



CHRONICLE – VII

March 2022 - August 2022



From Editors Desk



Dear **J**almitra,

It gives me great pleasure to present the chronicle with highlights of our last six months. In these unprecedented times of Corona and monkey pox I hope all of you are safe and healthy. To build back better our economies, environment and society we have to adopt a momentum for change. Recovery is our chance to shape a better future and the Sustainable Development Goals are our roadmap. We are at a pivotal time – for people, societies, economies, and our planet and need all-inclusive sustainable solutions. Let's find them with cooperation, cohesion and collaboration. I thank my team because I believe teamwork is the ability to work together toward a common vision and is an ability to direct an individual accomplishment toward organizational objectives. It is the fuel that allows common people to attain uncommon results. It is about finding your unique blueprint and expressing that courageously and confidently”

Thank you

Dr. Arvind Kumar

INDEX

S.No.	Title	P. No.
1	EDITORIAL: New India@75	4
2	RECENT DEVELOPMENTS	6
3	LATEST PUBLICATION & REVIEW	7
4	CONCLUDED PROJECT: Survey on Information Collection of Water Supply and Sanitation in Urban Slum Areas	9
5	COVER STORY: Factoring water in Production of 'Green Hydrogen'	10
6	SPECIAL REPORT: Dakar 2022 – The Forum of Responses	14
7	PERSPECTIVE: Cudgeling Plastics: Actuality or Illusion	22
8	REPORT: Land, Life, Legacy: From scarcity and prosperity	25
9	MAJOR EVENTS AND ACTIVITIES	33
10	ONGOING PROJECT: Scientific Approach towards Bridging SCIENCE and HEALTH Divide in a Sustainable Way	39
11	PUBLISHED ARTICLES	41
12	OPINION: An update on Climate Change	43
13	RESEARCH AND DEVELOPMENT: Waste Management Step Towards Sustainability: What Cannot Be Measured Cannot Be Managed?	49
14	CONCERN: Managed Aquifer Recharge (MAR) Innovations to Urban Water Resilience & Sustainability	54
15	REMINISCENCE: A Fulfilling Journey Through the Lens of an Environmentalist	57
16	ROAD TOWARDS SDGS REALIZATION : High Level Political Forum 2022	60
17	PRELIMS TO UN WATER CONFERENCE 2023: Second Dushanbe Water Conference	62
18	UPDATE: XV World Forestry Congress	64
19	ISSUE : UNEA-5.2: Nature at the Heart of Sustainable Development	66
20	YOUTH PERSPECTIVE : Nutrient based subsidy regime	68
21	YOUTH AGENDA: Plastic is Forever	70

New India @75

Dr. Arvind Kumar*

India one of the youngest nations in the lifespan of nations will turn 75 on 15th August 2022. The best is surely yet to come. India's youthful and aspirational population deserves a rapid transformation of the economy, which can deliver double-digit growth, jobs and prosperity to all. A strong foundation has been laid in the preceding years. While there is every room for confidence, there is none for complacency. A surge of energy, untiring effort and an unshakeable resolve on the part of the government, private sector and every individual citizen can achieve this transformation in the coming decade. Seventy five years ago, similar energy, effort and resolve from all Indians freed the country from colonial rule. Then, like now, foundations had been laid but a committed acceleration of effort is still necessary.



On the economic front, India moved from the initial promise of a new dawn to worrying under-performance, and then achieved a revival as one of the better-performing economies of the last three decades. It is now in a position to be the fastest-growing large economy for the foreseeable future. This year, India will become the world's fifth-largest economy. A decade ago, it didn't make the Top 10. From a Rs 2.9 trillion economy back in the 1950's, India today has become a sizeable Rs 130 trillion economy, growing roughly by 44 times over the period and emerging as the world's fifth largest economy. India's average per capita income has increased significantly, with Per Capita Net National Income (PCNNI, at constant prices) going up from Rs 7,513 in 1950-51 to Rs 86,660 during 2017-18, going up by almost 11 times..

But a retrospective analysis of the last 75 years also throws up some shining figures and facts. India's total food production, which stood at 54.92 million tonnes in 1950, had risen six-fold to 305.44 million tonnes by 2021-22. India has made huge strides in agriculture. It is today one of the leading producers of food grains in the world, with production going up from 77 million tonnes in 1959-60 to around 277 million tonnes during 2016-17. The country has not only ensured food security for its citizens but also entered the export markets for agricultural produce. India is also a leading producer of key commercial crops such as cotton and guar gum. In recent years, the country has also become a major fish producer of the world. The country's foreign exchange reserves have grown from INR 10.29 billion in 1950-51 to over INR 46 trillion currently and foreign investment has accelerated from INR 2.56 billion in 1948 to over INR 66 billion in 2022. Infrastructure growth in roads and railways, the rapid growth of the telecom, technology and financial services sectors are some of the other defining achievements of the Indian economy since independence.

Over the last 75 years, India has channeled her civilizational strengths and cultural diversity into a brand new shared future, and opportunities for achievement, progress, and prosperity for its billion-plus citizens, making our country an inspiration for the rest of the world .Internationally, India remains reassuringly status quoist beyond rightly seeking its place at the high table. The country remains one of the non-worry spots on the world map. It is stable and predictable, and a responsible nuclear power. Despite unresolved conflicts with two neighbors, it has positive relations with almost all countries that matter. It has no irredentist ambitions, and is usually part of the solution rather than the problem — as with climate change. It is the third-largest contributor to world economic growth.



Images Credit Hans News Service

All developing countries like India have large informal sectors and a huge burden of poverty, and need accelerated, yet sustainable, development in the current carbon-constrained environment. India’s success in growing at a quick pace, while keeping per capita emissions low, despite its large population is a potential model for replication for the developing world.

The idea is to collaboratively create an inclusive and sustainable India by working on vision elements covering skills, education, economy, urbanization and environmental sustainability, agriculture and health, innovation and moral leadership. We have to undertake focused interventions in all these fields for ensuring an inclusive and social development of the nation. India is expected to become the fastest growing major economy in the world and is projected to grow at the rate of 9.1% in 2022 as per Moody’s GDP projections. While India’s growth prospects certainly look bright, development efforts must continue for translating the vision of India@75 into reality. The partnership between citizens, industry and the Government for economic transformation will be further strengthened but cannot be achieved without public participation for a better and new India of our dreams.

**Editor, Focus Global Reporter*

RECENT DEVELOPMENTS

MoU with India Water Foundation and National Institute of Hydrology, Roorkee, Uttarakhand

Dr. Arvind Kumar, President, India Water Foundation signed a Memorandum of Understanding (MoU) with Dr. J. V. Tyagi, Director, National Institute of Hydrology (NIH) which is a premier Research and Development organization on Hydrology under the Ministry of Jal Shakti, Department of Water Resources River Development and Ganga Rejuvenation, Government of India. Dr. Kumar also presented Dr. Tyagi his book -'United Nations at 75 and beyond'. We look ahead to a fruitful collaboration on various projects and leverage our respective strengths and contribute to a water secure nation. We take this opportunity to thank Dr. J. V. Tyagi, for his warm gesture and gracious hospitality. Also present were Shweta Tyagi, Chief Functionary, India Water Foundation and Dr. Sudhir Kumar Scientist G and Dr. Sanjay K. Jain Scientist G from NIH.



MoU with India Water Foundation and School of Planning and Architecture, New Delhi

Dr Arvind Kumar, President, India Water Foundation signed MoU with Dr P. S. N. Rao, Director, School of Planning and Architecture New Delhi on 10th August 2022. SPA is recognized as an Institute of National



Importance by the Ministry of HRD, Government of India. Human habitat and environment being the basic concern of the School, the school has various research and collaborative projects on the same. IWF looks forward to global and regional projects with SPA in the realms of environmental planning and architecture and habitat improvement. Dr. Kumar also presented Dr. P. S. N. Rao his book -'United Nations at 75 and beyond'. Also present were Shweta Tyagi, Chief Functionary, India Water Foundation and Prof. Dr. Ashok Kumar, Dean (Academics), Dean (Students Affairs), Professor of Physical Planning, Prof. Dr. Sanjay Gupta, Dean

(Research), Dean (Faculty Welfare), Professor of Transport Planning, Prof. Dr. Rabidyuti Biswas, Professor of Physical Planning and Prof. Dr. Meenakshi Dhote, Professor of Environmental Planning from School of Planning and Architecture, New Delhi.

LATEST PUBLICATION & REVIEW

Ecosystem-Based Adaptation: Approaches to Sustainable Management of Aquatic Resources

(Arvind Kumar, *Ecosystem-Based Adaptation: Approaches to Sustainable Management of Aquatic Resources*, London: Elsevier Publishers, February 2022. Pages 682+)

Climate change and the pandemic have been with humankind as perennial problems for ages wreaking havoc with human lives and prosperity. Mass vaccination has provided a semblance of respite to humankind from the scourge of the COVID-19 pandemic but climate change continues to threaten the very existence of biotic life on Earth. Among the various solutions advanced by scientists from time to time to combat climate change, Ecosystem-Based Adaptation (EbA) is garnering sufficient international traction and its successful implementation in many countries, as portrayed in the book under review, is a testimony to its rationale and contemporary relevance.

The book presents a close examination of the role of ecosystem-based adaptation in managing river basins, aquifers, flood plains, and their vegetation to provide water storage and flood regulation. Furthermore, the book explores improved ecosystem-based services for managing floods conservation of water and its resources (including watersheds), avoiding water scarcity, and ensuring long-term water security planning, all in the context of sustainable development goals.

The academic and research worth of this book lies in its prime focus on applying ecosystem-based adaptation to major goals enshrined in the 2030 Agenda which is touted as a plan of action for the prosperity of the people of planet Earth. The author has meticulously intertwined linkages between ecosystem-based adaptation and major sustainable development goals by specifically focusing on viz., tackling the problem of hunger (SDG-2) by ensuring food security, clean drinking water (SDG-6) by ensuring water security, sustainable cities (SDG-11) by moving towards sustainable smart cities, climate action (SDG-13) by understanding the magnitude of the challenge of climate change and suggesting means to cope with this problem safeguarding life below water (SDG-14) by suggesting means and measures of sustain life below water, and protect life on Earth (SDG-15) by adhering to means and measures that help conserve life. The salient feature of this book lies in its emphasis on nature-based solutions, with specific emphasis on ecosystem-based adaptation (EbA), and it recommends mainstreaming EbA into national, provincial, and local level adaptation plans as a means to realize the goals of Agenda 2030.

The Daily Guardian THURSDAY | 28 JULY 2022

BOOK REVIEW

ECOSYSTEM-BASED ADAPTATION GARNERING INTERNATIONAL TRACTION

PRADIEP MALIK

Climate change and the pandemic have been with humankind as perennial problems for ages, wreaking havoc on human lives and prosperity. Mass vaccination has provided a semblance of respite to humankind from the scourge of the pandemic, but climate change continues to threaten the very existence of biotic life on Earth. Among the various solutions advanced by scientists to combat climate change, Ecosystem-Based Adaptation is garnering sufficient international traction, and its successful implementation in many countries, as portrayed in the book, is a testimony to its rationale and contemporary relevance. It presents a close examination of the role of ecosystem-based adaptation in managing river basins, aquifers, flood plains, and their vegetation to provide water storage and flood regulation. The book explores improved ecosystem-based services for managing floods, conservation of water and its resources, avoiding water scarcity, and ensuring long-term water security planning, in the context of sustainable development goals.

The academic and research worth of this book lies in its prime focus on applying ecosystem-based adaptation to major goals enshrined in the 2030 Agenda, which is touted as a plan of action for the prosperity of the people of planet Earth. The author has meticulously intertwined linkages between ecosystem-based adaptation and major sustainable development goals by specifically focusing on viz., tackling the problem of hunger (SDG-2) by ensuring food security, clean drinking water (SDG-6) by ensuring water security, sustainable cities (SDG-11) by moving towards sustainable smart cities, climate action (SDG-13) by understanding the magnitude of the challenge of climate change and suggesting means to cope with this problem safeguarding life below water (SDG-14) by suggesting means and measures to sustain life below water, and protecting life on Earth (SDG-15) by adhering to means and measures that help conserve life. The salient feature of this book lies in its emphasis on nature-based solutions, with specific emphasis on ecosystem-based adaptation (EbA), and it recommends mainstreaming EbA into national, provincial, and local level adaptation plans as a means to realize the goals of Agenda 2030. This book is helpful to scientists, policymakers, climatologists, development experts, and all those interested in saving this planet from the vagaries of climate change because it paves the way for easy implementation of sustainable development goals for ensuring a secure and sustainable future.

The book features ten chapters, and each chapter deals with the diverse ecosystems. The first



chapter focuses on the concept of disaster and its interlink ages with notions of risk and hazard, along with an emphasis on vulnerability and resilience as well. The second chapter provides a brief description of the main components of climate change—atmosphere, biosphere, cryosphere, hydrosphere, and lithosphere. Chapter three focuses on the Ecosystem-based Adaptation (EbA) approach as a concept, along with a brief examination of the major ingredients of the approach. Chapter four takes into account the pros and cons of mitigation and adaptation measures to deal with climate change. Chapter five deals with the theme of water security with a specific focus on the issues of water quality and water scarcity, and thereafter proceeds to analyse the impact of climate change on water. Chapter six takes into account the concept of food security, which is elaborated with a brief appraisal of the notion of hunger and the impacts of climate change on ensuring food security. Chapter seven deals with smart cities, along with a focus on linkages between urbanisation and sustainable development. Chapter eight focuses on life below water, with specific emphasis on environmental stressors like ocean warming, acidification, deoxygenation, and sea-level rise, along with anthropogenic stressors like plastic pollution, oil spills, overfishing, greenhouse gases, land-based sources of marine pollution, etc. Chapter nine focuses on the theme of life on Earth, with a specific focus on freshwater ecosystems, forests, genetic resources, wildlife, and land-use, etc. Chapter ten emphasises mainstreaming EbA in programmes and policies in the action plan at national and provincial levels. The concept of mainstreaming is examined along with categories of mainstreaming climate change adaptation. The writer is a former journalist and works in the Human Electricity Regulatory Commission as Dy Director, Media.



This book is helpful to scientists, policy-makers, climatologists, development experts and all those interested in saving this planet from the vagaries of climate change because it paves the way for easy implementation of sustainable development goals for ensuring a secure and sustainable future.

The book has ten chapters and each chapter deals with the diverse ecosystems. The first chapter focuses on the concept of disaster and its inter linkages with notions of risk and hazard along with an emphasis on vulnerability and resilience as well. The second chapter while providing a brief description of the main components of climate change— atmosphere, biosphere, cryosphere, hydrosphere, and lithosphere. The chapter three focuses on Ecosystem-based Adaptation (EbA) approach as a concept along with a brief examination of major ingredients of the approach. The chapter four takes into account pros and cons of mitigation and adaptation measures to deal with climate change. Chapter four takes into account pros and cons of mitigation and adaptation measures to deal with climate change. Chapter five deals with the theme of water security with specific focus on the issues of water quality and water scarcity and thereafter proceeds to analyze the impact of climate change on water. Chapter six takes into account the concept of food security, which is elaborated with brief appraisal of the notion of hunger and the impacts of climate change on ensuring food security. Chapter seven deals with smart cities, along with focus on linkages between urbanization and sustainable development. Chapter eight focuses on life below water, with specific emphasis on environmental stressors like Ocean warming, acidification, deoxygenation, and sea-level rise, along with anthropogenic stressors like plastic pollution, oil-spills, overfishing, greenhouse gases, land-based sources of marine pollution etc. Chapter nine focuses on the theme of life on Earth, with specific focus on freshwater ecosystems, forests, genetic resources, wildlife and land-use, etc. Chapter ten emphasizes on mainstreaming EbA in programs and policies in the action plan at national, provincial levels. The concept of mainstreaming is examined along with categories of mainstreaming climate change adaptation.

CONCLUDED PROJECT

Survey on Information Collection of Water Supply and Sanitation in Urban Slum Areas

India Water Foundation had undertaken a study for Japan International Cooperation Agency (JICA) for information collection on water supply and sanitation in selected 50 representative slum samples out of around 5200 urban slum areas of Delhi in 2021-22 in collaboration with NJS Engineers India Ltd. The objective of the study was to analyze the achievements and lessons learnt in water supply and sanitation sector in urban slum areas through reviewing related central and state government policies, programmes and activities by other development agencies. Reviewing and analyzing various JICA funded representative projects in the sector and proposing assistant policy/implementation plan for future project formulation in the water sector. Although The survey was quite a challenge in itself, especially considering the COVID prevalence and restrictions, the enthusiastic study team addressed those challenges and conducted the survey, various outreach activities and came up with invaluable data which became the ground stone to draft synthesis indicators enabling interpretation of results obtained from respondents. This study will be helpful in planning for future project formulation in the water sector to achieve the target of SDG6 and Clean India Movement. To read the complete report of the concluded study please clicks on the link : <https://www.indiawaterfoundation.org/final-report/>



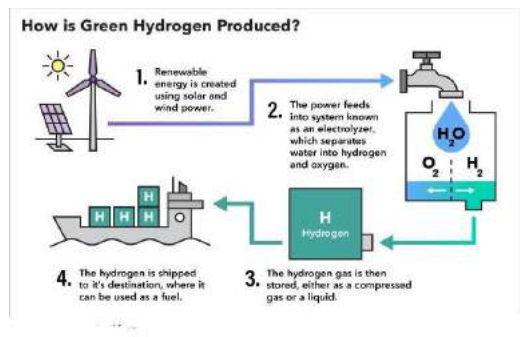
COVER STORY

Factoring water in Production of 'Green Hydrogen'

Dr. Arvind Kumar, President, India Water Foundation

Sometimes there's a trade-off between easy and clean, and government needs to pick the right side. It's critically important to making sure India meets its climate goals, and not just on paper. If we want to make sure we're supporting a truly green hydrogen and e-fuels industry, now is the time for the country to set go on the right path.

