

INTRODUCTION

Historical Back Ground

1

The Indian Institute of Soil and Water Conservation (formerly known as Central & Soil Water Conservation Research and Training Institute) was established on 1st April, 1974 with Headquarters at DehraDun by combining Soil and Water Conservation Research, Demonstration and Training Centers established in 1950's at DehraDun, Kota, Bellary, Udhagamandalam, Vasad, Agra and Chandigarh. Research centers were initially established by the Government of India and transferred to the Indian Council of Agricultural Research (ICAR) on 1st October, 1967. Subsequently two new Research Centers were established, one at Datia in Madhya Pradesh (18th September, 1986) to tackle soil and water conservation issues of Bundelkhand region and another at Koraput in Orissa (31st January, 1992) to address the ill effects of shifting cultivation. The Institute and its Research Centers, since inception, have focused primarily on evolving strategies for controlling land degradation (by adopting watershed approach), targeting area specific problems (such as ravines, landslides, mine spoils and torrents), demonstration of technologies for popularisation and imparting training besides developing technologies for water harvesting and recycling.

In the year 1956, experimental watersheds were set-up for generating watershed-based protection and production technologies. From the year 1974 onward, the Institute pioneered in operationalising the watershed concept through four Operational Research Projects at Sukhomajri (Haryana), Nada (Chandigarh), Fakot (Tehri-Garhwal in Uttarakhand), and G.R. Halli (Chitradurga, Karnataka). On realising, tremendous tangible and intangible, benefits from these watersheds, the ICAR developed 47 model watersheds in sixteen states in collaboration with State Agricultural Universities and State Agriculture Departments. Encouraged with the success of the model watersheds, the Ministry of Agriculture conceived a mega project entitled “National Watershed Development Programme for Rainfed Areas” (NWDPPA) for resource conservation and sustainable agricultural development in 29 states during 1991. Subsequently, the focus of watershed development programmes shifted towards community participation besides biophysical aspects to achieve sustainability in production systems. Success of the watershed management programmes generated a lot of interest among different stake holders and attracted many international agencies, like World Bank, ICIMOD, EEC, DANIDA, KfW Germany, SIDA and Swiss Development Corporation, for support, collaboration and funding. The research and training experience of the Institutes and its Research Centers is being put to good use by the Ministries of Agriculture, Rural Development, Environment & Forests, NRAA and various Central and State departments for capacity developmental programmes.

Land Degradation Scenario

India is blessed with vast natural resources but increasing pressure on land is disturbing the natural balance between the soil formation and soil depleting processes resulting in serious problems of land degradation which is threatening the national food security. As per the harmonized database on land degradation, about 120.72 m ha (36.70%) is suffering from various forms of land degradation on arable (104.19 m ha) and non-arable (16.53 m ha) lands out of the total geographical area of 329 M ha. In the degraded arable land, water erosion is the chief contributor (73.27 m ha) followed by chemical degradation (17.45 m ha), wind erosion (12.40 m ha) and physical degradation (1.07 m ha). Also, water erosion (9.30 m ha) and chemical degradation (7.23 m ha) are two major factors for land degradation in open forest areas. Land degradation through specific problems affects 17.96 m ha area comprising 8.53 m ha waterlogged, 5.50 m ha saline soils including coastal sandy area, 3.97 m ha ravines and gullies, 1.73 m ha shifting cultivation and 2.73 m ha riverine areas and torrents. Denudation of forest land in various watersheds has resulted in recurring floods, *chaos* and torrents besides there are serious issues of landslides, silting



of rivers and reservoirs. The annual production loss in major rain fed crops due to erosion in the country has been assessed as 15.7% of total production of cereals, oilseeds and pulses. These losses can be prevented or minimised by adopting appropriate Soil Water Conservation (SWC) strategies on arable and non-arable lands following the concept of participatory integrated watershed management.

Mandate

- Research for management of land degradation in a primary production systems and rehabilitation of degraded lands in different agro-ecological regions of the country.
- Co-ordinate research network for developing location-specific technologies in the area of soil and water conservation.
- Centre for training in research methodologies and updated technology in soil and water conservation and watershed management.

