



# CSWCRTI



## News

No. 5 : October 2013 to March 2014

[www.cswcrtiweb.org](http://www.cswcrtiweb.org)



### In this Issue



*Staggered Trenching for Horti-pastoral Land Use in Medium Deep Ravines of Chambal Region*

- ISO 9001:2008 Certificate Awarded to CSWCRTI
- Revised Training on Natural Resource Conservation at CSWCRTI
- Farmers First Conference for Northern Region Organized
- Workshop for Delineation and Characterization of Ravines Organized
- Special Course on Watershed Management Organized at IIRS

### Next Issue



*Katta-Crate Technology: A Cost Effective Measure for Rehabilitation of Torrents and Minespoil Areas*

### From the Director's Desk..



The northern region of the country, which includes mountainous and sloppy terrains of Himalayan region and the Indo-Gangetic plains, has unique social, ecological and political importance with diverse natural resources and agro-climates that supports over 100 million people and 38 million livestock. The extensive network of the Ganga-Yamuna river systems and abundant water resources of Himalayan States form the "water tower" and lifeline for people living far and wide.

Despite abundance of natural resources, the region has many sustainability problems owing to undulating terrains, excessive loss of soil and biodiversity, nutrients deficiency, climatic constraints, frequent natural calamities and prevailing over-exploitation of resources affecting large population. Most recently during mid-June 2013, the region, particularly Uttarakhand, experienced an unperceived havoc due to rainfall extremes that caused disastrous flash floods and landslides affecting human lives, animals, farm lands, and aquatic resources. The disaster left Uttarakhand and the country in a state of great shock.

Such tragedies remind us as stakeholders of all levels in the country that our natural resources need to be managed properly for their existence. A dovetailed top-down and bottom-up approach needs to be essentially followed to address all the concerned issues for mitigating the occurrence of any such tragic event in the future. All stakeholders need to be simultaneously engaged for achieving this objective. A small step in this direction has been taken by CSWCRTI, especially concerning grass root level stakeholders i.e. our farmers who face major brunt of such tragedies as they lose their livelihoods as well as lives. The CSWCRTI in collaboration with Indian Association of Soil & Water Conservationists organized a conference, Farmers First for Conserving Soil and Water Resources in Northern Region (FFCSWR-2014), during March 22-24, 2014, which is a part of series of conferences being organized in different regions of the country by the two organizations. These conferences provide a suitable platform for farmers to share their experiences about tackling natural resource management problems with other farmers and government organizations, and express their concerns to researchers, policy makers and administrators, besides enfoldng farmers into NRM efforts.

The thin layer of topsoil that covers the planet's land surface is the foundation of all civilizations. The significance of soil to human wellbeing and cultural enrichment is glorified in ancient Indian scriptures dating back to the dawn of civilization. Natural and anthropogenic activities have taken a heavy toll on the soil resources. The need to raise awareness and understanding of the importance of soil and soil functions, both in urban and rural environments, is being documented increasingly as a critical step in the protection and sustainable use of soils both in India and globally. Therefore, increasing everybody's awareness about soil through knowledge is the first rational step to allow society as a whole to understand and appreciate soil and its importance. For imbibing the spirit of conservation of soil at all levels, a pledge was taken at the conference by all concerned for conservation of our precious soil resources: "I pledge to intensify our endeavours to protect and improve soil resources that surround us in order to restore and maintain a sound ecological balance in land, air, and water. I commit myself to promoting public awareness and education on the **Save Soil Campaign** as well as the public reporting of the environmental impact of various activities being taking place on the thin layer of soil. I believe it is our responsibility to take care of soil and land resources so that it remains available in good condition to my children and grand children (for generations). I also pledge to continue promoting the benefits of soil conservation for the sake of human's well being."

We at CSWCRTI have also taken this pledge to continue putting in our best efforts to save soil from degradation for sustenance of mankind and all life forms that live on it.

P.K. Mishra



## New Initiatives

### ISO 9001:2008 Certificate Awarded to CSWCRTI



The CSWCRTI has been awarded the ISO 9001:2008 Certificate which is provided for implementation of quality management system from the Certification Body. The certificate has been awarded for the continual improvement and growth of CSWCRTI, Dehradun. The certificate is applicable for services and products for CSWCRTI, Dehradun. The certificate is applicable for services and products for CSWCRTI, Dehradun. The certificate is applicable for services and products for CSWCRTI, Dehradun. The certificate is applicable for services and products for CSWCRTI, Dehradun.

### Revised Training on Natural Resource Conservation at CSWCRTI

Inauguration of revised regular long term certificate course on soil and water conservation and watershed management for State government's soil conservation officers, agriculture officers etc. was held at the CSWCRTI, Dehradun on October 9, 2013. Dr. I.P. Abrol, Former Deputy Director General (ICAR), New Delhi spoke on the importance of training, feedback mechanisms between researchers-field functionaries-farmers and innate abilities of farmers in achieving soil and water conservation action, maintenance of soil organic carbon, in-situ moisture conservation, residue management, nutrients recycling and productivity improvement. He requested both trainees and faculty to be interactive to learn about field problems and the farmers' needs so as to strengthen the links between research-extension-farmers/end-users, which are presently weak throughout the country. Dr. Abrol emphasized that unless resource conservation is addressed and achieved, productivity enhancement may not be a reality. He called for the location specific, farmer specific and resource specific conservation and production technologies. The function was attended by 22 trainees from 8 States across the



country, viz., Assam (1), Kerala (4), Jammu & Kashmir (2), Nagaland (4), Meghalaya (5), Madhya Pradesh (2), Andaman & Nicobar Islands (2), and Uttarakhand (2) of the 1st batch of 4 months (originally 109<sup>th</sup> batch) new course along with Scientists of CSWCRTI and Indian Institute of Remote Sensing (Dehradun), officers of various State and Central Government departments such as agriculture, soil conservation etc.

Earlier, Dr. P.K. Mishra, Director, CSWCRTI introduced features of the new course that has been evolved through the series of exchange programmes using interactive seminars, meetings, web-enabled interactions and postal communications between experts, field functionaries, administrators and policy makers from across the country over a year. He informed that time span of the training has been reduced to 4 months instead of 5½ months previously without compromising the quality and vigour of the course, in which the content of the course has been expended to include all possible components of soil-water conservation, resource conservation and livelihood options. Dr. Mishra spelt out the benefits of the new course of shorter duration, particularly at a time when work pressures mount in the parent departments of the trainees due to reducing manpower and increasing work load, which is common in many State Governments.

Shri M. Limameren, Project Director, Department of Soil and Water Conservation, Nagaland and Dr. Parma Ram, Joint Director, Agriculture, Uttarakhand also attended and spoke on the scope and importance of the course in light of prevailing soil and water conservation related problems in their States. Shri Limameren, an alumnus of this course, vividly remembered his stay as a trainee in 1983 at CSWCRTI and the benefits he drew subsequently to mould his carrier and benefit farmers. He went on to request the trainee participants, who are officers from different State Governments, to be disciplined and focused in the proceedings of the course and cooperate with the faculty members for the interactive sessions that would benefit them immensely. A book of details on modules of the training was released on the occasion.

The 22 trainees from different states and from different departments/disciplines (Engineering-1, Agriculture-20 and Forestry-1) that undertook the course during October 9, 2013 to February 8, 2014 were awarded certificates on successful completion of their training in a valedictory function organized on February 7, 2014. During valedictory function, merit certificates of



different disciplines were also awarded to the meritorious trainees. Shri Enboklang Kharkrang of Meghalaya was adjudged the Best Trainee.

### Seminar on Carbon Dynamics of Soil Erosion Held

A seminar on carbon dynamics of soil erosion and deposits was organised by CSWCRTI in association with Indian Association of Soil and Water Conservationists (IASWC) on October 15, 2013 at CSWCRTI, Dehradun. World famous expert Prof. Dr. Timothy A. Quine, Associate Dean, College of Life and Environmental Sciences, University of Exeter, United Kingdom spoke on the topic "The carbon dynamics of soil erosion and deposition: insights from the interface between geomorphology and soil science". He explained that soil erosion affects the global carbon cycle, which influences global climate change greatly. Dr Quine narrated the fate of carbon during the soil erosion processes, drawing relationships between erosion, soil deposition and carbon burial. During the discussion, Dr. Quine informed that carbon sequestration is associated with accelerated storage of soil organic carbon (SOC) in 'young' eroded soils and burial of SOC below the depths at which microbial activity is highest. The SOC lost due to erosion is not totally lost, but about 26% is sequestered in deep soils, he informed. The seminar reminded that if we can arrest soil erosion through suitable management measures, the impacts of erosion can be minimised in addition to the possible quantum of eroded carbon being buried in deep soil deposits, particularly in floodplains and wetlands for the benefit of mankind. All the scientific staff attended the Seminar and discussed the issues of soil erosion-deposition-carbon fluxes.



### Special Course on Watershed Management Organized at IIRS

A special course on "Geospatial Technologies for Watershed Management", sponsored by CSWCRTI, was organised at Indian Institute of Remote Sensing (IIRS), Dehradun during December 16-27, 2013. Sixteen participants from CSWCRTI participated. During the training period, a field visit was also conducted to Mussoorie for ground truthing of satellite data. The lectures were delivered by renowned faculty, including Dr. Y.V.N. Krishna Murthy, Director, IIRS. In the Valedictory Function at IIRS, Dr. P.K. Mishra, Director, CSWCRTI, emphasised on the need of RS&GIS in Watershed Planning.



### Training on SAS Organized

A six-days training programme on statistical software SAS entitled "Researcher's Training-X on Data Analysis Using SAS" for scientists and staff of CSWCRTI was organized by CSWCRTI, Dehradun in collaboration with Indian Veterinary Research Institute (IVRI), Izatnagar at CSWCRTI, Dehradun during February 3-8, 2014 under the Consortia Project of the National Agricultural Innovation Project (NAIP) aimed at "Strengthening Statistical Computing for NARS". The faculty members of the course from IVRI introduced various statistical and analytical tools and techniques of SAS for better analysis and interpretation of the collected information. The course covered various designs of experiments, basic statistics, enterprise guide and other software details of SAS including various syntax and formulae. A total of 21 scientists and technical officers of CSWCRTI, Dehradun and its six Research Centres located across the country participated in the programme. The participants expressed usefulness of the training and the knowledge gained in their feedback on the programme.