Green hydrogen production will consume 1.5 ppm of Earth's freshwater or 30 ppb of saltwater each year, an amount smaller than what is currently consumed by fossil fuel-based energy production and power generation. Then what is the journalistic concern about the consumption of water in production of green hydrogen? As per the Green Hydrogen Compact Catalogue of the United Nations "Businesses, countries and other stakeholders are encouraged to establish Energy Compacts that can help deliver 25 GW of green hydrogen capacity by 2026, towards 500-1000 GW required by 2030, in line with the UN Marrakech Partnership's Climate Action Pathway on Green Hydrogen for a 1.5-degree compatible energy sector by 2050."



Sometimes there's a trade-off between easy and clean, and government needs to pick the right side. It's critically important to making sure India meets its climate goals, and not just on paper. If we want to make sure we're supporting a truly green hydrogen and e-fuels industry, now is the time for the country to set us on the right path.

The Ministry of Power has notified a Green Hydrogen Policy for production of Green Hydrogen using renewable sources of energy (solar, wind, etc.). It has set a target of 5 million tonnes per annum of green Hydrogen production by 2030. National Hydrogen Mission (NHM), launched by Government of India, aims at cutting down Carbon emissions and increasing the use of renewable sources of energy. It would aid the government in meeting its climate change adaptation and mitigation goals. Green Hydrogen can help achieve net zero Carbon dioxide emissions in energy intensive sectors like steel, chemical production, etc. It also looks at Hydrogen cooperation with GCC countries like Saudi Arabia, Oman and UAE. Hydrogen has emerged as an important source of energy, since it has zero Carbon content.



Uses of Green Hydrogen

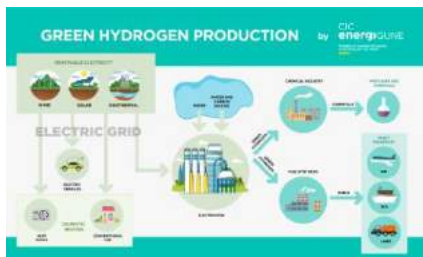
Currently, Hydrogen is mainly used in transport sector and industrial sectors including Oil refining, Ammonia production, Methanol production, Steel production etc. With time, green Hydrogen could be used to develop much more environment friendly fuel cell cars in order to complement the Electric Vehicle industry in India.

Rather than being directly consumed by endusers, the majority of water use today occurs within the supply chains that serve each sector of the economy. Most existing industrial and transport activities have large water footprints, because of their dependency on hydrocarbon fuels and/or electricity generated by thermal power plants. It is therefore important to consider the impact on water use of switching to renewable electricity and green hydrogen.

An important question is: do we have enough water to satisfy our future demand for green hydrogen? This is analogous to the long established, but no longer relevant, question as to whether we have enough oil and gas reserves to satisfy our future energy demand. The total mass of water on Earth is about 1.4×10^{21} kg. Approximately 2.5% of this is freshwater, of which only 9.3×10^{14} kg is classified as accessible surface water in lakes and rivers –glaciers and groundwater account for >99.7% of the fresh water resource. We currently use about 4.6×10^{12} kg of water p.a. and estimates suggest that we produce about 3.6×10^{12} kg of waste water p.a., which needs to be treated before being returned to rivers or used for human consumption.

Accessible fresh water and wastewater can enable green hydrogen production, but electrolyzers will need to use desalinated seawater in arid regions and at offshore wind/solar farms. Fortunately, the seawater resource on Earth is approximately 39 times greater than the fresh water resource. Together these respective amounts frame the water resources available for satisfying both established uses and the new demand associated with green hydrogen production

Interestingly the current annual loss of glacier ice due to global warming is of as similar magnitude to this, about 3.4×10^{12} kg. Accessible fresh water and wastewater can enable green hydrogen production, but electrolyzers will need to use desalinated seawater in arid regions and at offshore wind/solar farms. Fortunately, the seawater resource on Earth is approximately 39 times greater than the fresh water resource. Together these respective amounts frame the water resources available for satisfying both established uses and the new demand associated with green hydrogen production



Water Access for Hydrogen Production

Hydrogen production requires secure, long-term access to water. The efficacy of Indian infrastructure to support scaling up to long-term, commercial scale Hydrogen production is contingent on domestic

water resources (especially groundwater) and its sufficiency. The electrolysis process needs significant input of water. The water input required is around 9 liters/1 kg of Hydrogen produced. Large amount of water is also required for Hydrogen production using fossil fuels, with the current dominant technology of “steam reforming” using water for the reaction stage, process water and cooling water. There is a need to allocate some portion of ground water resources for Hydrogen production, with the consent of CGWA, NGT, etc.

The economic / finance model for any Hydrogen production will have to include the following costs for water due to: Identified sources, Water management – technical and process, Recycle and reuse, Balancing environment impact / Net Zero - including stakeholders, ecology, and others.

Water is governed by different central and state rules and various acts for different regions. New acts, such as wetland rules, will redefine the availability of water and the sources that could be utilized. The economic / finance model for any Hydrogen production will have to include the following costs for water due to: Identified sources, Water management – technical and process, Recycle and reuse, Balancing environment impact / Net Zero - including stakeholders, ecology, and others.

Figure 2.2 Selected colour-code typology of hydrogen production

	GREY HYDROGEN	BLUE HYDROGEN	GREEN HYDROGEN
Process	Reforming or gasification	Reforming or gasification with carbon capture	Electrolysis
Energy source	Fossil fuels	Fossil fuels	Renewable electricity
Estimated emissions from the production process ^a	Reforming: 9 - 18 ^b Gasification: 18 - 20	0-4.5 ^c	0

Note: a) CO₂eq = carbon dioxide equivalent per kilogramme of hydrogen; b) CO₂eq assumed for methane leakage from the steam methane reforming process; c) Emissions for blue hydrogen assume range of 0% and 84% carbon capture rate and 0.2% and 1.5% of methane leakage.

Alternative Water Sources

Given the uncertainty of water availability in the country, desalination, recycled wastewater and storm water would need to be employed as alternatives to freshwater for Hydrogen production and other industrial applications. Desalination of groundwater as well as Brackish Groundwater (BGW) can be considered a viable alternative to secure water supply for Hydrogen production. Hydrogen producers may also consider establishing their own brackish groundwater desalination plants modeled along the lines of seawater desalination plants. Sewage system water and industrial waste effluents that get discharged to water bodies and pollute them, can be treated and used for Hydrogen production. There is then a definite need to locate Oxygen based

The right choice of technologies (water treatment, cooling systems, water disposal), including assessment of hybrid solutions, will often vary on a project-by-project basis but all will be required to be addressed ultimately for projects to be successful. We can therefore expect that as the green hydrogen industry comes to fruition as part of our energy transition, water for hydrogen is and will become an increasingly important part of the water industry across the world.

treatment plants in the same location as the Hydrogen production facility areas, in order to improve the commercial viability of this type of projects. It is the rainwater that runs off the paved and non-paved surfaces in urban and sub-urban areas, unutilized. Its abundance, with due regard to treatment of pollutants can make this water an effective water source for Hydrogen production.

Optimizing Water Use for long term Sustainable production of green hydrogen

Energy is used in two forms (electrons and molecules) and it is now critical that both electricity and fuel are produced in an environmentally sustainable manner. If all existing fossil fuel use were switched to green hydrogen, the water requirement for electrolysis would amount to 1.8% of current global water consumption. This new demand would be counterbalanced by water savings achieved by not having to produce fuels from petroleum or biomass and by reducing the use of conventional thermal power plant. Furthermore, when green hydrogen is oxidized by combustion equipment and fuel cells, the same amount of water that was originally consumed by electrolysis is released back into the environment. Therefore, in general, a massive deployment of electrolysis will have a relatively neutral impact on the global water resource.

The water required by electrolyzers can be sourced from accessible fresh water, seawater and wastewater. In each case it must be purified and de-ionized prior to electrolysis. In dry regions, islands and offshore locations, electrolyzers will rely mainly on the seawater resource and this must first be desalinated (either at scale or by integration within the electrolyser system). Accordingly, there are distinct opportunities for deploying electrolyzers, ranging from decentralized hydrogen hubs at wastewater treatment plants to giga watt-scale hydrogen production at offshore wind/solar farms.

Several additional benefits are obtainable for the water industry, including improving the provision of drinking water in developing countries and oxygenating hypoxic zones in lakes, rivers and coastal regions. Therefore, it is recommended that electrolysis should play a more central role in future policies concerning energy and water: achieving a multi-terawatt electrolyser capacity by mid-century would yield massive positive benefits.

The right choice of technologies (water treatment, cooling systems, water disposal), including assessment of hybrid solutions, will often vary on a project-by-project basis but all will be required to be addressed ultimately for projects to be successful. We can therefore expect that as the green hydrogen industry comes to fruition as part of our energy transition, water for hydrogen is and will become an increasingly important part of the water industry across the world.

SPECIAL REPORT

Dakar 2022 - The Forum of Responses

“This 9th World Water Forum gives us the opportunity to sound the alarm on the seriousness of the situation so that water-related issues remain at the heart of the international agenda. The lives and health of billions of people around the world are at stake, but also the preservation of international peace and security”, said H.E. Macky Sall, President of the Republic of Senegal at the opening ceremony.

The 9th World Water Forum took place in Dakar, Senegal from 21-26 March 2022, under the theme: ‘Water Security for Peace and Development’. It is the first time that an international event of this magnitude



Figure: Speech by the President of the Republic of Senegal H.E. Macky_Sall in Opening Ceremony 9th World Water Forum

has been organized in sub-Saharan Africa. The location was aptly chosen as Africa faces acute challenges of universal access to water and sanitation while also battling the challenges of poverty and growing pressures related to climate change, rapid population growth, uncontrolled urbanization, pollution, etc.

The Grand Opening Ceremony was attended by more than 2000 participants from all over the world. The ceremony was graced by His Excellency Macky Sall, President of the Republic of Senegal. In the presence of his counterparts from Ethiopia, Congo, Guinea-Bissau, Mauritania, the Vice-President of Gambia, the President of the World Water Council, Mr Loïc Fauchon, the President of the World Bank, the Director-General of UNESCO and other participants from the water community all over the world.

The Forum was opened by H.E. Macky Sall, he noted that water is at the beginning and at the end of life and is important for peace, development and security in Africa, as well as globally. The President invited the international community to pay attention to water issues and asked participants to do everything to meet the expectations of the forum. Mr Loïc Fauchon, President of the World Water Council and co-organizer of the Forum spoke at the opening ceremony and reiterated calls for all to work together to



Figure - Speech by Mr Loic Fauchon President World Water Council in Opening Ceremony 9th World Water Forum

combat global water challenges and to adopt dialogue and cooperation to bring an end to water conflicts.



Figure: video message His Majesty Naruhito, the Emperor of Japan

He also called for the international community to set up a blue fund to help prevent the extreme shocks imposed by climate change.

There were also speeches from world leaders including, Mr. Denis Sassou Nguesso, President of the Republic of Congo, said that we will win the water battle through a permanent collective commitment in the context of a truly active solidarity and a consequent financial effort. Mrs Sahle-Work Zewde, President of the Republic of Ethiopia, said that this year's theme of water security for peace and development is an important topic for a secure society and a water development model. Through a video message His Majesty

Naruhito, the Emperor of Japan said that he hopes that the discussions at the Dakar Forum will bring new impetus to the water agenda in Africa and the world to achieve our goal. Recalling the theme of the Forum, World Bank President David Malpass noted the impact of Covid-19, inflation and rising interest rates on the economy, as well as the impact of climate change to development and peace. He called for policy and institution reform, increased investment in water and greater citizen participation in the face of the world's water challenges.

On behalf of the UN, the Director-General of UNESCO, Ms Audrey Azoulay released the 'World Water Development Report 2022' by handing over the report to the President of the Republic of Senegal, Macky Sall, during the opening ceremony. The report is aptly titled "Groundwater: Making the invisible visible". Ms Azoulay said that ground water is 20 times more important in volume than lake water but insisted that groundwater must be preserved from inappropriate use. She said that global cooperation at the UN level is the only solution to face the challenges and opportunities of water in general and advocates an international commitment to sustainable and equitable management of this vital resource.



Figure: most prestigious and globally recognized prizes 'The Hassan II World Water Prize' was given to the Organization for the Development of the Senegal River (OMVS)

One of the most prestigious and globally recognized prizes 'The Hassan II World Water Prize' was given to the Organization for the Development of the Senegal River (OMVS). It contributes to creating global awareness and taking concrete measures to promote the cause of water. The prize is awarded at every World Water Forum and the Moroccan Minister of Equipment and Water, Nizar Baraka, presented the prize to the High Commissioner of OMVS, Hamet Diane Séméga. The prize consists of a trophy, a certificate and a sum of 500,000 US dollars.

HIGHLIGHTS FROM THE FORUM

INITIATIVE DAKAR 2022

The main innovation of the Forum was the selection of high-impact projects for the achievement of SDG 6 on universal access to water and sanitation. The Dakar 2022 Initiative is a project focusing on economic, social and environmental development. The projects must respond to this goal and also take into account 4 priorities of the Forum: water and sanitation security and sanitation; water for rural development; cooperation; Tools and Means including the crucial issues of governance, knowledge management and innovation. In the end, 126 labeled projects were selected and will benefit from international exposure, partnerships and, for some, funding from the Forum's partner institutions.

HIGH LEVEL MEETINGS

The Forum kicked off with a number of high-level meetings including the Ministerial Round Table on 'Water Security for Peace and Development', under the aegis of the Ministry of Foreign Affairs and the Ministry of Water and Sanitation of Senegal. During this strategic meeting, the ministers discussed the major problems encountered in their respective countries and the challenges for water security. At the end of this high-level meeting, the stakeholders were called upon to adopt an action plan covering the various aspects of drinking

water quality, sanitation, pollution prevention and risk management. A roundtable discussion on 'Tools and Means for water security' was conducted by member countries of OECD with the participation of UNESCO. During this session, the speakers outlined the actions and work provided by several actors for universal access to water. The speakers noted that technical solutions and infrastructures are essential to ensure universal access to water and sanitation to deal with water that is overly abundant, scarce, and polluted. The speakers called for a wide range of means and tools is needed to implement such policies at all levels by governments and public and private sector actors.

The highly anticipated Parliamentarians' Dialogue was held on the second day of the Forum. The panel focused on the follow-up of the evaluation and consolidation of national public policies and international commitments on water and sanitation, in the service of peace and sustainable development. The discussions resulted in several solutions recommended by the parliamentarians, among others, the creation of a global parliamentary fund on water and innovative legislative frameworks; the establishment of a Blue Fund for water investment; the regular monitoring of governments' international commitments;



Figure: Ms. Debashree Mukherjee, Additional Secretary, Department of Water Resources, RD&GR, Ministry of Jal Shakti participating in the High Level Meetings under the theme of "Water Security & Sanitation for Peace and Development" at the 9th World Water Forum

the adoption of a water code already in place in Côte d'Ivoire. The parliamentarians also emphasized the issues of financing human resources to be increased and the consistency of public policies.

YOUTH VISION OF THE FORUM

Participation of youth was one of the priorities of this year's Forum. Senegal, with the support of its partners, created a place for the convergence of ideas and solutions across generations, sectors and countries: the Youth Space. The Youth Space offered young people from all over the world the possibility to work together with key actors, to strengthen their capacities on major water-related issues, as well as gather to make the necessary transformations that our societies and our planet require to ensure a sustainable and equitable present and future. By creating a true intergenerational exchange within the Youth Space, the World Water Forum in Dakar positioned itself as the catalyst of a global youth movement for water at the local, regional and global levels. Also to ensure a better representation of the world's youth, the SE9FME with the support of its partners had set up the 'Water Jambaars Programme' (Jambaars, a Wolof word meaning 'warrior'). The objective is to ensure a diverse representation of young people from around the world, Strengthen the scientific, technical, entrepreneurial, managerial, and leadership capacities of young people, Supporting and valuing youth initiatives in improving global water security, among others.

IMPORTANCE OF NEXUS APPROACH

During the high-level session on applying the nexus approach to the 'Water-Energy-Food-Environment' synergy, the panelists iterated that the Nexus issue is now more than necessary, especially in the context of developing countries in general and sub-Saharan Africa in particular, where storms, floods, droughts, climate shocks are aggravated by the heavy consequences of the health crisis. The panelists agreed that the nexus approach should be promoted and they mentioned, among other things, promoting a better understanding of the nexus concept for the development of synergies, bringing out good practices and innovative solutions to make the nexus approach operational, defining cooperation methods in order to maximize the benefits.



Figure: Union Minister Gajendra Singh Shekhawat gave a presentation on 'Water for Peace and Development' at the 9th World Water Forum

INDIA'S FOOTPRINT AT THE WORLD WATER FORUM

The Indian Government participated in a big way at the 9th World Water Forum. The Prime Minister was represented by a high-level delegation under the honorable Minister of Jal Shakti Sh. Gajendra Singh Shekhawat including officials from the ministry, WAPCOS Ltd, a Government of India undertaking, state governments like Meghalaya sending a high-level delegation, more than 100 delegates attended from India like members of world water council, other states and agencies.

The Jal Shakti Ministry showcased India's successful initiatives including, inter alia, success stories of the Swachh Bharat Mission, Jal Jeevan Mission, projects between India and Africa, via a country pavilion which was organized by Wapcos Ltd. The pavilion was visited by the President H.E. Macky Sall himself and was appreciated.



Figure: the pavilion was visited by the President H.E. Macky Sall

Sh. Gajendra Singh Shekhawat, Union Minister of Jal Shakti, gave a presentation on 'Water for Peace and Development'. He talked about India's challenges in the water sector and explained how India has dealt with it through programmes like the Swachh Bharat Mission, Jal Jeevan Mission envisioned by PM Narendra Modi. Ms. Debashree Mukherjee, Additional secretary, Jal Shakti

Ministry also spoke during the Forum on water supply and sanitation where she showcased India's successful endeavors to improve the water supply and sanitation situation in the country.