Presentation of Research Progress

The research progress for the year 2016-17 is being presented in a programme mode as per the advice of Research Advisory Committee of the Institute and as recommended by ICAR committee. Accordingly, the research activities were rationally divided into six programmes and 13 sub-programmes. For meaningful and logical comparison of research findings within a research programme/project, the order of presentation is as per agro-climatic regions, viz; hill region (DehraDun, Chandigarh, Udhagamandalam Centres), ravine region (Agra, Kota, Vasad), Bundelkhand region (Datia), black soil semi-arid region (Bellary) and shifting cultivation-lateritic soil region (Koraput). The research programmes and Programme Leaders are as follows:

Research programme	Project Leaders
P-1 : Water erosion appraisal in different agro-ecological regions.	Dr. P.R. Ojasvi
P-2 : Conservation measures for sustainable production systems.	Dr. N.K. Sharma (Arable) Dr. Harsh Mehta (Non-arable)
P-3 : Watershed hydrology for conservation planning.	Dr. D.R. Sena
P-4 : Rehabilitation of areas affected by mass erosion.	Dr. Ambrish Kumar
P-5 : Integrated watershed management for socio-economic growth and policy advocacy.	Dr. Pradeep Dogra
P_6 : Human resource development and technology transfer.	Dr. Bankey Bihari

Organisational Set-up

The information on organizational set-up had been presented through a chart in the beginning of the report.

Important Events

Union Minister of Agriculture and Farmers Welfare visited Kota Centre

On the occasion of Kisan Diwas organised at ICAR-IISWC Research Centre Kota, Shri Radha Mohan Singh Ji, Hon'ble Minister of Agriculture & Farmers Welfare, elicited 22 progressive farmers from 10 villages adopted by the Kota Centre under Mera Gaon Mera Gaurav (MGMG) programme. Hon'ble Minister congratulated Centre scientists for taking up MGMG programme in its true spirit and marked the event as a success indicator for initiatives taken up by scientists of the Centre under MGMG programme. In his address, Hon'ble Minister talked about necessity and potential benefits of Pradhan Mantri Krishi Sinchayee Yojna (PMKSY), Soil Health Card Programme, MGMG and Pradhan Mantri Fasal Bima Yojna (PMFBY). He also stressed upon urgency to focus on developing livestock productivity with a preference for indigenous breeds. He advised scientists to hold regular

meetings with other regional research, development and extension departments and keep political leaders informed about their achievements. Hon'ble Minister congratulated farmers, scientists, extension agencies and other state line departments for their efforts and achievements towards securing livelihood of farming community of Hadauti region. He encouraged all Heads of departments and institutions to hold regular periodical meeting and work as a team to build a prosperous future. Earlier, Dr. P.K. Mishra, Director welcomed Ministers and other delegates and briefed about activities of ICAR-IISWC; Dr. R.K. Singh, Head of Centre briefed about recent achievements of the Centre and current regional issues. Shri Om Krishna Birla, Member of Parliament (Kota); Shri Ajay Singh Klik, Co-operative Minister, Rajasthan State Government; Smt. Chandrakanta Meghwal, M.L.A.; Sh. Ramganj Mandi; Dr. G.L. Keshwa, Vice Chancellor, Kota Agriculture University were among distinguished guests. The event was participated by 198 farmers, 60 representatives from Kota Agricultural University, KVKs, District Line Departments, Press, Media and All India Radio.



