NAVSARI AGRICULTURAL UNIVERSITY

Proceeding of

National Conference on Innovative Resource Management Approaches for Coastal and Inland Ecosystems to Sustain Productivity and Climate Resilience

13-15, October, 2022

Organized by

Navsari Agricultural University, Navsari, Gujarat, India

In collaboration with

Gujarat State Chapter of SCSI, Navsari, Gujarat

Soil Conservation Society of India (SCSI), New Delhi

Sponsored by

Indian Council of Agricultural Research, Govt. of India, New Delhi

Ministry of Jal Shakti, Govt. of India, New Delhi

National Bank for Agriculture and Rural Development (NABARD)

Ministry of Earth Sciences, Govt. of India, New Delhi

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Ministry of Earth Sciences
Government of India

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NABARD

International Decade of Soils 2015-2024

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Navsari Agricultural University

Eru Char Rasta, Dandi Road
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(Gujarat) INDIA
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सत्यमेव जयते

प्रधान मंत्री
Prime Minister

MESSAGE

It is a pleasure to learn about the national conference organised by Navsari Agricultural University, Navsari, in association with Soil Conservation Society of India (SCSI) from October 13-15, 2022.

The theme – "Innovative resource management approaches for coastal and inland ecosystems to sustain productivity and climate resilience" – encompasses important environmental issues.

Productivity of agriculture, profitability for farmers and preservation of the environment – these are the three pillars that the future of agriculture rests upon.

The hardworking farmers of India have ensured records in productivity year after year and boosted food security. The government has worked with them to ensure greater profitability, higher incomes, lesser input costs and risk mitigation.

In the third pillar of preservation of the environment through sustainable agriculture, the government has worked with the farmers by providing them crores of Soil Health Cards to track soil health, promoting natural farming, encouraging the growth of millets for climate resilience, and more.

Following India's proposal, 2023 has been declared as the International Year of Millets. This is an initiative that will be immensely helped by discussions and deliberations in such conferences.

There is a nascent socio-economic mass movement shaping up for sustainable agriculture, involving government, farmers, consumers and other such important stakeholders. This movement needs the scientific community to offer leadership.

Such conferences are an excellent opportunity to bring people together to add momentum to sustainable agriculture and good nutrition.

I am positive that the deliberations in this conference will focus on diverse issues and deliberate upon security, sustainability and climate resilience.

As we celebrate Amrit Mahotsav of our Independence, let us work on making agriculture sustainable. The Amrit Kaal of next 25 years is a period to build a strong, healthy and self-reliant nation.

Best wishes to the organisers and participants of the conference.

(Narendra Modi)

New Delhi
आश्विन 20, शक संवत् 1944
12th October, 2022

Bhupendra Patel

Chief Minister, Gujarat State

Apro/jm/2022/09/19/rs

Dt. 19-09-2022

MESSAGE

Agriculture is the backbone of the Indian economy; nearly 60% of the Indian population directly depends on agricultural activities as a source of livelihood. Indian agriculture is dominated by small and marginal farmers, having only 44% of the total arable land. Also, subsistence farming is the norm for marginal and small farmers, for their own consumption, they instinctively concentrate on cereal-based crops, with high risks of climate anomalies or erratic weather conditions, in addition to severe floods and droughts. The modern agricultural production systems are simplified due to specialization and are intensified with high rates of external inputs to keep production conditions favorable to maintain the productivity levels. Instead of low input sustainable agriculture (LISA), ecological, organic, regenerative, biological or simply alternative agriculture approach should be emphasized.

I am much pleased to learn that **Navsari Agriculture University** is organizing a National Conference on *"Innovative Resource Management Approaches for Coastal and Inland Ecosystems to Sustain Productivity and Climate Resilience"* from **13th to 15th October, 2022** at **Navsari**. I hope that the scientific community gathered shall give a thought on these burning issues and work for the welfare of the farming community. I extend my warm welcome in Gujarat, to the scientific community and research scholars from all over India and offer my best wishes to the organizers of the event at Navsari.

(Bhupendra Patel)

રાઘવજી પટેલ

सत्यमेव जयते

ક્રમાંક-મં./કૃ.પ.ગૌ./ VIP/૨૦૨૨
મંત્રી
કૃષિ, પશુપાલન, ગૌસંવર્ધન
ગુજરાત સરકાર
સ્વર્ણિમ સંકુલ-૧, બીજો માળ,
સચિવાલય, ગાંધીનગર.
ફોન -૦૭૯૨૩૨૫૦૧૧૯
Fax- ૦૭૯૨૩૨૫૦૧૨૦
તા. 01/10/2022

MESSAGE

Over the years, due to continuous and mono cropping soil nutrient reserves have depleted significantly, the soils need to be replenished with the essential major and minor plant nutrients. As of now there is hardly any scientific evidence to support detrimental effect of judicious use of fertilizers on soil health, crop productivity or farmers' income. We need to promote farming systems and technologies which enhance income and also prove ecologically sound. Typical mono-cropping system followed in many regions of India is untenable option for sustenance of soil and livelihood of farmers. To overcome the problems encountered by specialized, input driven agriculture, the integration of crops, livestock, fishery components that sustains food and nutritional security with regular and periodic income to farmers is a better option. Integrated farming systems (IFS) that includes temporal and spatial mixing of crops, livestock, fishery, and allied activities in a single farm needs to be encouraged, which is a holistic approach to farming making farms adaptive and resilient. IFS that integrate animal and crop enterprises is already receiving renewed interest in marginal, small and medium farmers who cultivate less than one hectare. Inclusion of tree species along the farm boundaries and Agro-forestry systems that helps in increased carbon sequestration, biomass production, reduced consumption of fertilizers and pesticides, in addition to reduction in greenhouse gas emissions and multiple other benefits needs to be emphasized.

I hope the scientific gathering at Navsari Agricultural University will deliberate at length and come out with recommendations that could be beneficial for the agriculture sector in general and marginal and poor farmers in particular.

Your Regards,

Raghavji Patel

(Raghavji Patel)

सत्यमेव जयते
डॉ. हिमांशु पाठक
सचिव, एवं महानिदेशक
Dr HIMANSHU PATHAK
SECRETARY (DARE) & DIRECTOR GENERAL (ICAR)

भारत सरकार
कृषि अनुसंधान और शिक्षा विभाग एवं
भारतीय कृषि अनुसंधान परिषद
कृषि एवं किसान कल्याण मंत्रालय, कृषि भवन, नई दिल्ली 110 001
GOVERNMENT OF INDIA
DEPARTMENT OF AGRICULTURAL RESEARCH & EDUCATION (DARE)
AND
INDIAN COUNCIL OF AGRICULTURAL RESEARCH (ICAR)
MINISTRY OF AGRICULTURE AND FARMERS WELFARE
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Tel : 23382629, 23386711 Fax: 91-11-23384773

MESSAGE

I am happy to know that NAVSARI Agriculture University is organizing National Conference on **"Innovative Resource Management Approaches for Coastal and Inland Ecosystems to Sustain Productivity and Climate Resilience"** during October 13-15, 2022 in collaboration with Soil Conservation Society of India (SCSI), New Delhi and Gujarat State Chapter of SCSI, Navsari. Coastal agricultural areas are particularly exposed to a range of climate-related hazards such as rising sea levels, higher flood levels and storm surges, accelerated coastal erosion and seawater intrusion. These hazards may lead to a series of socio-economic impacts in the coastal zones like reduced agricultural productivity, loss of coastal habitats. Coastal agricultural practices are less stable than upland agriculture because they need to cope with frequent changes in salinity, tidal processes, water stresses and waterlogging. Coastal ecosystems are greatly impacted by location-specific land use. Projections of the precise magnitude, frequency and regional patterns of the impacts from climate change on coastal agriculture are uncertain.

Innovative interventions are required to establish climate resilient agriculture in coastal areas. Application of nano-technology, geospatial technologies, modelling and information technology is required for sustainable agriculture and watershed management. Adoption of natural farming can prove to be a feasible measure for resource conservation in our country. Climatic and non-climatic stressors, such as rise in temperature, rainfall fluctuations, population growth and migration, pollution, land-use changes and inadequate strategies are major challenges to coastal agricultural sustainability. The two most vital natural resources, soil and water, are being affected extensively and therefore, innovative technological interventions are required to be implemented before it is too late. The cascading impacts on the sustainability of coastal agriculture have not been adequately resolved and therefore, scientific studies need to be presented and deliberated in the conference to address these crucial issues.

I wish the conference a grand success.

(Himanshu Pathak)

Dated the 24th August, 2022
New Delhi

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डा. राकेश चन्द्र अग्रवाल
उप महानिदेशक (कृषि शिक्षा)
Dr. Rakesh Chandra Agrawal
Deputy Director General (Agril. Edn.)

PREFACE

I am delighted to learn that Gujarat State Chapter of Soil Conservation Society of India (SCSI) at Navsari Agricultural University, Navsari, Gujarat is organizing the 31st National Conference on "Innovative resource management approaches for coastal and inland ecosystems to sustain productivity and climate resilience", from October 13 to 15, 2022, in collaboration of Soil Conservation Society of India (SCSI), India.

A critical review and insight of the topics of seminar, it clearly that the main topics *viz.*, Conservation, management and reclamation of natural resources; Technological interventions for sustainable agriculture; Socio economic impacts of climate change; Coastal ecosystem and aquaculture; Biodiversity and land use system (Horticulture/Agroforestry) for nutritional and environmental security and Resource Conservation through natural farming are of prime importance in the present context. Our resources, which not only sustain human beings but wild and domestic animals (both aquatic and terrestrial) and floral diversity, at present needs to be debated. Such debates at national and international level will surely provide insight for policy makers, researchers, NGOs *etc*, a path of deep thinking and planning about conservation and sustainable utilization of these valuable natural resources in the era of climate change. I am sure that such conferences with burning topics would lead scientist and policy makers to work in well-defined and focused research to tap these resources in a way so that we as human being at present would be able to sustain them for future generation. In this way we would not be blamed to make our future generation to be deprived from many natural flora and fauna.

Therefore, conservation and sustainable utilization of natural resources, in view of livelihood and environmental security of generation to come, may it be terrestrial or aquatic is the need of hour, particularly in climatic uncertainty which is being witnessed by us with an increasing trend. I am sure that deliberations in a 3 days conference on very apt themes will provide a baseline for research priorities and future development on these aspects to make the nation natural resource rich and conserve for food, nutrition, livelihood and environmental security.

I extend my best wishes for the grand success of this timely and well thought out themes of the national level conference.

(R.C. Agrawal)

To:

The Organizers and Delegates of the 31st National Conference on Innovative Resource Management Approaches for Coastal and Inland Ecosystems to Sustain Productivity and Climate Resilience, Oct 13-15, 2022 at Navsari Agricultural University, Gujarat India

Namaskaram

It is wonderful to see the scientific and academic community come together to recognize the foundational role of sustainable agricultural practices in towards climate-resilience.

It is important that this research and knowledge lead to policy redirection and determined action towards improving the health of our soils – and there by ensuring the health and future of all life on the planet.

Sadhguru

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Sadhguru Office, Isha Yoga Center, Velliangiri Foothills, Ishana Vihar Post, Coimbatore641114

NAVSARI AGRICULTURAL UNIVERSITY

Navsari Agricultural University
Navsari - 396 450, Gujarat

Dr. Z. P. Patel
(Vice Chancellor)

MESSAGE

I am very pleased to welcome all of you to participate in the National Conference on *"Innovative Resource Management Approaches for Coastal and Inland Ecosystems to Sustain Productivity and Climate Resilience"* from October 13 to 15, 2022 at Navsari Agricultural University, Navsari.

Agriculture in India is hindered due to small landholdings, inadequate resources and lack of agro-technological information. Under the changing climatic scenarios, agricultural planning and use of agricultural technologies need to be precise for their effective application in management and sustainability of natural resources over different ecosystems. Collaborative and concerted efforts of the organizers of this Conference are the timely steps in right direction to provide a platform where users, experts and policy makers from different part of the country are intended to deliberate on different emerging issues and challenges in the field of natural resources management. I am sure that thought-provoking discussions/deliberations will be held on conservation and management natural resources, technological interventions for sustainable agriculture, socio economic impacts of climate change, coastal ecosystem, biodiversity for nutritional and environmental security and various other issues covering different themes in this conference. The conference will offer the opportunity to interact and develop network in the field of soil & water conservation through sharing views with experts and possible future collaboration across the India.

I hope that the scientific community gathered at Navsari Agricultural University shall give a thought on these burning issues and work for the welfare of the farming community. I extend my warm welcome in Gujarat, to the scientific community and research scholars from all over India and offer my best wishes to the organizers of the event at Navsari.

(Z. P. Patel)
(Vice Chancellor)

Soil Conservation Society of India
New Delhi

Dr. Suraj Bhan
(President)

MESSAGE

I am happy that the Soil Conservation Society of India (SCSI), in collaboration with Gujarat State chapter of SCSI, Navsari, Gujarat is organising 31st National Conference on "Innovative resource management approaches for coastal and inland ecosystems to sustain productivity and climate resilience" at Navsari Agricultural University, Navsari, Gujarat.

Natural resources are critically important components of life support system, the efficient conservation and management of which are vital for sustainable agriculture and rural development. With increasing demand on land for agriculture, increase in population, urbanization, industrialization and other non-farm uses of farm lands, diversion of land resources takes place not only from wastelands but also from agriculturally and ecologically significant areas including coastal ecosystem. The soil and water conservation technologies play major role for mitigating the impact of climate change on yield of various crops. The degradation of natural resources, soil and water has become a matter of serious concern for the farmers, researchers, academicians, scientists and policy makers, as these in turn affects socio-economic upliftment of rural population and sustaining agricultural productivity.

The Innovative resource management have been major driving force to enhance agricultural productivity, production, profitability and development in the country. In recent times the coastal and inland ecosystems require to be made sustainable which should be acceptable & affordable to the farmers, fisherman, economic viable, sustainable, ensure any harm on bio-health and also mitigate to climate change impact.

I am confident that the National Conference would provide long way solutions to gather professionals working in the field of Agriculture, Soil Science, Soil & Water Conservation Engineering, Forestry, Horticulture and allied agricultural sciences that include Students, Research Scholars, Faculties and Scientists from academic institutions and R&D and Non-government organizations to participate and present their work on sustaining productivity in the era of climate change, while managing the scarce natural resources.

I hope that the deliberations of the conference will result roadmap to support present status along with policy planning for judicious management of resources to mitigate the climate change in both coastal and inland ecosystem. I convey my best wishes for the success of the conference.

(Dr. Suraj Bhan)
(President)

FOREWORD

Water and Food security remain a persistent and overbearing problem for a large proportion of the world population in general and the Indian population in particular. It has an immediate consequence on soil in terms of determining survival strategies of small and marginal farmers in view of declining productivity, loss of surface soil mass, soil degradation, declining water levels and water scarcity. Global environmental problems such as land degradation, desertification, loss of biological diversities and climate change would dominate the overall objective of soil study in this century. Soil and water are the most essential resources for sustained quality of human life and related activities; therefore, soil resources and agro ecology-based agricultural development should be the strategy for exploiting renewable resources on which our nation must build and grow to fulfil all the cherished dreams.

Despite huge investment on the development of canal commands the irrigated area is hardly 37 % and still 63 % is dependent on rainfed or groundwater irrigation. The country neither has more land nor the viability of any bigger dam projects. In this context, for increasing crop productivity the only way out could be through the utilization of know-how available in Universities and Research Organizations on soil and water conservation, water management, integrated nutrient management, precision farming and comprehensive land use planning. Further, the total coastline of India which includes the island is about 7516.6 km, with a flourishing human population all along the coast, the soil and water problems of coastal districts are different from mainland or hilly areas. The land use plan of the coastal watershed has to deal with coastal erosion, soil degradation, sea water ingress, water pollution due to industrial conglomerates, erratic monsoon impacts, loss of vegetative cover, storms and possible tsunami threats. Agroforestry systems need to be implemented, for carbon sequestration, conservation of water and soil, industrial demand for wood, forest products, biodiversity conservation and environmental sustenance. Unless academia moves from working in discipline-wise silos, to adopting a multi-disciplinary and integrated approach for solving the complex problems of degrading natural resources, food, water, nutritional and economic security will remain a distant dream. With these points in view, a National Conference is organized at NAU, Navsari by inviting scientists, college faculty members and students to present their findings as well as to listen to the renowned experts in the field.

The Organizers are grateful to Dr Z P Patel, Hon Vice Chancellor, Navsari Agricultural Universality, for readily accepting the proposal of SCSI, New Delhi for hosting the 31st National Conference at Navsari Agricultural University. His consent and leadership have enabled the Gujarat Chapter to mobilise the participation of a large number of researchers from various Colleges and Research Units as well as availing the infrastructure facilities for the Conference. We also express our deep sense of gratitude to Dr Suraj Bhan, President of Soil Conservation Society of India for having faith in the newly formed Gujarat Chapter at NAU, Navsari and to host the national event. He is the man behind consistent persuasion to involve the scientific community working for soil and water conservation in Gujarat. The financial assistance received from Research and Development Fund of National Bank for Agriculture and Rural Development (NABARD) towards conduct of Conference including publication of proceedings of the Conference is gratefully acknowledged. The financial support and scientific resource from ICAR are the backbone for making the event successful, but also give due authenticity and meaning to the meet. The major financial help provided by the Ministry of Earth Jal Shakti & Ministry of Earth Sciences, Government of India has helped in improving the quality of Scientific Conference, is heart fully acknowledged. We are also thankful for the financial assistance from various organizations and cooperatives, listed in the appendix of publication. The organizing team is thankful to the participants and their respective organizations from across the country, for registering and participating in the three-day conference. Lastly, the organizers acknowledge the manpower support from various colleges, research units of Navsari Agricultural University and the Soil Conservation Society of India, New Delhi for making this event successful.

Organizers Desk

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Introduction

The 31st National Conference is organized from October 13 to 15, 2022 at Navsari Agricultural University, Navsari, Gujarat, India, by Soil Conservation Society of India (SCSI), India in collaboration with Gujarat State Chapter of SCSI. The aim of the conference is to gather professionals working in the field of Agriculture, Soil Science, Soil &Water Conservation Engineering, Forestry, Horticulture and allied agricultural sciences.UG/PG Students, Research Scholars, Faculties and Scientists from academic institutions and R&D and Non-government organizations to participate and present their work on sustaining productivity in the era of climate change, while managing the scarce natural resources. The papers in the conference are invited on innovative ideas and approach under six major themes covering current topics on soil and water conservation, land use systems, coastal ecosystem, natural farming, traditional farming systems and its socio-economic impact on the farming community.