As a cherry on the cake for India, The Kyoto World Water Grand Prize worth 2 million Yen has been awarded to an Indian organization called 'Pragati'. The Kyoto World Water Grand Prize is jointly organized by the Japan Water Forum and the World Water Council. This 5th edition rewarded field organizations from developing countries involved in the field of water. The award aims to find and develop outstanding local activities related to water issues around the world. The Grand Prize is an initiative of the City of Kyoto, host of the 3rd World Water Forum in 2003, and is awarded every three years on the occasion of each World Water Forum.



Figure Sh. Gajendra Singh Shekhawat, Union Minister of Jal Shakti, Ms. Debashree Mukherjee, Additional secretary, Jal Shakti Ministry and Officials from WAPCOS



Figure Dr. Arvind Kumar having a discussion with Sh. Gajendra Singh Shekhawat, Union Minister of Jal Shakti and Ms. Debashree Mukherjee, Additional secretary, Jal Shakti at India Pavilion, Dakar Senegal



Figure Dr. Arvind Kumar with H.E. Sh. G.V. Srinivas, Ambassador Embassy of India, Dakar (Senegal)

India Water Foundation (IWF) had a big presence at the 9th World Water Forum. As Governor on the board of World Water Council, Dr Arvind Kumar organized and contributed to various high-level panels and sessions.



Figure: Dr Arvind Kumar, President, India Water Foundation during his panel discussion in one of the thematic session of Rural Development of the 9th World Water Forum Dakar Senegal

Dr. Arvind Kumar spoke as a panelist in the session on **'Participatory governance for rural water supply and sanitation'**. The objective of the session was to highlight the contribution of the participatory governance approach to the massive development of sustainable sanitation in rural areas and rural towns and better understand the reforms undertaken in the governance of the

sector. During the session Dr. Arvind elaborated on how adopting integrated approach by cooperation, coordination and convergence will help in ensuring access to water supply and sanitation in rural areas. The session was organized by Programme SolidariteEau on 21st March 2022.

Dr. Arvind Kumar also spoke as a panelist in the session on **"Localizing Multi-stakeholders partnership for Sustainable Resilient and Inclusive Water Resources Management in Africa and Asia"**.

The objective of the session was to organize political dialogue to achieve water-related SDGs and water security in Africa and Asia among multi-sectors and actors to enhance the urgency and political commitment for sustainable, inclusive, and climate-resilient water resource management. Focusing on "policy coherence" and "stakeholders engagement," it will discuss what we need to do and how to mainstream water resilience into political and development agendas towards quality growth in post-Covid-19 communities in Africa and Asia. During the session Dr. Arvind elaborated on how border partnerships between governments, international organizations, private sector and regional Civil Society Organizations (CSO's) should be augmented and CSO's should be given more space and scope in order to address regulatory and resource mobilization challenges. The session was organized by Japan Water Forum and OECD.



Figure: President, India Water Foundation during his panel discussion in one of the thematic session on "Localizing Multi-stakeholders partnership for Sustainable Resilient and Inclusive Water Resources Management in Africa and Asia".

Ms. Shweta Tyagi, Chief Functionary of IWF was part of a high-level panel discussion in the session on **‘Systems approach to deliver water to people’**. The objective of this session was to present a preliminary vision Systems Approach to Deliver Water to People and to solicit feedback from the broad water community on the vision. During the session Ms. Tyagi elaborated on how adopting an integrated approach instead of a sectoral approach for achieving and implementing SDGs and also stressed on how cooperation and coordination among various agencies is imperative to deliver water and sanitation facilities to all. The session was organized by the World Water Council and moderated by Dr Rabi Mohtar, Dean and Professor, Faculty of Agricultural & Food Sciences American University of Beirut and closing



Figure Ms. Shweta Tyagi, Chief Functionary of IWF was part of a high-level panel discussion in the session on **‘Systems approach to deliver water to people’**.

remarks by Mr Guatavo Saltiel, Lead water and sanitation specialist at the World Bank.

To commemorate India Water Foundation’s founding day, IWF organized a special session on **‘Ecosystem based Adaptation for Complete Water Security’** at the World Water Council boot at the Forum. The session was moderated by Mr. Atul Bagai, Head, UNEP India Office, other speakers in the session were Mr. Lifeleng Li, Director, FAO Land and Water Division, Mr. Piyush Dogra, Consultant World Bank and Dr. Arvind Kumar, President, India Water Foundation. During the session Mr. Aiban shngain Swer, OSD of MBDA Meghalaya Government presented the case study of Meghalaya during the session. The session was inspired by the latest book of Dr. Arvind Kumar with Elsevier publications on Ecosystem based adaptation.



Foundation during the special session on **Ecosystem based Adaptation for Complete Water Security to commemorate IWF's founding day**

During the session Mr. Aiban shngain Swer, OSD of MBDA Meghalaya Government presented the case study of Meghalaya during the session. The session was inspired by the latest book of Dr. Arvind Kumar with Elsevier publications on Ecosystem based adaptation.



Figure: Dr. Arvind Kumar with H.E. Sh Dindin Wahyudin, Ambassador, Embassy of the Republic of Indonesia, Dakar (Senegal)



Figure: Dr. Arvind Kumar with Ms. Jennifer J. Sara, Global Director, Water Global Practice, World Bank, Governor, World Water Council

OUTCOMES OF THE FORUM



Figure: Closing ceremony at the 9th World Water Forum 2022 Dakar, Senegal

“Rest assured, nothing that has been done and said here in Diamniadio will be in vain, let alone forgotten. With abnegation, we will bring together the results of the Forum to the heart of the world water agenda, in particular at the 2023 UN conference on water. We will implement them in our territories, our homes, our fields, our rivers, our factories, in nature and in all our activities, in short, at all times and in all places” said Mr. Serigne Mbaye Thiam at the closing ceremony.

The 9th World Water Forum concluded with the release of a declaration called “Blue Deal”. The Dakar Declaration- A “Blue Deal” for Water Security and Sanitation for Peace and Development aimed at guaranteeing access to water and sanitation for all, ensuring adequate financing and inclusive governance, and strengthening cooperation. Through this declaration in four main areas, the aim is to accelerate the implementation of the right to drinking water and sanitation for all by providing appropriate legislative frameworks, said Abdoulaye Sène, Executive Secretary of the 9th World Forum. The declaration also emphasizes the need to mobilize all stakeholders through integrated and inclusive strategies. The text is the result of three years of preparation and a week of intense exchanges.



Figure: Closing ceremony at the 9th World Water Forum 2022 Dakar, Senegal

The 9th World Water Forum was a historic and effective Forum and was a perfect illustration that nothing great happens without passion and commitment. The Forum had a footfall of over 30,000 participants with over 3000 projects launched and 5000 contributions made. The Government of Senegal left no stone untouched to make Forum a success and made sure that all the participants felt welcomed by offering free transportation and food during the whole event. The Dakar 2022 has shown initiative, imagination, and dedication in placing various countries on the path leading to the improvement of the various indicators relating to water. The outcomes from the forum through its high level exchanges, proposes of innovative action plans will bring water issues to world and will have a real impact on the populations, especially those who do not yet have proper access to water and sanitation. This Forum has made the horizon clear and the road well marked towards the 10th World Water Forum which will be hosted by the Republic of Indonesia in 2024.

Shweta Tyagi, Chief Functionary, India Water Foundation

PERSPECTIVE

Cudgeling Plastics: Actuality or Illusion

Dr Arvind Kumar*

“Yes, UNEA 5.2 and UNEP@50 have delivered on plastic pollution. But history

At current levels, greenhouse gas emissions from the plastic lifecycle threaten the ability of the global community to keep global temperature rise below 1.5C. In 2019 the lifecycle of global plastic production – from extraction to disposal – was equivalent to the impact on the climate of 189 500MW coal-fired power stations. By 2050, the report predicts, the global plastic footprint will be equivalent to 615 coal plants running at full capacity.

ultimately will not judge us on resolutions agreed or plans made. It will judge us on actions delivered. It will judge us on whether we create a world without plastic pollution.” Said Inger Anderson at the closing of UNEA 5.2 which became a historic moment as delegates agreed to establish an Intergovernmental



Negotiating Committee with the mandate to forge an international legally binding agreement to end plastic pollution by the end of 2024. India took precedence and in June 2018, Prime Minister Narendra Modi had announced that India will eliminate all single-use plastic items in the country by 2022. Single-use plastic items such as ear buds, balloons, ice-creams and candies with plastic sticks, plastic flags and thermocol used in decoration will be banned from the specified period. The use

of plastic items that have a thickness of less than 100 microns such as plates, cups, glasses and wrapping or packing films around sweet boxes, invitation cards and cigarette packets, as well as cutlery products like forks, spoons, knives, straw and trays, will also be prohibited.

We do not realize that plastics originate from fossil fuels. In fact, the plastic industry accounts for about 6 percent of global oil consumption and is expected to reach 20 percent by 2050. As a result, due to the energy-intensive processes required to extract and distil oil, the production of plastics generates enormous amounts of greenhouse gas (GHG) emissions. When plastic is discarded in recycling bins, it goes away. But there is no “away” – only 9 percent is recycled globally and the rest is dumped in the natural environment. In fact, South Asia is one of the largest generators of plastic waste,

Annual CO2 emissions from plastic could grow to more than 2.75 billion tonnes by 2050

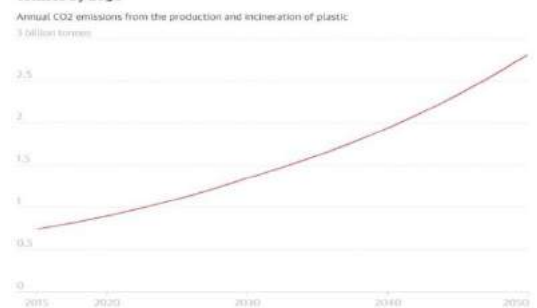


Figure 1 Source- International environmental law

discarding more than 26 million tons of plastics every day. South Asia also has among the world’s highest portion of waste that is openly dumped. When not recycled or disposed of in a controlled manner, discarded plastic waste generates GHG emissions when exposed to solar radiation both in air and water. At current levels, greenhouse gas emissions from the plastic lifecycle threaten the ability of the global community to keep global temperature rise below 1.5C. In 2019 the lifecycle of global plastic production – from extraction to disposal – was equivalent to the impact on the climate of 189 500MW coal-fired power stations. By 2050, the report predicts, the global plastic footprint will be equivalent to 615 coal plants running at full capacity. Around 18 million tons of plastics originating from South Asia are mismanaged and, consequently, are washed into the ocean, where they emit methane and ethylene due to exposure to sunlight. Polyethylene is the highest emitter of both gasses and is the most produced and discarded synthetic polymer globally.



Commitments and Promises

India generates around 9.46 million tonnes of plastic waste annually, according to a recent study by Un-Plastic Collective (UPC), of which – 40 per cent remains uncollected and 43 per cent is used for packaging, mostly single-use plastic. Some experts and environmentalists generally agree that the ban is not sufficient on its own and needs to be supported by other initiatives, government regulations and alternatives to plastics. Currently, a complete ban on plastic bags has been stayed by high court on a plea from the plastic industry. Almost all plastics eventually weather into micro versions of themselves. They flow from open dumps into nullahs and the Yamuna, eventually reaching Bay of Bengal. In fact, over 80% of the ocean’s plastics come from land.

It is clear that we cannot lose the momentum. What then should be the focus now? To begin with, the government should invest money in encouraging the setting up of ventures that provide sustainable products as an alternative to current non-recyclable products. With a vibrant MSME ecosystem in the country and thousands of start-ups being incubated should come up with alternatives to single use plastics. According to industry data, from the tonnes of plastic that are wasted annually, most of it is single-use. Now is the time when we should start adapting to a newer lifestyle by completely eliminating the use of single-use plastics. Offering various types of products for our daily needs, helping individuals to become more environmentally-conscious in pursuit of a cleaner and healthier planet. Single-use plastic has the most deteriorating effects on the environment and the species in it. In India itself, various states have banned the use of plastic carry bags, and have suggested opting for alternatives. A lot of individuals are fast-changing and are now switching to sustainable practices.

Can MSMEs deliver alternatives

We have to leverage India's rich start-up repertoire whilst also providing support to the country's start-up ecosystem. New business opportunities in the plastic waste management domain, new innovations and technologies which will help to overcome the challenges related to plastic waste collection segregation and recycling should be explored. Grass-root entrepreneurs should be motivated and incentivized to take up plastic recycling as a new business venture. Spider silk film and seaweed can replace plastic in various applications such as single-use sachets, which make up as much as 50 percent of all household plastic waste.

New business opportunities in the plastic waste management domain, new innovations and technologies which will help to overcome the challenges related to plastic waste collection segregation and recycling should be explored. Grass-root entrepreneurs should be motivated and incentivized to take up plastic recycling as a new business venture.

In Maldives, an innovative collaboration between Parley for the Oceans and Adidas is bringing up cycled marine plastics into the global athletic wear supply chain. These sorts of innovations and partnerships show us that ground-breaking solutions for marine plastics and climate change exist and can be scaled up. Creating a circular economy has been recognized as one of the biggest changes that people want nowadays in our society. The benefits represented by a more circular and inclusive economy are numerous; from reducing plastic waste to saving our natural resources and money, a circular economy seems to be the way forward in the next decades. We need to seize the moment and harness the interest and enthusiasm to act.

Opportunity for change

We have to eliminate all problematic and unnecessary plastic items. Innovate to ensure that the plastics we do need are reusable, recyclable, or compostable. Plastic is among the most significant and rapidly growing sources of industrial greenhouse gas emissions. Emissions from plastic emerge not only from the production and manufacture of plastic itself, but from every stage in the plastic lifecycle – from the extraction and transport of the fossil fuels that are the primary feed stocks for plastic, to refining and manufacturing, to waste management, to the plastic that enters the environment. Circulate all the plastic items we use to keep them in the economy and out of the environment. Cotton and non-woven polypropylene shopping bags are increasingly common, as are reusable and portable plastic and stainless-steel bottles, cups, and tableware. Reusability is also increasingly viable for personal hygiene products, through products like silicone menstrual cups and cloth nappies, bamboo-based products and glass ware. We need to innovate to create new materials and reuse business models and we need improved infrastructure to ensure all plastics we use are circulated in the economy and never become waste or pollution. The question is not whether a circular economy for plastic is possible, but what we will do together to make it happen. Ultimately, eliminating SUPPs is only one way to reduce environmental damage.

**President, India Water Foundation*

Article published in SME World May 2022 Issue



Chronicle:7
March 2022 – August 2022

Page 24 of 72
Copyright © 2008 India Water Foundation, India. All rights reserved.
Reproduction of this document or any portion thereof without prior written consent to prohibited Spaces, 17th Floor, Max Towers, Sector 16B, DND Flyway Noida-201301, India

REPORT

Land, Life, Legacy: From scarcity and prosperity

A report on UNCCDCOP-15

Shweta Tyagi*

15th session of the Conference of the Parties of the United Nations Convention to Combat Desertification (UNCCD) - Land Life Legacy: From Scarcity to Prosperity

The biennial meeting of the Conference of Parties (COP), the main decision making body of the United Nations Convention to Combat Desertification was held from 9th-20th May 2022 in Abidjan, Republic of Côte d'Ivoire. The 15th session of the Convention comprising of group of governments, organizations the private sector, civil society, youth other key stakeholders and the European Union was held to review commitments made to the UN Convention to Combat Desertification and plan and make recommendations for the future. The theme of the 15th COP of the UNCCD was '*Land Life Legacy: From scarcity to prosperity*'. It represented a global call to action to ensure land, the lifeline of the planet, continues to benefit present and future generations. It aims to bring together leaders from governments, the private sector, civil society and other key stakeholders from around the world to drive progress in the future sustainable management of land and galvanize sustainable solutions for land restoration and drought resilience. Drought, land restoration, and related enablers such as land rights, gender equality and youth empowerment were among the focus of the 15th COP agenda.

The 15th Convention of Parties held from 9th-20th May 2022 included multiple sessions of the Conference of the Parties (COP) and its subsidiary bodies: the Committee for the Review of the Implementation of the Convention (CRIC) and the Committee on Science and Technology (CST); Discussions with Committee of the Whole (COW); High-level segment meetings; Dialogue platforms with Civil Society and Plenary Sessions.

AGENDA		
CST	COP/COW	CRIC
Adoption of the agenda	Adoption of the agenda	Adoption of the agenda
SPI: Science-policy recommendations on land use planning for DLDD	Policy frameworks and thematic issues: <ul style="list-style-type: none">- Drought- Sand and dust storms- Gender- Migration	2022-2025 work plan of the secretariat and the GM

	- Land tenure	
SPI: Science-policy recommendations on monitoring drought resilience	UNCCD communication plan	2020-2021 results-based performance of the secretariat and the GM
SPI: Cooperation with other scientific panels and bodies (IPCC, IPBES...)	Relationships and synergies with other conventions and organizations	Next steps in promoting LDN
Science-policy knowledge management: SPI, best practices and the UNCCD Knowledge Hub	Preparation of the mid-term evaluation of the 2018-2030 Strategic Framework	GM work on resource mobilization
SPI work programme 2022-2023	2022-2023 budget, 2020-2021 financial performance	Collaboration with the GEF
Indicators for the 2022 national reporting	Report of the Evaluation Office	2022 national reporting
Agenda of the next CST	Civil society participation in the UNCCD	Promotion of capacity building
	Private sector participation in the UNCCD	

High Level Segment: 9th& 10thMay, 2022

The 15th Conference of Parties (COP) began with an Opening Ceremony of the UN Convention to Combat Desertification (UNCCD) on 9th May, 2022. The opening ceremony included a Presidential Summit and was attended by the President of the Republic of Côte d'Ivoire Alassane Ouattara; UNCCD Executive Secretary Ibrahim Thiaw; Indigenous Peoples, Hindou Oumarou and UN Deputy Secretary-General Amina J. Mohammed; UN leaders; Heads of state; Government Delegations and representatives of Indigenous Peoples Groups and Youth. The Presidential Summit outlined the theme of the Conference with most delegates highlighting economic risks from continued loss of fertile land; vulnerability of small producers, women and youth to environmental degradation; transformation of food systems; sustainable land management; development of drought policies and inclusion of women, girls, youth and indigenous people.

