Water: Crisis and Conservation" held on November 23, 2019

The Institution of Science, Education and Culture (ISEC), Kolkata had organized One-Day National Seminar in close collaboration with Birla Industrial and Technical Museum (BITM), Kolkata on "Water: Crisis and Conservation" on 23rd November, 2019 at Seminar Hall of BITM. This programme was financially supported by Higher Education Department, Government of West Bengal. After registration, the seminar was started at 11.00am, Prof. Santanu Das, the Secretary, ISEC invited Prof. Anil Kumar Ghosh, the President of ISEC to inaugurate the Seminar. In inaugural speech, Prof. Ghosh solemnly thanked Mr. V. S. Ramachandran, Director, BITM for his presence in spite of his busy schedule and then welcomed all the members of ISEC, invitees, Speakers, dignitaries and guests. He had told that ISEC was established by a group

of committees, scientists, professors with abled guidance and leadership of founder secretary Prof. Dr. Murali Mohan Biswas on 25.11.1980 with an aim to promote, to propagate and to develop the knowledge of science for educating the culture of society. He expressed his heartiest thanks to seminar committee and executive committee of ISEC. He stated the importance of water conservation and management. Water crisis is a real problem, so recycling of water is extremely necessary. He had mentioned that maintenance of water dam, reservoir is very important. As water gives life to all living beings, conservation of ground water is utmost necessary.

Then Mr. V. S. Ramachandran delivered welcome address. He had expressed his good opinion on working culture of Kolkata; the city of joy. He had appreciated the activities taken by students and professors in Kolkata. He had also mentioned that BITM has started a sky watch program and the museum had also brought a robot to make interaction with visitors. Mr. Ramachandran had also informed about the benefit of collaborative activities and its effectiveness for all collaborators. Then Dr. Swapna Mukherjee, the Vice President of ISEC and Coordinator of ISEC Seminar Committee welcomed the speakers, chairpersons and the audiences. She wish the very success of seminar and requested all speaker to provide technical paper based on their lecture so that it could be published in the international journal of ISEC, the Indian Science Cruiser.

Technical session 1 started after tea break. The Session Chairperson was Prof. Asis Majumdar, the Director, school of Water Resources Engineering, Jadavpur University, Kolkata. As the first speaker, Dr. Kayan Rudra, the Chairman, Pollution Control Board, Govt. of West Bengal, Kolkata was not present that day due some unavoidable circumstances, Prof. Majumdar had delivered a lecture on "Water Crisis, Experiences in India and Its Conservation". He had told that water quality is important rather than quantity due to the high presence of Arsenic and fluorosis contamination in water in West Bengal. There has been a huge water crisis since a decade in WB due to lack of rain fall. The ground water recharging for a place and rain water harvesting for one or two storied building is a solution of water crisis. He said recycling of water is necessary as rejection is higher than water reservation. The scarcity of water has increased globally as world population grew 3 fold whereas water demand grew 6 folds. He warned that almost 1800 million people would face absolute water scarcity by 2025 because of increased population and water consumption pattern. In South Asia, there will be severe crisis of both water and food. The people would suffer from inadequate sanitation and environmental threats. In East and Southeast Asia (India, China and Vietnam respectively) risk of flood would increase in terms of economy will increase rapidly. USA would have the greatest economic exposure to flood (coastal / fluvial) risk in the world (0.3 % of GDP). TheWater Footprint measures total water consumption by consumer or producer and its average value is 1240 m^3 water/person/year globally. In China it is 700 m^3 water/person/year (smallest) whereas in United States it is 2480 m^3 water/person/year (highest).India is facing a huge water crisis such that about 600 million people face extreme water stress. Statistically it is measured that 75% of households suffering from drinking water crisis, 84% of rural households are not getting piped water access, and 70% of water is contaminated. India's rank is now 120 among 122 countries as per water quality index. The Composite Water Management Index (CWMI) has reported that 21 major cities including Delhi, Bengaluru, Chennai, Hyderabad etc. are about to reach zero groundwater levels very soon. Currently, 12% of India's population has been struggling in 'Day Zero' because of excessive groundwater pumping, inefficient, wasteful water management and rainfall lacks. The report has mentioned that in year 2030, water demand in India will be increased by two times of the present demand. In West Bengal average rainfall is 1762mm/year and 7.5% of water resource of India is in West Bengal but it is not sufficient just because of rapid population growth, increase in irrigation and developmental needs. As a result Bengal Delta has been suffering from acute water crisis. All human should influence others for conserving water and protecting water resources. Different initiatives are being taken for water refinement, desalination and water reuse. Next Prof. Arunabha Majumder, Emeritus Fellow, School of Water Resources Engineering, Jadavpur University, Former Director-Professor, All India