Title : Innovative resource management approaches for coastal and inland ecosystems to sustain productivity and climate resilience

Broad Themes

1. **Conservation, management and reclamation of natural resources**
   - a. Organic and natural farming for climate resilience
   - b. Soil ecology and management
   - c. Coastal and inland salt affected soils
   - d. Bio engineering for soil and water conservation
2. **Technological interventions for sustainable agriculture**
   - a. Precision agriculture for sustainable natural resource utilization
   - b. Geospatial technologies in agriculture and watershed management
   - c. Nano technologies for sustainable agriculture
   - d. Molecular biology and biotechnological interventions for climate smart agriculture
   - e. Uses of modelling for sustainable agriculture
   - f. Information technology for sustainable agriculture
3. **Socio economic impacts of climate change**
   - a. Supply chain management under variable climatic conditions
   - b. Environmental quality incentive program
   - c. Agricultural Best Management Practices
4. **Coastal ecosystem and aquaculture**
   - a. Management of costal saline soil, crop production and ground water
   - b. Climate resilience and sustainable agriculture in coastal region
   - c. Biodiversity conservation in coastal ecosystem
5. **Biodiversity and land use system (Horticulture/Agroforestry) for nutritional and environmental security**
   - a. Biodiversity conservation and management for environmental sustainability
   - b. Land use system for nutrition and food security
6. **Resource Conservation through natural farming**
   - a. Low input agricultural practices
   - b. Traditional farming systems

INAUGURAL SESSION
Day-1

Venue: Central Examination Hall		**Date:** 13/10/2022; **Time:** 09.00 to 12:00
Rapporteur	:	**1. Dr. Lalit Mahatma,** Associate Director of Research, NAU
		2. Dr. M.S. Sankanur, Assistant Professor, COF, NAU, Navsari
Master of Ceremony		**Dr. Mehul G. Thakkar,** Associate Professor, AABMI, NAU

The 31st National Conference on "Innovative resource management approaches for coastal and inland ecosystems to sustain productivity and climate resilience" was held from October 13-15,2022 at Navsari Agricultural University, Navsari in collaboration with Soil Conservation Society of India (SCSI) and Gujarat State Chapter of SCSI supported by Ministry of Jal Shakti, New Delhi, Ministry of Earth Sciences, New Delhi, Indian Council of Agricultural Science and National Bank for Agricultural and Rural Development including many eminent private firms. The programme was inaugurated and presided over by Hon'ble Vice Chancellor, Dr. Z. P. Patel in the gracious presence of Dr. A.K. Singh, Vice President, NASS, New Delhi as the Chief Guest; Dr. A. Arunachalam, Director, ICAR-Central Agroforestry Research Institute, Jhansi, Uttar Pradesh and Mr. Maniswara Raja, Chief Conservator of Forest, Valsad, as the Guest of Honours'; Dr. T. R. Ahlawat, Director of Research & Dean Post Graduate Studies, Dr. O. P. Aishwath, Vice President, SCSI, West Zone and Principal Scientist, ICAR-NRCSS, Ajmer, Dr. P. K. Shrivastava Convener & Dean, College of Forestry (COF), NAU; Dr. J. M. Patel, Research Scientist, SWMRU, Navsari and Dr. K. G. Patel, Co-organizing Secretary were also present during the inaugural programme. Dr. T. R. Ahlawat welcomed the participants to Navsari Agricultural University and briefed about contributions and the specific areas of work being carried out at NAU, for the farming community of South Gujarat.

Dr. Z. P. Patel, Hon'ble Vice Chancellor stated that the aim behind the organization of this event was to deliberate on latest issues and concerns of soil and water conservation, land use systems, coastal ecosystem, natural farming, traditional farming system sand its socio-economic impact on the farming community. Dr. A.K. Singh, Chief Guest, highlighted that Agriculture has been the backbone of the Indian economy since time immemorial and it is still perceived as a way of life. He emphasised to the line departments that inclusion of Soil &Water Conservation Engineering, Forestry, Horticulture and allied agricultural sciences is the need of the hour. To revive Indian agriculture, Dr. A. Arunachalam, Guest of Honour, emphasized that there is a need of paradigm shift from agriculture to agroforestry, through suitable tree-crop combinations, which is very crucial to seize the hidden and untapped potential of agriculture and allied sector. Mr. Maniswara Raja, Guest of Honour, said that by transforming conventional Forestry into consumer driven forestry enterprise through deliberately incorporation latest technologies developed by SAUs/CAUs like SWCs, latest nursery techniques on forest lands, Line departments could make soil and water viable and sustainable. In the end, Dr. P. K. Shrivastava Convener of the Conference delivered the Vote of Thanks. Total 22 lead papers, 306 abstract comprising of 141 Oral and 166 posters were listed for 3 day deliberations. Further, during the inaugural programme, the dignitaries released the Book of Abstracts and Souvenir of the Conference was released. Also, twenty five academicians affiliated with Soil Conservation Society of India (SCSI) were conferred with various awards, for their outstanding contribution in the various fields of Science and Technology and Natural Resource Conservation and Management. Dr. Z. P. Patel, Hon'ble Vice Chancellor was conferred with honorary life membership of the SCSI, New Delhi. Before the inaugural function, dignitaries' inaugurated an exhibition comprising of products made in different Units of the University as well as the products made by the students under experiential Learning Units of various colleges of the University.

TECHNICAL SESSION-I

Lead Lectures

Day-1

Venue: Central Examination hall		**Date: 13/10/2022; Time: 14:00 to 16:00**
Chairman	:	**Dr. A. K. Singh,** Vice President NAAS, New Delhi
Co-Chairman	:	**Dr. S. K. Jena,** Principal Scientist, ICAR-IIWM, Bhubaneshwar, Odisha
Rapporteur	:	**Dr. Mukesh Kumar,** Asst. Prof., IGNOU &Treasurer (SCSI), New Delhi
	:	**Dr. R. P. Gunaga,** Assoc. Professor, CoF, NAU, Navsari
Hall coordinator	:	**Dr. Sankanur,** Asst. Prof.,CoF, NAU, Navsari

Recommendations:

1. **Initiatives by the Government of Gujarat to mitigate the impacts of Climate Change in the state by Dr. Shwetal Shah**, Technical Advisor, Climate Change Department, GoG, Gandhinagar (Pre-recorded presentation)

- Discussed about various initiatives of government of Gujarat in order to address the issues of climate change and described about i) solar roof top project on government buildings, ii) institutional biogas plant scheme, iii) LED tube lights in government primary schools, iv) star rated fans in government primary schools; v) two wheeler's subsidy for electric vehicles.
- He also described the role of government department in supporting various research schemes for climate change impact studies to renowned research and academic institutions of Gujarat.
- He also informed that Govt. of India sanctioned National Adaptation Fund for climate change for Gujarat.

2. **Multifunctional agroforestry for sustainability by Dr. A. Arunachalam**, Director, ICAR-Central Agroforestry Research Institute, Jhansi, UP.

- Described the role of Agroforestry since civilization to the present era. Agroforestry supports five F's, they are Food, Fiber, Fodder, Flower and Fertilizers, which provide livelihood security
- Agroforestry play a key role in sustainability of land use system including agriculture, horticulture, animal husbandry, *etc*.
- He also emphasized the importance of Industrial Agroforestry, Urban Agroforestry and Agroecology. So that each and every farmer(s) can utilize land space like bunds, alley, etc. for additional income by planting fast growing multifunctional tree species
- Restructuring of Agroforestry policy in order to accommodate many forest tree species that can easily be grown without transit like bamboo.

3. **Coastal and Inland Salt Affected Soils and Their Management by Dr. K. P. Patel, Former Dean (Agri), BC College of Agriculture, AAU., Anand**

- Briefed about salt affected soils of arid and semi-arid zones and factors responsible for the same.
- He stressed that saline soils cannot be reclaimed by any chemical amendment conditioners. However, leaching can remove salts from the plant root zone by providing adequate drainage.
- Good land management methods like land levelling can prevent salt build-up
- Reclamation of salt affected soil by means of organic amendments, crop improvement, genes form halophytes and salt tolerant crops.

- Sodic soil can be treated by replacing adsorbed sodium with soluble source of calcium like gypsum.
- Technological interventions can reclaim salt affected soils and play an important role in increasing national agricultural productivity and farmers welfare

TECHNICAL SESSION-I
Lead Lectures
Day-1

Venue: Conference Hall, Dept. of Soil Science and Agricultural Chemistry, NMCA		**Date:** 14/10/2022; **Time:** 17:00 to 19.00
Chairman	:	**Dr. N. K. Gontia,** Dean, CAET, JAU, Junagadh, Gujarat
Co-Chairman	:	**Dr. Sanjay Swamy,** Professor, CAU, Meghalaya
Rapporteur	:	**Dr. S L Pawar,** Assoc. Prof., SWMRU, NAU, Navsari
	:	**Dr. N S Thakur,** Asst. Prof., SAF, CoF, NAU, Navsari
Online session Coordinator	:	**Mr. Kirti Bardhan,** Asst. Prof., BSS, CoF, NAU, Navsari

Dr. S. Raman deliberated on "**Soil and water conservation through flora selection and management**". In his talk he suggested that in most of the studies *Vetiverzizaniodes* and Palmarosa among several tested grasses were most efficient in arresting the soil erosion. Among various vegetative barrier technologies, cover crop-risers in Nilgiris, contour vegetative barrier, in Rajasthan, silvipasture system in Shivaliks, shelter belts in

coastal sandunes as well as silt load reduction in canals have been found efficient, he suggested. His talk also highlighted that for bio-reclamation and biodarainagespcies like hyacinth could be sued.

This was followed by the **Dr. M S Hadda's** talk on "**Energies and sustainable agriculture**". He deliberated that there are ample opportunities of using renewable power sector. His talk highlighted about different sources and alternate methods/technologies which could be potentially used for emission reduction and restoring and sustaining inland terrestrial ecosystems.

The last lead lecture was in hybrid mode, in which world-renowned soil scientist, **Honourable Padma Shri Dr. Rattan Lal deliberated on the "Sustainable management of inland system for restoring and sustaining soil health and recabonization of the terrestrial biosphere**"

He deliberated on global climate change issues, changes in agriculture and emissions during pre agricultural and pre industrial era, etc., based on his vast experience; his pertinent concern was about soil health and its importance on productivity, fertility, and nutritional security. He stressed upon the nexus of all entities and ecosystem. Further, the eminent personality, expressed the concerns on that soil organic matter, which is heart of the soil, he reiterated that we need to follow the law of return i.e., whatever we are extracting from the soil should be added for soil sustainability. He deliberated that India should look stringently to feed burgeoning demographic level by 2050, by adopting plant-based diet. He remarked that we as human being should not take resources for granted. He further said that, regenerative agriculture should be adopted to create positive carbon budget, India should stress on soil centric technologies and carbon farming, crop yields can be increased with increase in SOC, people should be pro nature, reduce stubble burning to reduce emissions from agriculture sector, He also added that it's not only the major Indian grain contributing states which are being blamed for stubble burning but the entire south east Asia. He suggested that the crop residue should be converted to biochar to increase soil carbon which will result in enhanced soil fertility and health improvement. In his views, stubble burning cannot be minimized forcefully, but with the help of technology and incentivization. He opined that, India needs to inculcate nature-based education, which is already exists, in all religious holly books. In basic elementary education books alphabets should be nature based, rather than any other entity.

TECHNICAL SESSION - II (Parallel Session 1)
Lead Lecture
Day-2

Venue: Conference Hall Dept. of Soil Science and Agricultural Chemistry, NMCA		**Date:** 14/10/2022; **Time:** 09:00 to 10:50
Chairman	:	**Dr. S. Raman,** Retired Research Scientist, SWMRU, NAU, Navsari
Co-Chairman	:	**Dr. Pradeep K Rai,** Dr. Pradeep K. Rai, Professor, SSAC, SKUAST, Jammu
Rapporteur	:	**Dr. N.K. Pareek,** Assistant Professor, Agrometerology, ARS, SKRAU, Bikaner
		Dr. Sonal Tripathi, Associate Professor, SSAC, NMCA, NAU
Hall Coordinator		**Dr. Susheel Singh;** Assistant Professor In-Charge Food Quality Testing Laboratory, NAU, Navsari

Dr. B. K. Patel, Retired Research Scientist, BTRS, AAU, Anand, discussed several physical, chemical, and biological remediation approaches available for lessening the negative impacts of heavy metal-contaminated soil during his talk on "Remediation Strategies of Heavy Metals in Soil Ecosystem." His particular focus was biological remediation, which uses plants and microorganisms as a remediation alternative to address the issue of heavy metal contamination in a safe and environmentally friendly manner.

The next speaker was Dr. O. P. Aishwath, Principal Scientist, ICAR-NRCSS, Ajmer, andVice-President of SCSI West Zone. His topic was "Horticultural Crops for Management and Utilization of Coastal Degraded Land and Soil." He listed a number of crops ideal for degraded terrain, including medicinal, aromatic, and spice plants. Numerous plant species, including ashwagandha, senna, kalmegh, basil, lemongrass, and palmarosa, might be grown in degraded soils. These crops not only have commercial potential but also aid in restoring the soil.

In the third presentation, Dr. Sanjay-Swami, Professor, Soil Science and Agricultural Chemistry, Central Agricultural University, Barapani, Meghlaya, spoke on "Nature-based Solutions for Agricultural Sustainability and Climate Resilience in the NEH Region, India. In order to address deteriorating trends in crop output and soil erosion, he offered a variety of nature-based solutions (Nbs), including the Bun System, APATANI, Zabo, bamboo drip irrigation, modified bamboo drip irrigation, and alder-based farming.

The session's chairman, Dr. S. Raman, adjourned the meeting. He commended the technical session presenters for their insightful lectures on remediation strategies for contaminated soils, coastal land degradation, soil restoration and management through horticultural crops and nature-based solutions (Nbs). Finally, a vote of thanks was proposed by Dr. Susheel Singh.




Glimpse of Technical Session II (Parallel Session 1)

TECHNICAL SESSION – II

Oral Presentation

Day-2

Venue: Conference Hall Dept. of Soil Science and Agricultural Chemistry, NMCA		**Date:** 14/10/2022; **Time:** 10:50 to 18:00
Chairman &Evaluator	:	**Dr. B. K. Patel,** Retired Research Scientist, BTRS, AAU, Anand
Co-Chairman &Evaluator	:	**Dr. Nilay Borah,** Professor, Assam Ag. Univ.
Rapporteur	:	**Dr.Ambrish Yadav ,**
	:	**Dr. Neethu T M,** Assistant Professor, NMCA
Hall Coordinator &Evaluator	:	**Dr. Susheel Singh;** Assistant Professor In-Charge Food Quality Testing Laboratory, NAU, Navsari

The technical session started with welcome address by Dr. Susheel Singh, there were total of 45 oral presentations listed for presentations, out of which 19 were presented. The first oral presentation was delivered by Dr. Vineet Kumar Sharmain which he concluded that drip irrigation along with zero-tillage practices in sweet corn and rice cropping system achieved higher yield and improved the soil properties. More nutrient index was observed in irrigated soil as compared to rainfed area inferred from the study in 11 talukas of Gujarat, by the

second presenter. The speaker Jitendrakumar explained the land use cover of Arunachal Pradesh and reduction of OC due to Jhum cultivation. There were oral presentations from diversified topics such as impact of land configuration on soil properties as well as crop production under partially reclaimed coastal salt affected soils, ground water evaluation of coastal belt of Saurashtra Region, impact of drain depth and drain spacing on subsurface drain flow and nitrate loss, assessment of emission of green house gases from forest soils, the effects of climate change on bee keeping and honey production, impacts of pesticide residues in different type soils and crop production, role of Self Help Group in empowerment of women in agriculture, green supply chain management for climate risk management *etc.* Many speakers presented their paper on nutrient management as well as crop production under organic farming. There were good interactions of participants following each presentation. The technical session ended with summary by the chairman.

TECHNICAL SESSION - III (Parallel Session 2)
Lead Lecture
Day - 2

Venue: Conference Hall, Office of the Principal and Dean, NMCA, Navsari		**Date:** 14/10/2022; **Time:** 09:00 to 11:10
Chairman	:	Dr. P. K Shrivastava, Dean, CoF, NAU, Navsari
Co-Chairman	:	Dr. M. S. Hadda, Ex-Prof, Dept. of Soils, PAU, Ludhiana, Punjab
Rapporteur	:	Dr. Ranu Rani Sethi, Principal Scientist (SWCE), ICAR-IIWM Bhubaneswar
	:	Manjushree Singh, Asstt. Prof. (Ag. Engg.), NMCA, NAU
Hall coordinator	:	Dr. Sachin Patel, Asstt. Prof. (Ento.), NMCA, NAU

L-12	Dr. Patil as a lead speaker emphasized on scenario of global warming which is influencing agronomic efficiencies and fertilizer use efficiency. He also discussed various adaptations to be made to combat climate change. He also deliberated possible changes in crop selection in south Gujarat region. He emphasized on use of mulching. There were deliberations on effect of black and transparent mulching on weed growth. An enquiry was made on any known device for determining nitrogen use by the crop.
L-13	Dr. S. K. Jena in his lecture discussed various aspects of precision agriculture for natural resource management. He discussed about techniques like VRT, soil sampling through GIS, drones etc. He also answered a query on use of unmanned vehicles in agriculture.
L-14	Dr. S. Manivanan presented his work on soil and water conservation technologies for sustainable agriculture in coastal region. He suggested various technological interventions to manage natural resources of the coastal region. He also emphasized for execution of available technologies of land reclamation and ground water recharge of the coastal region.

L-16	Dr. R. P. Pandey deliberated on the topic Impact of Climate Change on Occurrence of Regional Droughts and impact of Government policy of defining drought at the country level. He answered the question regarding drought projection.
L-17	Dr. Gontia discussed regarding Robotics and Drones applications in Agriculture in detail. He emphasized the need of Robotics and Drones Applications in the present era. He elaborated the applications of drones and informed the house about the learning methodologies being introduced in Agricultural Engineering College to train the human resource. He also emphasised the inclusion of certificate courses to train young students in drones and robotics.

Dr. Hada,Co Chairman, interacted with the speakers during the lectures, while the Chairman Dr P K Shrivastava, concluded by summarizing the presentations made by the lead speakers during in the session. The session ended with the felicitations of Chairman, Co-chair, andRapporteurs of the session.