The Presidential Summit was followed by a Gender Caucus held on 9th May 2022. Attended by Heads of State, Departments and Delegation comprising of many women led states and departments; the Gender Caucus served as an effective platform to discuss role of women in agriculture value chains; gender equality in sustainable land management and inclusion of women in agricultural extension services and rights to land.

The High Level Segment of 15th Conference of Parties (COP) to the UNCCD began with an opening plenary; a series of Interactive Dialogues and roundtables. The opening plenary of the UN Convention to Combat Desertification (UNCCD) included an address by Shri Bhupender Yadav Union Minister for Environment, Forest and Climate Change and a special address by Sadhguru, spiritual leader and founder of ISHA Foundation. While, the Minister acknowledged the essential role of land in achievement of Sustainable Development Goals; he encouraged the adoption of soil conservation; sustainable agricultural production

and Soil Health Cards as innovative examples of scientific land management. This was supported by Sadhguru call to save soils and the adoption of a global target of 3% soil organic carbon content.

The 1st Interactive Dialogue on Land re-Generation was marked by discussions on role of youth; land based entrepreneurship development; approaches to the inclusion of youth in sustainable land management and implementation of UNCCD; and linkages with sustainable production and consumption. The 2nd Interactive Dialogue on Future Proofing Land Use was marked by discussions on food security, future risks to value chains; land restoration and sustainable land management; sustainable livestock development; sustainable consumption and production and the role of markets.



Conference of Parties (COP) and Committee of Whole (COW): 11th– 20thMay, 2022

The 15th Conference of Parties began with the official handing over of the Presidency from COP 14 host India to COP 15 host and President Côte d'Ivoire's. This was followed by opening statements of representatives of regional and interest groups, UN agencies, civil society and the private sector. The main events of the session were discussions and finalization of a Work Programme (2022-2025) and budget (2022-2023).

The 2nd meeting of the Conference of Parties began with a follow up for the mid-term review of the UNCCD Strategic Framework 2018-2030 scheduled for the 16th Conference of Parties in 2024. This included setting criteria, priorities and terms of reference for the midterm evaluation. India along with China requested the convention to be part of the Intergovernmental Working Group overseeing the evaluation of the UNCCD Strategic Framework. This was followed by a review of international policies and frameworks addressing the following:-

- **Migration:** International instruments like Global Compact for Safe, Orderly and Regular Migration and organizations like International Organization for Migration were found relevant to address migration issues due to land degradation/desertification and drought. Members supported assessing desertification-migration links; rural-urban migration trends etc. Members continued to emphasize on the potential of Sustainable Land Management (SLM) and Ecosystems Restoration in addressing land degradation and out migration.
- **Gender:** A separate session was organized for members of the 15th COP to support the gender-responsive implementation of the UNCCD 2018–2030 Strategic Framework. With preparation of Gender Action Plans (GAP), Gender Caucus and capacity building on gender issues some of the main

approaches adopted under the UNCCD, additional support included design of gender-responsive tools and guidelines; capacity building, strengthening of data collection

- **Land Tenure:** During the session on policy frameworks to address land tenure Delegates welcomed the technical guide on integrating the VGGT into the implementation of the UNCCD and Land Degradation Neutrality (LDN), and related efforts on awareness raising and capacity building.

The 3rd meeting of the Committee of the Whole (COW) began with a Review of progress in the implementation of the UNCCD communication plan; Promotion and strengthening relationships with other relevant conventions and international organizations, institutions and agencies; and Participation and involvement of the private sector in meetings and processes of the United Nations Convention to Combat Desertification and the business engagement strategy.

The 4th meeting of the Conference of the Parties began with the release of the 2nd Global Land Outlook (GLO2) and an open dialogue on Agro-ecological approaches and regenerative agricultural practices as solution to achieving land degradation neutrality (LDN) and addressing desertification, land degradation and drought (DLDD). The 5th Meeting the Conference of the Parties began with the presentation of the CRIC report, summarizing the recommendation to adopt eight draft decisions and its adoption by the members.



Opening Ceremony of the 15th Conference of Parties to the UNCCD

Committee for the Review & Implementation of the Convention (CRIC): 11th– 13th May & 16th– 18th May, 2022

The 1st session of the Committee for the Review and Implementation of the Convention (CRIC) began with the adoption of the agenda including a review of the effective implementation of the Convention at national, sub regional and regional levels; Multi-year work plan and Performance of Convention Institutions and Subsidiary bodies; Integration of Sustainable Development Goal 15 and 15.3; and Improving procedures for communication and capacity building for implementation of the Convention. Since 129 countries have committed to set Land Degradation Neutrality Targets, the committee considered some of the main gaps identified by members for strengthening the implementation of LDN including the need for customized support, guidance and capacity building- LDN assessments, data collection, monitoring and national reporting including the use of high resolution Earth observation data on LDN especially in dry lands.

The Committee for the Review & Implementation of the Convention resumed its sessions from 16th May 2022. One of the main agenda of the 2nd meeting of the Committee was improving the procedures for communication of information as well as the quality and formats of reports to be submitted to the Conference of the Parties. The main suggestions supported by the Committee include the adoption of e-learning tools to support national reporting; adoption of online spatial database based land-change monitoring platforms; creation of national level technical expertise to ensure high quality reports. Potential areas for capacity building requested by the Parties include scientifically robust technical classification of land use types, and of types and severity of land degradation and the identification of tools and indicators for monitoring progress of LDN. Other agendas of the Committee were Integration of Sustainable Development Goal 15 and related target 15.3 into the implementation of the Convention and land degradation neutrality; Development and promotion of activities for targeted capacity building to further the implementation of the Convention.

The 4th meeting of CRIC was initiated with discussions on financial mechanisms and securing equitable access to additional investments. Reports by the Global Mechanism and the Global Environment Facility were discussed. Here India supported China in the development of balanced funding mechanisms and funding through national focal points.



Representatives from each regional implementation annex, Western Europe and Other States, and Civil Society Organizations (CSOs) present during the CRIC

Committee on Science & Technology: 11th– 13th May & 16th – 18th May, 2022

The 1st session of the Committee on Science and Technology began with appointment of the Chair of the Session and opening remarks Ibrahim Thiaw, UNCCD Executive Secretary. The session emphasized on basing work programmes on solid scientific knowledge including comprehensive analysis of Intergovernmental Panel on Climate Change (IPCC) reports. The opening session of the Committee on Science and Technology was followed by a review of SPI Report on Integrated Land Use Planning and Integrated Landscape Management and their role in addressing Land Degradation/Desertification and Drought and achieving Land Degradation Neutrality. Another report by SPI on assessment and monitoring

of the resilience of vulnerable populations and ecosystems to drought was reviewed by the Committee. The report provided the global community with an inventory of drought resilience indicators and a road map for regional drought resilience assessments.

The 2nd Session of the Committee on Science and Technology was held on 12th May, 2022. The session included a review of coordination activities of the Science Policy Interface with other intergovernmental scientific panels; the effectiveness of the UNCCD Knowledge Hub on dissemination of best practices; Finalization of a Work Programme for the Science Policy Interface 2022-2023; Reporting mechanisms on the UNCCD 2018-2030 Strategic Framework; and inclusion of Civil Society Organizations in the official work programme. The 3rd session of the Committee on Science and Technology was held on 13th May, 2022.



Dais for the Committee on Science and Technology (CST)

Conclusion & Final Decisions

Following two weeks of high-level discussions and negotiations, UNCCD COP 15 adopted 38 decisions to improve drought resilience, reduce land degradation, and invest in land restoration efforts, including agreement to:

- Accelerate the **restoration of one billion hectares of degraded land** by 2030 through improved data collection, monitoring, and reporting; Integrate satellite data include data analytic tools for evidence-based decision making through integrated land use plans (ILUP) and Integrated Land Management (ILM)
- Integration of SDG 15 and related target 15.3 into the implementation of the Convention and LDN and development and promotion of activities for targeted capacity building
- Boost **drought resilience** by identifying the expansion of dry lands, improving national policies and early warning, monitoring and assessment; learning and sharing knowledge; building partnerships and coordinating action; and mobilizing drought finance.
- Improve national policies and **early warning, monitoring**, and assessment, in particular as related to sand and dust storms and drought;

- Improve efforts at capacity building, sharing of knowledge and lessons, and coordination at the national and regional level on systematic approaches to land conservation, sustainable land management etc
- Establish an **Intergovernmental Working Group on Drought for 2022-2024** to support a shift from reactive to proactive drought management;
- Address forced **migration** and displacement driven by desertification and land degradation by creating social and economic opportunities that increase rural resilience and livelihood stability, and by mobilizing resources for land restoration projects;
- Improve **women's involvement in land management** through ensuring secure land tenure; collecting gender-disaggregated data on the impacts of desertification, land degradation and drought; integrating Gender Action Plans into LDN
- Develop policies to reduce the impact and occurrence of **sand and dust storms** through early warning, risk assessment and reducing man-made causes;
- Promote decent land-based jobs for youth and **land-based youth entrepreneurship** and strengthen youth participation in the UNCCD process;
- Promotes access to financial resources through approval of special fund amounting to EUR 24,646,354
- Ensure greater synergies among the **three Rio Conventions**, including complementarities in the implementation of treaties like UNFCCC, Convention on Biological Biodiversity, Sendai Framework for Disaster Risk Reduction etc and through nature-based solutions and target-setting at the national level;
- Continue raising public awareness on Convention issues using online communication tools and traditional and social media
- Strengthen the participation of civil society organizations, media, private sector, Indigenous peoples, local communities, as well as sub national and local governments and youth in the work and meetings of the UNCCD.

New commitments adopted during the COP include:

- The Abidjan Call issued by the Heads of State and Government attending the Summit;
- The Abidjan Declaration on Achieving Gender Equality for Successful Land Restoration, which emerged from the Gender Caucus; and
- The Land, Life and Legacy Declaration, including the Abidjan Legacy Programme, a five-year, USD 1.5 billion comprehensive and innovative approach to fight against deforestation through forest restoration, and aims to restore 20% of the Ivorian forest cover by the end of the decade.

Other initiatives launched during the COP include:

- the Business for Land Initiative, to showcase commitments made by participating companies towards land degradation neutrality, both in supply chains and corporate social responsibility activities; and

- The Sahel Sourcing Challenge to enable communities growing the Great Green Wall to use technology to monitor progress, creates jobs, and commercializes their produce.

Future meetings of the Conference of the Parties to the UNCCD and its subsidiary bodies will be held in Saudi Arabia (COP16 in 2024), Mongolia (COP17 in 2026), and Uzbekistan (Committee for the Review of the Implementation of the Convention in 2023).

For details on declarations and outcomes of individual events: The Earth Negotiations Bulletin summary and analysis of COP 15 at <https://enb.iisd.org/convention-combat-desertification-unccd-cop15>



The Great Green Wall in Mali. The project aims to stop desertification by planting a massive line of trees in the

**Chief Functionary, India Water Foundation*

MAJOR EVENTS AND ACTIVITIES

4 August 2022

It was a pleasure to speak at the UNEP's International Methane Emissions Observatory (IMEO) meeting. It is a project to catalyze deep reductions in anthropogenic methane emissions worldwide. IMEO is a data-driven, action-focused initiative that takes an innovative approach to addressing the methane emissions problem by collecting, integrating, and reconciling methane data from different sources, including scientific measurement studies, satellites, rigorous industry reporting through the Oil and Gas Methane Partnership 2.0 (OGMP 2.0), and national inventories. Looking forward to be a part of the Advisory Council, and contribute through our experiences.



1 August 2022

Dear Jal Mitra, we are pleased to inform you that Dr Arvind Kumar, President, India Water Foundation signed a Memorandum of Understanding (MoU) with Dr. J. V. Tyagi, Director, National Institute of Hydrology (NIH) which is a premier Research and Development organization on Hydrology under the Ministry of Jal Shakti, Department of Water Resources River Development and Ganga Rejuvenation, Government of India. Dr. Kumar also presented Dr. Tyagi his book - 'United Nations at 75 and beyond'. We look ahead to a fruitful collaboration on various projects and leverage our respective strengths and contribute to a water secure nation. We take this opportunity to thank Dr. J. V. Tyagi, for his warm gesture and gracious hospitality.



Also present were Shweta Tyagi, Chief Functionary, India Water Foundation and Dr. Sudhir Kumar Scientist G and Dr. Sanjay K. Jain Scientist G from NIH.

28 July 2022

It was a pleasure to attend the meeting of SANS as a member and deliberate on the focus areas of the 6th South Asia Forum to be held in Pakistan. Appreciate the efforts taken up by SSWA office of UN ESCAP to strengthen this network.



2022 Annual Strategic Meeting of South Asia Network on the Sustainable Development Goals (SANS) virtually held today with members shared views on upcoming sixth South South West Asia Forum & next steps on expanding network.

United Nations ESCAP, SANS SDG PROJECT, Rajan Ratna, Subregional, SDGs, India Water Foundation, Biruni Institute, Sustainable Development Policy Institute (SDPI), Institute of Policy Studies of Sri Lanka (IPS), Centre for Policy Dialogue (CPD), South Asia Watch on Trade, Economics and Environment (SAWTEE), RIS, South Asian Network on Economic Modeling (SANEM), Institute for Studies in Industrial Development, CUTS International, Tarayana Foundation.

16 July 2022

Speaking on raising the echelons of ‘Environmental Protection’ at tagore international school East of Kailash as a chief guest I found it challenging yet interesting to infuse a sense of ‘Eco ownership’ among the students to knit together a social movement to embrace our Mother nature and work towards conserving the same.

An invite to become a part of IWF’s Jal Mitra endeavor was appreciated with enthusiasm by the students and the teachers. Interactions with the school students galvanized the opportunity to disseminate environmental awareness, best green practices and Eco-education corroborated with ‘Moral responsibility to Act’. At the outset, we attempted to nurture student’s capacities, Sustainability, Morality, Trusteeship among the students as we firmly believe ‘Children are the future torchbearers of our society’.



5 July 2022

The objective behind Van Mahotsav will only be fulfilled if the saplings planted are nurtured throughout the year to transform them into trees because trees clean the air, reduce green house gas, reduce soil erosion, protect the ozone layer, prevent water pollution, conserve energy, save water, provide habitat, protect ecosystem and also provide economic opportunities. Whether adding another seedling to a forest or adding one in your garden, Strategically planting trees is always a good idea. Watch the full video on India Water Foundation's YouTube channel

(<https://youtube.com/shorts/tM9Uhu35eOk>).

Link <https://fb.watch/eMvu8kWwG8/>

4 July 2022

Please find our SDG Accelerator action '**Amplifying SDG 6 towards people centric sustainability in the spirit of nexus approach**' published on the Actions page of United Nations Department of Economic and Social Affairs - Sustainable Development. It showcases how addressing holistic water management through SENSITIZE, INCENTIVIZE AND GALVANIZE model shall enhance realization of SDGs with 'No One Left Behind'. For detailed information click on- https://sdgs.un.org/partnerships/amplifying-sdg-6-towards-people-centric-sustainability-spirit-nexus-approach?fbclid=IwAR1r1atkS2uZyW1n9j0wq5Fr0c8nyOHLIOTs2Iq0S2zXxd_2CFu7e_lf2QM



2 June 2022:

"Wetlands contribute to all of the 17 SDGs, either directly or indirectly and their conservation and wise use represent a cost-effective investment for governments." said Dr Arvind Kumar President India Water Foundation at the breakout session on Wetland Conservation of the closing event of the 'Lead the Green Change/ Biodiversity Means Life' Campaign under the 'Biodiversity means Business II: Greener EU-India Supply Chains & Technologies' Organized by the EU Delegation to India along with Global Business In roads (GBI) on 2 June 2022 . Inputs from Experts and practitioners will be provided, collected, analyzed and summarized in a final end-of-campaign report which will be ready before the CBD, COP15 in 2022 Q3. This event gathered policymakers, stakeholders, organizations, corporate, technologies and financial institutions from India and EU. It addressed the adaptation, promotion and enforcement of greener corporate and public policies, technology, innovation, and models at the national, state and city levels.



<https://www.facebook.com/drarvind.kumar.3/posts/pfbid02oHuDK1H5Qn5qVyc8PEG31zzy21KjezAppzHxPSEsPeJhak1kYcWkrTVchPx2VRepl>

30 May 2022:

Cooperation among departments, convergence and coordination are the first few steps to be taken for the successful implementation of any initiative be it at national, state, or district level. Ms. Shweta Tyagi Chief Functionary India Water Foundation, under the project on 'Scientific Approach towards bridging SCIENCE and HEALTH divide in a sustainable way' supported by NCSTC Department, Ministry of Science and technology. India Water Foundation conducted a interdepartmental consultation in the district of Hapur on the occasion of tehsil diwas in the collectorate. The meeting was chaired by Chief Development Officer Ms. Prerna Singh and had participation from departments of Health, #Agriculture, skill development, social welfare, water resources, pollution control, Panchayatiraj, rural development, Industrial development, women self help groups where they all enlightened us by the special efforts made by their departments during COVID. Looking forward to many more interdepartmental consultations.