XXIV Meeting of ICAR Regional Committee No. I Organised at Govind Ballabh Pant University of Agriculture and Technology

The XXIV meeting of ICAR Regional Committee for Region No. I, covering states of Jammu & Kashmir, Himachal Pradesh and Uttarakhand, was held on May 30-31, 2016 at Govind Ballabh Pant University of Agriculture & Technology (GBPUAT), Pantnagar. The meeting was inaugurated by Dr. K.K. Paul, Hon'ble Governor of Uttarakhand. The meeting was attended by Sh. Ghulam Nabi Lone (Hanjoora), Hon'ble Minister for Agriculture, Govt. of Jammu & Kashmir; Dr. Trilochan Mohapatra, Secretary (DARE) & Director General (ICAR); Sh. C. Roul, Additional Secretary (DARE) & Secretary (ICAR); Sh. S.K. Singh, Financial Advisor (ICAR); Sh. Sudhir Bhargava, Sh. R.P. Singh and Sh. Suresh Chandel, Members of Governing Body of ICAR; Deputy Director Generals (ICAR), Vice Chancellors of State Agriculture Universities of Jammu & Kashmir, Himachal Pradesh & Uttarakhand; Assistant Director Generals (ICAR); Directors and Heads / Officers-in-charge of Headquarters / Regional Stations of ICAR Institutes located in Region I; Directors of Research Extension and Education of State Agriculture Universities of Jammu & Kashmir, Himachal Pradesh & Uttarakhand; Directors of State.



Workshop on Mobile Based Agro-advisory

A launching workshop was organised on July 2, 2016 at ICAR-IISWC, DehraDun to start the **mKrishi@PAWS** service for hill farmers residing in remote and difficult conditions. The ratio of extension worker to farmers in the country is 1:5000, which underlines a wide gap for extension workers to transfer farm technology. At the same time, about 70-75% hill farmers own mobiles, and the ownership is growing with every new day. This Mobile Based Agro-advisory service is expected to harness this potential for transfer of soil and water conservation, and production & protection technologies of fruits, vegetables, and cereals. Dr. A.K. Singh, Deputy

Director General (Extension), launched the service under ICAR-Extramural Research Project “Creation of ICT Network to Disseminate Knowledge about Soil & Water Technologies to Farmers in North Western Himalayas”. On the occasion, the Chief Guest emphasised upon the importance of soil and water conservation in crop husbandry and stressed to initiate research work on tuber crops, pulses, and oilseeds so that import of these commodities can be minimised. Earlier, Dr. P.K. Mishra, Director in his welcome address appreciated the initiative and expressed strong desire to expand this service to other Centres of the Institute. Mr. Aditya Tiwari, Project Manager, Tata Consultancy Services (TCS) made live demonstration. In the workshop along with the Institute staff members about 50 farmers participated and got orientation about PAWS (Personalized Agro-advisory on Water and Soil) service.



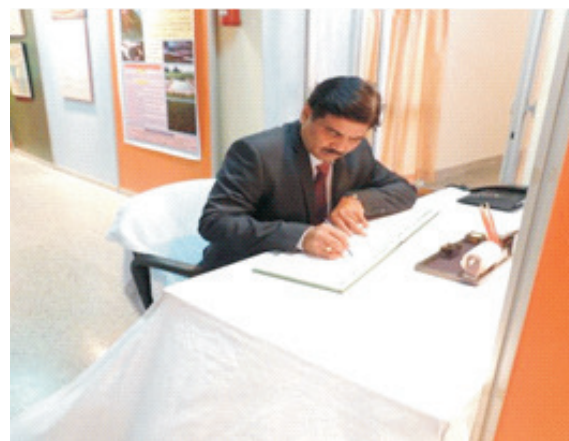
भाकृअनुप-भारतीय मृदा एवं जल संरक्षण संस्थान, देहरादून पर हिंदी दिवस एवं सप्ताह का आयोजन किया गया