Institute of Hygiene & Public Health, Government of India delivered his lecture on "Public Water Supply: Issues & Challenges". He told water is necessary for everything of our lives. The drastic change in climate affects livelihood of human and natural resources. He had mentioned that 2lakh people/ year die due to insufficient and unhygienic water (reported by Niti Aayog). People are suffering from water borne disease due to improper water management. Several schemes related to water resources and management has been proposed by National Water Policy in 2012 for sustainability. Central Ground Water Board (CGWB) who monitors the ground water level regularly has reported that it has declined by 52%. The Rural Water Supply (RWS) in west Bengal states that only 22913 Schools and 3615 Anganwadis get fresh water. 11 districts has been affected by water quality problem because of arsenic, fluoride contamination. Several researches are going on to improve water quality and sustainability e.g. rain water harvesting, appropriate treatment of surface water to get proper total dissolve solutes (TDS), De-fluoridation, arsenic removal, osmosis process, De-ionization of water etc. He forbade us from recommending RO water purifiers. The session chair remarked on the problem and proposed solutions related to water crisis as well after the two lectures. Both speakers and chairperson were felicitated by memento on behalf of ISEC.

Technical Session 2 started shortly after lunch break. The chairperson; was Mr. Subrata Halder, Executive Engineer (Agri-Irrigation), Planning Division, State Water Investigation Directorate, Govt. of West Bengal and Nodal Officer, National Hydrology Project, West Bengal (Ground Water). The speaker was Prof. Dr. Santanu Das, the Secretary, ISEC, Professor and HOD, Mechanical Engineering, Kalyani Government Engineering College, West Bengal. He delivered the lecture on "Installation of Rain Water Harvesting Systems: Need for Its Immediate Implementation". He told various reasons of water crisis. He stated that about 0.01% of total water is fresh water and most of this wasted due to improper use. The lack of rainfall results loss of ground water which leads to draught. He mentioned that presence of arsenic, iron, fluoride contents in water damage the quality of water. The Rain Water Harvesting (RWH) Systems may be a solution of this problem as it collects free rain water from roof top of building and stores it in a drum or even in a pond as per requirements of householders for wide use. He informed that Roof Top Rain Water Harvesting has promoted by The Association of Engineers, India. In fact, he himself had installed it his own house. Prof. Das told that as people should be aware about water shortage as it is increasing day by day. Then the chairperson discussed on this topic to all. The last lecture of that day was delivered by Dr. Subhasish Das, Assistant Professor, School of Water Resources Engineering, Jadavpur University on "Water Preservation through Soil Moisture Conservation". The chairperson was Dr. Sanchayan Mukherjee, Associate Professor in Mechanical Engineering Department, Kalyani Government Engineering College. Dr. Das had told about different water resources and water scarcity in world as well as in India. He mentioned that in spite of having 14 major river basins in India, 21 cities would face major ground water crisis in near future due to population growth, mismanagement of water conservation and wastage of surface water. He mentioned several methods to conserve water such as harvesting of surface runoff, improvement of mine water, tapping of ground water inflow into the sea. To conserve water resource some techniques like field funding, terracing, contour farming, tillage, mulching, strip/ mixed cropping, afforestation/ pasture development, build gabion structure (breaking runoff velocity, increasing irrigated area) need to be practised. To protect/ store ground water the schemes like gully plugs (stone wall terrace), gully treatment to increase cultivation area, water harvesting tanks, contour trenches, series of continuous contour trench, stone building, water absorption trench, seepage tank, check dams are being build. Then he showed different projects related to conserve water in his slides which are doing well. Then Dr. Sanchayan Mukherjee expressed his views on the lecture. After the lecture both speakers and chairperson were felicitated by a memento on behalf of ISEC.

After that, the Secretary of ISEC, thanked all the personalities who were involved for the success of the day's seminar in his vote of thanks. At last, Dr. Uttam Das made a brief cultural performance.

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