<https://www.facebook.com/drarvind.kumar.3/posts/pfbid08CvEXFPXkFGKiSfkbDkDuhXP1VQXNjrVjx5g7evr1RC7FLjbWBFjdArWCTbAVAUrI>

12 May 2022

India Water Foundation and International Network of Basin Organizations - INBO had comprehensive



discussions during a virtual meeting of our respective teams. The discussions focused on collaboration regarding organizing international events, project implementation plans, data management and sharing experiences gathered from our various projects on integrated water resource management and preparations of the 10th World Water Forum as colleagues in the board of World Water Council - Conseil Mondial de l'Eau. The meeting was attended by Dr. Arvind Kumar, President, IWF and Shweta Tyagi, Chief Functionary from India Water Foundation and Dr. Eric

Tardieu, Mr. Alain Bernard, Ms Stephanie LARONDE and Mr. Edouard BOINET from INBO. We are looking forward to a mutually beneficial association in the near future.

3 May 2022:

I am pleased to inform you that my full paper titled ‘**Enhancing Economic Agro-Forestry for Livelihood Opportunity via Ecosystem Restoration: A Case Study**’ under sub theme ‘Forests and Human Health: Revisiting the Connections’ has been accepted for the **XV World Forestry Congress** which is taking place at Seoul, Republic of Korea from 2–6 May 2022 on the theme of ‘Building a Green, Healthy and Resilient Future with Forests’. The congress is organized by FAO and Korea Forest Service, Government of Korea. The XV World Forestry Congress will provide a crucial opportunity for the global forestry community to consider the state and future of world forestry, particularly in the context of recovery from the COVID-19 pandemic while striving to achieve the Sustainable Development Goals (SDGs) and will identify key measures and recommendations for enhancing this role. Unable to make it to Seoul I am participating virtually. To access the abstract of the paper please click on



https://programme.wfc2021korea.org/en/session/abba1897-a9c1-ec11-997e-a04a5e7cf9dc?fbclid=IwAR2-uu6X6z7emC_VzU0HPXg7yy1iFrrBlmvPhUW59EAcoWYCygJRcUZhUfw



26 April 2022:

In the session on ‘Accelerating mobilization of finance’ I emphasized on Embedding climate-aware sustainable approaches into risk management and incentives by ensuring that markets can obtain and use the data and disclosure that they need to assess risks, while taking advantage of breakthrough technologies. The intervention was made in the 2nd meeting of the Informal Working Group (IWG) on Leadership Dialogue-3 (LD3) - “Accelerating the implementation of the environmental dimension of Sustainable Development in the context of the Decade of Action”, for Stockholm+ 50 under the aegis of UNEP organized on 26th April.

22 April 2022: “Biodiversity loss, Climate Action and prosperity for all is something that needs urgent and immediate action and is only possible through multi-stakeholder action” said Dr Arvind Kumar while making an intervention in the Second round of Informal Working Groups for Leadership Dialogue-1- Reflecting on the urgent need for actions to achieve a healthy planet and prosperity of all for Stockholm+ 50 under the aegis of UNEP. His session was on Integrated and joint approaches where he stressed on reinvigorating the institutions set up to foster regional cooperation to focus on attaining the SDGs and ensure that no person or country is left behind.



19 April 2022:

India Water Foundation had undertaken a study for Japan International Cooperation Agency (JICA) for information collection on water supply and sanitation in selected 50 representative slum samples out of around 5200 urban slum areas of Delhi in 2021-22 in collaboration with NJS Engineers India Ltd. The objective of the study was to analyze the achievements and lessons learnt in water supply and sanitation sector in urban slum areas through reviewing related central and state government policies, programmes and activities by other development agencies. Reviewing and analyzing various JICA funded representative projects in the sector and proposing assistant policy/implementation plan for future project formulation in the water sector. Although The survey was quite a challenge in itself, especially considering the COVID prevalence and restrictions, the enthusiastic study team addressed those challenges and conducted the survey, various outreach activities and came up with invaluable data which became the ground stone to draft synthesis indicators enabling interpretation of results obtained from respondents. This study will be helpful in planning for future project formulation in the water sector to achieve the target of SDG6 and Clean India Movement.



5 April 2022:

It was a privilege to be speaking at the multi stakeholder consultation on Government of India-United Nations Sustainable Development Cooperation Framework (UNSDCF) for the next five-year period 2023-2027 as the current framework 2018-2022 is in the final implementation phase. I stressed that ecosystem restoration and reforestation sequester carbon in plants and soil, and can enhance biodiversity and provide additional biomass, but can displace food production and livelihoods, which calls for integrated approaches to land use planning, to meet multiple objectives including food security. Thanks to UN India Office and The Resident Coordinator Mr Shombi Sharp and Niti Aayog for these series of multi stakeholder consultations to receive feedback from key players (CSOs, think tanks and economic enterprises) on the outcomes of 'Health and Wellbeing', 'Nutrition and Food', 'Quality Education', 'Economic Growth and Decent work', 'Climate Action and WASH', and 'Empowering People, Communities, and Institutions'. and understanding their perspectives on furthering the localization of SDGs in India and ensuring that they are coherently articulated and well reflected in the UNSDCF.

ONGOING PROJECT

Scientific Approach towards Bridging SCIENCE and HEALTH Divide in a Sustainable Way

Considering children as agents of change we communicated concerns and challenges all around related to Covid pandemic and how promoting community preparedness and sustainable health and hygiene culture will also affect the environment and eventually our planet under the project granted to India Water Foundation by NCSTC department, Ministry of Science and Technology, Government of India 2022-23. India Water Foundation celebrated World Earth Day with the students and teachers of Dewan Inter College Hapur where we conducted a painting competition. Several activities were undertaken under this project. This project is ongoing in the districts of Noida, Hapur and Bulandshahr in Uttar Pradesh and East Delhi District in Delhi. We also met the principals of government schools in Hapur and Bulandshahr.



As an initiation warming up for the project with Ministry of Science and Technology in the districts of Uttar Pradesh and Delhi, Ms. Shweta Tyagi, Chief Functionary India Water Foundation, had a project overview meeting with the district administration heads at Hapur, Bulandshahr, Noida and Delhi. To provide an overview of the project for a period of three days she had meetings with political representatives, district Magistrates and other officers in the districts. The warm positive gesture of the officers and political representatives, their enthusiasm and excitement for the project is commendable. This is what civil society organizations seek- support and cooperation for their endeavors to reach the last man standing. She met Mr. Anuj Singh, DM Hapur, Ms Prerna Singh CDO Hapur District and Mr. Puneet Kumar Patel ADM East Delhi District East Delhi, Noida and Bulandshahr, Mayor East Delhi Sh. Shyam Sunder Aggarwal, DM Noida Mr. Suhas LY DM Bulandshahr, Sh. Chandra prakash Singh and CDO Bulandshahr Sh. Abhishek Pandey. The district heads met Ms. Tyagi cordially and had a comprehensive discussion on other areas of cooperation.



PUBLISHED ARTICLES

August 2022



In his latest article on 'Rethinking Population Dynamics for SDG realization by 2030' published in #SMEWorld Magazine, Vol. XV, No. 08, Aug 2022 issue Dr. Arvind Kumar articulated how Population burst and reckless consumption habits put pressure on #biodiversity and #humancommunities, on governments to meet the demand and supply of essential services, exacerbating #food and #watershortages, reducing resilience in the face of #climatechange, and making it harder for vulnerable groups to rise out of intergenerational poverty". Click on the link ahead to read the complete article-

https://www.indiawaterfoundation.org/wp-content/uploads/2022/08/SME-WORLD-AUGUST-2022-ISUUE_4.pdf?fbclid=IwAR1PT7sclhK4irvoxpT3nm-ED2gtTcNYEySsnK6_UJhJgolcbYVK6PpV0k

July 2022

Pleased to share the published review of Dr. Kumar's recent book with Elsevier publications on 'Ecosystem Based Adaptation: Approaches to Sustainable Management of Aquatic Resources'. To read the complete review please click on the link-

https://theguardian.com/ecosystem-based-adaptation-garnering-international-traction/?fbclid=IwAR1fr5imYPTQm8_Lz60nYWbz5Z2agzOFM4dQgosCzy6Tq1zN4kdIPwRcTQ



July 2022

India Water Foundation made the first official presentation for the Ministry of Petroleum and Natural Gas, Government of India, on 'Factoring Water in Production of Green Hydrogen'. This article published as a cover story is an excerpt of the presentation and discussions held with the officials. Green Hydrogen production will consume 1.5 ppm of Earth's freshwater or 30 ppb of saltwater each year, an amount smaller than what is currently consumed by fossil fuel-based energy production and power generation. Then what is the journalistic concern about the consumption of water in production of green hydrogen? Published in SME World Magazine, Vol. XV, No. 07, July 2022 issue. Click on the link ahead to read the complete article-



https://www.indiawaterfoundation.org/wp-content/uploads/2022/07/SME-WORLD-July-2022-issue_AK.pdf



May 2022

India bans single use plastics from 1st July 2022. These particular plastics are the strongest threat to the environment, wildlife, and people. They contribute to rising #pollution levels, close to half of all plastics used worldwide end up in landfills or were dumped in the wild and are not #biodegradable. Instead, they break down into smaller fragments known as microplastics. The items banned include grocery bags, food packaging, bottles, straws, containers, cups, and cutlery. The choice for the first set of single-use plastic items for the ban was based on "difficulty of collection, and therefore recycling. Irresponsible individual behaviour is a major reason for single-use plastics cluttering up the environment. Reduce-Reuse-Recycle is the mantra to follow, also finding sustainable alternatives. Please find an article by Dr Arvind Kumar published in SME World magazine, May 2022 issue, for complete article please click here https://www.indiawaterfoundation.org/wp-content/uploads/2022/05/SME-WORLD-May-2022-Issue_1.pdf?fbclid=IwAR004uQyXjOcUQUkZzbY-IQHgrwofoAg73WcPAMus-7v_gtSc1iKzzya-ORM8



April 2022

Dr. Arvind Kumar, President India Water Foundation's article 'Dakar 2022 : Turning Rhetoric into Action!' published in SME World magazine, April 2022, Vol XV No.04 issue. The 9th World Water Forum took place in Dakar, Senegal from 21-26 March 2022, under the theme: 'Water Security for Peace and Development'. It is the first time that an international event of this magnitude has been organized in sub-Saharan Africa. The location was aptly chosen as Africa faces acute challenges of universal access to water and sanitation while also battling the challenges of poverty and growing pressures related to climate change, rapid population growth, uncontrolled urbanization, pollution, etc.....Read more Click Here <https://www.smeworld.asia/PDF/SME%20WORLD%20April%202022%20Issue.pdf>



OPINION

An update on Climate Change

Prof Ajit Tyagi*

I have seen many scientific reports in my time but nothing like the latest IPCC report. With fact upon fact, this report reveals how people and the planet are getting clobbered by climate change. Nearly half of humanity is living in the danger. Many ecosystems are at the point of no return. Unchecked carbon pollution is forcing the world's most vulnerable on a frog march to destruction. That spells catastrophe..."

■ UN Secretary General Antonio Guterres

Introduction

Climate is defined as average weather conditions prevailing at a place or a region over a long period. At a broader scale Climate system includes land, atmosphere, ocean and cryosphere. World Meteorological Organization (WMO) specifies a period of 30 years to define climate of a place. Climate is not static. It exhibits short term variability and change over a long period of time. Variation in climate from one year to another is known as Natural variability. Drought in one year and floods in another is a part of natural variability. Changes in weather elements and climate system observed over a long period of time is called Climate Change. The Earth's climate has changed throughout history. In the last 650,000 years and seen cycles of glacial advance and retreat, with an abrupt end of last ice age about 11,000 years ago. It marked the beginning of the modern climate era and of human civilization. Most of these climate changes are attributed to very small variation in Earth's orbit that change the amount of solar energy received by the Earth. These climate changes used to take place over a very long period spread over thousands of years. The current warming trend is of significance because most of it is caused by human activity since the mid-20th century and proceeding at a rate unprecedented.

Intergovernmental Panel on Climate Change (IPCC)

To address the issues of climate change, the Intergovernmental Panel on Climate Change (IPCC) was established in 1988 by the United Nations Environment Programme (UNEP) and WMO. It was dedicated to providing the world with objective scientific information relevant to understanding the scientific basis of the risk of human-induced climate change, its natural, political and economic impacts and risks and possible response options. The IPCC has three working groups. The first Working Group deals with scientific aspects of climate change, Second with vulnerability and adaptation and third with mitigation. The IPCC comes out with Assessment Reports (ARs) and Special Reports. The IPCC AR5 Special Report of 2018 based on latest models and impact studies stated that with global warming of 1.5^o C there would be increased risks to health, livelihood, food security, water supply, human security and economic growth. Since AR5, the knowledge base on observed and projected impacts and risks generated by climate hazards, exposure and vulnerability has increased significantly.

State of Global Climate 2021

The World Meteorological Organisation (WMO) is an intergovernmental organization with a membership of 193 countries. The WMO is specialized agency of the United Nations for meteorology (weather and climate), operational hydrology and geophysical sciences. The WMO monitors global climate through Global Climate Observing System (GCOS) and Global Atmospheric Watch (GAW). The WMO comes out with Annual Statement on the State of the Global Climate. These reports provide guidance to policy makers in international meetings like COP.

The WMO released State of Global Climate 2021 Report¹ on 18th May 2022. It gives details of climate indicators² such as Greenhouse gases, temperature, ocean heat, ocean acidification, sea level rise, sea ice glaciers, and extreme weather. The WMO report will be used as an official document for the UN Climate Change negotiations known as COP27 to take place in Egypt later this year.

Four key climate change indicators – greenhouse gas concentrations, sea level rise, ocean heat and ocean acidification – set new records in 2021. This is yet another clear sign that human activities are causing planetary scale changes on land, in the ocean, and in the atmosphere, with harmful and long-lasting ramifications for sustainable development and ecosystems.

Extreme weather – the day-to-day “face” of climate change – led to hundreds of billions of dollars in economic losses and wreaked a heavy toll on human lives and well-being and triggered shocks for food and water security and displacement that have accentuated in 2022.

Key Messages

Greenhouse Gas (GHG) concentrations reached a new global high in 2020, when the concentration of carbon dioxide (CO₂) reached 413.2 parts per million (ppm) globally, or 149% of the pre-industrial level. Data from specific locations indicate that they continued to increase in 2021 and early 2022, with monthly average CO₂ at Mona Loa in Hawaii reaching 416.45 ppm in April 2020, 419.05 ppm in April 2021, and 420.23 ppm in April 2022.

Global Annual Mean Temperature :The global annual mean temperature in 2021 was around 1.11 ±0.13 °C above the 1850-1900 pre-industrial average (Fig 1), less warm than some recent years owing to cooling La Niña conditions at the start and end of the year. The most recent seven years, 2015 to 2021, are the seven warmest years on record.

Ocean Heat : Ocean heat in 2021 was record high. The upper 2000m depth of the ocean continued to warm in 2021 and it is expected that it will continue to warm in the future – a change which is centennial to millennial time scales. All data sets agree that ocean warming rates show a particularly strong increase in the past two decades. The warmth is penetrating to ever deeper levels. Much of the ocean experienced at least one ‘strong’ marine heat wave at some point in 2021.

Ocean acidification. The ocean absorbs around 23% of the annual emissions of anthropogenic CO₂ to the atmosphere. This reacts with seawater and leads to ocean acidification, organisms and ecosystem services, and hence food security, tourism and coastal protection. As the pH of the ocean decreases, its

capacity to absorb CO from the atmosphere also declines. The IPCC concluded that “there is very high confidence that open ocean surface pH is now the lowest it has been for at least 26,000 years and current rates of pH change are unprecedented.

Mean Sea Level : Global mean sea level reached a new record high in 2021, after increasing at an average 4.5 mm per year over the period 2013-2021 (Fig 2). This is more than double the rate of between 1993 and 2002 and is mainly due to the accelerated loss of ice mass from the ice sheets. This has major implications for hundreds of millions of coastal dwellers and increases vulnerability to tropical cyclones.

Cryosphere: Although the glaciological year 2020-2021 saw less melting than in recent years, there is a clear trend towards an acceleration of mass loss on multi-decadal timescales. On average, the world’s reference glaciers have thinned by 33.5 meters (ice-equivalent) since 1950, with 76% of this thinning since 1980. 2021. Canada and the US Northwest with record ice mass loss as a result of heat waves and fires in June and July. Greenland experienced an exceptional mid-August melt event and the first-ever recorded rainfall at Summit Station, the highest point on the ice sheet at an altitude of 3 216 m

Floods : Flooding induced economic losses of US\$17.7 billion in Henan province of China, and Western Europe experienced some of its most severe flooding on record in mid-July associated with economic losses in Germany exceeding US\$20 billion. There was heavy loss of life.

Drought affected many parts of the world, including the Horn of Africa, Canada, the western United States, Iran, Afghanistan, Pakistan and Turkey. In sub-tropical South America, drought caused big agricultural losses and disrupted energy production and river transport. The drought in the Horn of Africa has intensified so far in 2022. Eastern Africa is facing the very real prospect that the rains will fail for a fourth consecutive season, placing Ethiopia, Kenya and Somalis into a drought of a length not experienced in the last 40 years. Humanitarian agencies are warning of devastating impacts on people and livelihoods in the region.

Hurricane Ida was the most significant of the North Atlantic season, making landfall in Louisiana on 29 August, with economic losses in the United States estimated at US\$75 billion.

The ozone hole over the Antarctic was large and deep reaching its maximum area of 24.8 million km² (the size of Africa) as a result of a strong and stable polar vortex and colder than average conditions in the lower stratosphere.