Venue: Conference Hall, Office of the Principal and Dean, NMCA, Navsari		**Date:** 14/10/2022; **Time:** 11:10to 18:00
Chairman &Evaluator	**:**	**Dr. R. G. Patil,** Retd. Reserarch Scientist, SWMRU, NAU
Co-Chairman &Evaluator	**:**	**Dr. R. P. Pandey,** Scientist G, NIH, Roorkey **Dr. Mukesh Kumar,** Asstt. Prof, IGNOU, Delhi
Rapporteur	**:**	**Dr. VipulShinde,** Asstt. Prof., Ag. Engg., NMCA, NAU
	:	**Er. Sonawane Ashish ,** Asstt. Prof., I&D, CAET,NAU, Dediapada
Hall coordinator	**:**	**Dr. Sachin Patel,** Asstt. Prof., Ento, NMCA, NAU

Presentation no.	Report
O/S-III/1	Authors determined dual crop coefficient using vegetative index based on reflectance for summer grown sesame. Estimated crop coefficient was compared with FAO adjusted crop coefficient. NDVI based crop coefficient showed lower crop water requirement values.
O/S-III/2	Carried out morphological analysis of Sheldedumal watershed using remote sensing & GIS. Various morphological characteristics of watershed were determined. It was observed that the watershed highly permeable with 5th order stream.

O/S-III/5	Reviewed various works regarding soilless cultivation and growing media optimization for sustainable agriculture. Various threats to costal agriculture were deliberated. It was concluded that coco peat could be used efficiently as a growing media in coastal region.
O/S-III/7	Climate change impacts on yield and water footprints of sweet corn crop using aqua-crop model was simulated. It was estimated that yield and water footprints were predicted to be increased by 2050.
O/S-III/1	Authors determined dual crop coefficient using vegetative index based on reflectance for summer grown sesame. Estimated crop coefficient was compared with FAO adjusted crop coefficient. NDVI based crop coefficient showed lower crop water requirement values.
O/S-III/2	Carried out morphological analysis of Sheldedumal watershed using remote sensing & GIS. Various morphological characteristics of watershed were determined. It was observed that the watershed highly permeable with 5th order stream.
O/S-III/5	Reviewed various works regarding soilless cultivation and growing media optimization for sustainable agriculture. Various threats to costal agriculture were deliberated. It was concluded that coco peat could be used efficiently as a growing media in coastal region.
O/S-III/7	Climate change impacts on yield and water footprints of sweet corn crop using aqua-crop model was simulated. It was estimated that yield and water footprints were predicted to be increased by 2050.
O/S-III/9	Allelic characterization, validation and protein functional analysis of CcTFL1 reveals association of InDel with growth habit in pigeonpea was carried out. It was revealed that there was an association of InDel with growth habit of the pigeonpea.
O/S-III/10	Effect of drip irrigation and fertigation on water use efficiency, water productivity and yield of broccoli was evaluated. Maximum water use efficiency was obtained at 0.6 PET level.
O/S-III/11	Identified potential sites for soil and water conservation within the Hathmati river basin, India, using RS & GIS. Also appropriate sites for check dam construction was estimated
O/S-III/12	Used Remote sensing models to monitor vegetation to assess the impact of watershed management practices in the parts of Narmada district, Gujarat All the talukas showed good vegetation cover during the months of June to September. During the period of 2001 to 2021, vegetation was revealed to be increased.

O/S-III/13	Estimated sedimentation rate in small reservoir by RUSLE and GIS of Kandi belt of Punjab. Sediment yield of Takaral dam was found to be 12.79 t/ha/y while in Golu dam it was around 12.70 t/ha/y
O/S-III/15	Analyses the effect of organic manure prepared from agro-wastes by inoculating with isolated cellulolytic and lignolytic bacteria on the nutritional composition, biochemical parameters and yield of sorghum. Manure prepared from banana pseudo stem found to be more suitable in terms of nutrient uptake
O/S-III/16	Climate change impacts on groundwater dynamics for the Shingoda river basin were evaluated using modeling and simulation technique. It was observed that daily maximum temperature had the maximum negative effect on groundwater recharge.
O/S-III/19	Used RS-GIS technique to study of the Change in Land use and land Cover in The Lower Tapi River Basin. Results showed that agricultural land reduced drastically by 259 km^2 during the period of 2015 to 2021.
O/S-III/21	Analyzed response of summer groundnut (Arachishypogaea L.) to nano boron in medium black calcareous soil. It was revealed that 0.2% of nano boron provides higher yield corresponds to all other treatments. There was no variation found in maturity day of groundnut.
O/S-III/25	Estimated SCS curve number under different crop cultivation practices and slope for natural rainfall condition Groundnut cultivation significantly reduces the runoff generation Slope of 1% showed highest runoff from the experimental area.
O/S-III/28	Geospatial approach was used to map surface water quality for drinking and for irrigation. In Navsari and Dang district water quality post monsoon was found to not suitable as per established standards.
O/S-III/29	Demonstrated Water resources management in Salebhata catchment of Odisha using Integrated approach of geospatial technologies and hydrological model. Under both the RCM scenario streamflow was found to be decreased except in monsoon season and in the month of December.
O/S-III/34	Asses the genetic diver diversity assessment of male date palm under hot arid ecosystem of western Rajasthan. Verities like CIAH/DP/M1 and CIAH/DP/M3 were found more suitable for higher pollen production.
O/S-III/41	Studied the entophytic bacterial siderophores and plant growth promoting activity. It was revealed that siderophores improves nutrient uptake from the soil through root nodes.

O/S-III/42	Evaluated the effect of customized fertilizers on yield and quality of FCV tobacco. It was observed that customized fertilizers had positive effects on green leaves and curved leaves of tobacco.
O/S-III/44	Carried out the validation of reference genes for quantitative real-time PCR normalization in chickpea under PGPRs and for stress condition.
O/S-III/45	Studied the spatial distribution of salts in soils of a vineyard in Krishna valley of Northern Karnataka. Grape orchard showed variation on salt dynamics as per the slope condition. It was also concludred that high salt concentration at harvest reduces the yield of grapes.
Chairman of the session Dr. Patil summarized all the 21 presentations and expected that more and more field studies shall be carried out in addition to working with RS GIS. He had congratulated all the presenters for their excellent studies. Session was concluded with felicitation of chairman, co-chairman and Rapporteurs.	






Session IV (Parallel Session 3)

Lead lectures

Day 2

Venue: Conference Hall, College of Forestry, Navsari		**Date: 14/10/2022; Time: 09:00 to 10: 50**
Chairman	:	Dr. S. L. Swami, Principal, Professor, IGKV, Raipur
Co-Chairman	:	Dr. Lalit Mahatma, Associate Director of Research, NAU
Rapporteur	:	Dr. V. B. Parekh, Asst. Professor, BSS, CoF, NAU, Navsari
		Dr. S.A Huse, Asst. Professor, FBTI, CoF, NAU, Navsari
Hall coordinator		Dr. MinalTandel, Asst. Professor, SAF, CoF, NAU, Navsari

During the session, four lead lectures presented by the distinguished speakers.

First lead lecture was delivered by Dr. S.L. Swamy, College of Agriculture (IGKV), Bilaspur on "Assessment of forest degradation and carbon emissions during past two decades in parts of Central India: implications for carbon management to mitigate climate change".Hisstudy provided an insight for comprehensive assessment of land use changes, deforestation and forest degradation leading to the disruption of carbon budgets in tropical forest ecosystem. He has conducted his study on Khudia range forest of district Mungeli, Chhattisgarh, India part of Amarkantak-Achanakmar Biosphere Reserve (AABR) and recorded changes in vegetation biomass and carbon stocks under plant functional forest types between 2000 and 2020. His analysis of spatially explicit geospatial data elucidates that anthropogenic land use changes are continuing in dry tropical ecosystems of Central India, and are leading to degradation and deforestation of forest lands and its conversion into agricultural lands and waterbodies. As a result 15% of the forest area was lost in the last twenty yearsand it has perturbed the carbon balance and aggravated carbon emissions from forests turning them into net carbon sources. The spatial variation in carbon stocks and the potential for emissions reduction under different management scenarios revealed that improved land use can lead to carbon neutrality. These land uses comprise of either conservation and restoration of 26-85% degraded forests (Open mixed forest and Moderately Mixed dense Forests), use of agroforestry on 1/5thof existing agricultural lands, or implementation regenerative agricultural practices in 30% area. These improved practices are in accordancewith the NDC under the Paris agreement of UNFCC, 2015 and commitments to reduce the 1 billion tons of C emissions by 2030, and also in consonance to implementation of the 2021 Glasgow pact. Achieving carbon neutrality, by offsetting emissions by sequestering C in land-based sinks, can limit the global temperature to below by 2^{0}C.

Second lead lecture was delivered by Dr. Lalit mahatma, Associate Director of Research, NAU, Navsari on the topic entitled "Potential characteristics of nano-formulations for the management of diseases in crops". Dr. Mahatma explained in details the fundamental concept of Nanotechnology and its potential use in manipulating atoms and molecules to create new systems, materials, and devices. He mentioned about application of Nano-formulations in Plant Disease Management andfor early and accurate diagnosis of plant diseases and to enhance efficiency of antimicrobial agents. Further, he has shared his findings on Nano particle synthesis with Garlic (*A.*

sativum) clove extract and Datura (*D. stramonium*) leaves extract.Dr. Mahatma reported that the synthesized nanoparticles had similar or better efficacy than the original extract in unsterilized condition against *S.rolfsii*. He concluded his talk with potential future use of Nanotechnology in agriculture.

Third lead lecture was delivered by Dr. Narendra Singh, Professor and Head, Department of Agricultural Economics, NMCA, NAU, Navsari. Dr. Singh presented his research findings on the Impact of socio-economic determinants on farm level adaptations to climate changein South Gujarat region of India based on the data collected from 2400 households. This study used a multivariate probit econometric technique to analyse the determinants of farm level adaptation strategies and revealed that farm size, access to credit, possession of machinery and awareness of climate change are the decisive determinants of farm level climate change adaptation variables. Dr. Singh has emphasized that the awareness generation on changes in climatic conditions among farmers have a more significant impact on increasing adaptation to changes in climatic conditions. Moreover, he advocated the policies aimed to strengthen the agricultural information system in the region to provide timely information to the farmers about the climatic conditions, climate change impacts and adoption strategies such as change in sowing dates, use of improved seed varieties, adoption of modern technologies, etc. However, in order to mitigate impact of climate change in a sustainable manner and livelihood security of farming community long term policiesand subsidies are the most important measures at primary level to encourage the farmers to adapt mitigation techniques.

Last lecture was delivered by Dr. Ruchira Shukla, Dean, ASPEE Agribusiness Management Institute, NAU, Navsari on "Corporate social responsibility (CSR) for sustainable agriculture development: perspectives and way forward". Dr. Shukla explained about the concept of CSR and its implications in sustainable agriculture. She summarized CSR as the voluntary behavior of companies beyond the legal requirements for integrating economic, social and environmental impacts of their operations. She mentioned about CSR Mandate in practice on improving the three P's (people, planet, and profit) in a balanced manner. Moreover, she emphasized upon CSR Spending pattern in sustainable manner underfocused areas of agriculture for sustainable development. She shared some CSR Initiatives in sustainable agriculture development viz., Mahindra& Mahindra, Adani Ports and Special Economic Zone Ltd, ITC Limited, Welspun India Limited *etc*. If the Corporate allocate more funds under CSR in agriculture, many challenges of the farm sector can be addressed. The emphasis of CSR in the Agriculture sector needs to be in the areas of environmental sustainability, natural resource management, innovation and technology led development, social development, entrepreneurship development, livestock development, market development, *etc*. According to Dr. Shukla commitment and representation of various stakeholders, effective policy support, proper monitoring system at various levels is needed to promote CSR activities in agriculture. Lastly, she concluded that companies also benefit as CSR is used as the power tool to maintain customer relationship and to obtain good image in the society.

Finally, lead lecture session was summarized by Co-Chairman Dr. Lalit Mahatma. Chairman and Dr. S. L. Swami mentioned gave his critical and concluding remarks at the end of the session.

TECHNICAL SESSION - IV (Parallel Session 3)

Oral Presentations

Day - 2

Venue : Conference Hall, College of Forestry, Navsari	:	**Date :** 14/10/2022; **Time :** 10.50 to 18:00
Chairman &Evaluator	:	Dr. S L Swami, Professor, Forestry, IGKVV, Raipur
	:	Dr. SusamaSudhishri, Principal Scientist, IARI
Co – Chairman & Evaluator	:	Dr. SandipSenger, Principal & Dean, CAET, Dediapada
Rapporteur	:	Dr. S. K. Jha, Associate Professor & Head, FBTI, COF
	:	Dr. S. K. Sinha, Assistant Professor, FPU, COF
Hall Coordinator	:	Dr. MinalTandel; Assistant Professor & Head, SAF, COF

In the third parallel session, technical **session-IV**, total 48oral presentations were listed, out of which25 were presented. The technical session comprised of **Theme IV:** Coastal ecosystem and aquaculture; **ThemeV:** Biodiversity and land use system (Horticulture/Agroforestry) for nutritional and environmental security; **Theme VI:** Resource Conservation through natural farming

Theme IV: Coastal ecosystem and aquaculture Under the theme IV, 6 oral presentations were made from total 12 listed

Oral presentation: -1

An oral presentation was on **Variation of soil organic and inorganic carbon in relation to irrigate and rainfed situations under cultivating of *hybrid/Bt/Desi* cotton crop of South Gujarat** byDr. S. M. Bambhaneeya, College of Agriculture, NAU, Navsari.In his discussion he revealed that irrigated soil in general were found to have more soil organic carbon (SOC) content as compared to rainfed soils.He noticed that rainfed surface soils were quite inferior to irrigated counterparts showing poor productivity index.

Oral presentation:-2

Efficient utilization of aquaculture effluents to maximize seed oil content of *Salicornia brachaita*Roxb was presented **by Dr.Sonal Tripathi,** Department of Soil Science and Agricultural Chemistry, NMCA, NAU, Navsari. She deliberated effect of integrated aquaculture through the utilization of wasteland and recycling the nutrient-rich aquaculture on *Salicornia brachaita*Roxb.oil content for irrigation and found that the source of irrigation aquaculture effluent indicated higher oil content (26.64%) than seawater (26.25%). She concluded that *Salicornia* can be presented as alternative to food/oil production with saline effluent from aquaculture on the coastal salt-affected soils of South Gujarat.

Oral presentation: -3

A presentation on **Assessment of warming in the coastal belt area of Southern Saurashtra region of Gujarat** was made by Dr. H.D. Rank, Department of Soil and Water Conservation Engineering &Department of Irrigation & Drainage Engineering, Gujarat.He projectedthat the warming trend of daily mean temperature from 1951-2005 to 2006-2100 for the annual, winter, summer and monsoon season increased from 0.018 to 0.023°C/year, 0.009 to 0.020 °C/year and 0.019 to 0.026 °C/year respectively. However,it reduced for summer from 0.025 to 0.021°C/year. Thus, warming trend will exist at varying rate during different seasons of the years.

Oral presentation: -4

The presentation on **A study to check the Efficiency of kitchen waste formulation on soil salinity reclamation**was made byKhayali D. Vaidya, Kuchchh University, Gujarat. She studied on the kitchen waste based bioformulation in pots and found that prepared bio-formulation could effectively reduce the salinity in soils

Oral presentation: -5

A presentation on **Climate change impact on reference evapotranspiration in coastal region of southern Saurashtra of Gujarat** was made by Dr. H.D. Rank, Department of Soil and Water Conservation Engineering &Department of Irrigation & Drainage Engineering, Gujarat.He projected the trend of evapotranspiration from 1951 to 2100 and found that it increased during winter season and decreased in monsoon season by different rate for the period of 1951-2005 and remains stable for summer seasons for the period 2006-2100.

Oral presentation: -6

The presentation was made by **Dr. S Vijayakumar, Scientist (Agronomy) ICAR-IIHR, Hyderabad**on **Extreme temperature and rainfall events trend over Kerala Coast.** The salient finding of his presentation was thattemperature related extreme events are more over Kerala coast in comparison to precipitation related extreme events. Kannur district is experiencing more extreme weather events over Alappuza district.

Theme V : Biodiversity and land use system (Horticulture/Agroforestry) for nutritional and environmental security

Under the theme V, 12 oral presentations were made out of total 17 listed

Oral presentation: -1

The presentation was made on **Horticulture -Fruit tree-based agroforestry systems for livelihood security in India** by **Ms. Mehfuza M Patel**, College of Forestry, NAU, Navsari. She discussed the different types of horticulture-based agroforestry system, its benefits, limitations, and management. She highlighted that horticulture-fruit based agroforestry system could play an important role in livelihood security of the nation.

Oral presentation: -2

The presentation was made on **Impact of INM and intercrop on soil properties under Teak (Tectona grandis L. f.) based agroforestry system** by **R.J. Mevada**, College of Forestry, NAU, Navsari. He concluded that soil properties improved under integrated nitrogen management treated okra-teak based agroforestry system as compared to open condition which in long term provide additional benefit of healthy and fertile soil.

Oral Presentation: -3

A presentation on **Correlation study between climatic parameters and different phenology stages of mango varieties under South Gujarat conditions** was made by Dr. S.J. Patil, Department of Horticulture, NMCA, NAU, Navsari. He pointed out that in mango extended rainfall delayed flower bud differentiation and temperature fluctuations during panicle initiation adversely affected its occurrence.

Oral presentation: -4

The presentation on **Phenotypic Diversity among the Natural Population of Malabar Neem (*Meliadubia* Cav.) in South Gujarat** was made by**R. M. Jaliya,** College of Forestry, NAU, Navsari. He found significant morphological variations among populations for the leaf, fruit and stone characters. Kaprada and Nana pondha population showed similarity in phenotypic appearance. On the contrary, Waghai and Sagai populations displayed divergence in morphological characters.

Oral presentation-5

A presentation on **Relative importance of artificial water hole distribution in site use of sympatric large carnivores in Gir protected area, Gujarat, India** was made by Mr. Rohit Chaudhary, College of Forestry, NAU, Navsari. He reported that high use of sites near the water holes could alter the prey-predator dynamics and competition among the carnivore communities in Gir.

Oral Presentation-6

A presentation on **Necessity of ethnic food culture in conservation of wild resources; way for food security** was made by Ms. Ankita Patel. She pointed out that safeguarding the ethnic food culture will be helpful for protecting wild food resources and diversity among the forest dwelling communities to ensure the food security.

Oral Presentation-7

Dr. L.K. Behera, College of Forestry, NAU, Navsari made a presentation on **Patterns of biomass accumulation and carbon storage in teak (*Tectona grandis* L.f.): An implication for development of biomass and carbon table for sustainable management.** He developed a separate table for biomass and carbon stock among different diameter and height classes in teak for its use in biomass estimation, carbon content and carbon trading. In open discussion, it was suggested by chairman to use biomass extension factor (BEF) during biomass estimation, carbon stock should be converted into tons/ha or Mg/ha and to estimate carbon content of tree by analyzing ash content using suitable equation.

Oral presentation-8

A presentation on **Assesssment of above ground biomass and carbon stock in Saptaparni, *Alstoniascholaris*(L) R. Br.**was made by J.R. Chavda, College of Forestry, NAU, Navsari. He concluded that Saptaparni tree can accumulate 117kg biomass and 50 kg carbon per tree, and a tree with a diameter of 40-50 cm can accumulate carbon of 121 kg.

