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International Decade of Soils 2015-2024

FROM THE PRESIDENT'S DESK

Climate change poses a fundamental threat to nature, species, and people. However, nature also provides key solutions for both carbon storage and building climate resilience – if the global community takes steps to protect, restore, and better manage our natural resources. The Paris Climate Agreement commits to keep global warming below 2°C by the year 2030 and to pursue efforts to limit warming to 1.5°C. The actions of the international community between now and 2030 will determine whether we can collectively slow warming enough to avoid the worst impacts of climate change.

It is projected that water availability will increase in some parts of the world, which will have its own effect on water use efficiency and water allocation. Crop production can increase if irrigated areas are expanded or irrigation is intensified, but these may increase the rate of environmental degradation. Since climate change impacts on soil water balance will lead to changes of soil evaporation and plant transpiration, consequently, the crop growth period may shorten in the future impacting on water productivity. Crop yields affected by climate change are projected to be different in various areas, in some areas crop yields will increase, and for other areas it will decrease depending on the latitude of the area and irrigation application. Existing modeling results show that an increase in precipitation will increase crop yield, and what is more, crop yield is more sensitive to the precipitation than temperature. If water availability is reduced in the future, soils of high water holding capacity will be better to reduce the impact of drought while maintaining crop yield. With the temperature increasing and precipitation fluctuations, water availability and crop production are likely to decrease in the future. If the irrigated areas are expanded, the total crop production will increase; however, food and environmental quality may degrade. With nearly 690 million people facing hunger, agri-food systems emitting one third of global anthropogenic GHG emissions and a growing public demand for

climate action, it is pressing to achieve food security while adapting to - and mitigating - climate change.

Climate smart agriculture (CSA) is an approach for transforming and reorienting agricultural systems to support food security under the new realities of climate change with three objectives (1) sustainably increasing agricultural productivity to support equitable increases in incomes, food security and development; (2) adapting and building resilience to climate change from the farm to national levels; and (3) developing opportunities to reduce GHG emissions from agriculture compared with past trends. A fundamental challenge is to address the needs of broad and diverse groups of stakeholders by identifying an appropriate set of innovative soil-crop management systems. This requires knowledge of the type and extent of expected changes in the climatic variables that affect crop production and the best adaptive management options for a given context. There is no template or set of procedures easily embraced to assure a climate smart sustainable agricultural system. Success depends upon location, scale, types of production and the objectives of the farmer. However, it is the acute set of issues and the opportunities that can be captured by getting it right that has inspired so many to embrace sustainable agriculture. To this end, millions of practitioners, scientists and other interested parties are actively experimenting, collaborating and applying innovative approaches.

Hyderabad Chapter of SCSI Celebrated World Water Day-2024

The Soil Conservation Society of India – Hyderabad Chapter (SCSI-HC) and Professor Jayashankar Telangana State Agricultural University (PJTSAU) have jointly organized the World Water Day - 2024 at the College of Agricultural Engineering, Kandi, on the theme of *Water for Peace*. Dr. K. Srinivas Reddy, Principal Scientist, CRIDA and Chairman, Soil Conservation Society of India Hyderabad Chapter, Dr. G. Manoj Kumar, Associate Dean, CAE, Kandi and Secretary, SCSI-HC, Dr. K. B. V. N. Phanindra, Associate Professor, Department of Civil Engineering, IIT-Hyderabad, Dr. S.A. Hussain, Senior Professor, Er. M. Srinivasulu, Head (SWCE) and Dr. N. Hari, Head (IRDE) have graced the occasion.

Associate Dean and Secretary, Soil Conservation Society of India Hyderabad Chapter, briefly addressed about the formation, importance and objectives of Soil Conservation Society of India Hyderabad Chapter. On 25-03-2019, SCSI-HC was launched at WTC, PJTSAU by Dr. V. Praveen Rao, the then V.C., Patron, Dr. K.S. Reddy, Chairman and Dr. G. Manoj Kumar, Secretary with more than 50 life members. The objectives of SCSI are to survey and assess the natural resources of this country, implementation of integrated watershed management by the involvement

of people and government, and for the development and management of micro water resources for bio-production. Then, he emphasized about the significance of World Water Day, that United Nation's theme for this year is "Water for Prosperity and Peace". He shed light on the objectives regarding how water can either foster peace or incite conflicts between nations and how water can lead us out of crisis. He mentioned the critical role on how water plays in global geopolitics and the necessity for sustainable water management practices. Dr. KS Reddy explained the importance of SCSI and highlighted the urgent need to conserve water resources, drawing attention to pressing

issues faced by cities like Bangalore and Chennai. He cautioned that Hyderabad could potentially face similar challenges if proactive measures aren't taken to conserve water.