### New Consultancy / Projects Initiated

- Study on hydrological profile, aspect and impact of river bed material (RBM) extraction on the hydrological profile of river Sharda (Tanakpur) during 2013-14 under the jurisdiction of Divisional Forest Officer, Haldwani Forest Division, Haldwani (Uttarakhand) was initiated by CSWCRTI, Dehradun.
- Assessment of sedimentary deposit for extraction of river bed material (RBM) from Malan and Sukhrao under the jurisdiction of Divisional Marketing Manager, Uttarakhand Forest



Development Corporation (UFDC), Kotdwara, District Pauri Garhwal (Uttarakhand) was initiated by CSWCRTI, Dehradun.

- MoU for consultancy project on estimation of permissible limit of minor mineral extraction in six rivers of Uttarakhand for a total amount of Rs.11,70,800 was signed with UFDC, Dehradun and work initiated by CSWCRTI, Dehradun.
- MoU for consultancy project on river training works in Song and Jakhan rivers of District Dehradun (Uttarakhand) for a total amount of Rs.1,12,360 was signed with Divisional Forest Officer, Dehradun Forest Division, Dehradun and work initiated by CSWCRTI, Dehradun.
- New projects were initiated under Tribal Sub Plan in three villages, Challanput, Patraput and Mukhibidei of Semiliguda block, Koraput, Odisha by CSWCRTI-RC, Koraput.
- Three consultancy projects, namely (a) Development of water management strategy and action plan under the Tamil Nadu biodiversity conservation and greening project in Gudalur Forest Division of the Nilgiris, (b) Development of water management strategy and action plan under the Tamil Nadu biodiversity conservation and greening project in North Division, Ooty, and (c) Development of water management strategy and action plan under the Tamil Nadu biodiversity conservation and greening project in South Division, Ooty were initiated during October 2013 by CSWCRTI-RC, Udhagamandalam.
- For preliminary discussion and field visit for a proposed consultancy project on Planning of Catchment Area Treatment of Durgawati Reservoir, sponsored by Bihar Forest Department, Patna, a team comprising of the five scientists of CSWCRTI, Dehradun visited Durgawati reservoir catchment area in Kaimur Wild Life Sanctuary during January 7-11, 2014.

## Important Events

### Farmers First Conference for Northern Region Organized

In response to the precarious agricultural & farmers' situation and continuing resource degradation in most parts of the country due to various causes and negligence, the Indian Association of Soil & Water Conservationists (IASWC) and Central Soil and Water Conservation (CSWCRTI, ICAR), Dehradun jointly organized the conference, Farmers First for Conserving Soil and Water Resources in Northern Region (FFCSWR-2014), during March 22-24, 2014. The



conference is a part of series of conferences organized by IASWC and CSWCRTI with the multi-sectoral approach on region wise conservation thrusts in line with one of the flagship focuses of the ICAR, "Farmers First". The first of its kind conference series in India will help to understand the ground realities, impact of scientific & technological innovations in natural resource management (NRM) and sensitize researchers, policy makers and administrators besides enrolling farmers into NRM efforts. This conference addressed, soil & water conservation, integrated watershed management, conservation farming, integrated farming systems, etc. with the focus on issues and experiences of innovative farmers from 5 States of Northern India (Haryana, Punjab, Himachal Pradesh, Uttarakhand and Jammu and Kashmir), besides NCR of Delhi and UT of Chandigarh.

The conference was inaugurated on March 22, 2014 by the Chief Guest Dr. J.S. Samra, Chief Executive Officer, National Rainfed Area Authority (NRAA), New Delhi. In his inaugural address, Dr. Samra called for the revision of interventions as per the needs of time, changing climate and socio-economic set ups. On the occasion, Dr. Samra delivered Dr. K.G. Tejwani Memorial Lecture. Dr. A.K. Sikka, Deputy Director General (Natural Resource Management), ICAR, New Delhi and Dr. Madhumita Mukherjee, Executive Director, National Fisheries Development Board (NFDB), Hyderabad were the Guests of Honour during the inaugural function. Dr. Sikka called for the integration of many possible sub-sectors into watershed management programs and rural development. Dr. Mukherjee called for introduction of fisheries interventions in watershed management programs and emphasised the need of climate resilient fisheries technologies and development of market facilities for fisheries products in the region. The Chief Guest conferred exemplary awards to eminent agricultural scientists.

Earlier, Dr. P.K. Mishra, Director, CSWCRTI welcomed the participants and briefed the core programs of the conference. He also spoke on the importance of farmers' innovations and initiatives in developing newer technologies and promoting the adoption of developed technologies. The conference was attended by over 200 participants including 60 innovative farmers. State and Central government agencies, renowned scientists and technocrats, experts from Krishi Vikas Kendra (KVKs) and NGOs, various Central and State agencies like National Rainfed Area Authority (NRAA), New Delhi; Indian Council of Agricultural Research (ICAR); National Fisheries Development Board (NFDB), Hyderabad; National Biodiversity Authority (NBA), Chennai; NABARD, Mumbai; Science and Engineering Research Board (SERB) of DST, New Delhi; and Department of Land Resources (DoLR), Ministry of Rural Development, New Delhi took part in the conference.

The Chief Guest of Valedictory Function of the conference on March 24, 2014, Dr. R.S. Tolia, Former Chief Secretary, Govt of Uttarakhand and Chief Information Commissioner, Uttarakhand addressed the participants and awarded the innovative farmers. He pleaded for the unified efforts of various governmental agencies and functionaries to maximise delivery from different schemes meant for the benefit of farmers. Dr. Matthew Prasad, Vice Chancellor, Uttarakhand University of Horticulture and



Forestry (UHF), Bharsar; Dr. S.K. Chaudhary, Assistant Director General (Soil & Water Management), ICAR, New Delhi; and Dr. Anil Prakash Joshi, Chairman, Himalayan Environmental Studies and Conservation Organization (HESCO), Dehradun were Guests of Honour. They addressed the participants during the concluding session to consolidate the outcome of the conference. Shri M.J. Sharma, Director, Department of Soil Conservation, Jammu & Kashmir; Dr. J.C. Bhatt, Director, Vivekananda Parvatiya Krishi Anusandhan Sansthan (VPKAS), Almora; Dr. Madhumitha Mukherjee, Executive Director, NFDB, Hyderabad; and Dr. V.C. Goyal, Head, National Institute of Hydrology (NIH), Roorkee addressed the participants on soil water conservation, watershed management and livelihood options including fish production in available water resources. In the concluding session, the dignitaries and participants pledged for conservation of soil under the “Save Soil Campaign” launched by the organizers.

Various recommendations on researchable issues, policy needs and extension efforts emerged from the discussion, which will be further refined by the organisers for the end users. Networking of farmers and creation of farmer associations, Field Farm Schools in modern villages, adoption of modern tools and techniques, refinement of indigenous knowledge, multiple use of water, integration of farming components etc. were identified as requirements. It was also recommended that policies should be different for hills and plains as per the specificity of resources, topography, and farmers' capacity.

### Workshop for Delineation and Characterization of Ravines Organized

A brain storming workshop was organised during January 6-8, 2014 at CSWCRTI-RC, Kota on “Developing a Methodological Framework for Delineation and Characterization of Chambal and Yamuna Ravines”. The workshop was inaugurated by Dr. Z.S. Solanki, Vice-Chancellor, Agricultural University, Kota. Scientist representatives from ISRO; NBSS&LUP Research Centre, Udaipur; CTAE (MPUA&T), Udaipur; DST, Agricultural University, Kota; and CSWCRTI-RCs Kota, Vasad and Agra participated in the workshop. An immediate need of taking this kind of project was expressed by participants for monitoring, delineation and characterization of ravine lands, which is pre-requisite for developing an efficient policy for scientific and sustainable productive utilization of these highly fragile lands.



Dr. R.S. Kurothe, Head, CSWCRTI-RC, Vasad emphasised the need for taking up innovative and cutting edge research. He stressed upon the need of consortium approach to share facilities, data and intellectual manpower for optimal use of investment by avoiding expenditure on repetitive items. Dr. Z.S. Solanki, reiterated the important role played by the different organizations for estimation, monitoring and optimum utilization in these natural treasures. Dr. G.L. Meena, Scientist (Soils) and Project Leader, CSWCRTI-RC, Kota made a brief presentation on the outline of the project and highlighted the real time need to develop a methodology by which the actual area of ravines can be estimated with the least cost in a practical timeframe. Dr. R.S. Singh, Head, NBSSLUP-RC, Udaipur made a presentation about ravine delineation using visual interpretation of remote sensing data integrated with soil and land features. Dr. A.T. Jayseelan, General Manager, RRSC-West, Jodhpur appraised about the data and maps generated along with methodology used by NRSC and RRSC for degraded lands including ravines. Dr. Gopal Kumar, Scientist (Soils), CSWCRTI-RC, Vasad made a presentation on experience with Mahi ravine delineation and characterization using free resources, mainly Google Earth. Dr. Suparn Pathak presented the scenario of satellite based mapping and also highlighted the potential of future satellites in the programme of ISRO. Dr. G.P. Juyal, Head (H&E), CSWCRTI, Dehradun emphasised on generating the kind of data sets and maps that have acceptability among policy maker. Instead of actual degraded land, vulnerable areas possessing high risk of degradation should also find a place in delineation if possible. Natural resources are too precious for population dense country like India and efforts should be made to restrict damage by proper risk zone mapping. Dr. P.R. Ojasvi, Principal Scientist, CSWCRTI, Dehradun emphasized the need of characterization of ravine.

After detailed discussion and inputs from the participants, the NRSC (RRSC-West), Jodhpur; NBSS&LUP, RC-Udaipur; and MPUA&T, Udaipur showed their willingness to be part of the collaborative project. The duration for the proposed project was revised to 2014-15 to 2017-18. The objectives were refined as (a) Develop a cost effective methodological framework for delineation and characterization of ravines (b) Identify, delineate and characterize Chambal and Yamuna ravines, and (c) Determine the change in status of gullied area at bench mark sites.