Oral Presentation:-9

A presentation on **Potential of plant growth promotion in cowpea *(cicer arietinum)* by application of Sulphur oxidizing bacteria and different forms of sulphur fertilizer**was made by Dr. Chintan Kapadia, Department of Plant Molecular Biology and Biotechnology, ACH, NAU, Navsari. He reported that the application of Sulphur oxidizing bacteria (*Delftia* sp.) significantly improves the cowpea growth-related parameters under the elemental and granular Sulphur application. This organism can be utilized for Sulphur oxidation in the soil for better growth of the crops. In open discussion it was suggested by chairman to analyze the biological pathway of this bacteria that how it helps for plant growth.

Oral Presentation-10

A presentation was made by Twinkle S. Patel,College of Forestry, NAU, Navsari on **Growth performance of different bamboo species in different levels of saline irrigation water in nursery**. Sherevealed that saline water irrigation up to 4dSm^{-1}for bamboo species *viz.*, *Bambusabambos*, *Bambusa vulgaris* and *Bambusabalcooa* showed better growth and development under nursery condition.

Oral presentation-11

A presentation on **Role of bamboo to check soil erosion and rehabilitate soil fertility**was made by J.R. Chavda, College of Forestry, NAU, Navsari. He reported that degraded land becomes fertile by introducing bamboo plantation because it improves soil porosity and checks erosion.

Oral presentation-12

The last presentation on the theme was made by Mr. V.B. Shambhalkar, College of Forestry, NAU, Navsari

on **Variation in oil content at different storage and drying conditions in Neem seeds.**He revealed that fresh neem fruits collected and properly treated was effective, when seeds dried in shade and kept in desiccator with cotton bags at room temperature was able to minimize the loss of oil content up to 4.19 per cent in the kernel during 300 days after providing treatment.

Theme VI: Resource Conservation through natural farming

Under the theme VI, 7 oral presentations were made out of total 19 listed

Oral presentation: -1

The presentation was made by **Dr. Nitin N. Gudadhe,** Department of Agronomy, NMCA, NAU, Navsari on **Climate smart resource conservation in chickpea through minimum tillage, rice straw mulch and depth of fertilizer placement.**He concluded that conventional tillage and rice straw mulch could be a better option for higher productivity of chickpea and improvement of soil properties followed by minimum tillage. The placement of fertilizer at depth 8 cm was more remunerative followed by 11 cm for growth, yield, quality, and economics of chickpea.

Oral Presentation: -2

Dr. K. NagendraPrasad,WorldPranic Healing Foundation India –Research Centre, Mysuru made a presentation on **Pranic Agriculture as a Traditional Farming System to Enhance Yield and RAPD polymorphism in Cabbage.** He concluded that pranic agriculture increased the diameter of cabbage and yielded 21% more than control. He highlighted the benefits of adopting pranic agriculture as it increases the yield, enhances plant growth, shelf life, lesser use of fertilizers and pesticides etc.

Oral Presentation-3

A presentation was made by Dr. N.S. Thakur, College of Forestry, NAU, Navsari on ***Meliadubia* Cav. Drupe pulp: A low input by-product source for small ruminant feed and crop yield enhancement.** He found that *M. dubia* drupes are a good alternate economic agro-industry by-product for livestock feed vis-à-vis it could be utilized as a soil fertility improvement source for higher growth and yield of receptor crops.

Oral presentation: -4

A presentation on **Effect of bio-organo-chemical fertilizer on periodical available nutrients status in clay soil** was made by Dr. V.J. Zinzala, NMCA, NAU, Navsari. He studied the management practices of organic and biological materials with chemical fertilizer and found that bio-organo-chemical fertilizer improves the periodical nutrient status of soil.

Oral Presentation: -5

A presentation on the effect of potassium and potassium mobilizing bacteria (KMB) with and without FYM on growth and yield of Wheat (*Triticumaestivum* L.) was made by Patel Swati H., AAU, Anand. She reported that the application of 10t FYM ha^{-1} along with potassium mobilizing bacteria and 40 kg K_2O ha^{-1} was beneficial to enhance the grain yield of wheat.

Oral presentation: -6

Dr. Ajay Kumar Mishra, scientist from IRRI Regional Center, Varanasi presented on **Natural Farming Practices for Improving Soil Health and Reducing the Environmental Footprint.** His key finding was that 0.3 t/ha rice grain can be produced under natural farming over conventional systems. Crops and varieties responded differently to natural and organic systems. Low input responsive rice varieties are better suited & need to be screened for natural farming systems. He focused that there is a need to identify key indicators and robust monitoring and evaluation systems to accelerate regenerative goals through natural farming practices.

Oral presentation: -7

Dr. M.S. Kahlon, Department of Soil Science, PAU, Ludhiana made a presentation on **Impact of crop residue management options on soil water holding capacity and moisture characteristics.** He highlighted that the crop residue incorporation improves infiltration rate of soil by 10.7 % over without residue retained treatment. The water holding capacity of soil was found to be 8 % more under residue incorporation than conventional practice.

TECHNICAL SESSION - V: Online SESSION
Day - 3

Venue: Conference Hall, SWMRU, NAU, Navsari		**Date:** 14/10/2022; **10:00 to 11: 30**
Chairman & Evaluator	:	**Dr. O. P. Aishwath,** Vice President, SCSI, West Zone
Co-Chairman &Evaluator	:	**Dr. J. M. Patel,** Research Scientist, SWMRU, NAU, Navsari
Rapporteur	:	**Dr. Narendra Singh,** Assistant Professor, Soil Science, NAU, Navsari
		Dr. A. P. Italia, Assistant Professor, NRM, ACH, NAU, Navsari
Hall coordinator		**Dr. S. L Pawar, Assoc.** Res.Scientist, SWMRU, NAU

The technical session-V (Online mode) was presided over by Dr. O. P. Aishwath, Vice President, SCSI, West Zone and co-chaired by Dr. J. M. Patel, Research Scientist, SWMRU, NAU, Navsari. Dr. A. P. Italiyaand Dr. Narendra Singh were the rapporteurs of the session.The delegation, Chairman and Co-Chairman were officially welcomed by Dr. S. L. Pawar, Associate Research Scientist, SWMRU, NAU, Navsari and gave a welcome message on natural resource management to start the technical session at 10:00 am.

In this technical session total seven oral presentations and five poster presentationswere in the list. Out of seven oral presentations, four were presented through online mode. Among these four oral presentations, Dr. Indirani discussed on topic of 'Drip fertigation for improving productivity, use efficiency of water and yield of brinjal'. She discussed about the nutritional importance and antioxidant activity of brinjal. She elaborated the importance of drip irrigation in improving water use efficiency and water productivity through drip irrigation. She also emphasized on fertilizer saving through fertigation. Second presentation was made by Dr. Lumbini Kalita on ' Nitrogen mineralization rate and kinetics of different organic sources in acid soil'. She discussed on how nitrogen mineralization occursunder different organics like FYM, poultry manure, pig manure and vermicompostunder acidic soil and importance of organic manures in improving soil physical, chemical and biological fertility. Third speaker Dr Isha Swati gave her talk on 'Rainfall simulation using ANN based Generalized Feed Forward (GFF) and multi linear regression (MLR) technique'. She addressed that rainfall modeling is one of the most critical topics in water resources planning, development and management on a sustainable basis. She discussed on various models made by her using ancient data of rainfall using various meteorological data interpretation models like ANN &GFF. She concluded that ANN models are useful tools for rainfall modeling with reasonable accuracy in the study watershed. Fourth presentation was given by Dr. Tridisha on ' Nutrient management through organics for higher yield of black turmeric in acid soils and discussed on how to fertilize crops through various organic sources under organic farming. She also addressed on nutrient released pattern from various organic sources through mineralization process. Out of five poster presentation, no one was available for poster presentation in this session.

Finally, a vote of thanks was proposed by Dr. S. L. Pawar, Associate Research Scientist, Soil and Water Management Research Unit, NAU, Navsari.




Glimpse of Technical session V : Online Session

SESSION- I

Poster Presentation

Day – 3

Venue : Dept. of Soil Science and Agril. Chem., NMCA, Navsari		**Date:** 15/10/2022**; Time:** 09:30 to 11:30
Chairman& Evaluator	**:**	Dr. Sanjay Swami, Professor at School of NRM, College of PGS in Agricultural Sciences, Barapani, CAU, Imphal
Co-Chairman	**:**	Dr. V. J. Zinzala , Assoc. Prof., Dept. Ag. Chem SS, NMCA, NAU, Navsari
Rapporteur	**:**	Dr. D. P. Patel , Asstt. Prof., NRM, COF, Navsari
	:	Dr. L. K. Behera, Asstt. Prof., SAF, COF, Navsari
Hall coordinator	**:**	Dr. R. P.Gunaga , Assoc. Prof., FPU, COF, Navsari
Evaluator	**:**	Dr. K. G. Patel, Assoc. Prof.,Dept. Ag. Chem SS, NMCA, NAU, Navsari

In this session, out of total 35, 21 posters pertaining to the Conservation, management and reclamation of natural resources were displayed, of which 18 were presented by the respective researches. The posters presented were appropriate to the thematic area and covered wide research topics on innovative resource management approaches such as organic farming, resource management, agroforestry, integrated nutrient management, climate smart agriculture androle of microbes in agriculture, that have its direct bearing to sustain productivity and climate resilience.

Extended Summary of Posters

Poster-I/1 was presented by H. P. Dholariya on Effect of solid and liquid organic sources on content and uptake of micro-nutrients by Finger Millet [*Eleusinecoracana* L.] grown under organic farming system carried out at Rajendrapur Farm, Navsari Agricultural University, Waghai. He concluded that nutrient uptake by grain and straw, application of 100 % and 75 % RDN through biocompost as well as enriched banana pseudostem sap @ 1 % and Jeevamrut @ 1 % was recorded best nutrient (Fe, Mn, Zn, and Cu) uptake among different treatments under study.

Poster-I/2 was on Influence of integrated nutrient management and summer green manuring on productivity and profitability of *Kharif* rice (*Oryza sativa* L.) carried out at Instruction farm, N.M. College of Agriculture, Navsari Agricultural University, Navsari which was presented by Sejal K. Parmar. She concluded that among various green manures and fertilizers, *in situ*dhaincha cultivation during summer season (fertilized 20:40:00 kg NPK/ha) and followed by application of 75% RDF (75:22.5:00 NPK kg/ha) for succeeding rice crop resulted into higher growth, yield attributes, yield and economic net returns.

Poster-I/4 was presented by Viral A. Patel on Performance of different fodder grasses with gypsum application on coastal salt affected soil. The author revealed the findings of the research as among the different fodder grasses, Hy. Napier grass gave the highest net returns of Rs. 110259/ha followed by guinea Grass of Rs. 102091/ha. The growing of grasses with gypsum application reduced soil sodicity and increased soil nutrient status.

Poster-I/6 was presented by Sunil Kumar T. on Impact of previous crop and its residues on growth and yield of *kharif* rice. The significant findings of this trial are as higher values of growth attributes and yield parameters of rice grown in *kharif* season were recorded when the crop was sown after incorporation of dhaincha than summer fallow treatment. Application of 100 % RDF registered maximum growth and yield parameters of rice. Further, the soil microbial count was recorded higher in dhaincha incorporated treatment before sowing of rice in the summer season and during *kharif* season.

Poster-I/9 was on Soil physical properties and seed germination as affected by various tillage operations presented by Paras Hirapara. The author highlighted the key findings of this trial as soil bulk density was found to be maximum in undisturbed soil while minimum in M.B. plough. Further, seed germination percentage for gram seed and basic infiltration rate were highest in M.B. plough tilled land. Thus, M.B. plough treatment was found better for improving the soil physical properties as well as infiltration rate and seed germination of gram.

Poster-I/15 was presented by A. R. Kaswala on effect of *TATVA*-G liquid organic formulation on germination and yield of green gram. The author highlighted that seed germination percentage for green gram was higher for the control treatment even though seeds treated with up to 50% of *Tatva*- G LOF (Liquid Organic Formulation) had recorded acceptable germination values as per the standards by the Central Seed Certification Board, New Delhi. Moreover, significantly highest yield of a green gram of 76.54 g/net plot was attained by 2% spraying and 4% drenching of *Tatva*- G LOF.

Poster-I/16 was on Potential of soil bacteria for arsenic transformation in soil in presence of metal pollutants presented by Nandita Baxi. Her key findings are as soil from the coastal ship breaking yard region was not found to be having arsenic content. However, soil from the near industrial region was found to contain Arsenic, where two bacillus-species *megatherium* and *aryabhattai* identified using 16S rRNA sequencing to bring about the arsenite oxidation. However, arsenite oxidation could not be seen in the presence of other heavy metals in these areas.

Poster-I/21 was presented by A. D. Raj on Effect of spacing and hybrid on quality of summer pearl millet (*Pennisetumglaucum*L.) under south Gujarat condition. He concluded that the highest available N, available P_2O_5 and available K_2O in soil were recorded by 30×15, 60x15 and 30x15 cm row spacing respectively moreover, pearl millet hybrids influenced a non-significant effect on available N, available P_2O_5 and available K_2O in the soil after harvest of the this crop.

Poster-I/22 was presented by V. M. Patel on Nutrient management in Indian bean and its *ratoon* crop sequence under south Gujarat condition. The application of 5 t FYM/ha and RDF (20: 40 kg N: P O /ha) to plant Indian bean crop were at par with each other for total green pod yield of *ratoon* Indian bean as well as at 1 and 2 picking than other treatments are the key findings of this trial.

Poster-I/23 was presented by B. K. Patel on Response of *rabi* castor to row spacing, date of sowing and intercropping of Indian bean (var. GNIB21) under south Gujarat condition. Castor sown with one row of Indian bean as intercrop resulted in higher castor seed yield and castor equivalent yield over castor sown without intercrop of Indian bean whereas the green pod yield of Indian bean was higher under treatment of castor sown during last week of October, spacing of 120 cm x 90 cm and intercropping of Indian bean in castor are the key findings of the present trial.

Poster-I/24 was presented by K. B. Sankat on Resource management to sustain cotton productivity of Hirsutum Cotton Hybrid in inland Ecosystem. Growing of hirsutum cotton hybrid; GSHH-2799 at 120 x 45 cm spacing with the application of 240 kg nitrogen/ha in five equal splits (each of 48 kg N/ha) at 30, 60, 75, 90 and 105 DAS may obtain higher seed cotton yield as well as net income are the key findings of the research.

Poster-I/25 was on Hydrogel: A sustainable technology in ornamental horticulture presented by Mallika Sindha. According to her, hydrogel may prove as a convenient and eco-friendly feasible option to achieve the goal of crop productivity under conditions of water scarcity. It has a good swelling capacity, lack of toxicity and controlled water released and plays an important role in conserving water, reducing irrigation frequency and releasing sufficient moisture to the growing roots of ornamental plants. Further, hydrogel also improve the physical soil properties like soil porosity, soil permeability and water infiltration which will significantly reduce surface runoff and soil erosion.

Poster-I/27 was onClimate cleverness vis-à-vis flower production presented by Saryu Trivedi. According to her, digital tools and data sciences are accelerating agriculture innovation and transforming farming to advance how to convert natural resources into beneficial outcomes and have a positive impact on sustainability. Climate-resilient floriculture is a blend of technical, cyber-computerized automation in crop production and maintenance of floricultural produce which uses artificial intelligence, informative resources, better weather forecasting powered with automated machinery and equipment, various sophisticated software which provides an exact growing condition for the crop, genetic- engineering and many novel technologies.

Poster-I/29 was on Global scenario of carbon sequestration in Teak plantation: A Review was presented by Aakash D. Patel. According to him, variation in carbon stocks/sequestration among teak plantations is mainly due to the locality and age of trees. Further, India, Nigeria, Myanmar, Indonesia, Thailand and Central America (the Isthmus of Panama) have carbon stocks of teak ranging from 1.61 to 181.13 tonnes/ha at the ages of 1-50 years.

Poster-I/30 was onHome gardens: Traditional system of biodiversity conservation, food security and socio-economic development was presented by Chauhan Punamkumari. According to her, in developing, countries such as Bangladesh, Indonesia, India and Sri Lanka, home gardens are the major source of food production, and nutrient supplements and contribute to the socio-economic development of farmers.

Poster-I/32 was presented by Darpana Patel on Effect of nutrient management on *rabi* vegetable crops in rice based crop sequence. She concluded that among the different cropping sequences, rice-radish was the most productive and remunerative cropping system.

Poster-I/33 was presented by Sapna Chandwanion Microbial mediated mitigation of lead stress by siderophore and ACC deaminase producing lead (Pb) tolerant bacteria in black gram (*Vignamungo* L.). The two bacteria,

Bacillus tequilensis (CWTS 5) and *Bacillus albus* (CWTS 10) combat Pb stress during *in-vivo* studies in profound amounts. Further, siderophore and ACC deaminase production is essential for developing a successful remedial mechanism. These are the main findings of this trial.

Poster-I/35 was presented by Harshida A. Gamit on UV-B radiation-resistant phyllosphere associated methylotrophic bacteria for their potential role in plant growth promotion under UV-B radiation. Key findings of her research are as the PMs (Phyllosphere methylotrophs) encounter harmful UV rays and had the ability to survive at 45^{0}C temperature, 16% PEG (polyethylene glycol), and plant growth promoting activity such as N_2-fixation, IAA production (120 µg/ml) and siderophore production. Moreover, PMs bacteria are a good target for future work on alleviating photo-irradiation to improve plant growth.

SESSION - II
Poster Presentation
Day - 3

Venue: Dept. of Soil Science and Agril. Chem., NMCA		**Date:** 15/10/2022; **Time:**08:30 to 11: 30
Poster putting time		08:30 to 09:30
Poster Evaluation time		09:30 to 11:30
Chairman	:	Dr. H. D. Rank
Co-Chairman	:	Er. P. R. Pandey
Rapporteur	:	Dr. Ashish Sonavane
	:	Dr. N. S. Thakur
Poster coordinator	:	Dr. S. M. Patel
Evaluator	:	Dr. Ranu Rani Sethi& Er. N. M. Shah

Total sixty six (66) abstract received, seventeen (17) participants presented their research works in this poster presentation session. Out of seventeen (17) presentations, eight (8) studies were related to fertilizer management in crops. While three (3) were related to irrigation water management in agriculture. In addition, four (4) studies were dealing with the use of remote sensing and GIS technology in soil and water resource management. One study was related to training systems for Ber fruits in arid eco system. Another study was related to use of nanotechnology to enhance post harvest flower qualities. All the posters were very much related to the theme and all the participants were appreciated by chairman and co chairman of the session.

