

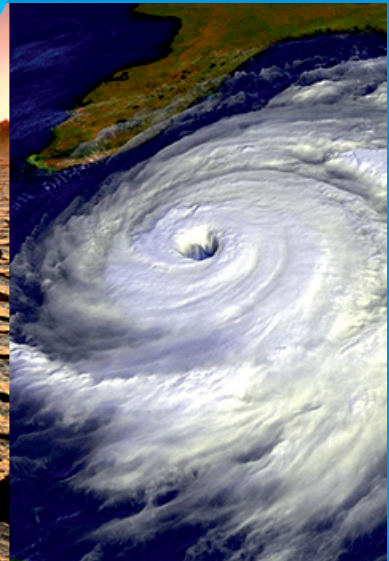
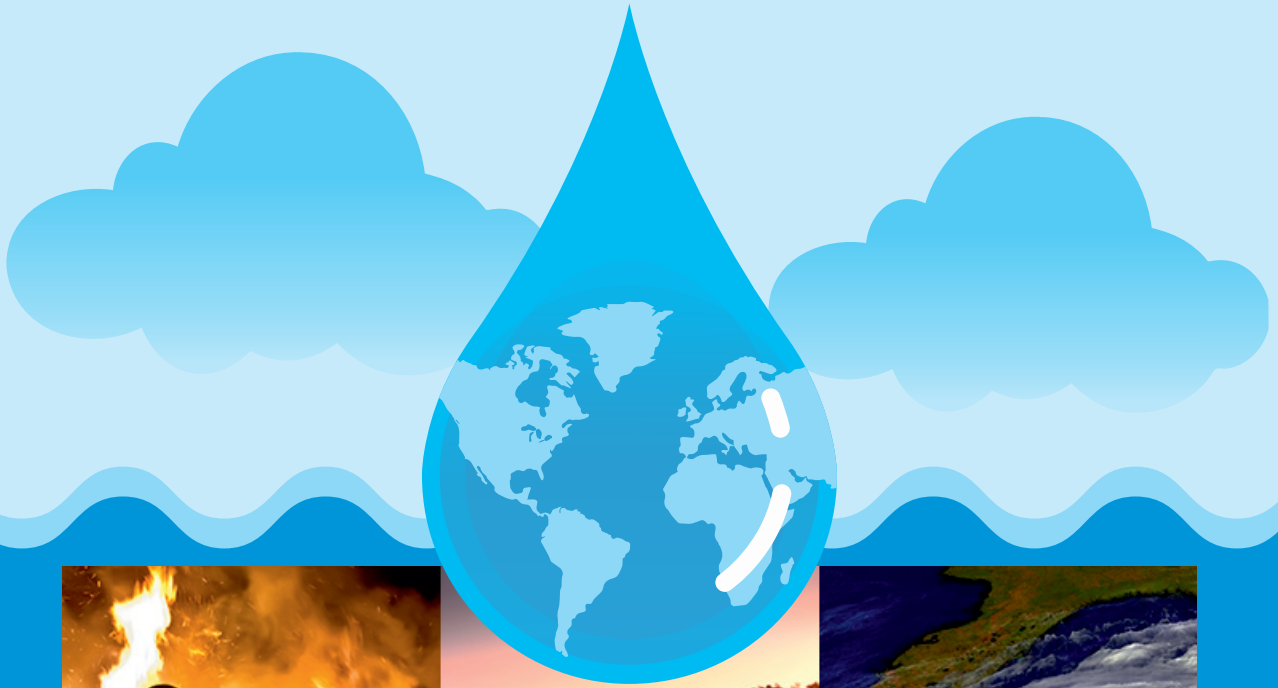


Department of Water Resources, Karnataka
Water and Land Management Institute (WALMI)
Dharwad



International Conference on **Water Management and Climate Change**

Dates : 24-25 January, 2023 (Tentative)
Venue : WALMI, Dharwad



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International Conference on Water Management and Climate Change

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Dr. Rajendra Poddar
Director,
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International Conference on Water Management and Climate Change

Water resources management has emerged as one of the most challenging issues for the policy makers as well as practitioners in the world. Water resources determine the agricultural productivity. Agricultural productivity in turns affects and living conditions of a large number of farmers dependent upon farming and general food security. This **International Conference on Water Management and Climate Change** attempts to construct relation between climate change and water resources management and its implications for farm productivity and rural livelihood. The Conference analyzes effects of each of them at different stages to arrive at long term and short term policy instruments. In the context of the current debate about climate change, it is necessary that the developing countries, like India, are taking considerable actions in terms of policies, programmes and projects and capacity building. However, the efforts and outcomes need to be enhanced to achieve the desired results.