## Foundation Days Celebrated

The 59<sup>th</sup> Foundation Day of the CSWCRTI-RC, Udhagamandalam was celebrated on October 21, 2014 with a call to bridge gap between recommendations of scientific community on conserving soil and water and prevention of natural calamities like landslips. Shri Srinivas R. Reddy, Project Director, Hill Area Development Programme (HADP) as the Chief Guest lamented that despite repeated warnings, constructions are ongoing at non-recommended locations, particularly steep slopes. He urged people to learn from the wisdom of natives of the Nilgiris who had created hatti (Badaga hamlets) and mund (Toda hamlets) on flat surfaces. He stated that the ecology of the district can be protected with concerted efforts and landslides can be prevented by taking precautions. Dr. O.P.S. Kholia, Head, CSWCRTI-RC, Udhagamandalam who presided over the celebrations, said that beneficiaries of research activities should be aware of not only their rights but also their responsibilities. Pointing out that landslides were a major problem in The Nilgiris, he said that observations and recommendation of scientists should be respected. The function was also graced by Shri B. Suhintharaj Koilpillai, District Forest Officer, The Nilgiris North and Ms. S. Kavitha, Project Director, District Rural Development Agency (DRDA), and Shri R. Raja, Executive Engineer, Department of Agricultural Engineering. Release of Hand Book on Soil Conservation and an exhibition formed part of the celebrations.



The 59<sup>th</sup> Foundation Day of the CSWCRTI-RC, Kota was also celebrated, on October 19, 2013. Eighty serving and retired employees of the Centre with their families participated in the celebration. Mrs. Verma, wife of late Shri Balvir Verma (former Head of the Centre) presided over the function. Dr. R.M. Singhal, former Deputy Director General (Research), ICFRE, Dehradun was the Guest of Honour. Dr. R.M. Singhal had received training in soil and water conservation at the CSWCRTI-RC, Kota during 1960s. He recalled his association with the Centre and the high quality of training programme conducted during those days. Several other retired persons shared their experiences and remembered their activities during their service at the Centre.

## Farm Innovators Day Celebrated

Keeping in view the overwhelming influence of farmers in Indian socio-economic context, Farm Innovators Day was organized at CSWCRTI-RCs Chandigarh, Kota, Udhagamandalam and Vasad on February 28, 2014 and at CSWCRTI-RC, Datia on March 03, 2014. The programme aims to provide a platform for interaction among various stakeholders of soil and water conservation and livelihood support systems in watershed management and share the innovative ideas and experiences of innovative farmers with other farmers, scientists and extension functionaries. The objective of the programmes was to honour deserving hard working farmers who contributed to the development of agriculture through adoption and dissemination of modern agricultural technologies. The programmes also focused on showcasing different modern technologies developed by the Centres, over the years.

CSWCRTI-RC Chandigarh celebrated the day at its Research Farm. A formal welcome of farmers and the Chief Guest was given by Dr. A.K. Tiwari, Head of the Centre. A film was presented on the research activities of the Centre. Different technologies developed by the Centre for increasing crop production from degraded lands were discussed with the farmers. The most outstanding technologies developed by the Centre over the years were shown and discussed by the scientists. Chief Guest, Dr. Tarlochan Singh, a progressive farmer of the region shared his experiences and views in the event. He emphasised the need for adoption of innovative agricultural technologies and also enlightened the farmers about the scientific practices of natural farming and organic farming that he adopted in his own farm. Farm Innovators Awards were



distributed among 5 farmers from different villages, for showing remarkable attitude in adoption and dissemination of modern agricultural technologies and practices.

The Farm Innovators Day was celebrated at CSWCRTI-RC, Udhagamandalam within the premises of the Centre. Five innovative farmers in soil and water conservation were selected from the Nilgiris, Erode and Coimbatore districts and presented "The CSWCRTI Awards for Innovative Farmers in Soil and Water Conservation 2014". About 50 farmers participated in the programme from various parts of Nilgiris, Coimbatore and Erode districts. Officials from United Plantation Association of South India (UPASI), Horticulture Department, and Sericulture Department participated in the function. Exhibition was arranged with the technologies of Udhagamandalam Centre and agro-input dealers. Shri Srinvas R. Reddy, IFS, Project Director, Hill Area Development Programme (HADP), Government of Tamil Nadu was the Guest of Honour. He motivated the farmers to utilize the new technologies emerging from the Centre for improving their standard of living. Dr. P. Kumaravadivelu, Project Coordinator, Sri Avinashilingam KVK, Karamadai, Coimbatore was another Guest of Honour who insisted that the farmers should keep the soil as live material. The Chief Guest, Dr. S. Balaji, IFS, Managing Director, TANTEA, Coonor congratulated the five farmers who won the awards. He stated that along with crop cultivation farmers should include animal components. For conservation of natural resources and generation of high remunerations, farmers should follow integrated farming system approach. He also insisted that the farmers need to select the new technologies and use them in their farms.

CSWCRTI-RC Kota organized the Farm Innovators Day at Badakhera watershed in Bundi district. The programme was inaugurated by Dr. N.L. Meena, Associate Professor, KVK, Bundi (MPUAT, Udaipur). About 168 leading, progressive and innovative farmers, Panchayat Sarpanch / Members participated in the meeting. The farmers who are implementing innovative technologies on soil and water conservation and livelihood support systems in watershed management were selected as Innovator Farmers in the region. Three farmers were awarded with the Farm Innovators Prize - 2014 for their innovative approach on field. They shared their success stories with other farmers who participated in the meeting.

The Farm Innovators Day was organized by CSWCRTI-RC, Vasad at its Research Farm. Dr. R.S. Kurothe, Head of the Centre welcomed



all the participants and farmers at this occasion. He addressed the gathering of farmers and motivated them to show their own generated agricultural know how, techniques and implements etc. to other farmers for their benefits. Importance of traditional wisdom of farmers in developing agricultural practices and their use and documentation by different organizations in the Gujarat state and in the country was explained to the farmers. Four farmers were awarded certificates and mementoes for their innovativeness in developing own practices or techniques in agricultural development in their fields.

The Farm Innovators Day celebrated at CSWCRTI-RC, Datia was inaugurated by Shri D.R. Rajput, Deputy Director (Agriculture), Datia along with Shri S.K. Tiwari, Assistant Director, Horticulture and Dr. R.K.S. Tomar, Co-coordinator, KVK, Datia. More than 80 participants, viz. officials / field workers from State Agricultural Departments, KVK, NGOs and progressive farmers of the district participated in the function. SWC technologies suitable for the region were explained to the participants through field visit, powerpoint presentation and documentary film show for their wider publicity and adoption by different stake holders.

### Scientist Field Experience Training Conducted

Six probation scientists were deputed from National Academy of Agricultural Research Management (NAARM), Hyderabad for undergoing 21-days Field Experience Training (FET) from February 22 to March 15, 2014 at CSWCRTI-RC, Bellary. Scientists of the Centre conducted their field data collection and problem identification exercise works at Joladarasi watershed area. A Village Seminar was organized by the probation Scientists at village Joladarasi, an adopted and developed village of the watershed. The scientists also visited various agriculture based industries and



Line Departments such as Rice Bran Oil Production Unit, Fishery Department, State Seed Corporation, Pesticide Testing Lab and other model watersheds, namely Ramasagara and Nethranahalli, developed by the Centre in Taluk Molakalmuru, District Chitradurga.

### World Congress on Agroforestry Delegates' Field Visits Conducted

Two field visits of delegates of World Congress on Agroforestry-2014 were organized at CSWCRTI-RC, Agra. In the first visit



organized on February 14, 2014, thirty-two delegates belonging to ten countries, including Australia, Malaysia, Indonesia, Mali, West Africa, Thailand, China, Vietnam, Kenya and India, undertook the field trip. In the second visit on February 17, 2014, eight delegates from African-Asian Rural Development Organization (AARDO) visited. The programme was sponsored by AARDO and funded by Ministry of Rural Development, Govt. of India. Delegates visited the museum and a film of on-going activities was also screened. They were briefed on Centre's pioneering work on management of degraded soils.

### Farmers' Field Days Organized

A Farmers Field Day was organised alongwith kisan-gosthi by CSWCRTI-RC, Agra at Etmadpur Watershed under Transfer of Technology (ToT) Program on February 21, 2014. Seven demonstrations of mustard and four of wheat crop were conducted on farmers' fields of Garapur, Katra, Chhirwari, Surehra and Yadavnagar villages. Scientists of the Centre and farmers visited the fields and discussed all related problems of the fields at sight. Detailed agronomic practices were discussed and farmers were sensitized for various in-situ moisture conservation practices and rain water harvesting. All the technical staff of the centre participated in the program. About 78 farmers participated. Gosthi was concluded with a talk by Dr. S.K. Dubey, Head of Centre in which he asked the farmers to adopt all the technologies developed and demonstrated in their fields and come forward for further linkages related to ravine development in watershed.

A Farmers Field Day on Bamboo Based Interventions for Reclamation and Productive Utilization of Degraded Ravine Lands was organised by CSWCRTI-RC, Vasad on February 28, 2014. Farmers and members of Tree Growers Cooperative Societies (TGCS) from various villages (Khorwad, Navapura, Mandhavapura and Sarnal) participated. Official of Anand Based NGO-Foundation



for Ecological Security (FES) also participated. The farmers and TGCS members visited various bamboo based interventions on Centre's Research Farm. They discussed and got exposed to various bamboo based interventions.

### Agriculture Education Day Celebrated

The Agriculture Education Day was observed for promoting the spirit of agriculture and allied subjects among school children at CSWCRTI, Dehradun on October 22, 2013, at CSWCRTI-RC, Kota and Vasad on October 17, 2013, and Chandigarh on October 21, 2013. The purpose of these celebrations was to generate awareness about the significance of agricultural education through different events like quiz contest, debate and painting competition related to agriculture and allied subjects. At Dehradun, 74 students and three teachers from Kendriya Vidyalaya, ONGC and Indian Military Academy participated. Dr. P.K. Mishra, Director, CSWCRTI highlighted the importance of agriculture education with examples of natural resource management, water harvesting, water use efficiency for achieving sustainability in agriculture and meeting the growing food demand of teeming population of this country. Dr. R.C. Jakhmola, Dr. G.P. Juyal, Dr. O.P. Chaturvedi and Dr. N.K. Sharma, Heads of Divisions, CSWCRTI spoke on various avenues of agriculture education and numerous job opportunities that are available in this country and abroad. On this occasion participants were exposed to various land degradation processes and their mitigation measures through a documentary film show and a visit to the Institute Museum. On this occasion, the 4<sup>th</sup> issue of CSWCRTI Newsletter was also released.