भाकृअनुप-भारतीय मृदा एवं जल संरक्षण संस्थान, देहरादून में बड़े हर्षोल्लास के साथ दिनांक 14 सितम्बर, 2016 से 21 सितम्बर, 2016 तक हिंदी दिवस एवं सप्ताह के कार्यक्रम आयोजित किए गए। इस श्रृंखला में दिनांक 14 सितम्बर, 2016 को एक कार्यक्रम आयोजित हुआ जिसमें संस्थान के निदेशक डॉ. पी. के. मिश्रा सहित सभी प्रभागाध्यक्षों मुख्य प्रशासनिक अधिकारी एवं वरिष्ठ वित्त एवं लेखा अधिकारी ने अपने विचार रखे। संस्थान में हिंदी सप्ताह के अन्तर्गत, हिंदी- अंग्रेजी शब्दावली प्रतियोगिता, निबंध, अनुवाद, शब्द रचना आदि कुल छः प्रतियोगिताएं आयोजित की गयी। इस अवसर पर श्री राधा मोहन सिंह जी, माननीय कृषि एवं किसान कल्याण मंत्री, भारत सरकार द्वारा प्रेषित सन्देश को संस्थान में परिचालित किया गया। दिनांक 21.09.2016 को समापन समारोह में पुरस्कार वितरण कार्यक्रम आयोजित किया गया। इस अवसर पर मुख्य अतिथि श्रीमती कुसम मीर चन्दानी, प्रबंधक (राजभाषा), तेल एवं प्राकृतिक गैस आयोग थीं।



Additional Secretary, DARE, New Delhi Visited ICAR-IISWC DehraDun

Shri Chhabilendra Roul, IAS, Additional Secretary, DARE, Ministry of Agriculture and Farmers Welfare, Govt. of India & Secretary, ICAR, New Delhi visited ICAR-IISWC, DehraDun on October 14, 2016. Shri Roul visited experimental fields at Research Farm, Selakui where he was briefed about the landuse and infrastructure at the farm. He discussed about the initiative being taken by ICAR-IISWC for Swachhta Pakhwada and appreciated the work on composting initiated at



the Research Farm. He further stressed upon proper landuses and climate smart agriculture for helping small and marginal farmers. He appreciated the innovation of soil loss measurement device being developed by the Institute. He also visited the facilities available at the institute and interacted with the trainees of four-months regular course.

Workshop on Shifting Cultivation in Odisha Organised

One day workshop was conducted on 'Shifting cultivation in Odisha – Status and Issues' on November 10, 2016, by ICAR- IISWC, RC, Sunabeda. Eminent personalities comprising of wide spectrum i.e researchers, members/stakeholders in policy formulation, Government agencies, NGOs working in this field, and farmers practicing shifting cultivation took active part in healthy discussion. Representatives of different organizations, including M.S. Swamynathan Research Foundation, Jeypore; Central University, Koraput; ITDA- Koraput, Government Soil testing laboratory; Forest Department of Koraput & Malkangiri; and NGOs namely Pragati, Dhan Foundation, Pradan were also present.



Director, ICAR-IIWM Visited NMSA Project Site

Dr. S.K. Ambast, Director, ICAR-IIWM, Bhubaneswar visited the innovative water harvesting structure constructed near Harshauli village on Harshauli drain by ICAR-IISWC, Dehradun on November 19, 2016 and appreciated the endeavours made for recharging the depleted groundwater in dark blocks of Muzaffarnagar. Earlier in the day, Dr. S.K. Ambast participated in a Kisan Goshti organised at village Rasulpur Jatan, District Muzaffarnagar adopted under the NMSA project to inform the farmers about efficient irrigation management practices in rabi crops.



Winter School on Watershed Hydrology to Mitigate Climate Change Impact Organised

The ICAR-IISWC Research Centre, Udhagamandalam organised a ICAR sponsored 21 days Winter School on “Advanced technologies in watershed hydrology to mitigate climate change impact on soil and water resources” during November 1-21, 2016. Dr. B.J. Pandian, Director, Water Technology Centre, TNAU, Coimbatore inaugurated the training and delivered the inaugural address. Dr. D. K. Singh, Professor, IARI, New Delhi in his Special address stressed that the models plays the major role in prediction of climate change impact and hydrological behavior of watersheds. On completion of the winter school, Dr. P.K. Mishra, Director distributed the certificates to the successfully completed candidates and delivered the valedictory address. Dr. O. P. S.



Khola, Head of the Centre presided over the functions. A total of 23 Scientists / Assistant / Associate Professors from 10 states, namely Tamil Nadu, Kerala, Karnataka, Andhrapradesh, Goa, Maharashtra, Gujarat, Punjab, Odisha and Megalaya participated.