The Conference is expected to have brain storming deliberations among a select group of experts on the impact of climate change on water resources and come out with appropriate policy suggestions. The Conference aims to generate novel ideas with suggestions and sustainable and pro people solutions to the complex problem of climate change from global experts.

Some of us who are directly and indirectly challenged by the growing water crisis shall be meeting in Water and Land Management Institute (WALMI), Dharwad, Karnataka, India during January 2023. These crucial issues will be deliberated under the following sub-themes:

1. Challenges of Water Management

- i) Supply Side Challenges
- ii) Demand Side Challenges

2. Implication of climate change

- i) Nature and extent of climate change
- ii) Impact of climate change on water resources

3. Way Forward

- i) Amelioration of implication of climate change- adaptation and mitigation
- ii) Policy mechanisms for sustainable water management

I. Challenges of Water Management

Supply Side Challenges

Global water supply remains more or less finite while the multi sectoral demand for water has been increasing over the decades. Planet has about 326 million cubic miles of water which amounts to about 71 per cent of the earth's surface. And, 97 per cent (320 million cubic miles) of this is found in the oceans (too salty for drinking, growing crops, and most industrial uses except cooling). Only about 3 per cent is fresh water. Out of this only 0.5 per cent is available and the remaining 2.5 per cent is unavailable (locked up in glaciers, polar ice caps, atmosphere, and soil; highly polluted; or lies too far under the earth's surface to be extracted at an affordable cost). To be precise, the supply is not constant but decreasing due to factors like water pollution. The common perception that world has enough water is false !



Demand Side Challenges

Global water demand has increased by 600 per cent over the past 100 years (Wada, Y. et al. 2018). And this demand will grow significantly over the next two decades in all the three components namely industry, domestic and agriculture. Global water demand for all these uses which is presently about 4,600 km³ per year will increase by 20 per cent to 30 per cent by 2050, up to 5,500 to 6,000 km³ per year (Burek, P. et al. 2016). Globally, water use for agriculture presently accounts for 70% of the total most of which is used for irrigation. Water demand for agriculture will increase by 60 per cent by 2025 (Alexandratos, N. & Bruinsma, J., 2012). Global use of water for industry which presently accounts for 20% of the total water demand will increase everywhere around the world by 2050. Domestic global water use currently accounts for 10% of the total and it is expected to increase significantly over the period 2010–2050 in all the world regions except for Western Europe. In the 2010s, groundwater use globally amounted to 800 km³ per year. India, the United States, China, Iran, and Pakistan accounted for 67% of the global extractions. Water withdrawals for irrigation are the primary driver of groundwater depletion worldwide. The drivers for increasing demand include growing population, industrialization and commercialization, new technologies of extraction and management and new developmental patterns.

Water Scarcity and Conflicts

Water crisis arises on account of quantitative and qualitative limitations. Quantitative scarcity arises out of expanding needs while the qualitative deterioration is due to pollution of water for productive purposes. Mismatch between demand and supply creates global and regional conflicts for sharing the limited water supply. The micro level water scarcities aggregate towards macro level scarcities and create conflicts among countries and the regions within countries. Several studies around the world show that climatic change is likely to impact significantly upon freshwater resources availability. While several countries / regions of the world have crossed threshold of scarcity, some are in transition. Unbridled competition to achieve and maintain high economic growth demands heavy exploitation of natural resources including water. There is a tremendous pressure on water resources across the globe. Signs of growing conflicts for water are seen all around - America, Europe, Middle East, Africa and Asia. Water conflicts aggravate into political conflicts and transboundary demographic movements creating geopolitical complexities for which Middle East is the evidence. For quite some time there has been a talk of global tensions leading towards Third World War for which neither wealth nor oil but WATER could be the cause.