The CSWCRTI-RC, Chandigarh celebrated Agriculture Education Day at the Research Farm. About 50 students from local schools led by their concerned teachers enthusiastically participated in the day-long programmes, and vowed to create awareness about agricultural education among their fellow students. Students of each participating school expressed his/her views on 'Role of agriculture in Indian economy' in a Declamation Contest. Students also participated enthusiastically in painting competition on "Agriculture and Environment." Different activities being carried out at the Research Farm were shown to the students. The students interacted with the scientists while visiting the Museum, research fields and Meteorological Observatory. Dr. R.K. Aggarwal, Former Head of Centre, was the Chief Guest of the event. In his address, he highlighted the importance of agriculture in Indian economy and role of agricultural education in improving the livelihood security in Indian context. Dr. A. K. Tiwari, Head of Center focused on role of agriculture in present economic scenario vis-a-vis sustainable development of the country. He also addressed the participants on the 'Importance of Agricultural Education for New





Generations'. Stories of successful soil and water conservation projects carried out by the centre in Shivalik region were highlighted through films and posters.

The Agricultural Education Day was inaugurated at CSWCRTI-RC, Vasad with address by Dr. R.S. Kurothe, Head of Centre who highlighted Indian Agricultural overview to the participating children and explained importance of agriculture in their life. A documentary film was screened to show different soil and water conservation projects undertaken and various soil and water conservation technologies developed at the Centre. Lectures on engineering and forestry technologies for soil and water conservation, impact of foreign direct investment on Indian agriculture, and importance of soil and water conservation for food security were delivered by the scientists. Emphasis was laid on ravine reclamation for their productive utilization in Gujarat. Career opportunities in agriculture education were explained and students were motivated to take up agriculture as a career. At CSWCRTI-RC, Kota, Agriculture Education Day was celebrated with 70 students from Jawahar Lal Nehru Govt. Senior Secondary School, Dadwara, Kota. Students were made aware of the importance of Agriculture and Agricultural Educations in India by Dr. R. K. Singh, Head of Centre. Career prospects in Agricultural Sector were spelt out to the students.



### International Trade Fair - Participated

CSWCRTI, Dehradun participated in the "Northern Indian International Trade Fair-2013" at Parade Ground, Dehradun during December 2-8, 2013 organised by India International Trade Event Organisation, New Delhi. The CSWCRTI Stall exhibited soil and

water conservation technologies developed by the Institute. During the event, thousands of visitors visited the stall and acquainted themselves with these latest techniques / technologies. Efforts made by CSWCRTI were appreciated by the visitors as well as the organizers of the Fair.



### Examinations Conducted

- Online NET examination-2014 (I) of ASRB, New Delhi was successfully initiated for the first time under supervision of Dr. D.R. Sena from March 26, 2014 onwards at Dehradun.
- ARS Examination-2013 of ASRB, New Delhi was successfully conducted under supervision of Dr. J.M.S. Tomar on December 27, 2013 at Dehradun.
- NET Examination-2013 of ASRB, New Delhi was successfully conducted under supervision of Dr. J.M.S. Tomar on October 27, 2013 at Dehradun.
- Examination for technical post (T-1, Field man) was successfully conducted under supervision of Dr. J.M.S. Tomar on October 20, 2013 at Dehradun.

### ICAR News/Reporter/Website Reporting

- "Agriculture Education Day"-ICAR Reporter, Oct.-Dec., 2013.
- "Productivity Potential of Bhimal" - ICAR News, October-December, 2013.
- "Farm Innovators Day Celebrated at CSWCRTI, RC, Udhagamandalam" - ICAR Website, February 28, 2014.
- "Agriculture Education Day Celebrated at CSWCRTI" - ICAR Website, October 22, 2013.
- "Revised Regular Four Months Training on Soil and Water Conservation and Watershed Management Begins at CSWCRTI" - ICAR Website, October 9, 2013.

### Awards and Recognitions

- Research Centre, Udhagamandalam: First Prize from Ooty Coonoor Town Official Language Implementation Committee for organizing Joint Programme on Hindi in the Nilgiris.
- Dr.S.K. Dubey, Head, Research Centre, Agra: Elected as Vice President of Indian Society Soil Salinity and Water Quality, Karnal.
- Dr. O.P.S. Khola, Head, Research Centre, Udhagamandalam: Awarded Fellowship of the Indian Association of Soil & Water Conservationists.
- Dr. Ambrish Kumar, Principal Scientist (Engg.), Dehradun: Conferred with Fellowship of the Indian Water Resources



Conserve Soil-Protect Nature

Society, Roorkee; Best Research Paper for 2013 published in *Indian Journal of Soil Conservation* (Vol. 41).

- Dr. S.L. Patil, Principal Scientist (Agronomy), Research Centre, Bellary: Awarded Fellowship of the Indian Association of Soil & Water Conservationists.
- Dr. A.K. Singh, Principal Scientist (SWCE), Research Centre, Agra: Elected as Executive Member for Agricultural Engineering Branch Institution of Engineers, Agra Chapter.
- Dr. Shakir Ali, Senior Scientist (H&E), Research Centre, Kota: Awarded Fellowship of the Institution of Engineers.
- Dr(s). Harsh Mehta, A.K. Singh, Shakir Ali and A.C. Rathore: Elected as Executive Member, Indian Association of Soil & Water Conservationists.
- Dr. B.K. Rao, Senior Scientist (Engg.), Research Centre, Vasad: Distinguished Services Award of Indian Society of Agricultural Engineers.
- Dr. S. Manivannan, Senior Scientist, Research Centre, Udhagamandalam: Best Paper Presentation Award in the International Conference on 'Extension Education Strategies for Sustainable Agricultural Development - A Global Perspective' at UAS, Bangalore.
- Dr. Sharmistha Pal, Scientist (Soils), Research Centre, Chandigarh: Awarded Postdoctoral Research Fellowship "Endeavour Australia Cheung Kong 2014" at University of Adelaide, Australia.
- Dr(s) P.K. Mishra, A.K. Tewari, N.K. Sharma, Pawan Sharma, S.L. Arya, R.P. Yadav, V.K. Bhatt, P. Bhattacharaya, P. Panwar, N.M. Alam, C. Jana: Best Poster Award in the ISTS-IUFRO Conference on Sustainable Resource Management for Climate Change Mitigation and Social Security at Chandigarh.
- Dr(s) Bankey Bihari, B.L. Dhyani, Charan Singh, Ambrish Tiwari, M. Muruganadam, D. Mandal and Suresh Kumar: Best Poster Award in the Conference on Farmers First for Conserving Soil and Water Resources in Northern Region (FFCSWR-2014) at Dehradun.

## Important Publications

### Research papers

- Alam, N.M., Mishra, P.K., Jana, C. and Adhikary, P.P. 2014. Stochastic model for drought forecasting for Bundelkhand region in Central India. *Indian Journal of Agricultural Sciences*, 84(2): 255-260.
- Arora, G., Chaturvedi, S., Kaushal, R., Nain, A., Tewari, S., Alam, N.M. and Chaturvedi, O.P. 2014. Growth, biomass, carbon stocks and sequestration in age series *Populus deltoides* plantations in tarai region of central Himalaya. *Turkish Journal of Agriculture and Forestry*, DOI: 10.3906/tar-1307-94.
- Bhattacharyya, R., Pandey, S.C., Bisht, J.K., Bhatt, J.C., Gupta, H.S., Tuti, M.D., Mahanta, D., Mina, B.L., Singh, R.D., Chandra, S., Srivastva, A.K. and Kundu, S. 2013. Tillage and irrigation effects on soil aggregation and carbon pools in the Indian sub-Himalayas. *Agronomy Journal*, 105: 101-112.
- Dutta, S. and Pal, S. 2014. Promises in direct conversion of cellulose and lignocellulosic biomass to chemicals and fuels: Combined solvent enanocatalysis approach for biorefinery. *Biomass and Bioenergy*, (<http://dx.doi.org/10.1016/j.biombioe.2013.12.019>).

- Goswami, S., Verma, K.S. and Kaushal, R. 2014. Biomass and carbon sequestration in different agroforestry systems of a Western Himalayan watershed. *Biological Agriculture and Horticulture*, 30(2): 88-96.
- Kumar, S., Raizada, A. and Biswas, H. 2014. Prioritizing development planning in the Indian semi-arid Deccan using sustainable livelihood security index approach. *International Journal of Sustainable Development & World Ecology*, DOI:10.1080/13504509.2014.886309.
- Mahanta, D., Bhattacharyya, R., Gopinath, K.A., Tuti, M.D., Mina, B.L., Pandey, B.M., Mishra, P.K., Bishta, J.K., Srivastva, A.K. and Bhatta, J.C. 2013. Influence of farmyard manure application and mineral fertilization on yield sustainability, carbon sequestration potential and soil property of gardenpea-French bean cropping system in the Indian Himalayas. *Scientia Horticulturae*, 164: 414-42.
- Mandal, D. and Sharda, V.N. 2013. Appraisal of soil erosion risk in the eastern Himalayan region of India for soil conservation planning. *Land Degradation and Development*, 24: 430-437. DOI: 10.1002/ldr.1139.
- Naik, B.S., Panda, R.K., Nayak, S.C., Sharma, S.D. and Sahu, A.P. 2013. Impact of pitcher material and salinity of water used on flow rate, wetting front advance, soil moisture and salt distribution in soil in pitcher irrigation - A laboratory study. *Irrigation and Drainage*, 62(5): 687-694.
- Pande, V.C., Kurothe, R.S., Sena, D.R. and Kumar, G. 2014. Cost of siltation in Sardar Sarovar reservoir: implications for catchment treatment. *Current Science*, 106(1): 35-39.
- Singh, Ramaneet and Ahlawat, I.P.S. 2014. Growth behaviour of transgenic cotton with peanut intercropping system using modified fertilization technique. *Proceedings of the National Academy of Sciences, India Section B: Biological Sciences*, 84(1): 19-30.
- Tomar, J.M.S., Das, A. and Arunachalam, A. 2013. Crop response and soil fertility as influenced by green leaves of indigenous agroforestry tree species in a lowland rice system in northeast India. *Agroforestry Systems*, 87:193-201.
- Verma, K.S., Kohli, S., Kaushal, R. and Chaturvedi, O.P. 2014. Root structure, distribution and biomass of five multipurpose tree species of western Himalayas. *Journal of Mountain Sciences*, 11(2): 519-525.