Continuing the discourse on water conservation and management, Dr. Phanindra, delivered a comprehensive speech on "An overview of Water in India: Availability, Management and Challenges", and explained in detail about the hydrological cycle, figures and statistics of global water resources, demand-supply dynamics, and strategies for conservation and replenishment of groundwater. He emphasized the importance of adopting management techniques and different models, including the utilization of remote sensing technology, to address water scarcity issues effectively.

On this occasion, to create awareness on water, essay writing and painting competitions were conducted among the students and prizes were distributed for the winners. More than 200 life members of Hyderabad Chapter, staff and students actively participated in the celebration and made this event a grand success. The world water day celebration reinforced the commitment of the chapter to promote responsible water stewardship for a better future.

Revitalizing Indigenous Knowledge of Sustainable Farming Practices in North East India

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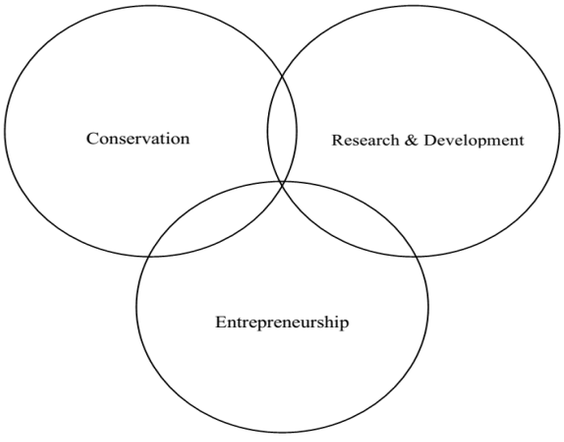
Working with indigenous knowledge requires a precise understanding and assessment of the process and product. Well-informed immersive research has the potential to alter the way we 'see' and 'value' a process or a technology, and create superior solutions which lead to all round development. One has to find a critical balance between the 'old' and the 'new', and celebrate aspects, which demonstrate potential, and in turn sacrifice other aspects which do not contribute to the overall performance. Therefore, it is essential to work with a sense of innovation and experimentation to develop solutions, which respond to current needs and realities of the society.

North Eastern Region (NER) of India represents three provinces *viz.*, East Himalayas, Brahmaputra Valley, and North East Hills, and covers about 7.7 percent of the total geographic area of India. Around 56 percent of the cultivated area of the NER is under low altitude (valley or lowland), 33 percent under mid-altitude (flat upland), and the rest under high altitude (upland terrace). Near about 22 percent land area is under crop cultivation in the region leaving 78 percent without cultivation. Majority of the fields in the region are situated across the hilly slopes. Traditionally, "slash and burn" agriculture (*jhum*) is practiced on about 0.88 M ha. Soil health is the most crucial factor in deciding the agricultural productivity. The region has several unique features: fertile land, abundant water resources, evergreen dense forests, high and dependable rainfall, mega biodiversity and agriculture-friendly climate, yet it failed to convert its strengths optimally into growth opportunities for the well-being of the people. It has diversity in cropping pattern; livestock management and diversity in culture, belief and socio-economic life. The size of land holdings is small which varies with state to state within the region. The mainstay of livelihood is only the agriculture which is predominantly traditional and CDR (Complex, diverse and risk prone), with a very backward industrial sector. The environment, local conditions, socio-economic and socio-cultural life of different tribal communities and the rituals associated with agricultural practices have developed many indigenous farming practices, which have in-built eco-friendly systems for conservation, preservation and utilization of natural resources and environment. These techniques and systems have sustainable agriculture base and are practiced since centuries. There is a need of an in-depth study to know the secret of their success. Moreover, with the passage of time, some of these practices need assessment and refinement to cater the location specific present-day demand, and for conservation of natural resources, particularly soil and water resources.

As a collective NER society, which is gradually transforming and integrating with the mainstream, it presents a unique context for studying ancient farming practices and developing ingenious hybrid solutions, which are inclusive, authentic and sustainable. By integrating different viewpoints and balancing individual needs with the needs of a community. The authors feel necessity for a mergence of ecological and economic concerns, and developing solutions together with local communities in a non-hierarchical, symbiotic, participatory and immersive manner, where indigenous knowledge and contemporary thoughts are given equal value, and the solutions are developed through rigorous field tests and objective analysis.