II. Implications of Climate Change

Nature and extent of climate change

In simplest terms, according to United Nations Climate Action, climate change refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, such as through variations in the solar cycle. But, since the 1800s, human activities have been the main driver of climate change, primarily due to burning fossil fuels like coal, oil and gas. And emissions continue to rise. The world is now about 1.1C warmer than it was in the 19th Century - and the amount of CO₂ in the atmosphere has risen by 50%. Many people think climate change mainly means warmer temperatures. But temperature rise is only the beginning of the story. Because the Earth is a system, where everything is connected,

changes in one area can influence changes in all others. The consequences of climate change now now include, among others, intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms and declining biodiversity.

The Paris Agreement (COP21) is a legally binding international treaty on climate change. It was adopted by 196 Parties at COP21 in Paris in December 2015. Its goal is to limit global warming to well below 2, preferably to 1.5 degree Celsius, compared to pre-industrial levels. The Paris Agreement made commitment that the world's richer countries should provide \$100bn (£87bn) annually by 2020 to help developing nations deal with the effects of climate change, and build greener economies. But, until 2019 only \$79.6 bn has been raised. A recent UN report said the \$100bn goal would not be reached until 2023 - even though a new and more ambitious target is supposed to be set for 2025. As preparations for this Conference are underway, the COP27 begins on November 6, 2022 in Sharm el-Sheikh, Egypt, amid concerns that commitments are not enough to hold global temperature increase to less than 1.5 degrees Celsius. The COP27 is seen as crucial if climate change is to be brought under control. More than 200 countries will attend the summit to discuss further measures to cut emissions and prepare for climate change, and it could lead to major changes to our everyday lives.

Now is the time to review working of these global systems based on the policy and field level experiences.

Implications for water management

Water and climate change are inextricably linked. Extreme weather events are making water scarcer, more unpredictable, more polluted or all three. These impacts throughout the water cycle threaten sustainable development, biodiversity, and people's access to water and sanitation. Flooding and rising sea levels can contaminate land and water resources with saltwater or faecal matter and cause damage to water and sanitation infrastructure, such as water points, wells, toilets and wastewater treatment facilities. Glaciers, ice caps and snow fields are rapidly disappearing. Melt water feeds many of the great river systems. Volatility in the cryosphere can affect the regulation of freshwater resources for vast numbers of people in lowland areas. Droughts and wildfires are destabilizing communities and triggering civil unrest and migration in many areas. Destruction of vegetation and tree cover exacerbates soil erosion and reduces groundwater recharge, increasing water scarcity and food insecurity. Growing demand for water increases the need for energy-intensive water pumping, transportation, and treatment, and has contributed to the degradation of critical water-dependent carbon sinks such as peat lands. Water-intensive agriculture for food production, particularly meat, and for growing crops used as biofuels, can further exacerbate water scarcity.

The current challenge is to establish firm linkages between climate change and its implications for water management and the present Conference will focus on those issues.

India: Climate Change and water management- Challenges and solutions

Annual average renewable fresh water resource of India is 1,869 billion cubic meters (BCM) as determined by national water balance. Per capita availability of water in India has declined from 5,831 m³ in 1,950 to 1,608 m³ in 2010. By 2050 it is expected to decline further to 1,139 m³, or to only about 22% of the 1950 level. Many river basins in India are water scarce. The direct effect of climate change on water resources are most directly manifest in changes in river flows and extremes. Taken together, the likelihood of water scarcity, driven by climate change alone, is as high as 30 to 50 per cent for India.



India is highly vulnerable to impacts of climate change on water resources due to its unique climate, geography and topography. Attainment of identified goals is possible by developing and adopting appropriate technologies in the water sector and with greater involvement of public in WRD and management.

Karnataka State is no exception to implications of climate change. Climate experts have warned that Karnataka is likely to be more vulnerable to climate change in India than other states. A report, 'Transitioning towards climate-resilient development in Karnataka,' prepared by experts under the leadership of Prof N H Ravindranath and Prof G Bala of IISc, have alerted the State government to act fast to reduce consequences of climate change.