### Books

- Chaturvedi, O.P., Juyal, G.P., Sharma, N.K., Mandal, D., Muruganadam, M., Kaushal, R., Sharma, S.N. and Kumar, Nirmal. 2014. *Souvenir - Conference on "Farmers First for Conserving Soil and Water Resources in Northern Region" (FFCSWR-2014)*, March 22-24, 2014. Indian Association of Soil Conservationists, Dehradun. 148p.
- Chaturvedi, O.P., Juyal, G.P., Sharma, N.K., Mandal, D., Muruganadam, M., Sharma, S.N. and Kumar, Nirmal. 2014. *A Compendium of Abstract of Papers - Conference on "Farmers First for Conserving Soil and Water Resources in Northern Region (FFCSWR-2014)*. Indian Association of Soil Conservationists. 78p.
- Dadhwal, K.S., Panwar, P., Kaushal, R., Saralch, H.S. and Chauhan, R. 2014. *Practical Manual on Agroforestry*. Jaya Publishing House, N. Delhi-110006. 277p.

Raizada, A., Khola, O.P.S., Mishra, P.K., Manivannan, S., Loganandhan, N. and Mandal, D. 2014. *Farmer Innovations and Initiatives in Natural Resource Conservation in Southern Region*. Indian Association of Soil Conservationists, Dehradun, India. 107p.

Verma, K.S., Panwar, P., Kaushal, R., Chauhan, S., Chander, J. and Chandel, R. 2014. *Souvenir cum Abstracts of the ISTS-IUFRO Conference on Sustainable Resource Management for Climate Change Mitigation and Social Security*. Indian Society of Tree Scientists and International Union of Forestry Research Organizations. 172p.

### Copyrights of Books/Manuals

- Sharda, V.N., Sikka, A.K. and Juyal, G.P. 2006. Participatory Integrated Watershed Management: A Field Manual. (Copyright No.: L-57177/2014 dated January 17, 2014).
- Dhyani, S.K., Sharda, V.N., Juyal, G.P. 2007. Training Manual on Soil Conservation & Watershed Management, Vol. III: Conservation Forestry and Management. (Copyright No.: L-56835/2013 dated December 13, 2013).
- Sharda, V.N. and Mandal, Debashis. 2011. Priority Classes for Erosion Risk Areas in Different States and Regions of India. (Copyright No.: L-55643/2013 dated October 24, 2013).
- Dadhwal, K.S., Sharda, V.N., Chaturvedi, O.P., Mehta, Harsh. Mohin, A.N. and Kumar, Nirmal. 2012. Intellectual Property Assets of CSWCRTI (1999-2011). (Copyright No.: L-55606/2013 dated October 23, 2013).
- Sharda, V.N., Juyal, G.P., Prakash C. and Joshi, B.P. 2007. Training Manual on Soil Conservation & Watershed Management, Vol. II: Soil and Water Conservation Engineering. (Copyright No.: L-50537/2013 dated June 20, 2013).

### Radio/TV Talks

- Dr. S.P. Tiwari, Head, Research Centre, Datia on "Fasal Sangoshthi-2014" organized by Prashar Bharti, Door Darshan Kendra, Gwalior on March 25, 2014.
- Sh. H.R. Meena, Scientist (Horticulture), Research Centre, Kota delivered a radio talk for All India Radio, Kota on "Poly house me ageti sabjiyon ko kaise ugayen" on 05.12.2013.
- Dr. G.L. Meena, Scientist (Soil Science), Research Centre, Kota delivered a radio talk on "Genhu ki Phasal Mai Urvarko ka Santulit Prabandhan" at AIR, Kota on October 28, 2013.
- Dr. Kuldeep Kumar, Scientist (Agronomy), Research Centre, Kota delivered a radio talk on "Weed management in rabi crops" at AIR, Kota on December 14, 2013.
- Dr. (Ms.) P. Sundarambal delivered a radio talk on activities of CSWCRTI Research Centre, Udhagamandalam and Recommended Soil and Water Conservation Measures for the Nilgiris at AIR, Udhagamandalam on February 4, 2014.

### Distinguished Visitors

**Dehradun:** Dr. Timothy A. Quine, Associate Dean, University of Exeter, U.K.; Dr. J.S. Samra, CEO, NRAA, N. Delhi; Dr. A.K. Sikka, DDG (NRM), ICAR, N. Delhi; Dr. Madhumita Mukherjee, Executive Director, NFDB, Hyderabad; Dr. R.S. Tolia, Former

Chief Secretary, Govt of Uttarakhand and Chief Information Commissioner, Uttarakhand; Dr. Matthew Prasad, Vice Chancellor, Uttarakhand University of Horticulture and Forestry (UUHF), Bharsar; Dr. S.K. Chaudhary, ADG (Soil & Water Management), ICAR, N. Delhi; Dr. Anil Prakash Joshi, Chairman, HESCO, Dehradun; Sh. M.J. Sharma, Director, Department of Soil Conservation, J&K; Dr. J.C. Bhatt, Director, VPKAS, Almora; Dr. V.C. Goyal, Head, NIH, Roorkee; Dr. B Singh, Head, Livestock Economics and Statistics, IVRI, Izatnagar; Dr. Ramesh Chandra, Jt. Director, GBPUAT, Pantnagar; Sh. S. Chandra, DGM, Pardeep Phosphates; Dr. Ashish Pandey, IIT, Roorkee; Dr. S. Sridhara, Assoc. Prof. UAHS, Shimoga, Dr(s). G. Nagesha and D.R. Siddagangaiah, Agriculture College, Hassan, Karnataka; Dr(s). C.L. Thakur, Neeraj Rana, Vishal S. Rana, UHF, Solan.

**Agra:** Dr. M. Choudhary, Deputy Advisor, Agriculture Division, Planning Commission, N. Delhi; Thirty-two delegates from World Congress on Agroforestry-2014 representing Australia, Kenya, Malaysia, Mali, Thailand, China, Vietnam, Indonesia; Eight delegates from African-Asian Rural Development Organization (AARDO) member countries.

**Chandigarh:** Dr. P.S. Naik, Director, IIVR, Varanasi; Dr. K.K. Katoch, Director (Extn), CSKHPKV, Palampur University; Dr. S.P. Sharma, Director (Res.), CSKHPKV, Palampur; Dr. R.K. Singh, Director, NRCE Hissar; Dr. Bir Pal Singh, Director, CPRI, Shimla; Dr. J.S. Samra, CEO, NRAA, N. Delhi; Dr. S.C. Sharma, Director, PAU Research Station, Ballawal Saunkri (Punjab).

**Datia:** Shri Amar Singh, D.A.E.O. Badarwas, Shivpuri (MP); Dr. S.K. Rai, Principal Scientist & Course Coordinator, IGFR, Jhansi; Sh. Shailendra Bundela, Bureau Chief, Nai Duniya; Sh. Uttam Das, Asstt. Director (Agriculture), Tripura; Dr. Arun Kumar, SDAD, Hansi (Haryana); Dr. Prabhat Sharma, Asstt. Professor, RSKVV, Gwalior; Sh. Raghuvver Yadav, BTM, ATMA, Shivpuri (MP); Sh. Pramit Kumar Gupta, SMS, ATMA, Kolaras, Shivpuri (MP); Dr. Anwar, Pr. Scientist, National Sugarcane Research Institute, Lucknow; Dr R.K. Singh, Coordinator, KVK, Lucknow; Sh. R.C. Regar, Chief Manager, Agril. Development Branch, SBI, Datia; Mrs. Jyoti Bhargav, Leader, IWMP Bamori, Guna (MP); Sh. Salendra Dhakad, Project Manager, SKG Samiti, Morena (MP).

**Koraput:** Sh. Sachin R. Yadav, Collector & DM, Koraput; Sh. P.K. Mishra, Principal, VSV, Sunabeda; Sh. Raghuram Padal, Hon'ble MLA, Koraput; Sh. Vijay S. Sharma, Programme Manager, Bastar Jan Vikas Sanstha, Jagdalpur; Sh. Sudhansu Mishra, Manager, BTTL, Jeypore; Dr. S. Behara, PC, KVK, Semiliguda.

**Kota:** Dr. Z.S. Solanki, Vice Chancellor, Kota Agricultural University, Kota; Dr. S.S. Tomar, Director (Extension), Kota Agricultural University, Kota; Dr. P.K. Gupta, Director (Research), Kota Agricultural University, Kota; Dr. Pratap Singh, ADR, Kota Agricultural University, Kota; Dr. R.S. Singh, Head, NBPGR, Regional Station, Udaipur; Dr. Ranveer Singh, Head, IVRI, Bareilly; Dr. P. Sharma, Pr. Scientist, IGFR, Jhansi; Dr. M.M. Das, Pr. Scientist, IGFR, Jhansi; Dr. A.K. Goel, Pr. Scientist, CIRG, Mathura; Dr. S.K. Sharma, Pr. Scientist, CIRG, Mathura; Dr. R.B. Sharma, Pr. Scientist, CIRG, Mathura; Dr. R.V.S. Pawaiya, Pr. Scientist, CIRG, Mathura; Dr. T.P. Verma, Pr. Scientist, NBSS&LUP, Udaipur; Dr. (Mrs) Mamta Tiwari, ADR, Kota



University, Kota; Dr. S.K. Bera, Pr. Scientist, D.G.R., Junagarh; Dr. A.T. Jayseelan, G.M., R.R.S.E. (West), Jodhpur; Dr. S. Pathak, Scientist-F, R.R.S.E. (West), Jodhpur; Dr. G.L. Garg, Research Officer, DST, Kota.