Climate Change Impacts and Risks

Climate change impacts and risks are becoming increasingly complex and more difficult to manage. Multiple climate hazards will occur simultaneously, and multiple climatic and non-climatic risks will interact, resulting in compounding overall risk and risks cascading across sectors and regions. If global warming transiently exceeds 1.5°C in the coming decades or later (overshoot), then many human and natural systems will face additional severe risks, compared to remaining below 1.5°C. Depending on the magnitude and duration of overshoot, some impacts will cause release of additional greenhouse gases and some will be irreversible, even if global warming is reduced

IPCC Working Group II Report for Policy Makers³ states that adverse impacts from climate hazards and resulting risks are cascading across sectors and regions, propagating impacts along coasts and urban centres and in mountain regions. These hazards and cascading risks also trigger tipping points in sensitive ecosystems and in significantly and rapidly changing social-ecological systems impacted by ice melt, permafrost thaw and changing hydrology in polar regions. Wildfires, in many regions, have affected ecosystems and species, people and their built assets, economic activity, and health. In cities and settlements, climate impacts to key infrastructure are leading to losses and damages across water and food systems, and affect economic activity, with impacts extending beyond the area directly impacted by the climate hazard. In Amazonia, and in some mountain regions, cascading impacts from climatic (e.g., heat) and non-climatic stressors (e.g., land use change) will result in irreversible and severe losses of ecosystem services and biodiversity at 2°C global warming level and beyond. Unavoidable sea level rise will bring cascading and compounding impacts resulting in losses of coastal ecosystems and ecosystem services, groundwater salinisation, flooding and damages to coastal infrastructure that cascade into risks to livelihoods, settlements, health, well-being, food and water security, and cultural values in the near to long-term.

Food security: The compounded effects of conflict, extreme weather events and economic shocks, further exacerbated by the COVID-19 pandemic, undermined decades of progress towards improving food security globally. Worsening humanitarian crises in 2021 have also led to a growing number of countries at risk of famine. Of the total number of under nourished people in 2020, more than half live in Asia (418million) and a third in Africa (282 million).

Displacement: Hydro Meteorological hazards continued to contribute to internal displacement. The countries with the highest numbers of displacements recorded as of October 2021 were China (more than 1.4 million), the Philippines (more than 386 000) and Viet Nam (more than 664 000).

Ecosystems: including terrestrial, freshwater, coastal and marine ecosystems – and the services they provide, are affected by the changing climate and some are more vulnerable than others. Some ecosystems are degrading at an unprecedented rate. For example, mountain ecosystems – the water towers of the world –are profoundly affected. Rising temperatures heighten the risk of irreversible loss of marine and coastal ecosystems, including sea grass meadows and kelp forest. Coral reefs are especially vulnerable to climate change. They are projected to lose between 70 and 90% of their former coverage area at 1.5 °C of warming and over 99% at 2 °C. Between 20 and 90% of current coastal wetlands are at risk of being lost by the end of this century, depending on how fast sea levels rise. This will further compromise food provision, tourism, and coastal protection, among other ecosystem services.

Adaptation

Adaptation, in response to current climate change, can reduce climate risks and vulnerability mostly via adjustment of existing systems. Many adaptation options exist and are used to help manage projected climate change impacts, but their implementation depends upon the capacity and effectiveness of governance and decision-making processes. Enabling conditions are key for implementing, accelerating and sustaining adaptation in human systems and ecosystems. These include political commitment and follow-through, institutional frameworks, policies and instruments with clear goals and priorities, enhanced knowledge on impacts and solutions, mobilization of and access to adequate financial resources,

monitoring and evaluation, and inclusive governance processes. These and other enabling conditions can also support climate resilient development.

There are a range of adaptation options, such as disaster risk management, early warning systems, climate services and risk spreading and sharing that have broad applicability across sectors and provide greater benefits to other adaptation options when combined. For example, climate services that are inclusive of different users and providers can improve agricultural practices, inform better water use and efficiency, and enable resilient infrastructure planning.

Climate resilient development is the need of the hour. It integrates adaptation measures and their enabling conditions with mitigation to advance sustainable development for all. It calls for inclusive governance, investment aligned with climate resilient development, access to appropriate technology and rapidly scaled-up finance, and capacity building of governments at all levels; the private sector and civil society enable climate resilient development. Common goals and social learning build adaptive capacity for climate resilient development. When implementing adaptation and mitigation together, and taking trade-offs into account.

* **Prof Ajit Tyagi:** Honorary Patron & Chairman of the Committee on Climate Change, India Water Foundation (Hon'ble "Koteswaram Professor" at Ministry of Earth Sciences GOI, and Former Director General (DG) of the India Meteorological Department (IMD).)

References

1. WMO Statement on the State of the Global Climate in 2021
<https://public.wmo.int/en/media/press-release/four-key-climate-change-indicators-break-records-2021>
2. Using Indicators to explain our changing climate to policy makers and the public Michael Williams (WMO Secretariat) and Simon Eggleston (GCOS) WMO Bulletin : Vol 66(2), 2017
3. IPCC, 2022: Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem (eds.)]. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3–33, doi:10.1017/9781009325844.001.

Figures

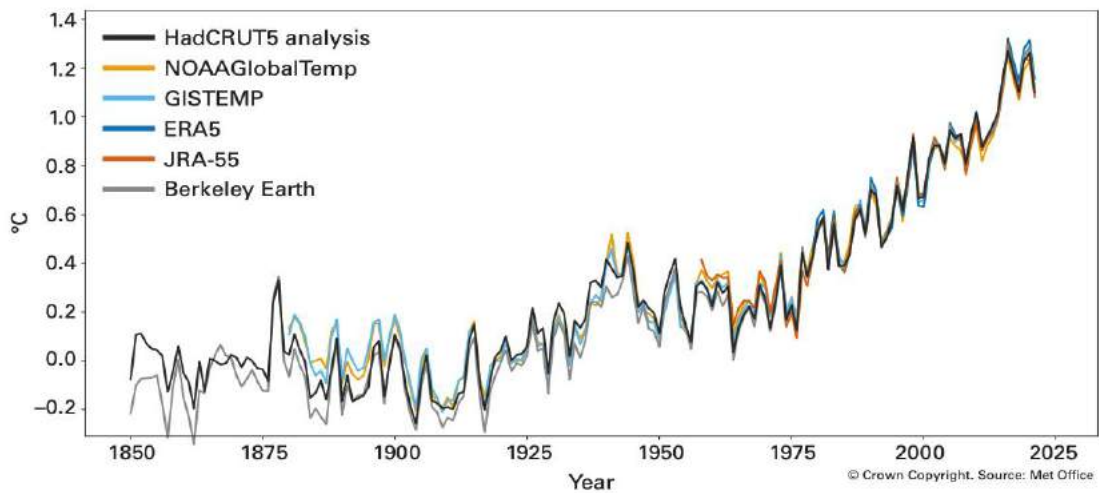


Fig 1 Global annual mean temperature difference from pre-industrial conditions (1850–1900) for six global temperature data sets (1850–2021). For details of the data sets and processing see Data sets and methods. Source: Met Office, United Kingdom of Great Britain and Northern Ireland

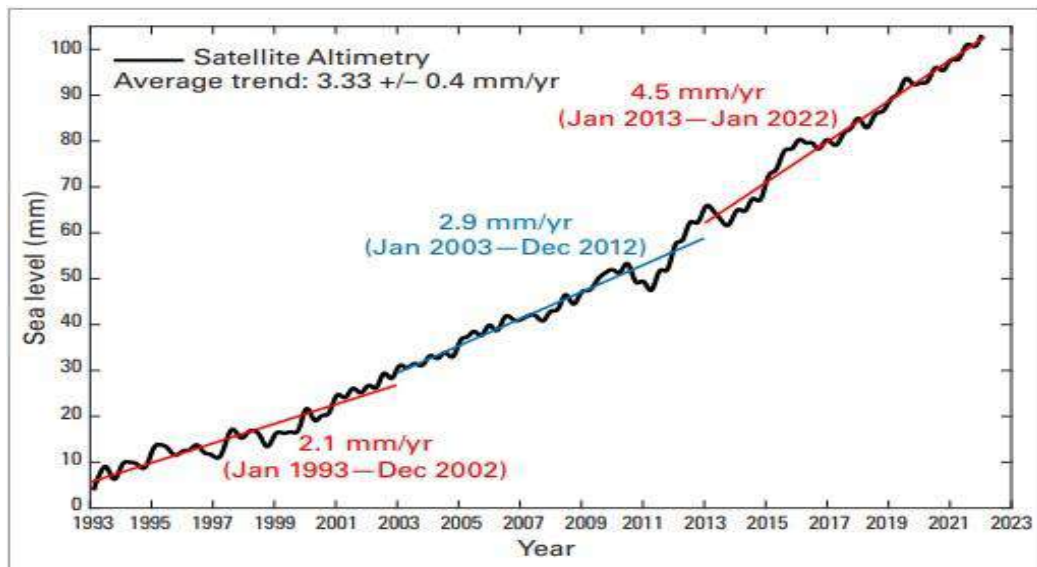


Figure 2 : Global mean sea level evolution from January 2016 to 2019 from high precision altimetry Source: AVISO altimetry (<https://www.aviso.altimetry.fr>)

RESEARCH & DEVELOPMENT

Waste Management Step Towards Sustainability: What Cannot Be Measured Cannot Be Managed?

Dr. K. Balachandra Kurup¹

1. Introduction

India is currently facing serious environmental and public health threat from the mounting waste stream. This situation is evident in all towns and cities with people suffering from health problems and degraded environment due to poor governance and paralyzed administrative set up. It has been identified that India represents one of the world's largest and fastest growing waste management markets and is expected to channelize huge investment in this area to improve the municipal waste management. The Ministry of Environment, Forest and Climate Change (MoEFCC) and the Ministry of Housing and Urban Affairs (MoHUA) have together rolled out policies and programmes to address these issues. However, most of these have failed to achieve their objectives due to a lack of clarity, commitment amongst the stakeholders, and poor enforcement by the regulators, especially the Local bodies. Although a large number of private and public entities are involved in various sectors of waste management, most approach is unscientific, unprofessional and without pragmatic strategies and goals. There have been several studies and reports on the generation of wastes in the urban areas since 1990s. Broadly these studies indicated significant variations in per capita waste generation and this disparity seriously affects waste management programmes. The per capita waste generation is highly essential to formulate policies and strategies to initiate action plan on waste management, technology options and systematic disposal and treatment facilities.

The parliamentary 'Standing committee on Urban Development' submitted a report on 'Solid Waste Management Including Hazardous Waste, Medical Waste and E-Waste' in 2012 listing down a slew of recommendations to improve the SWM in India. Looking at the poor situation on solid waste collection, segregation, and treatment, the committee asked the government to review the SWM crisis in the country in a comprehensive manner involving all stakeholders. They have emphasized the need for a roadmap and arrangement of funds and manpower without delay to address the issue considering the hazard to human health and the environment. The Parliamentary committee further noted that an estimated 2000 tons of sanitary waste is generated in India every day. This is disposed of carelessly making the informal recycling workers vulnerable to deadly diseases such as HIV, Hepatitis B and C, and Ebola virus. The committee proposed that the manufacturers of diapers and sanitary napkins should explore the use of recyclable materials in the product. Also, the health ministry was asked to allocate adequate funds for dealing with sanitary waste. It is high time for the central and state governments, and Urban Local Bodies to come together and come up with a concerted initiative. This article illustrates the plight of waste management programme, analyze the situation and propose suggestions for improvement.

¹ Dr. K. Balachandra Kurup, Governance, and Institutional expert, based in Trivandrum, Kerala, India email: balan_kurup@yahoo.com

² Standing committee on urban development, 2020-21, Ministry of Urban development, March 2021

2. Global and Indian scenario

Globally, more than 2.1 billion tons of municipal solid wastes (MSW) is generated every year, in addition to agricultural, forestry and industrial wastes. Most of these wastes end up in landfills, as the most common way to get rid of the waste problem and 'throw-away' strategy. However, throwing away leads to health hazards, safety issues and loss of the valuable resources. India is the second largest nation in the world, with a population of 1.21 billion, accounting for nearly 18% of world's human population, but it does not have enough resources or adequate systems in place to handle the solid wastes. The waste management is intrinsically related to the culture, lifestyle, climatic condition, population density and the industry/residential characteristics of individual cities. Indian cities are fast developing in population densities and lifestyle changes. There are 53 cities in India with a million plus population, which together generate 86,000 TPD (31.5 million tons per year) of MSW at a per capita waste generation rate of 500 grams/day. The total MSW generated in urban India is estimated to be 68.8 million tons per year (TPY) or 188,500 tons per day (TPD) of MSW. The 2014 report by the "Task Force on Waste to Energy," under the Planning Commission³, estimates that urban India will generate 2,76,342 tons per day (TPD) of waste by 2021; 4,50,132 TPD by 2031; and 11,95,000 TPD by 2050. The per capita waste generation is 450 grams per day, and has increased at a rate of 1.3 percent per annum. The amount of waste generation in 84,456 wards varies from 32 MT to 22,080 MT per day, as of January 2020. Maharashtra generates the highest, at 22,080 MT per day (from 7,322 wards), while Sikkim generates the lowest, at 89 MT per day (from 53 wards). Amongst the Union Territories (UTs), Delhi generates the highest amount of waste, at 10,500 MT per day. Overall, Daman & Diu is the lowest waste generator in India. Such a steep increase in waste generation within a decade has severed the stress on all available natural, infrastructural and budgetary resources. India's 168th ranking in the 2020 EPI reflects our improved knowledge about the current state of the world. Ten years ago, these same metrics would have given India a rank of 163rd in the world.

3. Key Issues

Day by day, the problems of waste are escalating because of changing consumption patterns, industrial development, and urbanization. In Europe, recycling systems to produce materials or energy from waste products have now become well established. In many developing and emerging countries, the waste management systems in use are still inadequate and unsustainable. Especially on the peripheries of urban centres, it is common practice to dispose of rubbish in unsafe landfills and illegal dumps, or in rivers and drainages. Local authorities are often unable to introduce integrated waste management systems due to the associated high costs. Very few models are capable of financing themselves while operating effectively. Sustainable waste management and recycling systems aim to reduce the quantity of natural resources consumed, while ensuring that any resources already taken from nature are reused many times, and that the amount of waste produced is kept to a minimum. The processing of waste plays a key part in this. Waste that is not properly managed, especially excreta and other liquid and solid waste from households and the community, are a serious health hazard and lead to the spread of infectious diseases. Unattended waste lying around attracts flies, rats, and other creatures that in turn spread disease. Normally it is the wet waste that decomposes and releases a bad odour. This leads to unhygienic conditions and thereby to a rise in the health problems. Thus, excessive solid waste that is generated should be controlled by taking certain preventive measures.

³ Report on the Task Force on Waste to Energy," under the Planning Commission, Vol 1, May 2014

The current practice of waste management has serious implications on aesthetics, health, water quality and air quality. Therefore, considerable effort required by way of evolving appropriate environmental management plan and its implementation to upgrade the current practices to the environmental regulatory standards. The environmental management plan so evolved need to give thrust on improving the current practices, especially with respect to open dumping, storage, primary collection, composting practices, street sweeping and fleet operation.



Image Credit: News18

The Ministry of Environment and Forest (GoI) framed “Municipal Solid Waste (Management and Handling) Rules 2016 under the Environment Protection Act, 1986 making it mandatory for all Local Self-Government institutions in the country irrespective of size and population to implement the directions contained in the rules. Most of the ULBs in the country have not been in a position to implement the aforesaid rules and situation has continued to remain highly unsatisfactory in spite of instructions given by the State Authorities and Hon. Supreme courts and High Courts from time to time. The 73rd and 74th

Constitutional amendment gives constitutional recognition for Local Self Government institutions specifying the powers and responsibilities. However, very few ULBs in the country have prepared long-term action plans for effective disposal of MSWM in their respective cities or towns. The major critical issue is that in many local bodies, the waste management is handled by the health section which do not have expertise on environmental management aspects. In few states dedicated waste management section is created to oversee the functioning, management and monitoring of waste management programme. Besides, a clear waste strategy is required at different local circumstances especially on prioritising, conducting waste audits, interpreting data, utilising data for resource recovery, public engagement in the implementation of the developed strategy and achieving targets. Support is essential in all those areas for all stakeholders in India, where waste is mostly handled in the traditional way.

It has been noticed during various missions that waste management in the local bodies is mostly limited to the occasional removal of heaps of rubbish in roads and some public places. To deliver the statutory responsibility, there is an urgency to build up capacities of Local Authorities in this relatively complex sector. The attitudinal changes of elected representatives and officials in the Local self-government institutions are a necessary prerequisite to evolve a systematic SWM programme. The waste generator is not made accountable either for disposal or to pay for it. LAs require a strategic policy and direction, institutional, social and technical support in strengthening the management capabilities.

Managing waste is a hurdle for waste generators, councils/government organizations, policy makers and waste managers. This is partly due to the lack of awareness of the various steps and factors that need to be considered in the governance, administrative and legislative set up of local governments in handling waste and protecting the environment. Lack of training in the selection of technologies is also partly responsible for the failure of several waste handling and management efforts. Expert training is required through educational, technical, management or environmental institutions in India. Regular capacity building workshops for officers and waste handling personnel is required to empower the governance system of the waste management sector. Globally taking, waste management is constantly developing and updated

based on local and international expertise, lessons learnt from mistakes as well as through continuous research and development by industries and government.

Despite the increasing use of Life Cycle Assessment (LCA) in waste management policies and strategies in the past two decades, there is still a lack of qualitative review of the role LCA in waste management sector. The need of adaptation to local conditions and at the same time technology innovation is necessary to be combined. There is a whole culture of waste management that needs to be put in place - from the micro-level of household and neighbourhood to the macro levels of city, state, and nation.