III : Way forward

Climate policymakers must put water at the heart of action plans. Sustainable water management helps society adapt to climate change by building resilience, protecting health and saving lives. It also mitigates climate change itself by protecting ecosystems and reducing carbon emissions from water and sanitation transportation and treatment. Governments should cooperate across national borders to balance the water needs of communities, industry, agriculture and ecosystems. Innovative financing for water resource management will be needed to help attract investment, create jobs, and support governments in fulfilling their water and climate goals. Sustainable, affordable and scalable water solutions include: improving carbon storage; protecting natural buffers; harvesting rainwater; reusing wastewater; harnessing groundwater; adopting climate-smart agriculture.

Adapting to the adverse effects of climate change is a major area of action under the UNFCCC. As the climate changes, societies will have to learn to adapt. It is crucial for the welfare of global agriculture, how quickly farmers will adapt to the changing climate and what policies or technologies will enable rapid adaptation. The Paris agreement, adopted through Decision addresses crucial areas necessary to combat climate change. Adaptation solutions take many shapes and forms, depending on the unique context of a community, business, organization, country or region. There is no 'one-size-fits-all-solution'—adaptation can range from building flood defenses, setting up early warning systems for cyclones and switching to drought-resistant crops, to redesigning communication systems, business operations and government policies. Many nations and communities are already taking steps to build resilient societies and economies, but far greater action and ambition will be needed to cost effectively manage the risks, both now and in the future.

Here is the challenge to the climate change, water and agriculture experts, intellectuals, global peacemakers and political visionaries to intervene and save the world from catastrophe. We should try to stop and resolve the conflicts. We need to sit together, talk to each other, understand each other and work together in a spirit of global partnership. As the Paris Agreement places great emphasis on climate-related capacity-building for developing countries there is a need for developed countries to enhance support for capacity-building actions. We must respect the nature and its bounties and limitations and restructure our economic activities and developmental priorities. There is a scope for adopting several innovative water management technologies to overcome the challenges posed by the climate change. These call for appropriate policies, institutional mechanism, adequate and timely funds. technology and trained manpower.

“The world must step up and protect people and communities from the immediate and ever-growing risks of climate emergency. We have no time to lose”....Antonio Guterres, Secretary General, United Nations, 3, November 2022

THE VENUE

Water and Land Management Institute (WALMI), Dharwad was established under the Water Resources Department of Government of Karnataka (the then Irrigation Department) in 1985 to provide leadership in capacity building in water and land management. Within a span of little over 37 years, WALMI has made a mark for itself in building capacity of farmers and engineers in water and land management. It has been conferred with outstanding Jala Prahari Award (2019) Government India for its efforts in mass awareness in water conservation and management. Presently, WALMI has been recognized at national and international levels.

WALMI, Dharwad is located at about 14 km on National Highway-4 between Bengaluru and Pune on the outskirts of Dharwad city. Spread over seven small hills at an average altitude of 750 meters above mean sea level, Dharwad enjoys a salubrious climate amidst thick vegetation. Dharwad is known as educational and cultural centre and has excellent climate throughout the year. Temperatures are moderate from late October to early February (25-28°C, with no rainfall).

Dharwad is well connected by road, rail and air. Nearest domestic airports are located at Hubballi (20 kms), Belagavi (70 kms) and Goa (180 Kms). Hubballi is an important railway junction with connectivity of trains to Mumbai, Pune, Jaipur, New Delhi, Howrah, Bengaluru, Hyderabad, Visakhapatnam, Ahmedabad, Vijayawada, Tirupati, Thiruvananthapuram, Chennai etc. Goa is the nearest international tourist place (180 km). Other nearest places of tourist attraction are Vijayapura (200 km) famous for Golgumbaz (world's second largest whispering gallery), Almatti Dam with garden (220 km), Kudala Sangam (200 km), Aihole and Pattadakallu (180 km; having sculptures of Chalukya's period of national heritage) and Badami caves (150 km). The Western Ghats, globally acclaimed hot spot of biodiversity are within 50 km from Dharwad.

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