**Udhagamandalam:** Mr. W. Osboane, United Kingdom; Sh. T. Pandiyan, Professor, TNAU, Coimbatore; Sh. Ramesh Kumar, IFS, Central Academy for State Forest Service, Coimbatore along with 38 Forest Range Officers; Sh. P. Sikarwar, Assistant Professor (SWE), JNKVV, Jabalpur; Dr. N. Kumar, College of Horticulture and Forestry, Passighat; Dr. H.N. Bhange, Assistant Professor (SWCE), College of Agricultural Engineering and Technology, Dapoli, Ratnagiri; Dr. P. Kamaraj, Assistant Professor, AEC&RI, Kumulur; Sh. S. Muraleedharan Pillai, Assistant Professor, Krishi Bhawan, Edappattu, Malappuram

### Foreign Visits

- Dr. P.K. Mishra, Director visited Cornell University, Ithaca, New York, USA to attend NAIP sponsored training in the area of Leadership/Management Development Program from February 23 - March 8, 2014.
- Dr. P.K. Mishra, Director and Dr. D.R. Sena, Pr. Scientist (SWCE) visited Institut fur Hydraulik und landeskulturelle Wasserwirtschaft, Vienna Austria under DST-BMWF (OeAD) collaborative project "Application of Dynamic Simulation Models to Establish Erosion-Productivity Relationships and Soil Organic Carbon Sequestration Potential for a Future Changing Climate" from November 23 - December 1, 2013.
- Dr. O.P. Chaturvedi, Head, Plant Science Division visited Melbourne and Canberra, Australia to attend 2<sup>nd</sup> India-Australia Joint Working group Meeting from November 21-25.
- Dr. Debashis Mandal, Sr. Scientist (Soil Science) visited Carbon Management and Sequestration Center, School of Environment and Natural Resource, Ohio State University, Ohio for carrying out short term research as visiting research scholar from September 23 - December 22, 2013.

### Workshops and Trainings Organized

- Conference on "Farmers First for Conserving Soil and Water Resources in Northern Region (FFCSWR-2014)" from March 22-24, 2014 at Dehradun.
- ISTS-IUFRO Conference on Sustainable Resource Management for Climate Change Mitigation and Social Security from March 13-14, 2014 at Research Centre, Chandigarh.
- Exposure visit of thirty-six students along with three faculty members of College of Agriculture, Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKVV), Tikamgarh (M.P.) on March 13, 2014 at Research Centre, Agra.
- Training on "Construction and Management of Bunds and Recharge Structures for Wells/ Tubewells" sponsored by Gramin Development Services (NGO), Lalitpur (UP) from March 4-7, 2014 at Research Centre, Datia.
- Short course training programme on "Agroforestry Farming System" sponsored by Director (NRM), Meghalaya Basin Development Authority (MBDA) from March 3-9, 2014 at Dehradun.

- Farmers' field day on "Bamboo Based Interventions for Reclamation and Productive Utilization of Degraded Ravine Lands" on February 28, 2014 at Research Centre, Vasad.
- Field visit of Officers Trainees of Uttar Pradesh Land Development Corporation (UPLDC), Government of Uttar Pradesh from February 28-March 2, 2014 at Research Centre, Agra.
- Twenty-one days Field Experience Training (FET) of six probation Scientists deputed from National Academy of Agricultural Research Management (NAARM), Hyderabad from February 22-March 15, 2014 at Research Centre, Bellary.
- Training on "Ravine Reclamation" from February 10-March 02, 2014 at Research Centre, Kota.
- Researcher's Training-X on "Data Analysis Using SAS" in collaboration with IVRI, Izatnagar from February 3-8, 2014 at Dehradun.
- Training-cum Exposure Visit on "Soil and Water Conservation and Watershed Management" sponsored by the Project Director, Watersheds, Deogarh, Odisha from February 3-8, 2014 at Dehradun.
- Eight weeks training on "Production Potential and Value Addition of Fruit Species in Kota Region" to student from Amity University, Noida, U.P. from January 27 - March 26, 2014 at Research Centre, Kota.
- Training-cum-Exposure Visit on "Soil and Water Conservation and Watershed Management" sponsored by Project Director, Watershed Development Mission, Sambalpur, Odisha from January 19-26, 2014 at Dehradun.
- Brain Storming Workshop on "Developing a Methodological Framework for Delineation and Characterization of Chambal and Yamuna Ravines from January 6-8, 2014 at Research Centre, Kota.
- Skill development programme on "Technologies for Management of Arable and Non-arable Lands" from December 20-22, 2013 at Research Centre, Kota.
- Short course on Soil and Water Conservation sponsored by ATMA, Jotwada, Rajasthan from December 16-21, 2013 at Dehradun.
- Short course on Soil and Water Conservation sponsored by Chief Agriculture Officer, Chamoli, Uttarakhand from December 9-11, 2013 at Dehradun.
- Institutional Training on "Soil and Water Conservation and Watershed Management" for B. Tech students from Agricultural Engineering College and Research Institute, Tamil Nadu Agricultural University, Coimbatore from Nov. 28, 2013 - Feb. 15, 2014 at Research Centre, Udhagamandalam.
- Institutional Training on "Soil and Water Conservation and Watershed Management" for B. Tech students from College of Agricultural Engineering, University of Agricultural Sciences, Raichur, Karnataka from November 6 - December 6, 2013 at Research Centre, Udhagamandalam.
- Short course on "Rabi Crop Management" organized from October 22-24, 2013 at Research Centre, Kota.
- Three days trainings (10 no.) organized for officers of Gujarat State Watershed Management Agency (GSWMA) at Research Centre, Vasad.

- Short course on “Soil Conservation and Watershed Management” sponsored by Additional Deputy Commissioner (Dev.), Faridkot, Punjab from November 19-23, 2013 at Dehradun.
- Trainings on “Integrated Watershed Management” for state government officials, WDT members from Himachal, Haryana and Punjab at Research Centre, Chandigarh.
- Trainings on “Improved Soil Water Conservation Technologies and Crop Production” sponsored by ATMA, Shivpuri, M.P. at Research Centre, Datia.
- Trainings on “Integrated Watershed Management” (3 no.) sponsored by District Watershed Development Agency (DWDA), Ramanathapuram, Tamil Nadu for WDT members and farmers at Research Centre, Udthagamandalam.

### **Workshops/Meetings/Trainings Attended**

- Conference on Farmers First for Conserving Soil and Water Resources in Northern Region (FFCSWR-2014) at Dehradun (March 22-24, 2014): 70 Scientists, CTO, ACTO, STO and TO.
- ISTS-IUFRO Conference on Sustainable Resource Management for Climate Change Mitigation and Social Security at Chandigarh (March 13-14, 2014): Dr(s). A.K. Tiwari, Pawan Sharma, S.L. Arya, Ram Prasad, P. Panwar, Sharmistha Pal, V.C. Pande, R. Kaushal, Rajkumar.
- Training on Construction and Management of Field Bunds and Recharging Wells/Tube Wells sponsored by GDS, Lalitpur, U.P. (March 4-7, 2014): Dr. Dev Narayan.
- Short course training on Assessment of Soil Carbon Pools and their Significance to Carbon Sequestration in Soils at Punjab Agricultural University, Ludhiana (February 26 - March 4, 2014): Er. S. Patra.
- Meeting of ATMA as Member Governing Board at Datia (March 4, 2014): Dr. S.P. Tiwari.
- Regional workshop on Water Resources Conservation: Village Ponds and Lakes organized by CSE National Key Resource Centre (February 25-26, 2014): Dr(s). V.K. Bhatt, Shakir Ali.
- Training on Commercial Farm Forestry as Resource Person at HAU, Hissar (February 24-27, 2014): Dr. Charan Singh.
- National Conference and Exhibition on Divine Medicinal Plants, Plants Based Medicinal Products, Panchgavya and their Role in Integrated Rural Development at Vigyan Bhawan, N. Delhi (February 21, 2014): Dr. H. Mehta.
- SLNA meeting at Jaipur (February 21, 2014): Dr. Shakir Ali.
- User Interface Meet (IUIM-2014) organized by IIRS at Dehradun (February 20-21, 2014): Dr(s). Charan Singh, Ambrish Tiwari.
- International Symposium on Integrated Water Resource Management (IWRM-2014) organized by CWRDM, Kozhikode (Kerala) (February 19-21, 2014): Dr. Om Parkash.
- International Symposium on Integrated Water Resource Management at Centre for Water Resources Development & Management, Kozhikode, Kerala (February 19-21, 2014): Er. Uday Mandal.
- Short Course on Use of GPS & Remote Sensing in Watershed Management as resource person at Research Centre, Kota (February 18, 2014): Er. S.S. Shrimali.