4. The Way forward

Since the waste management is a local issue, every State need to have its own waste management policy focusing on the new mantra of 5Rs (Reduce, Reuse, Recycle, Recovery, Refuse) in parallel with environmental pollution controls based on the 'polluter pays principle and 'extended producer responsibility'. From most of the responses provided by the government, it looks like the primary issue in dealing with the issue of waste management is coordination between the various agencies involved in addressing the issue. The Central Government is limited to making rules and providing certain funds while the onus of implementation is with the states the local bodies. Without serious co-ordination between these agencies, effective waste management will not take place. Experience shows that lack of commitment, poor governance and accountability and lack of capacity among working staff in the ULBs are main reasons for not yielding results in this sector. Field-tested combination of technologies is known and the government is committed to deal with the issues. What is further required is to adopt integrated development approach with forward and backward linkages.

Another major concern is the large number of informal sectors engaged in collection of recyclable materials from different segments of waste stream and sells them to the recycling market. Most of these informal sectors work in an un-organised manner and therefore, the work of collecting these materials is not effective and sustainable. Hence, there is a need to consider for providing legal recognition to the informal sectors so that recycling work becomes more organised and ensure better working conditions to them.

5. Conclusion

As explained above there is an urgent need to organize massive awareness campaign on Solid Waste Management (from segregation at source to its disposal) should be undertaken at all levels. Elected representatives and officials should be motivated and equipped to handle their respective functions in a systematic manner. Decentralized and low-cost options are commonly viewed as solutions for the poor and/or for underdeveloped areas, raising of the profile of low-cost options and alternative technologies as well as of making it 'fashionable' to minimize waste going out of the habitats at micro-level. More specifically, there is a need for exchange of information and innovations amongst rural and urban bodies and technical support for introducing alternative technologies and processes. Intensive capacity building programs, appropriate IEC materials, technical manuals and documentation, and sharing of best practices amongst facilitators are required urgently so that such experiences can provide solution to the many sanitations crisis that are unfolding.

Similarly, strong partnership and collaboration should be developed with everyone including Residents Welfare Associations, Self-help groups, neighborhood groups, voluntary organizations and youth clubs. It is extremely important to strengthen or re-orient the resident welfare organizations and bring them into the

mainstream of SWM. While undertaking SWM task, the Liquid waste management should be given equal importance in view of abundant rainfall, high water table problem and most of the drains being filled with wastes. Above all the legal enforcement mechanism should be strengthened to ensure incorporation of waste management systems in constructions i.e. bio gas plants in all buildings, especially flats and commercial establishments. Stringent legislative measures to render littering a cognizable offence, to ban plastics and provisions to arrest offenders. There should a centralized monitoring system or the existing monitoring system should be made more effective for SWM. The local bodies should be updated frequently on what is happening elsewhere in order to adopt good initiatives and to avoid duplication of errors. The performance of service agencies should also be evaluated objectively and communicated to the local bodies.

An integrated approach of environmental processes and governance is required for effective solid waste management. There are numerous localized efforts, views and actions that are insufficient for an overall and total management of water and waste. India currently lacks proper training and capacity building activities at government, managerial or official level to properly address this issue. Therefore, this capacity building workshop is proposed to empower officers in the government and private sector on integrated and total waste management strategies and approaches required for a city.

In short, the waste management sector should develop a long-term planning horizon of 2-25 years. Similarly, a short term implementation plan covering 5 years with planning and learning phase and withdrawal phase which leads to sustainability. It is imperative to conduct waste audit to review and validate the data on waste characteristics on a regular basis as per the requirement of the local bodies. Along with the introduction of user fee, penalties, fine etc to make the enforcement mechanism more meaningful as well.

CONCERN

Managed Aquifer Recharge (MAR) Innovations to Urban Water Resilience & Sustainability

S.K. SHARMA*

Abstract:

Adoption of innovative MAR approaches to pursuing sustainable water management is an inescapable necessity of time particularly when changing climates are impacting water & water infrastructure system. Achieving sustainable & secured urban water supply & services would need to use holistic IUWM framework. The suggestive MAR innovation includes Aquifer storage & Recharging System (ASR) River & Lake-Bank Filtration System (RBF/LBF) with storage goal and potable water use. Also MAR System such as Modular Rain Tank System, In-stream modifications & recharge, conventional RWH System with non-storage goals can also be used to support non-potential urban water supply uses. Role of stakeholders & water managers is imperative to sustainable urban water management.

1. Introduction: Conventional water harvesting & conservation measures are variously in vogue in Urban India but the water supplies and services are continuously under pressure to vagaries of climate change.

Innovative MAR techniques with storage goal & high value uses as well as methods with non-storage goal and low value uses can help meet strategic objective of water resilience & sustainability. Water resilience can be effective through cooperative work of consumers, stakeholders & water managers toward the intended water sustainable goal.

Paper outlines innovative MAR based Integrated Technology prospective to rejuvenation of urban water sustainability.

2. Role of MAR in Urban Water Management: Managed aquifer recharge can play vital role in enhancing urban water storage capacity and capability enabling water managers and stakeholders keep pace with variabilities of run-off due to changing climates. The rate of recharge is dependent on the unsaturated aquifer volume space that influences number and types of MAR structures needed for urban water supply management.

3. Types of Innovative MAR System for Urban Environment: An array of methods is in practice world over for recharging water in urban situations. Recharging methods are contingent upon being developed based on soil infiltration, topographic, hydro-geologic, hydrometeorologic and watershed data sets generated with use of Remote Sensing & GIS technology. While infiltration techniques are suitable to recharge unconfined aquifers, the confined deeper aquifers are recharged through well injection pressures.

Typical innovative MAR techniques to achieving urban water resilience include Aquifer Storage & Recovery, Lake and River Bank Filtration systems, having water-storage goal for potable use in addition to conventional Roof-top Rain Water Harvesting, Soil-Aquifer treatment (SAT), check dams & nala bunds and Modular under join Rain water Harvesting etc. which variously have non-storage goal and non-potable water use.

1. **Urban Aquifers & MAR Systems:** The depth, limit & extent as well as Empty-storage space of both Alluvial & Hard rock aquifers are pre-requisite to planning MAR systems. Aquifer sensitivity maps, maps of potential contaminant sources and maps showing direction and rate of movement of ground water flow are of paramount importance to develop aquifer recharging plans. There has to be compatibility between source recharge water and native ground water under recharge. Due to complex nature of aquifer systems, the complexity of hydrogeologic-framework is also required to be investigated in detail prior to recommending the design, suitability and feasibility of MAR methods and recharging structures.
2. **Source water for Recharging:** Managed recharge to aquifers can be used to store water from various sources such as urban storm water from roofs of houses and buildings, pavements and roads which shed water from their embankments. Source water also includes water from rivers & lakes, ponds, treated waste water and desalinated sea-water. Recycled urban storm water can be stored in aquifer underlying parks & gardens, sports complexes and fly-overs for non-potable uses.
3. **MAR: Problems & Issues:** The diminishing water availabilities and deteriorating water quality due to effects of climate change and urbanisation are becoming more pronounced in urban centers. MAR can alone secure water supply and compensate for effects of climate change. MAR can be adopted to protecting the environment by limiting the level of pollution in inland waters and creating hydraulic barriers to preventing saline water ingress in coastal aquifers.
4. **Combating & Strengthening Resilience to Climate Change through water security System:**

Urban water systems are faced with impacts of climate change, rapid urban population growth, population migration from rural to urban centres as well as deteriorating age-old water infrastructure. The need to manage urban water supply has therefore been an urgent and inescapable necessity of time. The integrated urban water management (IUWM) thus seeks to integrate planning, management and, community participation to building climate –resilient city and township water supply and sanitation system. IUWM is holistic management of urban water supply, sanitation, storm water & wastewater to yielding sustainable socio-economic & environmental objectives. Various IUWM application tools can help water utilities manage the threat & menace of climate change.

5. **Alternative Water Sources:** In view of uncertainties of urban water availabilities, various alternatives to fresh water for Hydrogen production such as desalination of seawater & inland brackish ground water, recycled wastewater & storm water would need to be employed. The abundance of storm water run-off from paved/unpaved urban & sub-urban areas that goes to water bodies as unutilised water when suitably treated can make this water effective water source for Hydrogen production.
6. **Priority MAR Methods:**
The Empty storage capacity of urban Aquifers classify themselves into priority category areas (viz priority 1 & priority II Category Area) to the recharging of ground water.

Priority I category MAR project will involve high value use areas as potable supply water & priority II as lesser value use areas for non-potable water use such as for horticulture & watering of parks & gardens. It is imperative to list out the priority I & IIMAR Projects. These are given in table-1 below

Table-1: MAR Priority projects:

I	Priority I MAR Project (For potable water use)	:	Recharge System <ul style="list-style-type: none"> ASR & ASTR Well System. River Bank Filtration (RBF) & Lake Basin Filtration (LBF) System
II	Priority II MAR Projects (For Non-potable water use)	:	<ul style="list-style-type: none"> Check dams, Gabbion & Nalabunds. City Roads, Sports complex, Flyovers Shafts & Trench driver bore wells. Pond basins.

7. Conclusions:

Many Towns & cities in India suffer from the menace of climate change as well as lack of capacity to survive & sustain the impacts of climate extreme. The resilience to urban water strengthens when build on the basin of various application tools of IUWM can help water utilities manage the threats of climate change.

The application of Managed Aquifer Recharge methods to enhancing safe & secure water supplies are inescapable necessity of time. The urgency of MAR to urban water sustainability stems from twin hazards of aquifer de-saturation & deterioration of urban water quality.

Priority MAR projects & Methods for potable & non-potable urban water supply needs have been briefly described below-

References:

Taylor,S.; Moenich, M	:	A framework for Climate Resilience; Clim. Dev. 2012,4,311-326
Nancy Green Leigh and Heonyeng Lee	:	Sustainable and Resilient Urban water System: The Role of Decentralization and Planning
Joel Casanova, Nicolas Devau& Marie Pettenati	:	Managed Aquifer Recharge: An overview of Issues and Options

** Dr. S. K. Sharma: Principal Advisor, India Water Foundation (Ex member Central Ground Water Board, Ministry of Water Resources, GOI)*

REMINISCENCE

A Fulfilling Journey through the Lens of an Environmentalist

Kavita Prasad*

Follow the quote by Chris Grosser- “Opportunities don’t happen, you create them.” Yes, joining India Water Foundation (IWF) has proved one of my sensible and wise decisions in 2018 that helped me to create better opportunities shortly.

The present generation is revolutionizing the very definition of a career by finding a 3F- satisfactory (Fin+Family+Focus) career track with a purpose-driven work profile. Congenerous to the 80% workforce in the social development sector, I was also trying to create the bridge between a knowledge-driven organization and personal development opportunities. As a non-profit civil society and reputed think tank, IWF is the answer to all my queries since day one. Joining IWF as a senior consultant has paced me with the rapidly, emerging aspirational career as I was keen to leverage my existing skills and experience to create social impact at an international level.

The lens of Sustainable living and fulfillment

Allying personal vision with organizational mission helped me to understand the difference between a conventional career and living a sustainable lifestyle. We all agree that our lifestyle choices impact the world around us, the work culture of IWF provides every employee to find ways to live better and lighter by balancing family and career goals.

Starting in the IT industry with multiple roles back in 2009, I moved from IT to the SD sector and worked with services covering a wide array of aspects from technical to sociological in various UN divisions to support roles. As a mother of a seven-year daughter (Avighna), I was struggling with my time and focus but with the flexible shifts and highly supportive leadership in IWF, I bloomed my skills and excel as a Consultant. As IWF supports global standards for achieving gender equality and works with governments and civil society to design laws, policies, programmes, and services, I am confident in the effective implementation of women’s rights and encourage other aspirants to join IWF.

The lens of Knowledge- Beginning with a Think-Tank

IWF aligned with my core strength in Engineering, International Law, Sociology, and Gender studies. The team equipped me with insights into policy development and SDG interlinkages. The mentorship of top leaders made my path impactful with urban implementation guidance, considering primary dimensions of social, economic, and environmental pillars.

The lens of New Pastures and opportunities

I joined IWF to provide consultation as an International Law and Diplomacy expert but additionally started an advisory role as a member of the advisory committee. This advancement in profile has proved a



byproduct of multiple factors, one of which is a strong desire to give my best to society and the nation. Another important factor to be excited about the role is my dedication as an ecofeminist in the social sector. I gained practical experience to fill the Gender gaps, public health issues, and livelihood opportunities. I am deeply committed to working on the several socio-economic issues troubling the nation.

In addition, the modes of engagement with the civil-social sector IWF expanded considerably, catalyzing interest among public, private, and international groups of stakeholders and professionals. The esteemed organization also found resonance with experienced women re-entering the workforce after a career break. The inherently inclusive culture encourages women to pursue a career in the sector in a purpose-aligned manner.

The Lens of Growth and Satisfaction

Professionally, joining IWF has taught me that a small change is sufficient to create a larger impact. The leaders of the Water sector- Dr Arvind Kumar and Ms Shweta Tyagi, have introduced me to a passionate purpose-driven team that creates a holistic impact across the globe.

Even during the global pandemic, we were rigorously working with the national and international stakeholders and technical teams to fill the gaps in urban development for marginalized and weaker sections, in cooperation with local, state, and national governments.

I successfully supported policies and action plan frameworks to support various development projects as the reviewer. During my surveys for Water-Sanitation and Infrastructural development projects, we promoted sustainable project plans for the efficient use of resources and new technologies to reduce the harmful impact on the environment and climate. As IWF encourages sustainable livelihood opportunities through new technologies and practices, we tried creating global partnerships across stakeholders. Every team member comes from different personal and professional backgrounds but works happily and effectively for a common goal with no hidden agendas.

I admire the compassionate, knowledgeable, and visionary leadership of IWF and would like to pay my deepest regards to the wonderful, impact-creating, team for being supportive.

I recommend it to all social development aspirants, especially Interns, Junior Researchers, Project Officers, Programme Managers, and Consultants. I look forward to continuing to learn and appreciate all the encouragement and support. Please accept my heartfelt gratitude for the wonderful experience, healthy, safe & positive work culture, and the integrated mentorship to understand the environment better.

Thank you!

About the author

*Kavita is an active member of the Advisory Committee at IWF. She serves as a senior consultant to the organization since 2018. She is the subject matter expert on International Law, Gender Issues, and Technical Documentation.



She has a degree in Bachelor of Engineering in Information Technology from Delhi University. She has vast experience and a Post Graduate degree in International Law and Diplomacy. She also earned a Master's degree in Sociology to serve the sectors like DRDO, IIHMR, UNESCAP, and WHO with different approaches, technologies, and domains. As a consultant at India Water Foundation, she is responsible for the delivery and effectiveness of various program interventions pan-India and also supports the technical roadmap for the organization.

Kavita enjoys traveling, meeting people, culinary fusion, and poetry. She is passionate about research integration and willing to explore ecofeminism to help create more women leaders.



ROAD TOWARDS SDGs REALIZATION

High Level Political Forum 2022

Shweta Tyagi*

The meeting of the HLPF conducted from 5-7 July and from 11-15 July under the theme- 'Building back better from the COVID disease while advancing the full-implementation of the 2030 Agenda for Sustainable Development'. The Forum focused on the leadership and guidance to advance the full implementation of the 2030 Agenda as the Decade of Action and Delivery, ensuring sustainable, inclusive and resilient recovery from the pandemic, **leaving no one behind**. Today's global challenges- climate change, the COVID-19 pandemic, major food and energy and financial issues have posed serious threats on humanitarian situation, affecting 1.2 billion people's living and require extraordinary measures to make lost ground and accelerate progress.

Delegates reviewed progress on SDG 4- quality education on July 6, SDG 5- gender equality and SDG 14-life below water on July 7 and SDG 15- life on land on July 11.

Countries also gave presentation on their VNRs (Voluntary National Reviews). Years of progress have been reversed due to widespread impact of COVID and conflicts in different regions of the world. The near shutdown of the international tourism and travel for months has resulted in debt stress and a high need for debt relief. Closure of schools due to pandemic has impacted nearly 90% of the students worldwide amongst which a major portion used to depend on school meals for daily nutrition. Unequal access to digital learning tools significantly increased inequalities affecting over 20 million students that would never return to school.

To move ahead for the fulfillment of the SDG, quality education needs to reach every child supporting their physical and emotional well-being and focus on shifting from memory-oriented education to research skills and creativity. Teachers should be availed with decent work conditions and labour rights including pay and need to be involved in policy decisions through social dialogue. During the pandemic, women have gone through increased domestic violence as lockdown forced many girls and women into confinement with their abusers, subjecting 641 million women to physical/sexual violence and nearly 45% of global employment losses in 2020. To combat gender-based violence globally and securing social and cultural norms, strong legal framework is required. SDG-14 receives the lowest level of financing among all SDGs. To align public spending in the progress of SDGs, removing subsidies on activities contributing to biodiversity loss, promoting blue and green bonds, carbon credits and stakeholder engagement, such pushes can prove to be transformative in shifting from an extractive economy to regenerative economy that values ecosystem services. Vulnerability needs to be put at the heart of finance. To maintain the



Image Source/Credit: IISD Earth Negotiations Bulletin. The first day of HLPF 2022 began in the UN General Assembly Hall

biogeochemical balance of the oceans sustaining all life on the earth, agencies should work coherently on the land-sea pollution and promote the bond financing to support the blue economy. In pursuit of SDG-15, inclusive and accessible financing and equitable pro-poor approach can help in addressing the threat posed by the invasive alien species, land degradation and mismanagement of waste on forests. However, lack of progress on the SDGs cannot be simply attributed to the pandemic. The war in Ukraine and other conflicts going on, have been the highest number of conflicts since 1945.



Image Source/Credit: IISD Earth Negotiations Bulletin. Delegates gather for the session on SDG 17 and interlinkages with other SDGs

In order to build back better, we need to look whether the measures taken are advancing the 2030 Agenda and how effective they are in addressing the implementation of SDGs. Though the countries have been taking appropriate measures to cushion the impacts of the pandemic on the poor and vulnerable population, they differ widely in their ability in resisting income shocks and generating employment using various packages and social security system. To keep moving

ahead for accelerating implementation of SDGs, we need to renew the science-policy pact and include civil society in the regional meetings to first understand the ground realities and then priorities the action. However, unequal having of resources hinders their accomplishment. Emphasis to be put on recovery policies to push away the negative impacts of the pandemics on the sustainable goals and reverting them back to their nature as integrated, indivisible and interlinked. Enlisting the lessons learnt and recognizing the opportunities present can impel the political commitments required to make the structural reforms and mobilize the finances for sustainable recovery and build back better.