Hon' ble Member of Parliament Sh. A.K. Selvaraj Visited TSP villages

Sh. A.K. Selvaraj, Hon'ble Member of Parliament, Rajya Sabha was the Chief Guest of a Farmers Fair and Training Programme on 'Agricultural Mechanisation and Marketing' organised by ICAR-IISWC Research Centre, Udthagamandalam on December 4, 2016 at Senguttaiyur village, Coimbatore District, Tamil Nadu under Tribal Sub Plan. Hon' ble Member of Parliament distributed a power sprayer and a mini tractor to two groups of villagers of Senguttaiyur and Seenguli villages for custom hiring purpose among the farmers. The agricultural inputs, viz. high yielding variety of pulse seeds, manures and fertilisers for integrated nutrient management, vermicomposting bags and polyfilms for drying agricultural products were also distributed to the beneficiaries of the villages. The Rajya Sabha Member appreciated the efforts of ICAR-IISWC Research Centre for taking up various activities under TSP in the region.



ICAR-IISWC Centre Honoured with Nilgiri Conservation Award 2016

The IISWC Research Centre, Udthagamandalam was honoured with the prestigious “Nilgiri Conservation Award” by the Nilgiri Documentation Centre on February 3, 2017 for its achievements in the field of research, development and capacity building activities in soil and water conservation in Nilgiris.

Conference on Farmers FIRST for Conserving Soil and Water Resources in North Eastern Region

Hon'ble Chief Minister of Assam, Shri Sarbananda Sonowal inaugurated the Conference on Farmers First for Conserving Soil and Water Resources in North Eastern Region organised by Indian Association of Soil and Water Conservationists (IASWC), Dehradun on February 9, 2017 at Guwahati. Hon'ble Chief Minister emphasised on enhancing productivity and farmers' income, particularly rural youth, without adverse impact on natural resources. On the occasion, the Chief Minister Gram Samradhi Yojana and Village Tourism was initiated by the Chief Minister. Dr. A.K Singh, DDG (Agril Extension), ICAR, New Delhi highlighted the philosophy and approach of Farmer FIRST Programme. Dr. KM Bujarbaruah, Vice Chancellor, Assam Agricultural University, Jorhat delivered Dr KG Tejwani Memorial Lecture on 'Towards Meeting Soil-Man-Soil Expectation'. About 80 farmers from the NEH states participated to share their experience with researchers and extension workers. Earlier, Dr. P.K. Mishra, Director, ICAR-IISWC, Dehradun and President (IASWC) welcomed the Chief Guest and other dignitaries.