A three-pronged approach is required to work with indigenous knowledge, which focuses on (1) conservation, (2) scientific research and development,

and (3) grass root entrepreneurship. Connecting these three domains can create a fertile ground for indigenous knowledge to grow and adapt in response to changing realities at a local, regional and global level.



Pillars for working with indigenous knowledge

Adopting these fields as essential pillars for working with sustainable farming systems and ancient wisdom can lead to novel solutions, which are resilient and representative of different sections of society, and allow transmission of this knowledge to younger practitioners.

(A) Conservation

Preservation and protection are the first steps in a sequence of successive measures required for working with indigenous knowledge. This creates a reference for all subsequent actions. In context of NER, this stage assumes critical importance owing to rapid changes occurring across all domains of the society. With specific reference to sustainable farming practices, conservation assumes high priority owing to the inherent nature of a living ecosystem. Once lost or damaged, remediating and restoring such ecosystems to their original performance is a great challenge. Therefore, it is essential to interact with the local farmers to reveal the current state of indigenous farming practices, their overall performance, and the local communities' relation with these practices. This will create a foundation for evaluating the scale of the conservation challenge and facilitate an appropriate local strategy. It will also reveal critical insights for scientific research and development.

(B) Research and development

Many of the indigenous farming practices need assessment and refinement to cater the location specific present-day demand of the local communities. Therefore, well defined location specific research and development for addressing the research gap is must.

(C) Entrepreneurship

Creating ecology-based grass root entrepreneurial opportunities is critical for a self-sustaining development model in North East India. Therefore, aligning local needs with indigenous farming practices is the need of hour to alleviate the nexus of poverty, food security and environmental degradation. Potential adaptation of the farming practices for food and nutritional security for humans and other biota is really a critical value-addition and livelihood promotion strategy. This will transform these farming systems into a source of food, nutrition, fodder, fuel, fibres, and timber for local communities. Other key value addition interventions may include to find out alternative processing and value addition options for various farm produce/products at local level, and creating a grass root 'design and grow' cooperative for providing infrastructure development solutions to other tropical regions.

In conclusion, revitalizing indigenous knowledge requires extraordinary sensitivity and commitment from a social and scientific viewpoint.

Meghalaya Chapter of SCSI observed World Water Day

The Meghalaya Chapter of SCSI observed 'World Water Day' on 22nd March, 2024 at Thadnongiaw village in Umsning Block of Ri-Bhoi district, Meghalaya by organizing an awareness programme on "Water for Peace" wherein around 50 farmers and village headman participated.

Dr. Sanjay Swami, Professor (Soils) & Chairman of the SCSI-Meghalaya Chapter extended greetings to all the farmers on the occasion of world water day. In his remarks, he apprised that world water day is observed on 22nd March each year with focus on a specific water related problem assigning a specific theme. This year's theme is "Water for Peace" that aims to highlight the benefits of water management as a conduit for peace, showcasing effective mechanisms and tools to enhance cooperation and prevent water-related disputes. He further shared that Meghalaya is called "the abode of clouds." The word "megh" means "cloud," and "-alaya" means "abode" or "home." The state falls within the Inter-Tropical Convergence Zone (ITCZ), which is an area near the equator where the northeast and southeast trade winds meet, resulting in a convergence of moist air and the formation of low-pressure zones. This convergence of air masses leads to high levels of atmospheric instability, which in turn results in frequent and intense rainfall, especially during the monsoon summer months. However, the State, which is almost dependent on monsoon for its water supply, power and agriculture, has seen a significant decline in rainfall,

resulting in depleted water sources. As per recent report, Meghalaya has had a 15% decrease in rainfall over the past five years, exacerbating the already dire water scarcity in a situation where the demand for potable water has been growing. Long back, when Sohra (Cherrapunji) created a world record for the highest rainfall in 1861, it received 22,987 mm of rainfall in a year. More than 160 years later, it has reduced by more than half to 11359.4 mm a year as per the Indian Meteorological Department. The current crisis is a culmination of multiple factors, including climate change, deforestation, and unsustainable water management practices. These issues have synergistically led to a decline in water availability, particularly in urban areas. He stressed that considering the multiple and competing needs for water and the increased pressure on water resources, an integrated and holistic approach must be adopted for water resources management, where the various social, economic and environmental needs are balanced and met in a sustainable manner. He also appreciated the traditional wisdom of the Meghalaya farmers for efficiently managing water through local practices like bamboo drip irrigation system.