Session III
Poster Presentation
Day: 3

Venue: Dept. of Soil Science and Agril. Chem., NMCA, Navsari		**Date:** 15/10/2022;**Time:** 08:30 to 11: 30
Poster putting time		08:30 to 09:30
Poster Evaluation time		09:30 to 11:30
Chairman	:	Dr. V. R. Naik , Assoc. Dir. Res., NAU, Navsari
Co-Chairman	:	Dr. J.M. Patel, Res. Sci., SWMRU, NAU, Navsari
Rapporteur	:	Dr. S. L. Pawar, Assoc. Prof., Soil Sci., SWMRU, NAU, Navsari
	:	Er. Ketan Sondarva, Asstt. Prof., SWCE, CAET, NAU, Dediapada
Poster coordinator	:	Dr. Jayesh Pathak, Asstt. Prof., SAF, COF, NAU, Navsari
Evaluator	:	Dr. N. K. Pareek, Assistant Professor, SKRAU, Bikaner Dr. P. K. Rai , Professor, SKUAST, Jammu

Sr No.	PS No.	Title of poster and author	Representative	Remarks / Comments
1	1	Effect of solid and liquid organic sources on content and uptake of micro-nutrients by Finger Millet (*Eleusine coracana* L.) grown under organic farming system H. P. Dholariya, Sonal Tripathi, R. R. Sisodiya	Bhoomika B.	Good information regarding sea water utilization
2	2	Irrigation water management and climate change	Surve Nilam	-
3	3	Need of Aqua agroforestry in coastal area of Dandi, Navsari		How many kinds of aquaculture available? More data is recommended for the better interpretation

4	4	Impact of integrated nutrient management on growth and yield of brinjal under coastal salt affected soils of south Gujarat	M.M. Patel	Treatment details in conclusion should be clear, Which design adopted in the experiment need to be explained, What is the potential of banana pseudostem production in university
5	5	Management of costal saline soil, crop production and ground water	Komal N. Rathava	How to study plant properties in this type of experiment? How to use coastal saline water for the irrigation in crops What is the salinity level of Dandi water? What is Biochar?
6	7	Lotus: a potential aquatic flower crop for coastal region	Saryu Trivedi	What is the potential use of Lotus? What is Kamal dandi? Medicinal use of Lotus seed? Should have more detail on the nutritional value of Lotus seeds
7	9	Preliminary Survey of Plant Diversity at Goima Forests – Riparian Ecosystem of RiverKolak in South Gujarat	S. S. Malik	What are the major tree plants in the study area? What is Riparian ecosystem? Which product is selling high for the study area?
8	11	Study of Coastal vegetation Surrounding Ambika River Estuary In South Gujarat	Shefali B. Tandel	What is the ecological index of different vegetations? What is the salinity of the location where sea and river water meets?
9	13	Bauhinia malabaricaRoxb.: seed treatments on germination and early seedling growth for conservation of LKT species	Madhuri Sukhadiya	What are the common types of Bauhhinia? What is LKT? What were the soaking effects on the germination of seeds?
10	14	Assessment of ground water quality status by using irrigation water quality index method in Navsari taluka	Sonal Tripathi	What is the threshold land of water quality index for the water?
11	16	Response of summer groundnut (*Arachis hypogaea* L.) to irrigation level and antitranspirant on growth, yield and quality	P. B. Kotadiya	Already recommendations are published nation wide
12	17	Land use Pattern of Valsad District in Gujarat.	Dileshwar Nayak	Barren land is on the increasing trend, reported year is 2000-2011. What is the current status in 2022?
13	19	Evaluation of some post-emergence herbicides and their mixtures forweed control in wheat (Triticumaestivum L.)	S. J. Vekariya	What are different filters recommended for the particular treatment? Which was the most effective treatment among all? B/C ratio of the study?

14	21	Response of kharif paddy to bio fertilizers and inorganic fertilizers	B. B. Tandel	Paper is old i.e. year 2009 What is the Zinc efficiency of the study area?
15	26	Conservation of natural resources for sustainable fruit production	Khalasi, D. N.	Role of conservation practices on different fruit crops? What is mix cropping? Difference between mixed cropping and inter cropping.
16	27	Effect of integrated nutrient management on seedling growth and biomass of sandal wood (*Santalum album* L.)	Govind	What is the crop duration of Sandal crop? Why vermicompost was not used for the sandal crop? What is the meaning of INM? What is PSB?
17	30	Potential of Teak based agroforestry system	-	Paper should be presented by author or co authors only.
18	33	Rehabilitation of sodic soils by Growing Multipurpose Tree Species	Mansi U. Bharadva	What is the multipurpose tree species? How to produce humic acid?
19	34	Assessment of pre-sowing treatments on seed germination in lesser known tree species *Milliusa tomentosa* (Roxb.) J. Sinclair	Madhuri Sukhadiya	Mention common names of tree species
20	36	Legal Frameworks for Biodiversity and Environmental Conservation in India	Patel Arti	What is National Agroforestry policy? Which part of the policy is more effective?
21	37	Ecological risk assessment of chlorantraniliprole residues in sugarcane grown soil	Lokeshkumar Saini	What is the use of chlorantraniliprole?
22	38	Wood production and Economics of Eucalyptus based Agroforestry systems	Payal Thumbar	Review type of work, needs more elaborative information / data
23	40	Growth Performance of Multipurpose Tree Species in Problematic Conditions	T. S. Patel	Main difference between degraded land and eroded land? What is the difference between fertility and productivity?
24	41	Biodiversity conservation and nutri security through kitchen garden in south Sikkim	H K Deshmukh	What are the fruit crops in the kitchen garden? Is seedless papaya available in Sikkim?
25	42	Assessment of chemical properties of Litchi growing soils of Assam	Chittadeep Nath	Is there any yield gap between different types of soil in litchi growing?
26	43	Effect of Seed Priming with Low Cost Input and Irrigation on Seed Production of Rabi Sun hemp Under KyariLand of South Gujarat	V. G. Bavalgave	What is the opportunity cost in the sun hemp cultivation? What is the cost of seed in Sun hemp crop?

27	45	Effect of different legumes in castor relay cropping system	S P Deshmukh	What is the rejuvenation in soil? What is the potassium content in the soil?
28	49	Effect of potassium and potassium mobilizing bacteria (KMB) with and without FYM on yield of wheat (Triticum aestivum L.)	Swati H Patel	Potassium in the **sate** is 247 kg/kg. What are the interaction effect of FYM and K and KMB? What is the source of K in soil?
29	53	Effect of tillage practice on sugarcane production	Vineet kumar	Why deep tillage more beneficial in Sugarcane crop?
30	54	Response of little millet (Panicummiliare L.) to organics	Sonawane S. S.	What is the method for the production of bio compost?
31	57	Effect of tillage, seed bed preparation and FYM on sorghum	D. K. Patel	Suggestion FYM: Main plot Seed: remaining plot
32	58	Influence of imazethapyr and foliar spray of urea on growth and yield attributes and yield of blackgram (*Vigna mungo* L.)	Brahmbhatt Dhruv	What is the influence of imazethapyr?
33	61	Critical period of crop-weed competition in aerobic rice	Kushiram Kumawat	Weeding was done by manual method More focus should be on the cost and Benefit cost ratio.
34	63	Vermicompost yield and quality as influenced by use of poultry litter as substrate	Shilpi gupta	Is there any ill effect of poultry litter on the vermicompost in the farm?

VALEDICTORY SESSION

Day - 3

Venue: Central Examination Hall, NAU		**Date: 15/10/2022; 14:00 onwards**
Chairman	:	**Dr Z P Patel**, Hon. Vice Chancellor, NAU, Navsari
Chief Guest	:	**Dr. S Raman**, Retd. Research Scientist, SWMRU, NAU
Guet of Honor	:	**Dr. R. G. Patil**, Retd. Research Scientist, SWMRU, NAU
Convenor of Conference		**Dr. P. K. Shrivastava** , Convener and Principal & Dean, College of Forestry, NAU
Soil Conservation Society of India		**Dr. Mukesh Kumar**, Professor & Treasurer, SCSI, New Delhi
Rapporteur	:	**1. Dr. Hemant Sharma,** Associate Professor, ACH, NAU
	:	**2. Dr. P. K. Dubey,** Assistant Professor, ACH, NAU
Master of Ceremony	:	**Dr. Swati Sharma,** Assistant Professor, AABMI, NAU

The valedictory function of the 31st National Conference on "Innovative Resource Management Approaches for Coastal and Inland Ecosystems to Sustain Productivity and Climate Resilience" was organized on 15th October, 2022. The President of the valedictory function was Dr. Z. P. Patel, Hon'ble Vice-Chancellor, NAU, Navsari. On this occasion, Dr. S. Raman, Former Research Scientist, GAU, Gujarat was invited as the Chief Guest and Dr R G. Patil, Retd. Research Scientist, Soil & Water Management Research Unit, NAU was the Guest of Honor.

At the outset, Dr. Mukesh Kumar, Professor & Treasurer, SCSI, New Delhi welcomed all the dignitaries and explained the purpose of conference and informed that untill now Society had organized 30th National and 4th Intentional conferences at various places in India. Dr. P. K. Shrivastava, Convener and Principal & Dean, College of Forestry, NAU, Navsari presented the brief report of the 31st National conference. He informed that the conference was attended by about 250 participants from 19 states of India including 1 participant from Egypt. The conference had four technical sessions along with poster and oral presentations by the delegates and the students. There were 306 abstracts submitted by researchers, out of which 141 papers were listed for Oral and 166 papers for poster presentations. Total 245 researchers and students registered much above the expected 200 participants, of which 135 abstracts were submitted from NAU alone, due to the initiative of Hon Vice Chancellor Dr. Z. P. Patel. The USP moment of the Conference was the message from Prime Minister Narendra Modi directly in the inaugural session. During the Conference 17 eminent and experienced speakers enlightened the gathering with lead lectures, including the online presentation of paper by Padmshree and Professor (Dr) Ratan Lal, from Ohio State Agricultural University, USA. While, Dr S Raman, delivered the J S Bali (1923-2016) Memorial Lecture on the topic "Climate Change in India, an overview" just before the plenary session. Moreover, on the first day, to entertain the delegates coming from various corners of the country, a colorful cultural programme depicting different forms of garba dance and songs of Gujarat, was also organized with the participation of students from various colleges of the University.

Dr. Z. P. Patel, Vice-Chancellor, NAU, Navsari, in his Presidential address, congratulated the Soil Conservation Society of India and the Organizers of the Conference for successfully organizing the 31st National conference. He expressed his apprehensions about sea water ingress and soil salinity all along the coast. He persuaded the scientific community to ponder the practical ways to deal with this major problem all along the coastal areas of India. He also emphasized about the need of collaboration and co-ordination among various departments for successful implementation of projects. Dr. S. Raman, former Research Scientist, GAU, Gujarat opined on the collaboration and linkages between KVKs and ICAR institutions. He also discussed regarding issues of climate change and salinity of soil, management of soil salinity with especial reference to coastal belt. Dr. R. G. Patil, Guest of Honor gave the brief history about the different schemes *viz;* NARP, NATP, NAIP and NAEP *etc* and emphasized about the responsibility of attending the sessions with all sincerity, once registered, and delegated by the institutions for attending such Conferences / Seminar / Symposia / Workshops.

Dignitaries disbursed 24 awards to participants listed under various themes of oral and poster presentations, sizeable number of awards had been won by faculties and students of Navsari Agricultural University due to large number of participation and opportunity to present the number of years of field work at door steps. During the session, Dr. Jitendra Kumar, ICAR- Indian Institute of Soil Science, Bhopal; Dr. Nagendra Prasad K, Senior Research Consultant, World Pranic Healing Foundation Mysore, and Prof. (Dr.) S. L. Swami, from IGKVV, Raipur, Chhattisgarh gave the positive feedback and appreciated the hospitality and arrangements in the conference. The program ended with the vote of thanks by Dr. K. G. Patel, Professor & Head, Department of Soil Science, NMCA, NAU, Navsari. Last session of the Conference was anchored Dr Swati Sharma.

Way Foreward

- Scientific community should focus on food and nutritional security along with agricultural sustainability and climate resilience in the Amrit Kal of next 25 yrs.
- Concerted efforts should be made to celebrate 2023, as the International Year of Millets proposed by India aiming for higher productivity, greater profitability with lesser inputs and risk mitigation.
- To revive Indian agriculture collective effort is needed at the field level for application of various agricultural branches of Agriculture, Agricultural Engineering, Forestry, Horticulture, Biotechnology, and allied sciences for increasing productivity and profitability.
- With decreasing forest lands there is a need to shift from agriculture to agroforestry, through suitable tree-crop combinations.
- To make soil and water conservation more viable and sustainable, there is a need to transform conventional Forestry into consumer driven forestry enterprise through deliberately incorporation of latest technologies on Soil and Water Conservation, Nursery techniques developed by SAUs/CAUs on forest lands.
- Initiatives of Government of Gujarat to address the issues of climate change through i) solar roof top project on government buildings, ii) institutional biogas plant scheme, iii) LED tube lights in government primary schools, iv) star rated fans in government primary schools; v) two wheeler's subsidies for electric vehicles could be replicated in other states of the country.
- Role of Agroforestry to supports five F's, Food, Fiber, Fodder, Flower, and Fertilizers for livelihood security of tribal farmers
- Agroforestry could play a pivotal role in sustainability of land use system including agriculture, horticulture, animal husbandry, *etc*.
- Emphasis on Industrial Agroforestry, Urban Agroforestry and Agroecology for meeting the industry demand and mitigate the impacts of climate change.
- Utilizing land space like bunds, alley, etc. for additional income by planting fast growing multifunctional tree species
- Restructuring of Agroforestry policy in order to accommodate many forest tree species that can easily be grown without transit like bamboo.
- Reclamation of saline soils by providing adequate drainage for leaching of salts from the plant root zone, before application of any chemical amendment conditioners.

- Land levelling methods to prevent salt build-up should be adopted under thegood land management practices.
- Reclamation of salt affected soil by means of organic amendments, crop improvement, genes form halophytes and salt tolerant crops. While, sodic soil can be treated by replacing adsorbed sodium with soluble source of calcium like gypsum.

- Technological interventions to reclaim salt affected soils and important role in increasing national agricultural productivity and farmers welfare
- Alternate methods/technologies need to be used for emission reduction and restoring and sustaining inland terrestrial ecosystems.
- Emphasis on plant-based diet for nutritional security to feed the burgeoning population by 2050.
- Regenerative agriculture needs to be adopted to create positive carbon budget for improvement in quality and quantity of yield.
- Stress on soil centric technologies and carbon farming, crop yields can be increased with increase in SOC.
- Reduce stubble burning to reduce emissions from agriculture sector, the crop residue may be converted to biochar to increase soil carbon which will result in enhanced soil fertility and health improvement.
- Stubble burning cannot be minimized forcefully but with the help of technology and incentivization
- Nature based education, which already exists, in all religion's holy books. In basic elementary education books alphabets should be nature based, rather than any other entity.
- Biological remediation in the form of plants and microorganisms could be used as an alternative to mitigate the negative impacts of heavy metal from the contaminated soil.
- Commercial potential of horticulture, aromatic, spice, and medicinal species like ashwagandha, senna, kalmegh, basil, lemongrass, and palmarosa needs to be promoted in coastal degraded soil.
- To address deteriorating trends in crop output and soil erosion, nature-based solutions for agricultural sustainability and climate resilience, nature-based solutions like Bun system, APATANI, Zabo, bamboo drip irrigation, modified bamboo drip irrigation, and alder-based farming needs to be promoted.
- Aqua – Agro-forestry model in coastal areas for financial security of residents of coastal areas
- Potentiality of lotus crop grown in harvested rain water along the coastal landscape could be explored.
- Multipurpose tree species is an alternative for rehabilitation of sodic soils
- Improvement in irrigation and fertilizer use efficiency through micro irrigation, mulching and proper crop selection and adaptation techniques to combat climate change and global warming
- Precision agriculture for natural resource management and techniques like VRT, soil sampling through GIS, drones and use of unmanned vehicles is the way forward to achieve the desired crop growth and retain youth in the farming sector.
- Execution of available soil and water conservation technologies of land reclamation and ground water recharge in the coastal region for sustainable agriculture.
- Need to develop regular drought monitoring and early warning system for different climatic regions.
- Demarcation of areas vulnerable to drought for effective mitigation planning.
- Emphasis on learning methodologies on Robotics and Drones applications in Agriculture in course curricula of Agricultural Engineering and introduction of short-term certificate courses for youth on use, operation, and maintenance of drones and for specific farm operations.
- Coco peat may be used efficiently as a growing media in coastal region.
- Manure prepared from banana pseudo stem is suitable in terms of nutrient uptake
- Application of 0.2% of nano boron provides higher yield in summer groundnut (*Arachis hypogaea* L.) in medium black calcareous soil.
- Customized fertilizers have positive effects on green leaves and curved leaves of tobacco.
- Improved land use by conservation and restoration of degraded forests, use of agroforestry, implementation regenerative agricultural practices can lead to carbon neutrality
- Achieving carbon neutrality, by offsetting emissions by sequestering C in land-based sinks, can limit the global temperature to below by 2^0C.

- Potential of nanotechnology for conservation of micro nutrients in soil media needs to be explored. Farm size, access to credit, possession of machinery and awareness of climate change are the decisive determinants of farm level climate change adaptation variables.
- Climate change adaptation techniques like change in sowing dates, use of improved seed varieties, farm mechanization, precision in agriculture and use of artificial intelligence and drone technologies, value addition and post-harvest technologies needs to be promoted through policy decisions.
- Emphasis of Corporate Social Responsibility (CSR) to address farm sector issues especially for sustainable agriculture, environmental impacts, natural resource conservation, innovation and technological development, social development, entrepreneurship, livestock, and market development.
- To promote CSR activities in agriculture sector, commitment and representation of various stakeholders, effective policy support, proper monitoring system at various levels is needed. The CSR activities will be a power tool to maintain customer relationship.
- Irrigated soil in general was found to have more soil organic carbon (SOC) content as compared to rainfed soils.
- *Salicornia brachaita* Roxb can be used as an alternative to food/oil production with saline effluent from aquaculture on the coastal salt-affected soils.
- Kitchen waste based bio formulation could effectively reduce the salinity in soils
- Horticulture-fruit based agroforestry system could play an important role in livelihood security of the nation.
- Teak based agroforestry system is useful to improve soil properties and fertility
- Table (*Tectona grandis* L.)could be used for biomass and carbon stock among different diameter and height classes of teak and carbon trading
- Saptaparni, *Alstoniascholaris* (L) R. Br. tree can accumulate 117 kg biomass and 50 kg carbon per tree, tree with a diameter of 40-50 cm can accumulate carbon of 121 kg.
- Sulphur oxidizing bacteria (Delftia sp.) and different forms of Sulphur fertilizer application significantly improve the cowpea (*Cicer arietinum*).
- Saline water irrigation up to 4dSm-1 in bamboo species viz., *Bambusa bambos*, *Bambusa vulgaris* and *Bambusa balcooa* show better growth and development under nursery condition
- Bamboo plantation in degraded lands is a potential crop to improves soil porosity, check soil erosion, improve soil fertility in addition to providing source of income
- Climate smart resource conservation in chickpea through conventional tillage and rice straw mulch could be a better option for higher productivity and improvement of soil properties followed by minimum tillage. The placement of fertilizer at 8 cm depth was more remunerative followed by 11 cm depth, for growth, yield, quality, and economics of chickpea
- Pranic Agriculture - a traditional farming system, which shows in increase yield, enhanced plant growth, increased shelf life, lesser use of fertilizers and pesticides needs further evaluation at other places.
- *Melia dubia* Cav. drupe pulp,a low input by-product source for small ruminant feed and crop yield enhancement, through improved soil fertility.
- Bio-organo-chemical fertilizer improves the periodical nutrient status in clay soil. Application of 10 t FYM ha^{-1} along with potassium mobilizing bacteria (KMB) and 40 kg K_2O ha^{-1} was beneficial to enhance the grain yield of wheat (*Triticum aestivum* L.).
- Crops and varieties respond differently to natural and organic systems. Low input responsive rice varieties are better suited and need to be screened for natural farming systems.
- There is a need to identify key indicators and robust monitoring and evaluation systems to accelerate regenerative goals through natural farming practices.