- Training as Resource Person at Research Centre Sikkim, Research Complex for North Eastern Region, Barapani under NICRA (February 17, 2014): Dr. D.V. Singh, Er. S. Patra.
- Progressive Punjab - Agriculture Summit at Mohali (February 16-19, 2014): Dr(s). A.K. Tiwari, R.P. Yadav.
- Workshop on State Level Dialogue on Changing Development Paradigm in Ecologically Sensitive Uttarakhand at Dehradun (February 13, 2014): Dr(s). N.K. Sharma, Ambrish Tiwari.
- 10<sup>th</sup> Advanced level Training in Soil and Plant Analysis and Water Quality Assessment at Soil Science and Agricultural Chemistry Division, IARI, N. Delhi (February 11-March 3, 2014): Dr. U.K. Maurya.
- Group Monitoring Workshop for TISAN, SYST & STAWS programmes of SEED, Department of Science & Technology at Chandigarh (February 10-11, 2014): Dr. Pawan Sharma.
- World Congress on Agroforestry at N. Delhi (February 10-14, 2014): Dr (s) P.K. Mishra, O.P. Chaturvedi, H. Mehta, Charan Singh, J.M.S. Tomar, A.C. Rathore, R. Kaushal, Rajkumar.
- National workshop on Rubber Dam Technology at DWM, Bhubaneswar (February 10 -11, 2014): Dr(s). Ambrish Tiwari, D.C. Sahoo, S. Manivannan.
- KRISHI VASANT-2014 (Farmers Fair) organized by CICR, Nagpur (February, 9-14, 2014): Dr. Om Parkash.
- National seminar on Emerging Climate Change Issues & Sustainability Management Strategies at OUAT, Bhubaneswar (February 7-10, 2014): Dr. D.R. Sena.
- 11<sup>th</sup> Agricultural Science Congress on Agriculture and Education: Shaping India's Future at OUAT, organized by NAAS, N. Delhi (February 7-9, 2014): Dr. M. Madhu.
- Asia-Africa Agribusiness Forum (FICCI) sponsored by FICCI at N. Delhi, (February 04-06, 2014): Dr. H. Mehta.
- Workshop on Managing Arid Agriculture in Changing Climate Scenario at CAZRI, Jodhpur (Feb. 4, 2014): Dr. Kuldeep Kumar.
- Training programme Researchers Training-X on Data Analysis using SAS at CSWCRTI, Dehradun (February 3-8, 2014): Dr(s). Ambrish Kumar, B.N. Ghosh, D.V. Singh, D. Mandal, J.M.S. Tomar, P.P. Adhikary, K. Kannan, A.C. Rathore, R. Kaushal, M. Muruganandam, J. Jayparkash, N.M. Alam, Rajkumar, Sh. V.K. Jain, Sh. S.K. Sharma, Sh. Prakash Singh.
- Brain Storming on Carbon Economy in Indian Agriculture at N. Delhi (February 1, 2014): Dr. P.K. Mishra.
- National Seminar on Bamboo Productivity in Forest and Non-Forest Areas at FRI, Dehradun (January 30-31, 2014): Dr(s). P.K. Mishra, O.P. Chaturvedi, S.K. Dubey, B.K. Rao, R. Kaushal.
- Seminar on Soil Management Option for Integrated Farming Towards Livelihood Security at Kolkata (Jan. 28, 2014): Dr. M. Madhu.
- NAIP sponsored Management Development Workshop on Technology Management for Researchers at NARM, Hyderabad (January 27-31, 2014): Dr. H. Mehta.
- Mid-term Review meeting of ICAR Regional Committee Meeting at CIFRI, Barrackpore, Kolkata (January 24, 2014): Dr. M. Madhu.
- Vocational Training Programme for Farmers organized by Krishi Vigyan Kendra, Datia (January 23, 2014): Dr. Dev Narayan.



- Training programme on Stress Management at NAARM, Hyderabad (January 21-24, 2014): Dr. B.N. Ghosh.
- Meeting of State Level Nodal Agency (SLNA) for IWMP, Haryana (January 20, 2014): Dr. A.K. Tiwari.
- Directors Conference at Baramati (January 19-20, 2013): Dr. P.K. Mishra.
- Committee of Parliament on Official Language (Hindi) at Research Centre, Udthagamandalam (January 12-17, 2014): Dr. Charan Singh, Sh. Vishawaranjan and Sh. A.K. Bhatt.
- Training programme on Commercial Seed Production at KVK, Datia (January 17, 2014): Dr. Om Prakash.
- National Seminar on Spatial Technologies for Watershed Planning at Thiruvananthapuram, Kerala (January 8-9, 2014): Dr. O.P.S. Khola.
- Meeting with Chief Conservator of Forest and DFO's of State Forest Department, Bihar for Planning Catchment Area Treatment Plan of Durgawati Reservoir at Patna and Kaimur Wild Life Sanctuary (January 7-11, 2014): Dr(s). G.P. Juyal, O.P. Chaturvedi, P.R. Ojasvi, D.V. Singh, R. Kaushal.
- Brain Storming Workshop on Developing a Methodological Framework for Delineation and Characterization of Chambal and Yamuna Ravines at Research Centre, Kota (January 6-8, 2014): Dr(s). G.P.Juyal, Dr. P.R.Ojasvi, D.R. Sena.
- ITRA Water Launch Workshop as Advisor at India, N. Delhi (January 1, 2014): Dr. P.K. Mishra.
- PIB Meeting at Kendriya Sadan Chandigarh (December 18, 2013): Dr. Ram Prasad.
- All India Workshop on Sustainable and Inclusive Mountains Development at Udthagamandalam (December 29-30, 2013): Dr. O.P.S. Khola.
- Interactive Meet on Research Interventions for Developing Tribal Farming Community of Uttarakhand at Dehradun (December 21, 2013): Dr(s). Charan Singh, D.V. Singh.
- Regional Committee Meeting of Region No. VI for Mid-Term Review of progress on action points at CAZRI, Jodhpur (December 18, 2013): Dr. R.K. Singh.
- Rabi Interface of farmers - Extn. Workers and Scientists organized by Dy. Director, ATMA, Datia (December 17, 2013): Dr. Om Parkash.
- Training on Soil and Water Assessment Tool Modelling at National Institute of Hydrology, Roorkee, Uttarakhand (December 16-20, 2013): Ch. Jyotiprava Dash.
- Short course on Geospatial Technologies on Watershed Management at IIRS, Dehradun (December 16-27, 2013): Dr(s). K. Rajan, H. Biswas, D.C. Sahoo, K.K. Sharma, R. Kaushal, R. Ranjan, Kuldeep Kumar, G.L. Meena, Sh. Prabhat Kumar, Er. Monalisha Pramanik, Sh. R.B. Meena, Sh. A.K. Sharma, Sh. Ashok Kumar, Sh. Amit Chauhan.
- Scientific Advisory Committee (SAC) meetings at KVK, Datia (December 16 and October 3, 2013): Dr. S.P. Tiwari.
- Sangoshti (Hindi) on Agriculture Technologies and Its Maximum Use by the Farmers at Central Institute of Fisheries Education (CIFE), Mumbai, Maharashtra (December 15-16, 2013): Dr. Bankey Bihari.
- Conference on National Ground Water at TNAU, Coimbatore (December 13-14, 2013): Dr. O.P.S. Khola.
- Review meeting of Quality of Ground Water and Remedial Measure in states of Punjab and Haryana at Chandigarh (December 12, 2013): Dr(s). A.K. Tiwari, R.P. Yadav.
- National training on Project formulation, Risk Assessment, Scientific Report Writing and Presentation sponsored by NAIP at IARI, N. Delhi (December 09-13, 2013): Dr. Rajeev Ranjan.
- State level workshop cum exhibition on Micro-irrigation in Uttarakhand at Raj Bhawan, Dehradun (December 9-10, 2013): Dr. Bankey Bihari.
- Scientific Advisory Committee meeting at UPASI-KVK, Coonor (December 6, 2013): Dr. O.P.S. Khola.
- International Conference on Extension Education Strategies for Sustainable Agricultural Development - A Global Perspective at UAS Bangalore (December 5-8, 2013): Dr. S. Manivannan.
- Meeting on State Focus Paper 2014-15, Uttarakhand at NABARD, Dehradun (December 3, 2013): Dr. P.K. Mishra.
- Northern India International Trade Fair-2013 organized by India International Trade Event Organization, N. Delhi at Parade Ground, Dehradun (December 2-8, 2013): Dr. Bankey Bihari.
- ICAR-University State Department Interface Meeting at CRRI, Cuttack (November 26-27, 2013): Dr. D.C. Sahoo.
- International training on Plant Genetic Resources and Seeds: Building Community Resilience in the Face of Change organized by MSSRF, Jeypore, Odisha (November 15, 2013): Dr(s). M. Madhu and P.P. Adhikary.
- Training on Science & Technology for Rural Societies organised by CDMNIAR, Lal Bahadur Shastri National Academy of Administration, Mussoorie (November 18-29, 2013): Dr. Ashok Kumar.
- International Conference on Climate change and Implications for Water Resources and Nutrition Security at International Life Sciences Institute, ILSI-India and Centre for Integrated Modelling of Sustainable Agriculture and Nutrition Security (CIMSANS) at Bangalore (November 15-16, 2013): Dr. P.K. Mishra.
- Conference on Rain Water Harvesting at Purnima College, Jaipur (November 16, 2013): Dr. R.K. Singh.
- Meeting on Green Development and Gross Environmental Product (GEP) organized by HESCO - Amar Ujala Foundation at HESCO, Dehradun (November 12, 2013): Dr. G.P. Juyal.
- Meeting with DDG (NRM) and Director, Soil Conservation, Jaipur to review the progress of watershed projects in Rajasthan at Jaipur (November 15, 2013): Dr. R.K. Singh.
- Workshop on Technology Vision - 2035 in India for Resource Management sponsored by TIFAC DST, Govt. of India at FRI, Dehradun (November 15, 2013): Dr. G.P. Juyal.
- Workshop on Natural Resource Management at FRI, Dehradun (November 15, 2013): Dr. N.K. Sharma.
- Training programme on Application of Remote Sensing in GIS in Natural Resource Management sponsored by NNRMS (ISRO) at NBSS&LUP, Nagpur (November 12 to December 2, 2013): Er. Uday Mandal.
- International Conference on Interdisciplinary Areas with Chemical Sciences (ICIACS - 2013) at Punjab University,

Chandigarh, (October 30 - November 1, 2013): Dr(s). Sharmistha Pal and Sathiya K.