Dr. Popiha Bordoloi, SMS, KVK-Ri-Bhoi and an active member of the Meghalaya Chapter, while speaking on the occasion highlighted that despite of plenty of rain during the monsoon period, the farmers of Meghalaya are not able to raise second crop in *rabi* season due to lack of irrigation water availability, especially in uplands, as a result cropping intensity is very low (120%). Lack of sufficient storage capacity of water and poor water management practices leads to seasonal water shortage. The dependency on springs for meeting drinking water needs is very high in the State and the discharge of these springs is also dwindling. A simple micro rain water harvesting structure- *Jalkund* can be a solution to this problem. She urged the farmers to harvest the rain water when it is available in plenty and utilize it in the lean period for domestic and agricultural purposes.

Many members of SCSI-Meghalaya Chapter also participated in this event. The programme ended with vote of thanks proposed by Smt. Plenty Makri, a progressive female farmer from the village.

IoT Based Joint Training Organized by ICAR-Central Citrus Research Institute and Soil Conservation Society of India

ICAR-Central Citrus Research Institute, Nagpur, and Soil Conservation Society of India, New Delhi jointly organized one day training program on "IoT Based Micro-Irrigation System for Nagpur Mandarin", under the Social Scientific Responsibility Policy of the DST-SERB Project entitled "Development of Sensor-Based Fertigation Scheduling to Enhance Water Productivity and Nutritional Density of Nagpur Mandarin (*Citrus Reticulata Blanco*)" in the auditorium hall on 21st March, 2024. The training was organized in order to develop an overall understanding of IoT-based micro-irrigation systems for Nagpur mandarin among the students, scientists, farmers, and other stakeholders of agricultural/horticulture. There are 52 trainees from across India. The training started with the inauguration function which was graced by the presence of Dr. R. K. Sonkar, Pr. Scientist (Horticulture), ICAR-CCRI, Nagpur as a chief guest. Dr. Sonkar highlighted the significance of IoT-based technologies in improving production techniques for Nagpur mandarin cultivation.

The technical session of programme featured four presentations delivered by various experts namely and given in tabular form Mr. A. J. Agrawal from Jain Irrigation System Limited, Dr. D. T. Meshram, Pr. Scientist (L&WME) ICAR-CCRI, Nagpur, Dr. Anil Pimpale, Head, Agril. Engg. Section, College of Agriculture, Nagpur, and Er. Santosh Khaire (T.O.) and Er. Akshay Utkhede (JRF) covering various aspects of IoT based micro-irrigation system.

Overall the lectures and field demonstrations provided a complete capsule for trainees to gain profound insights into IoT based micro irrigation and fertigation in Nagpur

mandarin. The training programme was coordinated by Dr. D. T. Meshram, Pr. Scientist (L&WME). Dr. Surjit Mondal, Sr. Scientist (Soil Science), ICAR-CCRI, Nagpur, delivered vote of thanks.

ICAR-CCRI and SCSI Celebrated World Water Day

The "World Water Day-2024" was celebrated by ICAR-Central Citrus Research Institute, Nagpur in collaboration with the Soil Conservation Society of India, New Delhi on 22nd March, 2024, focused on the theme of "Leveraging Water for Peace" pertinent to the global challenges related to water scarcity and management. The event held at village Astikala, Ta-Kalmeshwar in Nagpur district aimed to raise awareness about the rapid depletion of water resources due to human activities and to encourage action. The program featured a lecture by Dr. Deodas T. Meshram, Principal Scientist (L&WME), ICAR-CCRI, Nagpur, along with contributions of Shri. Shyam Deshbratar, a progressive farmer of Astikala village, and Mr. Akshay D. Utkhede (JRF), ICAR-CCRI, Nagpur. The speakers highlighted the crucial role of water in agriculture and horticulture, emphasizing its importance for sustainable water resource management.

Dr. Meshram focused on technologies for assessing water resources and highlighted the significance of water management technologies, as well as the role of remote sensing (RS) and geographic information systems (GIS) in agriculture. He also shed light on the 'Jal Shakti Abhiyan: Catch the Rain' movement, aimed at conserving rainwater.