- Crop residue incorporation improves infiltration rate of soil by 10.7 % over without residue retained treatment. The water holding capacity of soil was found to be 8 % more under residue incorporation than conventional practice.
- Application of 100 % and 75 % RDN through bio compost as well as enriched banana pseudo stem sap @ 1 % and Jeevamrut @ 1 % is good nutrient (Fe, Mn, Zn, and Cu) for Finger Millet [*Eleusine coracana* L.] grown under organic farming system.
- Summer green manures, in situ dhaincha, and fertilizers, cultivation during summer season (fertilized 20:40:00 kg NPK/ha) followed by application of 75% RDF (75:22.5:00 NPK kg/ha) for succeeding rice crop resulted into higher growth, yield attributes, yield and economic net returns Kharif rice (*Oryza sativa* L.).
- With application of gypsum on coastal salt affected soil and growing of Hy. Napier grass soil sodicity could be reduced while increasing the nutrient status of soil.
- Soil microbial count is higher in dhaincha incorporated treatment before sowing of rice in the summer season and during kharif season.
- M.B. plough improves soil physical properties as well as infiltration rate and seed germination
- Significantly high germination and yield of a green gram could be attained by 2% spraying and 4% drenching of Tatva- G liquid organic formulation (LOF)
- Two bacillus-species megatherium and aryabhattai identified using 16S rRNA sequencing to bring about the arsenic oxidation to detect arsenic (metal pollutants) content
- Application of 5 t FYM/ha and RDF (20: 40 kg N: P O /ha) in Indian bean crop are at par with each other for total green pod yield of ratoon Indian bean as well as at 1 and 2 picking.
- Rabi Castor sown with one row of Indian bean (var. GNIB21) as intercrop results in higher castor seed yield and castor equivalent yield over castor sown without intercrop of Indian bean, whereas the green pod yield of Indian bean is higher under treatment of castor sown during last week of October, spacing of 120 cm x 90 cm and intercropping of Indian bean in castor
- To sustain cotton productivity of Hirsutum Cotton Hybrid in inland ecosystem, cotton hybrid; GSHH-2799 at 120 x 45 cm spacing with the application of 240 kg nitrogen/ha in five equal splits (each of 48 kg N/ha) at 30, 60, 75, 90 and 105 DAS can give higher seed cotton yield as well as net income.
- Use of Hydrogel in ornamental horticulture is a promising eco-friendly technology under conditions of water scarcity. It has a good swelling capacity; lack of toxicity and controlled water release could reduce irrigation frequency.
- *In-vivo* studies indicate microbial mediated mitigation of stress by two bacteria, *Bacillus tequilensis* (CWTS 5) and *Bacillus albus* (CWTS 10) combat lead (Pb) stress.
- ANN models are useful tools for rainfall modeling with reasonable accuracy in watershed studies. Need of collaboration and co-ordination among various departments for successful implementation of projects.
- Issues of climate change and sea water ingress, soil salinity, management of soil salinity along the coastal belt needs comprehensive attention.

RECOMMENDATIONS

Soil Issues

- Reduce stubble burning to reduce emissions from agriculture sector, the crop residue may be converted to biochar to increase soil carbon which shall result in enhanced soil fertility and improvement in soil health. Stubble burning cannot be minimized forcefully but with the help of technology and incentivization
- Achieving carbon neutrality, by offsetting emissions by sequestering C in land-based sinks, can limit the global temperature to below by 2^0C.
- Bamboo plantation is a potential crop for degraded lands to improves soil porosity, check soil erosion, improve soil fertility in addition to providing source of income.
- Biological remediation in the form of plants and microorganisms could be used as an alternative to mitigate the negative impacts of heavy metal from the contaminated soil.

Traditional / Natural farming

- There is a need to identify key indicators and robust monitoring and evaluation systems to accelerate regenerative goals through natural farming practices.
- Regenerative agriculture and emphasis on plant-based diet for nutritional security needs to be adopted to feed the population, create positive carbon budget for improvement in quality and quantity of yield.
- Crop residue incorporation improves infiltration rate of soil by 10.7 % over without residue retained treatment. The water holding capacity of soil was found to be 8 % more under residue incorporation than conventional practice.
- Application of 100 % and 75 % RDN through bio compost as well as enriched banana pseudo stem sap @ 1 % and Jeevamrut @ 1 % is good nutrient (Fe, Mn, Zn, and Cu) for Finger Millet [*Eleusine coracana* L.] grown under organic farming system.
- Climate smart resource conservation in chickpea through conventional tillage and rice straw mulch could be a better option for higher productivity and improvement of soil properties followed by minimum tillage. The placement of fertilizer at 8 cm depth was more remunerative followed by 11 cm depth, for growth, yield, quality, and economics of chickpea
- Crops and varieties respond differently to natural and organic systems. Low input responsive rice varieties are better suited and need to be screened for natural farming systems.

Coastal Agro-Ecosystem

- Aqua – Agro-forestry model in coastal areas for financial security of residents of coastal areas
- Issues of climate change and sea water ingress, soil salinity, management of soil salinity along the coastal belt needs proactive land use planning and field execution.
- Commercial potential of horticulture,aromatic, spice, and medicinal species like ashwagandha, senna, kalmegh, basil, lemongrass, and palmarosa needs to be promoted incoastal degraded soil.
- Application of gypsum on coastal salt affected soil and growing of Hy. Napier grass has the capacity to reduce soil sodicity while increasing the nutrient status of soil.

Forestry/Agroforestry

- Suitable tree-crop combinations and Agroforestry needs attention not only to mitigate the impacts of climate change but also to meet food, fodder and water demand in the wake of decreasing forest cover. Restructuring of Agroforestry policy in order to accommodate many forest tree species that can easily be grown without transit like bamboo.
- Emphasis on Industrial Agroforestry, Urban Agroforestry and Agroecology for meeting the industry demand and mitigate the impacts of climate change.
- Utilizing land space like bunds, alley, etc. for additional income by planting fast growing multifunctional tree species

Technology Driven

- Precision agriculture for natural resource management and techniques like Variable Rate Technology (VRT), soil sampling through Geographic Information System (GIS), drones and use of unmanned vehicles is the way forward to achieve the desired crop growth and retain youth in the farming sector.
- Execution of available soil and water conservation technologies of land reclamation and ground water recharge in the coastal region for sustainable agriculture.
- Need to develop regular drought monitoring and early warning system for different climatic regions.
- Demarcation of areas vulnerable to drought for effective mitigation planning.
- Emphasis on learning methodologies on Robotics and Drones applications in Agriculture in course curricula of Agricultural Engineering and introduction of short-term certificate courses for youth on use, operation, and maintenance of drones and for specific farm operations.
- Land leveling methods to prevent salt build-up should be adopted under the good land management practices.

Policy option

- Scientific community should focus on food and nutritional security along with agricultural sustainability and climate resilience in the Amrit Kal of next 25 yrs.
- Concerted efforts should be made to celebrate 2023, as the International Year of Millets proposed by India aiming for higher productivity, greater profitability with lesser inputs and risk mitigation.
- Farm size, access to credit, possession of machinery and awareness of climate change are the decisive determinants for farm level climate change adaptation variables.
- Emphasis of Corporate Social Responsibility (CSR) to address farm sector issues especially for sustainable agriculture, environmental impacts, natural resource conservation, innovation and technological development, social development, entrepreneurship, livestock, and market development.
- To promote CSR activities in agriculture sector, commitment and representation of various stakeholders, effective policy support, proper monitoring system at various levels is needed. The CSR activities will be a power tool to maintain customer relationship.
- Concerted efforts are needed by various agricultural branches of Agriculture, Agricultural Engineering, Forestry, Horticulture, Biotechnology, and allied sciences for increasing productivity and profitability.

Appendix – I
List of Participants

Sr. No.	Name	Designation & Address	Institution
		Members of SCSI	
1.	Dr. Prashant Kumar Shrivastava	Dean, College of Forestry (COF), Navsari Agricultural University (NAU)	NAU - COF
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12.	Dr.Nilay Borah	Professor Assam Agricultural University	Assam
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79.	Dr.ManojkumarRamanbhaiGami	Assistant Research Scientist, Navsari Agricultural University	NAU
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81.	Dr. Dr. Manish M. Patel	Associate Research Scientist, Athwa Farm,	NAU - Surat
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85.	Dr.KanubhaiBhimabhai Sankat	Assistant Research Scientist, Agronomy	NAU
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87.	Mr. Sonavane Sandeep Sudhakar	Assistant Professor, College of Agriculture	NAU - Waghai
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108.	Dr.Kirankumar Suthar	Assistant Professor, Dept. of Bio technology	NAU - ACH
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110.	Dr. Deepak Shrivastava	Bilaspur	BTCAPS
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113.	Dr.Jayesh Pathak	Assistant Professor	NAU - COF
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115.	Dr.H.D. Rank	Professor and Ex Dean, Junagadh	JAU
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117.	Dr.Sejalben K Parmar	Assistant Professor	NAU
118.	Dr.H.M. Virdia	Research Scientist, Main Sugarcane Research Station	NAU
Research Fellows			
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120.	Dr. MevadaRamabhai Jepabhai	Research Associate, Department of NRM	NAU - COF
121.	Ms. Bhoomika Bhimjibhai Patel	Senior Research Fellow, Soil and Water Management Research Unit	NAU - SWMRU
122.	Ms. Chauhan Punamkumari Chandrajit	Senior Research Fellow	NAU - COF
123.	Ms. SurveNilam Vijay	Senior Research Fellow	NAU - COF

Sr. No.	Name	Designation & Address	Institution
124.	Dr.PriteshkumarSureshbhai Mistry	Senior Research Fellow (SRF), Soil & Water Management Research Unit	NAU - SWMRU
125.	Mr. Chintan Dholariya	Senior Research Fellow	NAU - COF
126.	Sukhadiya Madhuri	Senior Research Fellow	NAU - COF
127.	Ms. Patel AnkitabenKantilal	Project Associate-1	NAU - COF
128.	Jigneshkumar B. Bhusara	Senior Research Fellow	NAU - COF
129.	Dr.Sondarva Rameshbhai Lakhamanbhai	Senior Research Fellow	NAU - COF
130.	Mr. Abinash Mazumder	Project Associate-l, Institute of Horticulture Technology	Assam
131.	Mr. Jayendrasinh R. Chavda	Senior Research Fellow	NAU - COF
132.	Mr. Chaudhari Viragkumar Mukeshbhai	Project Assistant	NAU - COF
133.	Mr. ChhaganiyaHemrajbhaiJayvantbhai	Senior Research Fellow	NAU - COF
134.	Dr. Lokesh Kumar Saini	Senior Research Fellow, Food Quality Testing Laboratory	NAU
135.	Ms. Odedara Varsha Hamirbhai	Senior Research Fellow	NAU - COF
136.	Mr. Ojefkhan Imdadalikhan Pathan	Senior Research Fellow	NAU - COF
137.	Mrs. Nidhi Bhargav Patel	Senior Research Fellow	NAU - COF
138.	Dr. Prajapati DhavalkumarRajeshbhai	Senior Research Fellow	NAU - COF
139.	Dr.KhalasiDevangbhaiNatvarbhai	Senior Research Fellow, Ph.D. (Horti.) Faculty At & Post-Movasa, Western Street,	Other
140.	Mr. Rathod KeyurkumarRamanbhai	Senior Research Fellow	NAU - COF
141.	Mr. Patel AakashkumarDurlabhbhai	Senior Research Fellow	NAU - COF
142.	Dr. Anjali Verma	Senior Research Fellow, Dr. Y S Parmar University of Horticulture and Forestry Nauni Solan Himachal Pradesh	YSPUHF - Nauni
143.	Prajapati dharamshibhaih	Research Associate	NAU - COF
144.	Mohini.P.Patel	JRF	NAU - COF
145.	Rohit Chaudhary	Research Associate	NAU - COF
146.	PravinbhaiA.Chaudhari	Senior Research Fellow	NAU - COF
147.	Bhuva Dhaval C.	Senior Research Fellow	NAU - COF
148.	JilariyaDevanand	Senior Research Fellow	NAU - COF
149.	Bhanderi Bhavin N	Senior Research Fellow	NAU - COF
150.	Mrs. Neha Sharma	Ph.D. Scholar Bhagwat University Ajmer	Ajmer

Sr. No.	Name	Designation & Address	Institution
		Students	
151.	Ms. Heli S. Oza	Ph.D. Scholar, Anand Agricultural University	AAU - Anand
152.	Mr. Aamir Ishaq Shah	Ph.D. Scholar, Punjab Agricultural University Ludhiana	PAU
153.	Mr. Tamminaina Sunil Kumar	Ph.D. Scholar	NAU - NMCA
154.	Ms. MendaparaIshaKishorbhai	M.Sc. (Agri.) genetics and Plant Breeding, Research Scholar, Dept. of Genetics and Plant Breeding,	NAU - NMCA
155.	Mr. Jasper Victor	M.TechStudent, Soil& Water Conservation, Allahabad	ICAR SHUATS
156.	**Name Missing**	**UPI224488683634**	
157.	Mr. Jaliya Rakeshkumar Manubhai	Ph.D. Scholar Navsari Agricultural University	NAU - COF
158.	Mr. Kotadiya Prajay Babubhai	Ph.D. Scholar Navsari Agricultural University	NAU
159.	Ms. BonjuriSaikia	Student, Kolongpar Road, Khutikatia, Haiborgaon, Nagaon,	Assam
160.	Mr. Sojitra Manojkumar Arvindbhai	Ph.D. Student Junagadh Agricultural University	JAU
161.	Ms. Neha Toppo	Ph.D. Scholar, Sam Higginbottom University of Agriculture, Technology and Sciences	SHUATS Naini
162.	Mr. Rohan Serawat	Ph.D. Scholar, Sam Higginbottom University Of Agriculture, Technology And Sciences Harotachomu, Rajasthan -303702	Jaipur
163.	Mr. Manjul Kumar	Ph.D. Scholar, NaiPrayagraj UP - 211007	SHUATS Naini
164.	Ms. Ishaswati	Student Punjab Agricultural University	PAULudhiana
165.	Mr. Iska Srinath Reddy	Ph.D. Scholar, Sam Higginbottom University Of Agriculture, Technology and Sciences Student Mehawa, Naini, PrayagraJ, UP-211007	SHUATS Naini
166.	Mr. Rajat Mishra	Research Scholar, Pantnagar, U.K.	GBPUAT
167.	Dr.Mehraj U Din Dar	Ph.D. Scholar, Soil and Water Engineering, Punjab Agricultural University	PAU
168.	Mr. Keniya Bhavikkumar Jagdishbhai	M. Sc. (Agri.) Soil Science and Agricultural Chemistry	NAU - NMCA
169.	Ms. Hetvi Naik	Ph.D. Scholar, C.G.Bhakta Institute of Biotechnology,UkaTarsadia University	Bardoli

Sr. No.	Name	Designation & Address	Institution
170.	Ms. Harshida Gamit	Ph.D. Scholar, C.G.Bhakta Institute of Biotechnology,UkaTarsadia University	Bardoli
171.	Mrs. Sapna Chandwani	Ph.D. Scholar, C.G.Bhakta Institute of Biotechnology,UkaTarsadia University	Bardoli
172.	Ms. Shilpi Gupta	Ph.D. Scholar, Assam Agricultural University	AAU, Jorhat
173.	Name Missing	**IMPS33312000162**	
174.	Mr. Subham Roy	Ph.D. Scholar, Assam Agricultural University, Jorhat	AAU - Jorhat
175.	Ms. Patel Drashtiben Kantilal	Ph.D. Scholar, Navsari AgriculturalUniversity	NAU
176.	Mr. Chittadeep Nath	M.Sc. Soil Science, Assam Agricultural University, Jorhat	AAU - Jorhat
177.	V.B. Shambharkar	Ph.D. Scholar, Forestry, Student Vth Semester Dept. of SAF, COF	NAU - COF
178.	Diksha Sharma	M.Sc. Agronomy, College of Agriculture, Rajasthan	Udaipur
179.	Mr. Anshul Sharma	M.ScResearch Scholar (Agronomy), Rajasthan College of Agriculture	Udaipur
180.	Ms. Rupam Bharti	M. Sc.Ag in Agronomy, Rajasthan College of Agriculture	MPUAT, Udaipur
181.	Ms. Swati Kunjam	Ph.D. Scholar, Rajasthan College of Agriculture, Rajasthan	MPUAT, Udaipur
182.	Mrs. Patel Upasanabahen Jayantibhai	Ph.D. Scholar, Navsari Agricultural University	NAU
183.	Ms. Patel Arti Manilal	M.Sc. Forestry, Student,3rd Sem, College of Forestry	NAU - COF
184.	Ms. ThumbarPayalDineshbhai	M.ScForestry,student3rd Sem, College of Forestry	NAU - COF
185.	Mr. Gyan Singh	Ph.D. Scholar, Prayagraj	SHUATS
186.	Ms. Patel SwatibahenHasmukhbhai	Ph.D. Scholar, Anand Agricultural University	AAU
187.	Mr. Patel Deep Mahendrabhai	Ph.D. Scholar, SardarkrushinagarDantiwada Agricultural University	SDAU
188.	Mr. Malek Soufil Sharifmiya	PhD Student, College of Forestry	NAU - COF
189.	Mr. Mohd Tabish	Student, Jabalpur	JNKVV
190.	Ms. Kachhiyapatel Krishnaben Alpeshkumar	Ph.D (Agri) Scholar, Junagadh Agricultural University, Junagadh, 362001	JAU
191.	Name Missing	**UPI227210876975**	