**Chief Functionary, India Water Foundation*

PRELIMS TO UN WATER CONFERENCE 2023

Second Dushanbe Water Conference

FGR Bureau

The 2nd Dushanbe Water Conference, held from 6-9 June 2022, with the theme ‘Catalyzing water action and partnerships at the local, national, regional and global level’, valuing water by enabling water transformative policy and transparent cross-sectoral cooperation and management. The decreased amount and degraded quality of water year by year is driven by different factors such as growing population which demands more water to grow food, combined with unequal consumption patterns and ‘business as usual’ practices in the usage and management of water, intervening social, economic and environmental goals to be achieved. Access to safe water and sanitation is an essential part of human society, contributing to good public health, which became even more evident during the COVID-19 pandemic. Climate change worsens the situation by fluctuating the water cycle, altering rainfall patterns and inducing extreme weather events. By 2050, about 5.7 billion people will live in areas that are water scarce for at least one month per year and 1.6 billion people in areas prone to floods. Water-related issues generally transcend geographic boundaries, affecting migration patterns worldwide. These interconnected pressures majorly affect vulnerable population, hit hardest by water impacts and can be tackled through extensive involvement in a deliberate manner. Although so much progress has been made in the water sector in previous decades, we are still lagging behind in the implementing the solutions. Water is a powerful tool in sustainable development, making societies safer and resilient. Safe drinking water and sanitation are essential for healthy life. Sanitation



Image Courtesy/Credit: UN Water- The ‘Dushanbe Declaration’ from the second High-level Conference on the International Decade for Action

became even more evident in the wake of COVID-19 crisis. Stakeholders such as government, international organizations, civil society, private sector and academia through their collaborative actions, can add values to the livelihoods of the poor and vulnerable people by ensuring each one of them has access to clean water and sanitation. Political commitments do play a crucial role in addressing the water issues, willingness from other side as local, national, regional and international cooperation in promoting science-based solutions is equally important. Capacity building through inclusive participation of women, youth, minorities, migrants and refugees in decision-making and knowledge dissemination through sharing information and best practices will help in delivering benefits for all, taking in view the agenda of ‘Leaving no one behind’. The conference provided the platform to smoothen cross-sectoral cooperation by understanding how

Page 62 of 72

the governments, multilateral organizations can act jointly in the field of water to implement water-related targets of the 2030 Agenda for Sustainable Development and SDG-6, particularly. Creation of environmentally sustainable and climate-resilient infrastructure, investment in water-supply and sanitation infrastructure, wastewater and waste management, promoting good WASH services and scaling up culture of hand hygiene to increase pandemic prevention, preparedness and response. The conference came up with outcomes including the multilateral dimensions of the water sector, based on exchanging information on water-related development plans, disaster risk drivers for equitable, efficient, sustainable and resilient management and use of water and urging governments to assess their capacities and weaknesses in policy in order to support the global response to the COVID-19 crisis.

UPDATE

XV World Forestry Congress

FGR Bureau

Forests provide nutritious plant and animal-based foods and innumerable useful products. Forest goods and services generate income, support health and well-being spanning rural and urban economies. Apart from ecosystem services, they also help in adapting to climate change through relevant mitigation co-benefits and by making local communities resilient. XV World Forestry Congress took place in Seoul, Republic of Korea, from 2-6 May, 2022. The theme- of the congress was 'Building a green, resilient and healthy future with Forests'. The event was organized by the Korean Forest Service (KFS) and the Food and Agriculture organization of the UN (FAO). The delegates - governments and public agencies representatives, international organization, the private sector, academic and research institutions, NGOs, community and indigenous organizations, attended meeting in a hybrid mode. The World Forestry Congress concerning forests and the products and services they provide, included six sub-themes. The XV World Forestry Congress concluded after five days with Seoul Forest Declaration focusing on integration and responsible sharing of forests among stakeholders, institutions and sectors underlining the importance of forests in combating the multiple crises humanity faces- climate change,



biodiversity loss, land degradation, hunger and poverty. Pressure on all natural resources is rising, with rising demand for forest products from the construction, packaging, and bio-energy sectors. So, there is urgent need to increase forest cover and provide more efficient and sustainable use of forests. The sub-themes designated towards sustainable and resilient future, highlighting the importance of moving towards a circular bio-economy and climate neutrality. The topics of the sub-themes included implementing global commitments

for transforming food systems to enhance production, advancing on nature-based solutions for mitigation and conservation of biodiversity and climate-change adaptation, adapting green pathway for growth and inclusive and economic sustainable development containing broad initiatives to change production ways and consumption in order to bring change and sustain the sector. It helped in enhancing collaboration between science and technology and strengthened forest education and improved communication on forestry issues. The congress concluded with the theme- Forests without boundaries stressing to understand that the forests transcend political, social and environmental boundaries for achieving meaningful sustainable management of forests. The main outcome including Ministerial Call on Sustainable Woods and Youth Call for Action were noted. Forest-based solutions should combine the perspective of family farmers, small holders, forest communities, indigenous people and youth. Women face large inequalities, lack behind from gains of forest related investments

and often get restricted to bottom-up approach, while men cooperatives are mainly characterized by the top-down approach. The participation of women cooperatives need to be boosted with enhanced competitiveness. Integration of youth can bring lots of productive ideas for farming, creating a holistic and sustainable transformation. Owning of forests by governments evicted indigenous people. Indigenous communities need to be involved and paid fairly in managing ecosystem and upheld in implementation of REDD+. They safeguard forests and biodiversity preserving traditional knowledge and maintaining cultural heritage. Forest governance is turning out be more stakeholder-driven. Finance needs to be accessed in a way that it links global objectives for halting forest degradation and reversing forest degradation. Restoration will be more successful when it shifts its focus away from “number of trees in the ground” towards restoration as a means for improving local livelihoods, including food and wood security, disaster risk reduction and resilience, and addressing social issues.

ISSUE

UNEA-5.2: Nature at the Heart of Sustainable Development

Dr. Arvind Kumar*

UNEA-5.2 conducted between 28 February 2022 to 2 March 2022, virtually in Nairobi with the theme of ‘Strengthening Actions for Nature to Achieve the Sustainable Goals’ to bridge, build on and catalyze impacts of the multilateral efforts on biodiversity, climate, food systems and pollution, made for both people and the planet. The session also marked the period of reflection and celebration of the UNEP’s accomplishments over the past 50 years from 3 - 4 March 2022, as UNEP@50.

In accordance with the COVID-19 guidelines, taking care of the minimum requirements, the meetings took place in hybrid format, either online or in person. Plastic pollution, chemicals, biodiversity, nature-based solutions, green recovery and were among the highly discussed topics.

On Monday, 28 February, the UNEA-5 President opened the meeting and urged the delegates to reset their relationship with nature, extend their support towards ending the plastic pollution and commended them for providing a science-policy panel on chemicals, waste and pollution. He also highlighted that the gavel of the meeting was made from the plastic. On Tuesday, 1 March 2022, The Committee of the Whole (COW) approved 11 resolutions and one draft decision on the date and venue of UNEA-6, forwarded them to UNEA for adoption. One of the resolution paved way for the Science-policy panel for the management of chemicals and waste to tackle pollution. At the final day of deliberations on 2nd March, the Assembly adopted 13 resolutions, one decision and UNEA-5.2 ministerial declaration, particularly on plastic pollution.

Some of the key messages from the Leadership dialogue: Perceptions to take concrete steps to address the triple threat of climate change, biodiversity loss and pollution, coping with sustainable development are summarized below –

One of the lessons from the COVID-19 we have learnt that the nature and human health are complexly linked. Sound conservation practices can limit the impact of emerging diseases and natural assets can be instrumental for reviving better.

Despite all the available information, urgent action has not been taken. We need to enhance coherence and collaboration across all levels.



Image Courtesy/Source: UNEP

In order to foster better responses and make multilateralism work in environmental crises, we need to strengthen national and international coordination and collaboration between MEAs and enhance engagement with stakeholders.

The post-2020 Global Biodiversity Framework (GBF) has played a significant role to synchronize the collaboration between existing MEAs and integrate global conservation actions.

For greener and more inclusive economic growth, we need to embed sustainability in budget design and implementation, prioritize debt-for-nature swaps and provide financing to small and medium-sized enterprises to achieve sustainability goals.

Hundreds of billions of dollars are spent on harmful financing on nature-negative agricultural subsidies. The transparency and accountability of financial markets need to be monitored. Public and private funding need to be aligned, supported by policy coherence and political consistency.

An Intergovernmental Negotiating Committee (INC) was established to tackle plastic pollution, including marine plastic litter, close the existing gaps and consider the circular solutions across the lifecycle of the plastic products from source to sea to end plastic pollution and forge an International legally binding agreement by 2024, addressing the full lifecycle of plastics, considering its production, design and disposal.

The Assembly recommended the Member States to adopt sustainable use of biodiversity and reverse the biodiversity loss through protection, conservation and restoration of ecosystems, making resilient and minimize the risk of disease outbreak. The assembly also acknowledged the importance of animal welfare and promotes One Health Approach under SDGs. A clean, healthy and sustainable environment is indispensable part of the human life.

UNEP as a leading global authority, have a huge potential for substantive outcomes, with multilateralism at its core to achieve global participation, inclusivity and effective outcomes. However, India Water Foundation appreciates the huge impact and outreach of the assembly sessions and its importance in reaching a global collaboration for the environment.

**President, India Water Foundation*

YOUTH PERSPECTIVE

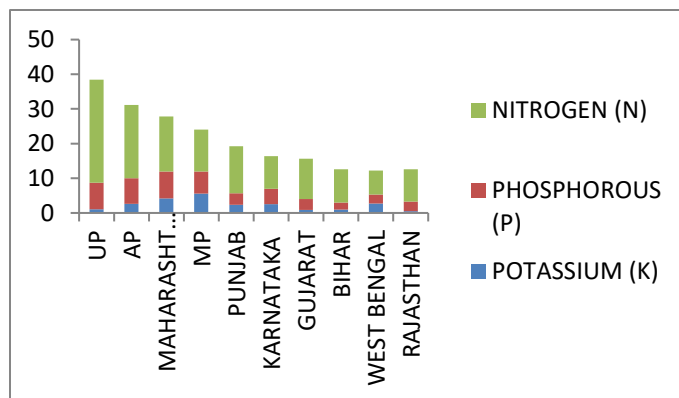
Nutrient based subsidy regime

Ashish Sharma*

Worldwide, the consumption of fertilizers has been skyrocketing. According to FAO, it's significantly exceeded the all-time high of more than 140kg per hectare of arable land in 2016. Agricultural subsidies to improve production and productivity have been widely condemned because of the fiscal cost to the government and they are perceived to be skewed. In India since economic reforms began in 1991, numerous efforts have been made to reform the fertilizer sector; it's been over a decade since the Nutrient based subsidy scheme for fertilizers was initiated to dispel farmers from incessant use of urea containing only Nitrogen (N) and increase the consumption of Phosphatic (P) & Potassic (K) fertilizers which will lead to balanced fertilization, improve soil health, yield more produce, enhance farmers income and eventually would also ease off fertilizer subsidy burden on the exchequer.



However, after the launch of NBS in 2010, the fertilizer consumption has increased manifold over the years and similar gains are not visible on the ground. Under NBS, the fertilizer subsidy to farmers based on nutrients like P & K is announced on an annual per Kg basis determined through international prices of fertilizers which are volatile and directly proportional to energy prices. The policy intends towards balanced



Agriculture Statistics at a Glance, 2020

use of fertilizers (N: P: K = 4:2:1) which is asymmetrical towards N (6.7: 2.4: 1) as Urea remains under price control making it difficult to recast resources within the sector for optimum efficiency. The subsidized urea has led to siphoning it to bulk traders or industrial users such as plywood and animal feed makers; smuggled to neighboring countries like Bangladesh and Nepal; and significant environmental externalities including soil acidification, heavy metals pollution, soil compaction, changes in soil micro-biome,

eutrophication, bio-magnification, underground water deterioration, and water runoff making water bodies exposed to chemicals.

The government has launched a bunch of reforms regarding the utilization of urea, which includes mandatory neem-coated urea and directly making fertilizer subsidies to manufacturing companies. However, these interventions merely serve the elephant in the room- of excessive use by farmers themselves. Hence, the following measures can be taken to reverse the trend:

- Self-reliance, and less dependence on imports;
- Extended NBS model to Urea;
- Subsidy increase needs to be ousted with the distribution of price change;
- Develop alternative sources of enriching plants like organic and bio-fertilizers, nurturing compost with a good amount of nitrogen, Nano urea by IFFCO;
- Improving fertilizer efficiency in consonance with geographical conditions through need-based use rather than broadcasting by educating farmers through Kisan call centers and,
- The transfer of subsidy to farmers directly instead of manufacturing industries.

Although remarkable achievements have been accomplished regarding agricultural production in India but many grueling challenges for ensuring food security and agro-ecology remain. Taking into consideration that all three supplements N, P & K are vital to the quantity and quality of produce, the Government must necessarily work for a comprehensive policy for all fertilizers.

**Intern @ India Water Foundation*

YOUTH AGENDA

Plastic is Forever

Aayushi Singh*

Plastic production accounts to some 400 MT per year globally. “From the deepest ocean trench to the highest mountain, from the tiniest speck of micro plastic to the chunkiest bottle, plastic pollution is a growing menace.” Reliance on plastics has continued to grow, convenience and low costs, as the main drivers for its continuous use. There has been a massive increase in the production of plastics, especially single-use plastics.

The main leakage of plastics to the environment usually occurs following use and during disposal, with large volumes lost as a result of littering. A large amount of post-consumer plastic waste involves plastic packaging, with discarded packaging accounting about 46% of total annual plastic waste generation. Most plastic packaging is disposed of within a relatively short time. Disposable cups, plates, cutlery, carrier bags, takeaway containers- most of them are used only for a short period, many for less than a day. About 11 MT of plastic waste enters the ocean every year, of which 2.7 MT of waste comes from rivers. COVID-19 pandemic has aggravated the situation due to sudden increase in single-use plastics for safety precaution, home delivery and takeaway food. In fact it was tempting to switch to single-use products during the pandemic outbreak in a bulk amount, reason being considered as safe and hygienic. However, it gave false sense of security. Hygiene does not necessarily mean using products in one go, rather it ends up creating huge amount of waste and using lots of resources. Fisheries-related debris is the largest single category by volume found in beach litter. Coastal and sea-based tourism is another source of plastic waste through intentional or accidental littering of shorelines. Globally, about 1,500 metric tons of microplastics per year from personal care products are estimated to escape from wastewater treatment plants into aquatic environments.

Plastics fragment into microplastics, further smoothening their way to shorelines, within sediments and deep into habitats. Microplastics generated on land make their way to oceans through waste water systems, street drains, poorly managed waste disposal sites, run-off from agricultural soils and transport through the air. Though plastics reach the oceans by variety of pathways, rivers are a primary source. Microplastic is of major concern as it extensively harms the aquatic life, in turn to human beings also. Animals get entangled in them, starve, deprive of oxygen and light, drown, suffer from internal tissue damage and toxological harm. The microplastics also end up reaching the food chain through consumption of biomagnified sea-food. Individuals who drink water only from bottled sources ingest more than 90,000 microplastic particles annually, compared to an annual intake of 4,000 particles ingested by those who drink tap water. Once microplastics enter the environment, they are extremely difficult to remove. Globally, the plastic production is expected to be around 34,000 MT by 2050. Eliminating single-use plastics can be a good start in deloading the ever-rising plastic volume.

When we lag behind to properly manage the waste, it automatically finds its ways in the environment, affecting all the biotic and abiotic components of nearly all the ecosystems. Our societies and economies do depend on plastics, but it is a product should not generally be for single-use. To free from plastics, we need to keep it circulating in the economy, where it brings value, not on ocean currents, where it brings harm.

Waste collection services can be expanded to more households, facilitated in a number of ways- door-to-door, from bins at curbside, other drop-off points, maintaining reliability in flow of enhanced and streamlined collection of plastic waste in recycling facilities and hence, reduce their amount escaping into the environment. Women, who are central to household waste management, need to be included as key stakeholders.

Plastic packaging needs to be redesigned; otherwise, 30% of this sort of waste would never be recovered or reused. However, improving product design and eliminating non-functional material wouldn't be sufficient. Along with this, consumer behavior significantly determines the level of production and its leakage as litter into the environment.

Current level of plastic recycling is estimated to be 10%, which is far less than the global recycling rate of other materials. Building circularity in support of sustainable consumption and production objectives across the life cycle of plastics means going beyond the 3Rs (Reduce, Reuse and Recycle), to 5Rs with Recover and Redesign. Acknowledging make-up of the marine litter collected from the beaches can be helpful for clean-up drives and reduction of the sources.

It's a high time to change the way we produce, consume and dispose off the plastics we use. Without shift in the waste generation and management, waste mismanagement would end up releasing millions of tons of litter into the terrestrial and aquatic ecosystems. To improve the waste management, it is crucial to develop trust within local communities and build up scalability while accessing new technologies. We need to transit from virgin plastics towards out-sourcing recycled materials. Global problem requires global solution, to manage plastic waste in an environmentally sound manner, local partnership is necessitated with specific inclusion of women and youth groups.

*Intern @ India Water Foundation



PUBLISHED BY



For more information.....

www.indiawaterfoundation.org

SHWETA TYAGI

CHIEF FUNCTIONARY
INDIA WATER FOUNDATION
TEL. NO. 91-11-2634953