Additionally, progressive farmers from various villages shared insights into water-saving techniques in citrus crops, including the importance of surface and sub-surface drip irrigation systems. The event was attended by 9 progressive farmers and a total of 21 participants, who contributed to the discussions and shared their experiences. The program was coordinated by Engg. Akshay Utkhede, who also extended a vote of thanks to all attendees.

Overall, the event served as a platform for exchanging knowledge, experiences, and innovative solutions to address water-related challenges in agriculture, promoting the sustainable use of water resources for a more peaceful and prosperous future.

Ensuring Environmental Sustainability through Blockchain

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Blockchain is a secure and immutable way of storing and sharing a data across a network of computers without a central authority or intermediary. It is a decentralized, distributed ledger system that can record transactions between two parties efficiently and in a verifiable way. Blockchain is a scalable technology, and it can be used to handle many transactions. Virtually anything of value can be tracked and traded on a blockchain network, reducing risk, and cutting costs for all involved. The blockchain collects transaction information and enters it into a block, like a cell in a spreadsheet containing information. Once it is full, the information is converted into digits, which creates a hexadecimal number called the hash.

Blockchain technology is still relatively new to the agricultural industry, but it is already making great strides. One of the primary benefits to farmers using blockchain in agriculture is the ability to monitor and verify sustainable farming practices. As data is collected, practices with environmental impacts are monitored. These practices may include the use of dangerous chemicals, energy and water consumption, crop rotations, and more. Since all of this data is recorded in the blockchain, it is accessible to consumers and other stakeholders. Sustainable practices can also be written into smart contracts that incentivize compliance. These contracts are coded into the blockchain and automatically executed, once specific terms are met. The following are some ways to achieve environmental sustainability through blockchain:

Reducing waste: Blockchain technology can significantly reduce food waste by enhancing the traceability and transparency of the supply chain. It allows for real-time monitoring of the food products, from farm to table, enabling quicker response to any issues, thereby minimizing waste.

Optimizing resource use: Blockchain enable precise tracking of resource use such as water, fertilizers, and energy; promoting optimal utilization and reducing excessive consumption. It encourages sustainable resource management by providing immutable and transparent data on resource consumption patterns.

Promoting responsible agricultural practices: Through smart contracts, blockchain can incentivize farmers to adhere to sustainable and eco-friendly farming practices by automating rewards or subsidies for compliance with environmentally friendly protocols.

Enhancing biodiversity: Blockchain can support biodiversity by documenting and preserving the variety of plant species and their genetic material. It can facilitate the exchange of this information between farmers, researchers, and conservationists, promoting cultivating diverse crops.

Carbon footprint and emission tracking: Blockchain can provide a transparent and unalterable ledger of carbon emissions and other environmental impacts of agricultural practices, allowing for accurate carbon accounting and facilitating the implementation of carbon credit systems.

Blockchain technology is a beacon of hope for achieving environmental sustainability in agriculture. It empowers the agricultural sector to mitigate environmental challenges and foster a harmonious relationship with nature.

32nd National Conference on
Soil, Water and Energy Management for Sustainable Agriculture and Livelihood Security

Dated: 18-20 October, 2024

Venue:

Chandra Shekhar Azad University of Agriculture & Technology,
Kanpur-208002 (U.P.), India

Organized by

Soil Conservation Society of India - U.P. Chapter
and
Department of Soil Conservation & Water Management,
Chandra Shekhar Azad University of Agriculture & Technology, Kanpur

Themes of the Conference

1. Soil resource conservation and management for achieving sustainable development goals
2. Water harvesting and its efficient management in the farming system.
3. Utilization of new &renewable energy for sustainable soil and water management.
4. Resource conservation technologies for sustainable agriculture, forestry and livelihood security.
5. Site-specific nutrient management for resource conservation and higher productivity.
6. Climate-smart, digital agriculture, use of IoT and machine learning for enhancing agricultural productivity and income.
7. Women empowerment and community involvement in agriculture.
8. Government policies, natural and organic farming for sustainability.

Important dates:

Last date for abstract submission:	05 August, 2024
Intimation of acceptance of abstracts:	05 September, 2024
Submission of full length paper:	15 September, 2024
Last date for Registration (without late fee):	15 September, 2024

For more information, Please contact

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Conference updates

All other Information of the conference and updates shall also be available on the website of CSAU&T, Kanpur (www.csauk.ac.in) and SCSI (www.scsi.org.in).

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