Sr. No.	Name	Designation & Address	Institution
192.	Ms. Dhodia Jugnuben Bhikhubhai	STUDENT, 567-G, Railway station, Near AnajGodown, Sonarpada, Ta-Fort Songadh, Dist- Tapi, 394670	NAU
193.	Mr. Umesh Sharma	M.Sc. Research Scholar (Agronomy) Rajasthan College of Agriculture	Rajasthan
194.	Ms. Khayalivaidya	Ph.D scholar, KSKV Kachchh University Department of Earth and Environmental Science, University	Kachchh, Bhuj
195.	Mr. Chauhan Karansinh Jayshukhbhai	PhD student, SardarkrushinagarDantiwadaAgricultural University	SDAU
196.	Ms. Palleti Prasanna	Professor Jayashankar Telangana State Agricultural University, Pin -502285.	Hyderabad
197.	Name Missing	**UPI227501982160**	
198.	Name Missing	**UPI227501982592**	
199.	Ms. Athulya B M	PG Scholar, Kerala Agricultural University	KAU
200.	Mr. Ankurkumar Kanaiyalal Patel	Ph.D. Student	VNSGU
201.	Ms. Lumbini Kalita	MSc research scholar ,	AAU , Jorhat
202.	Mr. Hirapara Paraskumar Subhashbhai	Ph.D. Researcher, Junagadh Agricultural University	JAU
203.	Ms. Rathava Komalben Narsinhbhai	Ph. D. (Horticulture), Floriculture and landscape Architecture, Navsari 396450	NAU - ACH
204.	Ms. Amanpreet Kaur Benipal	Student, Central Mechanical Engineering Research Institute Punjab	CSIR- Punjab
205.	Mr. Govind	PhD Student College of Forestry	NAU - COF
206.	Ms. Patel Tejalbahen Prakashbhai	PhD Scholar (Horticulture) Floriculture and Landscape Architecture, Navsari Agriculture University	NAU - ACH
207.	Ms. Bharadva Mansi U.	M.Sc. Student, College of Forestry, NAU. Navsari - 396450	NAU - COF
208.	Mr. Ram MayurbhaiLumbhabhai	Ph.D Forestry, Navsari Agricultural University, Navsari,	NAU - COF
209.	Ms. SindhaMallikabenRavjibhai	Ph.D student, Navsari Agricultural University, Navsari,	NAU
210.	Mrs. Patel Mehfuza M	Ph. D. Student, College of Forestry	NAU - COF
211.	Ms. Trivedi Saryu Jaldhibhai	Ph.D. Scholar in Floriculture and Landscape Architecture	NAU - ACH
212.	Mr. Chauhan Ankitkumar Hiralal	PhD scholar, SDAU, Dantiwada	SDAU

Sr. No.	Name	Designation & Address	Institution
213.	Ms. Patel Twinkal Sanjaybhai	M. Sc Forestry Department of Silviculture and Agroforestry	NAU - COF
214.	Ms. Kotadiya Rushita Hirajibhai	Ph.D (Agri), Anand Agricultural University	AAU
215.	MonalibenAshokbhaiDavara	M. Sc (Soil Science), Junagadh Agricultural University, 362263	JAU - Junagadh
216.	Mr. Sagarkumar Jagdishbhai Vekariya	M. Sc (Agronomy), Junagadh Agricultural University,	JAU - Junagadh
217.	Mr. Patel Dikshitkumar Jethabhai	Ph. D. Scholar Anand Agricultural University	AAU
218.	Ms. Priyanka Uttam Maity	PhD (ABM) ASPEE Agribusiness Management Institute Student, Navsari	NAU - AABMI
219.	Ms. Tankiwala Aneri Kantilal	Ph.D scholar Navsari Agricultural University	NAU
220.	Alpaben Babubhai ladumar	Student	NAU - COF
221.	Kamani Harsh Arvindbhai	Student	NAU - NMCA
222.	Garima Tak	Student	RVSKVV, MP
223.	Chauhan Jahanvi. D.	Student	NAU - COF
224.	Ganvit Rakesh S	Student	NAU - NMCA
225.	Nirali G. Patel	Student	VNSGU, Surat
226.	Shefali B Tandel	Student, COF,NAU	NAU
227.	Name Missing	**UPI227838190716**	
228.	Patel ShardkumarDineshbhai	Student, NAU	NAU
229.	Patel Kishan K	Student	NAU
230.	Solanki Manish B	Student, KachchhUniversity	KU
231.	AvinashG.J	Student, NMCA	NAU
232.	Dr. Alpesh Thakore	BKM, Science College	Valsad
233.	Dr. Vikas R. Nayak, DR Office	Associate Director of Research	NAU

Sponsors

1. Ministry of Jal Shakti , Government of India
2. Indian Council of Agricultural Research, ICAR, New Delhi
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8. Laxmi Bio Farm, Buldhana, Maharashtra
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10. Cooperative Sugar Factory Limited, Gandevi, via Billimora, Dist. Navsari, Gujarat
11. Elixir Technologies Pvt. Limited, Bangalore
12. GadatVibhagVividh Kar Karyakari Sahakari Khedut Mandali,tal- Gandevi, Dist- Navsari, Gujarat

13. Amalsad Vibhag Vividh Kar Karyakari Sahakari Khedut Mandali, Amalsad, tal- Gandevi, Dist- Navsari, Gujarat
14. Agricultural Product market committee (APMC), Sardar market, Billimora, 396321, Dist- Navsari, Gujarat
15. Navsari Agricultural University, Navsari, Gujarat
16. Soil conservation society of India, New Delhi

Sr. No.	Name of Institution	No of Participant			
		Staff	Researchers	Students	Total
1.	NAU Participant	76	28	32	136
2.	AAU, Anand Participant	1	-	2	3
3.	JAU Participant	7	-	5	12
4.	SDAU Participant	-	-	3	3
5.	Other Participant (Outside Gujarat)	33	4	33	70
6.	Name Missing Participants registered	7	-	-	7
7.	Lead Lectures	18	-	-	18
	Total	**142**	**32**	**75**	**249**
	Sponsor				**15**

Missing Names (Online Registered for the Conference)

Sr. No.	Dated	Transaction id	Name	Designation	Amount	Receipt no.
1	01-09-2022	UPI224488683634	Purushottam Agrawal		1500	
2	20-09-2022	IMPS33312000162	Society member		1500	
3	29-09-2022	UPI227210876975	Ms. Tridisha Deka		1500	
4	01-10-2022	JAKA22100128141	Dr. Vivek M. Arya	Professor Soil Science	4000	
5	02-10-2022	UPI227501982160	Society Membership		1500	4967
6	02-10-2022	UPI227501982592	Society Membership		1500	4968
7	06-10-2022	UPI227838190716	Amit Bhadu		1500	5016

Appendix - II
Lead Lectures Presented

Sr. No.	Name	Topic
1	**Dr Ratan Lal** Distinguished University Professor of Soil Science, The Ohio State University, Columbus, **USA**	Sustainable management of inland system for restoring and sustaining soil health and decarbonization of the terrestrial biosphere
2	**A. Arunachalam** and Suresh Ramanan S. Director, CAFRI, **Jhansi, UP**	Multifunctional agroforestry for sustainability
3	**B. K. Patel**, K. C. Pateand Dileep Kuma Rtd. Soil Scientist, Empaneled Expert Soil Conservation, Accredited by NABET, AAU, **Anand, Gujarat**	Remediation strategies of heavy metals in soil ecosystem
4	**Dr. Susanta Kumar Jena** Principal Scientist & Project Coordinator (Consortia Research Platform on Water) ICAR- Indian Institute of Water Management, Bhubaneswar-751023, Odisha, India	Precision Agriculture for Sustainable Natural Resource Utilization
5	**Dr. K P Patel** Rtd. Dean & Principal, B A College of Agriculture, AAU **Anand, Gujarat**	Coastal and Inland Salt Affected Soils and Their Management
6	**Dr R G Patil,** Retd. Research Scientist, SWMRU, NAU	Drip Irrigation and Mulching in Relation to Climate Change
7	**Dr. O.P. Aishwath** , Principal Scientist (Soil Science) ICAR-NRCSS,Tbiji,Ajmer	Horticultural Crops for Management and Utilization of Coastal Degraded Land and Soil
8	**Dr S L Swami** Professor (Forestry) BTC College of Agriculture & Research Station, Indira Gandhi Agricultural University, Raipur, Chhattisgarh - 495001	Assessment of Forest Degradation and C Emissions during Past Two Decades in Part of Central India: Implications for C Management to Mitigate Climate Change
9	**Ruchira Shukla** and Swati Sharma Dean, ASPEE Agribusiness Management Institute Navsari Agricultural University Navsari-396450	Corporate Social Responsibility for Sustainable Agriculture Development: Perspectives and Way Forward
10	**R.P. Pandey** Scientist – G & Head, Environmental Hydrology Division, National Institute of Hydrology, Roorkee	Impact of Climate Change on Occurrence of Regional Droughts
11	**Dr. Narendra Kumar Gontia** Principal and Dean, College of Agricultural Engineering and Technology, Junagadh Agricultural University, Junagadh, Gujarat	Robotics and Drones Applications in Agriculture
12	**S. Manivannan**[1] and V Kasthuri Thilagam [1]ICAR - Indian Institute of Soil and Water Conservation, Research Centre, Fern Hill (post), Udhagamandalam – 643 004, Tamil Nadu	Soil and water conservation technologies for sustainable agriculture in coastal region

13	**Dr. S. Raman,** Freelance Consultant – Natural Resource Management, Mumbai	Soil and water conservation through flora selection and management
14	**Mr. Shwetal Shah**, Technical Advisor, Climate Change Department, Government of Gujarat	Initiatives by the Government of Gujarat to mitigate the impacts of Climate Change in the state
15	**Narendra Singh and P. K. Shrivastava** Professor, Agricultural Economics, Navsari Agricultural University, Navsari	Impact of Socio-Economic Determinants on Farm Level Adaptations to Climate Change
16	**Lalit Mahatma, Ravikumar Vania, Ranapratap A. Raut, Narayan A. Musmade, Kiran P. Suthar[2] and Nitin M. Patel** Associate Director of Research, Navsari Agricultural University, Navsari	Potential characteristics of nano-formulations for the management of diseases in crops
17	**Sanjay-Swami,** Professor (Soil Science and Agricultural Chemistry), School of Natural Resource Management,College of Post Graduate Studies in Agricultural Sciences, CAU,Umiam (Barapani) - 793 103, Meghalaya	Nature-based Solutions for Agricultural Sustainability and Climate Resilience in NEH Region, India
18	**Dr. M. S. Hadda**, Professor of Soil Conservation (Retd.) Department of Soil Science, PAU, Ludhiyana-141004	Energies and sustainable agriculture

Appendix – III
SCSI Awardees facilitated in the 31st National Conference

1	**Life Time Achievement** Er. B. Rath	8	**Book Award** Dr. A.S. Yadav
2	**Honorary Membership Award** Dr. Z. P. Patel	9	**Communication Award** Ms. Meetali& Ms. Deepshikha Bharti
3	**National Fellow** Prof. SL Swamy Dr. Sheetal Sharma Dr (Mrs) Susama Sudhishri,	10	**Special Research Award** Dr. K. Karthikeyan Dr. Ajay K. Mishra
4	**Gold Medal** Dr. (Ms) Ranu Rani Sethi Dr Rohitashw Kumar Dr Rakesh Kumar Dr.Vivak M. Arya	11	**Sumer Memorial Award** Dr. D.S. Srivastava
5	**Leadership Award** Dr Mainak Ghosh Dr G. Thiyagarajan Dr. Deepak Kumar Sarolia Dr. Gyanendra Kumar Rai Dr. B. Krishna Rao	12	**Mrs Mohini Kumari Gupta Memorial Merit Scholarship** Mr. Ankireypalli Jaya Kishore Kumar Reddy
6	**Student Incentive Award (PhD)** Dr. Abrar Yousuf **Student Incentive Award (MSc)** Mr. Abinash Mazumder	13	**Best Referee of JSWC-2021** Dr. Jagdish Prasad
7	**Dr J.S. Bali Award** Prof. Sanjay-Swami	14	**Best State Chapter-2021** Assam State chapter of SCSI

(Dr. TBS. Rajput) (Sh.RAS Patel) (Dr. Sanjay Arora) Suraj Bhan

Appendix - IV
List of awardees of best paper presentations

Name	Title	OS/PS code	Rank
	Oral Session - O/S/II		
Susheel Singh	Persistence and downward movement of halosulfuron methyl in different type of soils of Gujarat	O/S-II/39	**I**
Pramod Kumar Dubey	Agronomical evaluation of different paddy varieties under organic farming	O/S-II/24	**II**
Susheel Singh	Persistence of Halosulfuron Methyl in Soil, Water and Its Terminal Residues in Sugarcane Leaves and Juice	O/S-II/40	**III**
ShailendraViyol	An assessment of emission of N2O and CH4 from forests soils	O/S-II/44	**III**
R. K. Yadav	Effect of Drip irrigation and fertilizer application on yield and quality of Tomato (*Solanum lycopersicum* L.) cv. ArkaRakshak	O/S-II/46	**III**
	Oral Session - O/S/III		
Neethu T.M.	Effect of organic manure prepared from agro-wastes by inoculating with isolated cellulolytic and lignolytic bacteria on the nutritional composition, biochemical parameters and yield of sorghum	O/S-III/15	**I**
Manjushree Singh	Water resources management in Salebhata catchment of Odisha: An Integrated approachof geospatial technologies and hydrological model	O/S-III/29	**I**
R.K Meena	Genetic diversity assessment of male date palm (*Phoenix dactylifera* L.) under hot arid ecosystem of western Rajasthan	O/S-III/34	**II**
H.D. Rank	Modelling and simulating the …..shingoda river basin	-	**II**
Prasang Harji Rank	Simulating the climate change impacts on yield and water footprints of sweet corn crop using aqua-crop model	O/S-III/7	**III**
	Oral Session - O/S/IV		
L. K. Behera	Patterns of biomass accumulation and carbon storage in Teak (*Tectona grandis* L. f.): An implication for evelopment of biomass and carbon tables for sustainable management	O/S-IV/23	**I**
V.B.Shambharkar	Variation in oil content of different storage and drying conditions in Neem Seeds	O/S-IV/29	**II**
N. S. Thakur	*Melia dubia* Cav. drupe pulp: A low input by-product source for small ruminant feed and crop yield enhancement	O/S-IV/36	**III**

Poster Session

Name	Title	OS/PS code	Rank
	Poster Session - P/S/I		
Sapna Chandwani	Microbial mediated mitigation of lead stress by siderophore and ACC *deaminase* producing lead (Pb) tolerant bacteria in blackgram (*Vigna mungo* L.) *Sapna Chandwani and Natarajan Amaresan*	PS-I/33	**I**
Harshida Gamit	UI-B radiation-resistant phyllosphere associated methylotrophic bacteria for their potential role in plant growth promotion under UI-B radiation *Harshida A. Gamit and Natarajan Amaresan*	PS-I/35	**II**
A. R. Kaswala	Effect of Tatva-G Liquid Organic Formulation on germination and yield of green gram	PS-I/15	**III**
	Poster Session - P/S/II		
Prasang Harji Rank	Drip fertigation strategy for reducing the water footprints of cotton crop cultivation	PS-II/19	**I**
D. J. Chaudhari	Dynamics of Land Use in South Gujarat	PS-II/15	**II**
Deepak K. Sarolia	Response of ber varieties at different training systems under hot arid ecosystem	PS-II/50	**III**
	Poster Session - P/S/III		
Jaimin R. Naik	Assessment of ground water quality status by using irrigation water quality index method in Navsari taluka	PS-III/14	**I**
Chittadeep Nath	A comparatile study on soil properties and nutrient status of Tezpur litchi growing areas of Assam	PS-III/42	**I**
Malek Soufil Sharifmiya	Preliminary Survey of Plant Diversity at Goima Forests – Riparian Ecosystem of River Kolak in South Gujarat	PS-III/9	**II**
Sukhadiya Madhuri	*Bauhinia malabarica* Roxb.: seed treatments on germination and early seedling growth for conservation of LKT species	PS-III/13	**III**
Shilpi Gupta	Vermicompost yield and quality as influenced by use of poultry litter as substrate	PS-III/63	**III**

Appendix – V
Stalls of Navsari Agricultural University Products

- Display of products of Bamboo ResourceCentre
- Honey prepared by the Students Experiential Learning Unit
- NaurojiStonehouseFruit fly trap
- NAUROJI Bio fertilizers
- Products of Banana Pseudo-stem
- Value added and Post-Harvest Products produced by Experiential Learning Unit

Appendix – VI
Cultural Evening

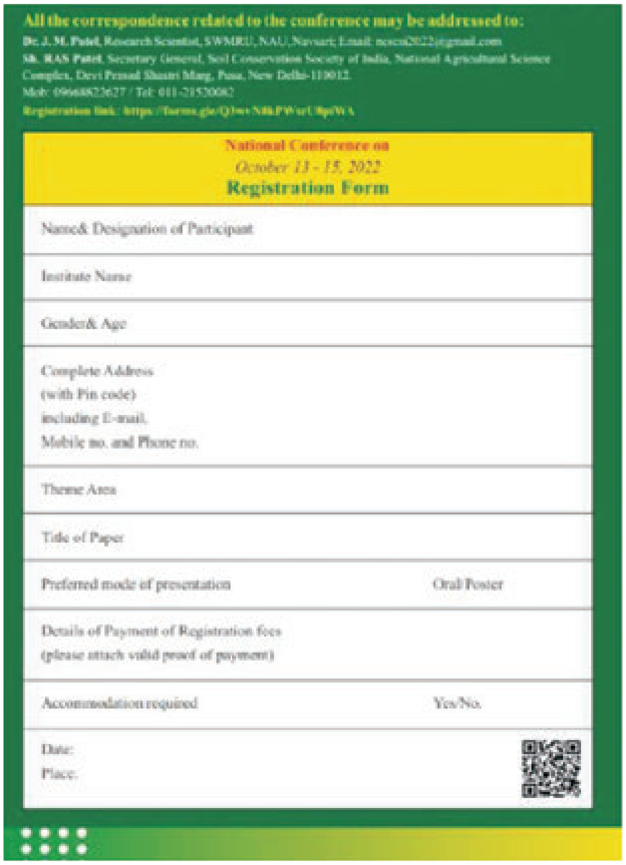
Directed By: Dr. Ajay Narwade, Associate Professor, NMCA, NAU, Navsari

Hosted By: Disha Pandya, III Sem. and from 3rd semester and Abha Jha, VII Sem. NMCA

Performances:

- Folk dance "Tipanni", performed by UG girl students of NMCA, the dance originated from Chorwad region of Saurashtra, Gujarat. It is performed by women, holding long wooden stick from the bottom block called "garbo".
- Folk dance "Hudo" performed by the PG students of IAABM, Navsari, it is the folk-dance originating from mimicking sheep fights by Bharwad tribe, shepherd community.
- Folk song, performed by UG student of CoF, it is an example of how information is passed through generations by narrating historical culture of people involved in the music from the beginning.
- Filmi song by Dr. Mahesh Desai, Assistant Professor, CoF, NAU, Navsari
- Classical dance - Bharatnatyam by Anjali and Avantika from ACHF, the dance form expresses South Indian religious themes and spiritual concepts.
- Folk dance "Hudo", performed by the UG students of Horticulture
- Filmi song by Dr. Satish Sinha, Assistant Professor, CoF
- Gujrati folk song by Gadhvi Jaydan Matidan and Adarsh Pansuriya, students of CoF and NMCA respectively
- Another Gujarati folk song by UG student Hadiya Dilipbhai Anandbhai performed
- SCSI member Dr. N. K. Pareek, Senior Scientist, SKRAU, Bikaner also gave his performance at the end.