- Discussion cum meeting on SWC Practices for Maize Cultivation organized by Department of Agriculture, Datia (October 30, 2013): Dr. S.P. Tiwari.
- Exhibition on Global Agri. Connect 2013 on Agriculture Capacity Building - A new paradigm at IARI, N. Delhi (October 25-27, 2013): Dr(s). P.K. Mishra, O.P.S. Khola, Bankey Bihari, Charan Singh, Sh. Suresh Kumar.
- Workshop on Integrated Watershed Development Programme sponsored by NWDP-Solan (HP) at Kuniyar, Solan (October 24, 2013): Dr(s). V.K. Bhatt, Ram Prasad.
- Annual Convention 2013 of the Indian Society of Soil Science at CAZRI, Jodhpur (October 23-24, 2013): Dr. P.K. Mishra.
- Training-cum-workshop for PRIs of Solan block at Solan (October 23, 2013): Dr. V.K. Bhatt.
- Training on Climate Change and Carbon Mitigation at ICFRE, Dehradun (October 21-25, 2013): Dr(s). A.K. Parandiyal, B.N. Ghosh, A.C. Rathore.
- Brainstorming Workshop on Land Use Planning for Multi-Functional Agriculture and Land Use Policy at NASC Complex, N. Delhi (October 18, 2013): Dr. P.K. Mishra.
- SAC meeting and Farmer Fair of KVK (VPKAS, Almora), Chinaylisaur (Uttarkashi) as institute representative (October 10, 2013): Dr. Raman Jeet Singh.
- Research Coordination Meeting for Rabi crops at Command Area Development, Kota (October 9, 2013): Dr. Kuldeep Kumar.
- SAC meeting of KVK, Umarnkot, Nabarangapur, KVK, Malkangiri and KVK, Semiliguda (October 7-10, 2013): Dr(s). M. Madhu, D.C. Sahoo.

### Personalia

#### Joinings/Transfers

- Dr Lekh Chand, Senior Scientist (Agronomy) joined Division of SS&A, Dehradun.
- Sh. M.N. Ramesha, Scientist joined Research Centre, Bellary on transfer from Research Centre, Datia.
- Dr. Rajkumar, Scientist (Forestry) joined Research Centre, Vasad on transfer from Dehradun.
- Dr. Dinesh Kumar Meena, Scientist (Ag. Economics) joined Research Centre, Agra.
- Dr. Rajeev Ranjan, Scientist (Soils) joined Research Centre, Datia on transfer from Dehradun.
- Mrs. Monalisha Pramanik, Scientist (Engg.) joined Research Centre, Datia on transfer from Dehradun.
- Dr. K. Kasthri Thilham, Scientist (Soils) joined Research Centre, Udhagamandalam on transfer from CRRI, Cuttack.
- Sh. S.K. Yadav, Technical Officer joined Research Centre, Datia on transfer from Research Centre, Chandigarh.
- Sh. Prakash Singh, Technical Officer joined Research Centre, Kota on transfer from Research Centre, Agra.
- Sh. Prakash Singh, Technical Officer joined Dehradun on transfer from NIR on Jute & Allied Fibre Technology, Kolkata.
- Sh. Rajesh Nagar, Technician (T-1 Fieldman) joined Dehradun.
- Smt. R. Raina, LDC joined Research Centre, Chandigarh on transfer from NRC Biotechnology, N. Delhi.

### Promotions

- Dr(s). A.K. Singh, D.R. Sena promoted to Principal Scientist.
- Dr(s). B.K. Rao and A.K. Vishwakarma promoted to Senior Scientist, PB-4.
- Dr(s). A.C. Rathore, N. Longanandhan promoted to Sr. Scientist.
- Dr(s). B.K. Shetty and Sh. B.S. Naik promoted to Scientist GP 8000.
- Dr(s). Praveen Jakhar, Hombe Gowda, D. Ramajayam, Sharmistha Pal, Gopal Kumar, Dhanjay Burman promoted to Scientist GP 7000.
- Sh (s). Ashok Kumar and Vikram Chauhan promoted to Chief Technical Officer.
- Dr. Gambhir Singh promoted to Assistant Chief Technical Officer.
- Sh (s). R.S. Negi, A.K. Nitant, S.K. Yadav, Fateh Singh, N.S. Sindhwal, B. Baboo, R. Mohanraj promoted to Senior Technical Officer.
- Sh(s). Shiv Ram Singh, B.N. Seshadri promoted to Technical Officer.
- Sh (s). Shailendra Kumar Yadav, G.W. Barla, M. Obulanaidu, Vikram Singh, Jasmat Singh, Sh. Anand Kumar, Hukum Singh, Deepak Kaul, M.P. Juyal promoted to Senior Technical Assistant.
- Sh. Pramod Kumar, Subhash Kumar, B.C. Bisht, Sunadhar Kindal promoted to TA.
- Sh(s). Hari Om Arya, D.G. Damor promoted to Technical Assistant.
- Sh (s). Surat Singh, K.D. Mayavanshi, Ram Samuj, Zala Ashok Kumar Amar Singh, Rohit Kumar promoted to Senior Technician.
- Sh. R.S. Kanwar, Asstt. Promoted to AAO.
- Sh. Sunil Singh promoted to UDC.

### Retirements

- Dr. R.C. Jakhmola, Principal Scientist (Dehradun); Er. K.P. Tripathi, Principal Scientist (Dehradun); Sh. Dhoom Singh, Assistant Chief Technical Officer (Kota); Sh. K. Channabasappa, Technical Officer (Bellary); Shri L. Rangaraj, Technical Officer (Udhagamandalam); Smt. Nisha Agarwal, Senior Technical Assistant (Agra); Sh. Bhola Dutt, Technical Assistant (Kota); Sh. Pitamber Singh, SSS (Dehradun); Sh. Chotney Lal, SSS (Chandigarh); Sh. Ujjagar Singh, SSS (Chandigarh); Sh. N. Beeman SSS (Udhagamandalam); Smt. Morsri, SSS (Agra); Sh. Vishwanath, TSL (Agra); Sh. Bihari Lal, TSL (Dehradun).

### Technology

#### Staggered Trenching for Horti-pastoral Land Use in Medium Deep Ravines of Chambal Region

Staggered trenching has been found suitable for horti-pastoral land use of medium deep ravines of the Chambal region for their economic utilization. Trenching with 274 numbers of size 4.5 m x 0.6 m x 0.45 m are excavated for trapping 75% potential runoff generated to accommodate 122 numbers of plants per hectare. The alignment and construction of trenches (i.e. marking the position of trenches on the ground) is started from the ridge. In no case the trenches in the downstream area is to be constructed unless the areas above are covered with trenches. For tree planting, pits of size 1 m x 1 m x 1 m are dug at a distance of 1 m in the downstream side of the excavated trenches both in ravine humps and beds during the month of April-May. The dugout soil is



left for desiccation during May-June. All dried roots, pebbles etc. from the piled soils is removed. About 25-30 kg of farm yard manure (FYM) is mixed with the piled soil along with 100 gm of insecticide powder in each pit. If soils are deficit in phosphorus, addition of 1 kg of single super phosphate (SSP) will improve phosphorus level in the soil. These pits are filled up to rim with mixture of soil and FYM. Planting of fruit trees is taken up just after first monsoon showers. Fruit trees of at least one year age are planted at ravine top e.g. seedlings of amla (*Indian gooseberry, Emblica officinalis*) (var. NA-7 or Chakaya) in case of amla + grass system. The ravine beds can be used for raising bamboo (*Dendrocalamus strictus*). Bamboo seedlings are planted after onset of first monsoon rains. Polythene wrappings of procured or raised seedling is removed and the seedling is inserted in to the prepared pit by making a small hole at the centre of the pit followed by a little compression for allowing the seedling to be in close contact with the mixed soil in the pit for its better establishment. The interspaces are planted with *Cenchrus ciliaris* (Dhama) grass at 30 cm x 30 cm spacing by making a furrow or pit



of 15 cm depth across the general land slope. About 4-5 tillers are sufficient for sodding in a single pit to reduce soil erosion hazards. Amla and bamboo plants are rarely affected by insects and flies. Drenching with 0.2% solution of Chloropyriphos (25 EC) and 0.1% solution of Monochrotophus helps to keep termites and flies away, respectively from the plants when attacks are witnessed.

The system does not require major intercultural practices, but periodic weeding and hoeing in the initial stages up to 2<sup>nd</sup> year of plantation improves growth of planted seedling. Addition of FYM at six monthly intervals @25-50 kg per plant will improve production of amla fruit and application of 20 kg of nitrogen per hectare during late September or early October will prolong availability of green fodder during winter. Grass production increases from the 2<sup>nd</sup> season to 5<sup>th</sup> seasons of harvest and declines gradually. Hence, about 1/3<sup>rd</sup> area is resodded or resown at the end of every five years for sustained grass production from the area. The trenches also improve soil profile moisture and mitigate the adverse impact of dry spells. Amla and bamboo are harvested in fifth year and grass is harvested during the second season of sodding.

The average amla fruit equivalent (AFE) yield of the system is 8.27 t/ha/yr against 3.8 t/ha/yr from untreated ravine land, and improvement recorded in trenched areas is 117.6% higher over the untreated land. The total cost of cultivation of horti-pastoral systems with trenching over 25 years is ₹2,52,409 per hectare and trenching cost is ₹13,316. Horti-pastoral systems with trenching yield sustainable production for its life span of 25 years. Assuming average production level for its life span, the trenching system will yield additional returns of ₹6,59,229 per hectare. The net return from this system is 3 times higher over capital cost with benefit cost ratio of 3.05. This trenching system is suitable under rainfed condition for semi-arid region with medium and deep ravinous lands along the banks of the major rivers like Beas, Yamuna, Kholas of the Ganga, Chambal, Kalisindh, Mahi, Narmada, Sabarmati and their tributaries in the states of Punjab, UP, Bihar, West Bengal, Rajasthan, Madhya Pradesh and Gujarat.



हर कदम, हर डगर  
किसानों का हथकण्डा  
भारतीय कृषि अनुसंधान परिषद

Agrisearch with a human touch

Published by : P.K. Mishra, Director

Editorial Board : Pradeep Dogra, Principal Scientist

Rajesh Kaushal, Senior Scientist

Nirmal Kumar, Chief Technical Officer

Design & Photographs : L.K. Sharma, Asstt. Chief Tech. Officer

**CENTRAL SOIL & WATER CONSERVATION RESEARCH & TRAINING INSTITUTE**

218, Kaulagarh Road, Dehradun - 248 195, Uttarakhand

Ph: +91 135 2758564 (O), +91 135 2754968 (R) Fax : +91 135 2754213 & 2755386

Email : [director@cswcrtidn.org](mailto:director@cswcrtidn.org) & [directorsoilcons@gmail.com](mailto:directorsoilcons@gmail.com)

Website : [www.cswcrtiweb.org](http://www.cswcrtiweb.org)