Important Publications

- Annual Report 2015-16, ICAR-IISWC, DehraDun.
- IISWC News, No.10 (April to September 2016). ICAR-IISWC, DehraDun (Half yearly Newsletter).
- IISWC News, No.11 (October 2016 to March 2017). ICAR-IISWC, DehraDun (Half yearly Newsletter).
- Gupta, S.K; Panwar, Pankaj and Kaushal, Rajesh (2017) Agroforestry for Increased Production and Livelihood Security. New India Publishing Agency, New Delhi. 500p.
- Mishra, P. K., Juyal, G. P., Tripathi, K. P., Ojasvi, P. R., Shrimali, S. S., Sena, D. R., Kumar, Ambrish, and Patra, S. 2017. Field Manual on Soil and water Conservation Structures. ICAR, New Delhi, 135p.
- Muruganandam, M; Mandal, D; Kaushal ,Rajesh; Mishra, P. K; Chaturvedi, O. P; Sharma, N.K; Ojashvi, P.R; Singh, Lakhan. and Sangeeta N. Sharma (2016). Natural Resource Management Opportunities and Technological Options (edited book). Satish Serial Publishing House, New Delhi. Pages 1-325.
- Naik, B. S; Paul, J. C. and Panigrahi, B. (2016). Land and Water Use Planning for Eastern Ghat Region of Odisha, India: Optimization of Net Return and Minimization of Soil Loss in Watershed. Lambert Academic Publishing, Germany, ISBN-13:978-3-659-97892-0: 192p.
- Pande, V. C. and Naik, Umesh (2016). Optimizing Irrigation Water Use for Resource Sustainability. LAP LAMBERT Academic Publishing, BahnhofstraBe 28, 66111, Deutschland, Germany. Pp 178.
- Dubey, R.K; Dubey, S.K; Rama Pal; Bhushan, L.S; Yadav ,R.C. and Gawande ,A.P. (2016). Appraisal of Soil and Water Conservation Interventions and Agro-Techniques in Agra watershed. No.TB-01/A/E2016.
- Mishra, P.K; Singh, Lakhan; Kumar, Ambrish; Mandal, D; Kaushal Rajesh, and Alam , N.M. (Eds.). Soil and Water Conservation Bulletin-2016. pp 1-108.
- Panwar, Pankaj; Bhatt, V.K; Sharmistha Pal, Ram Prasad, Singh, Pratap; Tiwari, A.K. and Mishra , P.K. (2016) Farm pond technology for harvesting and recycling of rainwater for climate resilient agriculture in rainfed Shivalik). Technical Bulletin No. T-70/Ch-16/2016.
- Singh, A.K; Sharma, K.K; Dubey, S.K. and Suresh Chandra 2016 Peripheral bund: Controlling Measures for Ravine Formation in Arable Land. Technical Bulletin No. T-71/A-02
- Singh, D. V., Patra, S., Morade, A. S., Tomar, D. K., and Mishra, P. K. (2017). Participatory Water Resource Management and Agricultural Development in Tribal Areas of Uttarakhand – A Success Story-Soil and Water Conservation Bulletin-2016. IASWC, Dehradun, 21-26.
- Tiwari, A.K; Pratap Singh, R.K. Aggarwal, Y. Agnihorti, Pawan Sharma, Ram Prasad, Pratap Bhattacharyya, V.K. Bhatt, Pankaj Panwar and Sharmistha Pal (2016). Integrated Land and Rainwater Management for Sustainable Production (Mandhala Watershed, Himachal Pradesh). Technical Bulletin No. T-68/C-15: 78 p

Important Meetings

- 48th Meeting of Institute Management Committee at Dehradun on 25 February 2017.
- Research Advisory Committee (RAC) meeting of the Institute held at IISWC, Dehradun during 27-28 January 2017

Training Programme

During the year, two batches of regular training course were conducted at DehraDun in which 46 officers were trained. So far, 2862 officers have been trained at Head Quarters DehraDun and Regional Research Centres. In addition, the institute also organised 55 short courses at DehraDun and its research centers at Agra, Bellary, Chandigarh, Datia, Kota, Koraput, Udhagamandalam and Vasad in which 2028 gazetted and non gazetted officers, watershed functionaries / farmers etc were trained.

Resource Generation

For the Institute, revenue worth ₹ 131.75 lakhs was generated during 2016-17. Highest revenue was generated through sale of farm produce, fish & poultry (₹77.05 lakhs) followed by internal resource generation (training & consultancy) activities (₹19.88 lakhs), sale of publications (₹ 0.67 lakhs) and lab analysis (₹2.80 lakhs). It is attributed to efficient management of resources at Research Farms, organization of 104 short-term courses, sale of Institute publications, analytical testing fee and undertaking a number of consultancy projects.

Name of Institute / Research Centre		(₹ in lakhs)	
		Funds	Expenditure
IISWC, DehraDun and its 8 Research Centres	Non-plan	4807.00	4806.77
	Plan	473.40	466.97
	Total	5280.40	5273.74

Staff

The strength of sanctioned staff as on 31.3.2017 including filled and vacant positions is given as follows:

Category	Sanctioned	In position				Vacant
		Total	SC	ST	OBC	
RMP	01	01	-	-	-	-
Head/Principal Scientist	15	7	-	-	-	8
Sr. Scientist	28	17	-	-	-	11
Scientist	85	74	11	7	19	11
Administrative	83	63	10	6	3	20
Technical	176	110	20	6	7	66
Supporting	207	170	45	7	27	37
Total	595	442	86	26	56	153