Appendix - VII
Publications of the Conference



All the correspondence related to the conference may be addressed to:

Dr. J. M. Patel, Research Scientist, SWMRU, NAU, Navsari; Email: [illegible]

Sh. RAS Patel, Secretary General, Soil Conservation Society of India, National Agricultural Science Complex, Devi Prasad Shastri Marg, Pusa, New Delhi-110012.

Mob: [illegible] / Tel: 011-21520082

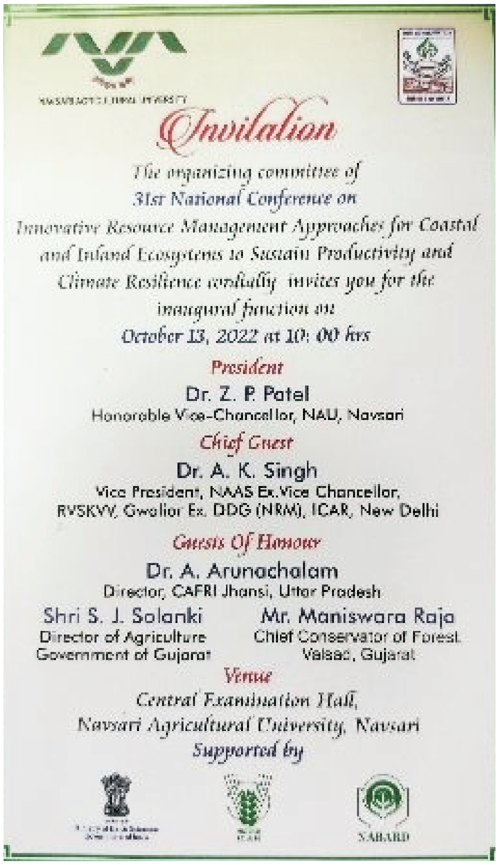
Registration link: [illegible]

National Conference on

October 13 - 15, 2022

Registration Form

Name& Designation of Participant	
Institute Name	
Gender& Age	
Complete Address (with Pin code) including E-mail, Mobile no. and Phone no.	
Theme Area	
Title of Paper	
Preferred mode of presentation	Oral/Poster
Details of Payment of Registration fees (please attach valid proof of payment)	
Accommodation required	Yes/No.
Date: Place:	



Invitation

The organizing committee of 31st National Conference on Innovative Resource Management Approaches for Coastal and Inland Ecosystems to Sustain Productivity and Climate Resilience cordially invites you for the inaugural function on October 13, 2022 at 10: 00 hrs

President

Dr. Z. P. Patel

Honorable Vice-Chancellor, NAU, Navsari

Chief Guest

Dr. A. K. Singh

Vice President, NAAS Ex.Vice Chancellor, RVSKVV, Gwalior Ex. DDG (NRM), ICAR, New Delhi

Guests Of Honour

Dr. A. Arunachalam

Director, CAFRI Jhansi, Uttar Pradesh

Shri S. J. Solanki

Director of Agriculture Government of Gujarat

Mr. Maniswara Raja

Chief Conservator of Forest. Valsad, Gujarat

Venue

Central Examination Hall, Navsari Agricultural University, Navsari

Supported by

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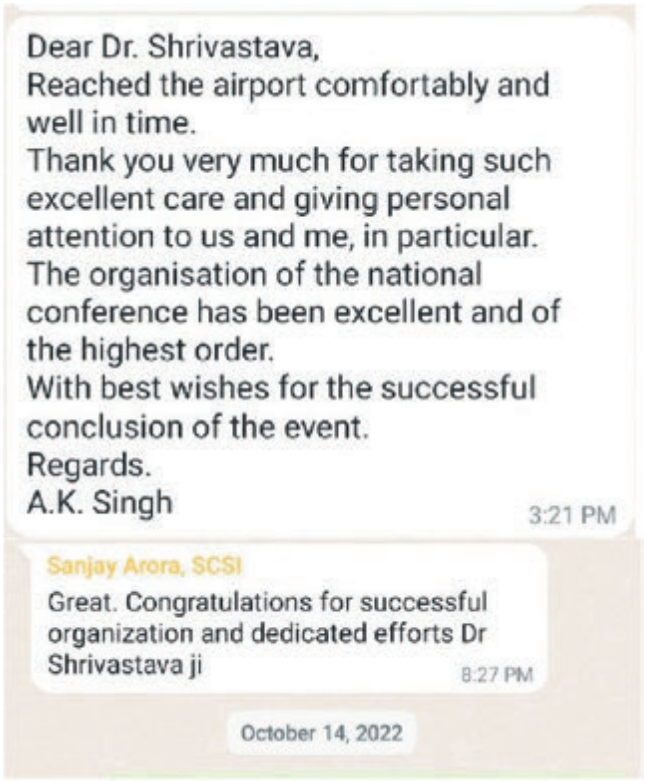
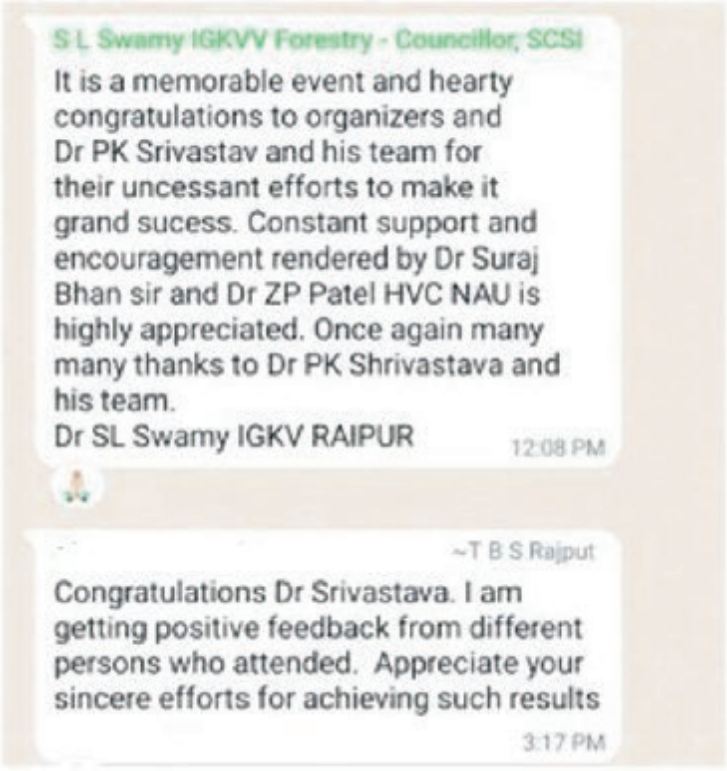
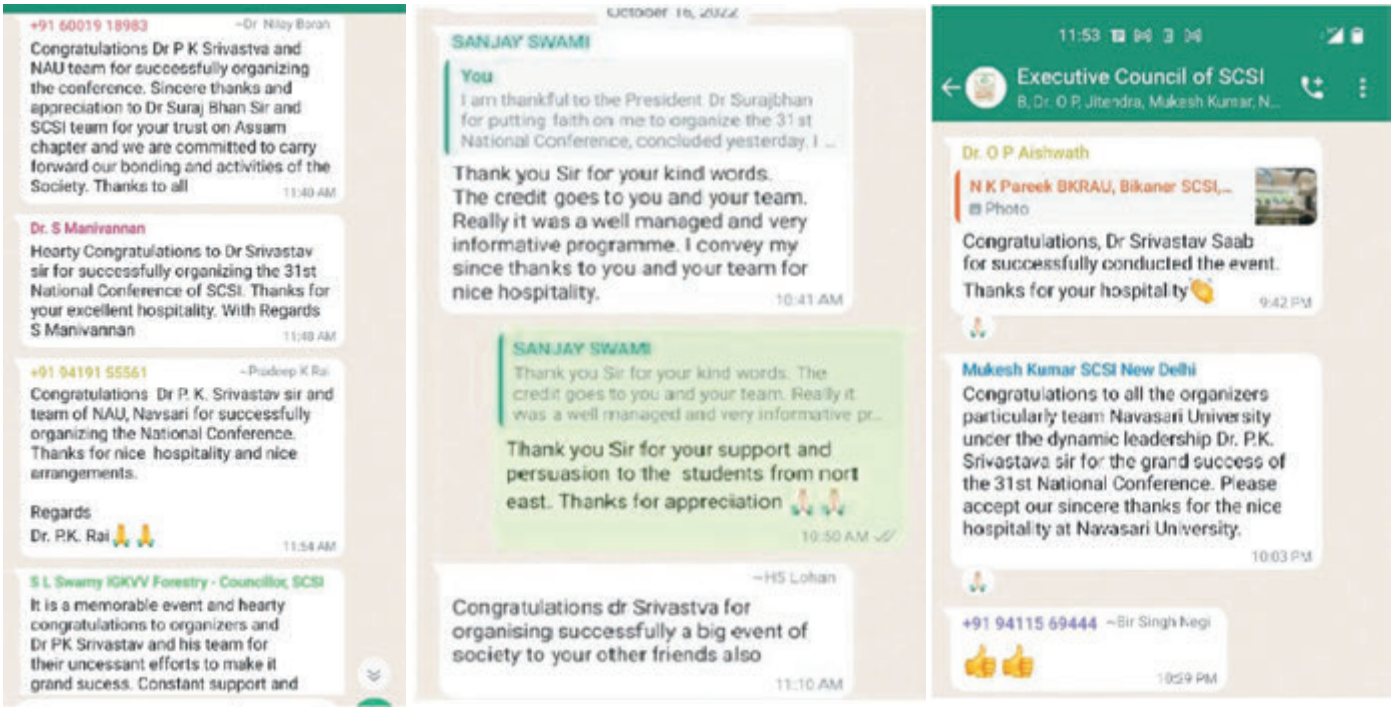
Appendix – VIII
Participants Feedback

In the plenary session, feedback from the three participants from outside Navsari Agricultural University was invited, in which Dr. Jitendra Kumar, ICAR- Indian Institute of Soil Science, Bhopal; Dr. Nagendra Prasad K, Senior Research Consultant, World Pranic Healing Foundation Mysore, and Prof. (Dr.) S. L. Swami, from IGKVV, Raipur, Chhattisgarh gave the positive feedback and appreciated the hospitality, arrangements and overall organizing the national conference at Navsari Agricultural University. .






+91 60019 18983
Congratulations Dr P K Srivastva and NAU team for successfully organizing the conference. Sincere thanks and appreciation to Dr Suraj Bhan Sir and SCSI team for your trust on Assam chapter and we are committed to carry forward our bonding and activities of the Society. Thanks to all
Dr. S Manivannan
Hearty Congratulations to Dr Srivastav sir for successfully organizing the 31st National Conference of SCSI. Thanks for your excellent hospitality. With Regards S Manivannan
+91 94191 55561
Congratulations Dr P. K. Srivastav sir and team of NAU, Navsari for successfully organizing the National Conference. Thanks for nice hospitality and nice arrangements.
Regards
Dr. P.K. Rai
S L Swamy IGKVV Forestry - Councillor, SCSI
It is a memorable event and hearty congratulations to organizers and Dr PK Srivastav and his team for their uncessant efforts to make it grand sucess. Constant support and
SANJAY SWAMI
You
I am thankful to the President Dr Surajbhan for putting faith on me to organize the 31 st National Conference, concluded yesterday. I ...
Thank you Sir for your kind words. The credit goes to you and your team. Really it was a well managed and very informative programme. I convey my since thanks to you and your team for nice hospitality.
SANJAY SWAMI
Thank you Sir for your kind words. The credit goes to you and your team. Really it was a well managed and very informative pr...
Thank you Sir for your support and persuasion to the students from nort east. Thanks for appreciation
Congratulations dr Srivastva for organising successfully a big event of society to your other friends also
Executive Council of SCSI
Dr. O P Aishwath
N K Pareek BKRAU, Bikaner SCSI,...
Photo
Congratulations, Dr Srivastav Saab for successfully conducted the event. Thanks for your hospitality
Mukesh Kumar SCSI New Delhi
Congratulations to all the organizers particularly team Navasari University uncer the dynamic leadership Dr. P.K. Srivastava sir for the grand success of the 31st National Conference. Please accept our sincere thanks for the nice hospitality at Navasari University.
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Appendix - IX
Organizing Committees for the National Conference

Steering
Dr. T.R. Ahlawat
Dr. N. M. Chauhan
Dr. P. K. Shrivastava
Dr. H. V. Pandya
Dr. R M Naik
Dr. Alka Singh
Dr.Ruchira A. Shukla
Dr. V.R. Naik
Dr. Lalit Mahatma
Dr D. D. Patel
Dr J. J. Pastagia
Dr. S H Sengar
Dr. Sanjay Jha
Shri Chirag B. Naik
Er. H. T. Bhalsod

Finances
Dr. J. M. Patel
Dr. Vallabh J. Zinzala
Dr.Dileswar Nayak
Dr.OdhavjiVadaviya
Mr. Sanjay Rabari
Mr. Kapil G. Tandel
Mr. Ojefkhan Pathan

Fund raising
Dr. V.R. Naik
Dr. K. G. Patel
Dr. Harsha T. Hegde
Dr Rajesh P. Gunaga
Dr.Laxmikanta Behera
Dr Kirti Bardhan
Dr. Shailesh Mali
Dr.Dileswar Nayak
Dr Satish Sinha
Dr. S.M. Patel
Er. Ashish V. Sonawane
Er. Nirav Pampaniya

Food
Dr.Jaimin R. Naik
Dr. Ajay V. Narwade
Dr. D.P. Patel
Dr. S.M. Patel
Dr. R.S. Chauhan

Cultural
Dr. Ajay Narwade
Dr. M. K. Desai
Dr. S. K. Sinha
Dr.Haimil Joshi
Dr. Gopal Chopda
Dr. Jayesh Pathak
Dr. A.A. Mehta
Er. Nirav Pampaniya

Registration
Dr.Sonal Tripathi
Dr. Manjushree Singh
Dr. Narendra Singh
Dr. Neethu TM
Mrs. NilamSurve
Ms. Bhoomika B Patel
Mr. Jitendra D Choudhari

Master of Ceremony
Dr. Mehul Thakkar
Dr. Swati Sharma
Dr.Jaimin R. Naik
Dr. H.T. Hedge

Thematic Sessions (Oral)
Dr. Sanjay Arora
Dr. Sonal Tripathi
Dr. D. P. Patel
Dr. Neethu TM
Dr. Manjushree Singh
Dr. Vipul Shinde
Er. Ashish Sonowane
Dr. R. P. Gunaga
Dr. Arun Lakkad
Dr. Shailendra V. Viyol
Dr. J.M. Patel
Dr. S. L. Pawar
Er. K. N. Sondarva
Dr. A. R. Kaswala
Dr. M. B. Tandel
Dr.RavatSisodiya
Dr. Vipul Parekh

Thematic Sessions (Poster)
Dr. R. P. Gunaga
Dr. S. L. Pawar
Dr. L.K. Arvadiya
Dr.Susheel Singh
Dr.Laxmikanta Behera
Dr. Ashok Italiya
Dr. Nitin Gudadhe
Dr. S.A. Huse
Dr. B.S. Desai

Stage
Dr. S. L. Chawla
Dr. Shailesh Mali
Dr. N. S. Thakur
Dr. Sheetal Jadhav
Dr. M.R. Parmar
Mr. Chintan Dholariya

Memento & Certificate
Dr. K.G. Patel
Dr. M.B. Tandel
Dr A. P. Italiya
Dr. M. S. Sankanur
Mrs. Nilam Surve

Accommodation
Er H.T.Bhalsod
Dr. V.P. Vejapara
Dr. Shailendra V. Viyol
Dr. Dev Raj
Dr. Danny Tandel
Dr. Sanjay Pradhan
Dr.JwalantbhaiZala
Dr. Ram J. Mevada
Dr. V.M. Prajapati

Transport
Dr. A. R. Kaswala
Dr. Pramod Dubey
Dr.NayanThesiya
Er. A.K. Senapati
Dr. Manoj Gami
Dr.RavatSisodiya
Dr. Kapil Patel
Er. F.M. Sahu
Mr. Bhavin N Bhanderi

Press and Media
Dr.ShamjibhaiKavad
Dr. Vipul Shinde
Dr. Sushil Singh
Dr.SumitSalunkhe
Dr. A. A. Kazi
Dr. R.S. Chauhan

Stall Arrangement
Dr. S.K. Jha
Dr. P. M. Mistry
Dr.Ramabhai J. Mevada
Mr. Ojefkhan Pathan

Conference Hall
Dr. R. P. Gunaga
Dr. K.G. Patel
Dr. A. R. Kaswala
Dr. Swati Sharma
Dr. Dev Raj
Dr. Vallabh J. Zinzala

Messages
Dr P K Shrivastava
Dr. L.K. Arvadiya
Dr. N. S. Thakur
Dr. R. P. Gunaga
Dr. Vipul Shinde
Dr Dhaval Dwivedi
Dr Kirti Bardhan
Dr. Manjushree Singh
Dr P K Dubey
Dr Sudha Patil
Dr. Swati Sharma
Mr. Jitendra D Choudhari

Appendix - X
Sponsors

1. Ministry of Jal Shakti , Government of India
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13. Amalsad Vibhag Vividh Kar Karyakari Sahakari Khedut Mandali, Amalsad, tal- Gandevi, Dist- Navsari, Gujarat
14. Agricultural Product market committee (APMC), Sardar market, Billimora, 396321, Dist- Navsari, Gujarat
15. Navsari Agricultural University, Navsari, Gujarat
16. Soil conservation society of India, New Delhi

NAVSARI AGRICULTURAL UNIVERSITY

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Soil Conservation Society of India (SCSI), New Delhi

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Ministry of Jal Shakti, Govt. of India, New Delhi

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