

INTRODUCTION

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HISTORICAL BACKGROUND

The Central Soil and Water Conservation Research and Training Institute (CSWCRTI) was established on 1st April, 1974 with its Headquarter at Dehradun by combining Soil and Water Conservation Research, Demonstration and Training Centres of Govt. of India located at Dehradun, Kota, Bellary, Udhagamandalam, Vasad, Agra and Chandigarh. Presently, CSWCRTI was renamed as ICAR-Indian Institute of Soil & Water Conservation (IISWC) vide Council letter No.1(14)/2014-PIM dated May 13, 2014. Research centres were transferred to the Indian Council of Agricultural Research (ICAR) on 1st October, 1967. Subsequently, two new Research Centres were added to the Institute, one at Datia in M.P. (1986) to tackle soil and water conservation problems of Bundelkhand region and another at Koraput in Orissa (1992) to address the problems of shifting cultivation.

The Institute and Research Centres have focused on evolving strategies for controlling land degradation following watershed approach, tackling special problems such as ravines, landslides, mine spoils and torrents; demonstration of technologies and imparting training besides developing technologies for water harvesting and recycling. In 1956, experimental watersheds were set up for generating watershed-based protection and production technologies. From 1974 onward, the Institute pioneered in operationalizing the watershed concept through four Operational Research Projects at Sukhomajri (Haryana), Nada (Chandigarh), Fakot (Tehri-Garhwal in Uttarakhand), and G.R. Halli (Chitradurga, Karnataka). After realizing 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 Departments. Encouraged with the success of the model watersheds, the Ministry of Agriculture conceived a massive National Watershed Development Programme for Rainfed Areas (NWDPR) 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 also attracted many international agencies like World Bank, ICIMOD, EEC, DANIDA, KfW Germany, SIDA and Swiss Development Corporation for collaboration and funding support. The research and training experience of the Institutes and its Research Centres is being utilized by the Ministries of Agriculture and Farmers Welfare, 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 forming 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 affects the maximum (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). Water erosion (9.30 m ha) and chemical degradation (7.23 m ha) are also the major factors for land degradation in open forest areas. Land degradation having special 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, and torrents. There are also serious problems of landslides and silting of rivers and reservoirs. The annual production loss in major rainfed crops due to water erosion in the country has been assessed as 15.7% of total production of cereals, oilseeds and pulses

which is equivalent to ₹205.3 billions considering minimum support price of 2011-12. These losses can be prevented by adopting appropriate strategies on arable and non-arable lands following the concept of participatory integrated watershed management.

MANDATE

- Research for management of land degradation in 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 2015-16 is being presented in a programme mode. 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	Programme 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 has been presented through a chart in the beginning of the report.

IMPORTANT EVENTS

माननीय केन्द्रीय कृषि एवं किसान कल्याण मंत्री, भारत सरकार, श्री राधा मोहन सिंह ने भारतीय मृदा एवं जल संरक्षण संस्थान देहरादून द्वारा उत्तराखण्ड राज्य के जनजातीय क्षेत्र में जल संसाधन प्रबन्धन हेतु विकसित किये गये माडल में रूचि दर्शाई

माननीय केन्द्रीय कृषि एवं किसान कल्याण मंत्री, भारत सरकार, श्री राधामोहन सिंह ने दिनांक 14 जून 2015 को देहरादून का भ्रमण किया। इसके दौरान भारतीय मृदा एवं जल संरक्षण संस्थान के निदेशक डॉ० पी०के० मिश्रा ने माननीय मंत्री महोदय से भेंट की (फोटो 1.1) तथा संस्थान द्वारा उत्तराखण्ड



Photo 1.1: Director apprising ongoing activities and future plan to Hon'ble Union Minister of Agriculture and Farmers Welfare.

फोटो 1.1: निदेशक, भा.मृ.ज.सं.सं., देहरादून द्वारा माननीय केन्द्रीय कृषि एवं किसान कल्याण मंत्री जी को संस्थान में चल रही गतिविधियों और भविष्य की योजनाओं को अवगत कराते हुए

राज्य के देहरादून जनपद के जन-जातीय क्षेत्र में कृषि सिंचाई हेतु जन-सहभागिता आधारित विकसित किये गये जल संसाधन कार्य के बारे में विस्तृत जानकारी दी। माननीय मंत्री महोदय ने संस्थान द्वारा किये गये इस कार्य की सराहना की तथा उन्होंने निकट भविष्य में इस परियोजना क्षेत्र में अपने भ्रमण की इच्छा जाहिर की क्योंकि वर्तमान केन्द्र सरकार की कार्य सूची में सिंचाई हेतु जल संसाधन विकास संबंधित कार्यों को प्राथमिकता दी गई है। इस विचार विमर्श के दौरान संस्थान के निदेशक महोदय एवं उक्त परियोजना के मुख्य अन्वेषक डा० डी०वी० सिंह ने पूर्ण किये गये कार्यों एवं इनके निष्पादन की सम्पूर्ण प्रक्रिया के फलस्वरूप क्षेत्र के कृषि विकास में दृष्टिगोचर हुई प्रगति के बारे में माननीय मंत्री महोदय को बताया। संस्थान द्वारा उक्त कार्य भारतीय कृषि अनुसंधान परिषद की जनजाति उप- योजना के अन्तर्गत स्थानीय लोगों की जन-सहभागिता के साथ किया जा रहा है।

Member of Parliament Shri D.S. Yadav visited ICAR-IISWC Research Centre, Agra

Shri Darshan Singh Yadav, Hon'ble Member of Parliament, Rajya Sabha from Etawah visited ICAR-IISWC Research Centre at Agra. Dr. S.K. Dubey, Head welcomed and briefed him about Centre's activities. He showed keen interest in pollution level of Jharna Nala and deteriorating ground water quality in ravines of Yamuna. He was quite happy with the Centre's activities and asked for detailed report on pollution being caused by Jharna Nala. His visit was quite encouraging for the Centre's staff.

Odisha Government Chief Secretary visited IISWC Headquarter Dehradun

Chief Secretary, Shri G.C. Pati, Government of Odisha along with Dr. Vinod Kumar, Director, IGFNA, Dehradun visited ICAR-IISWC at Dehradun on November 16, 2015 (Photo 1.2). He expressed interest in the training of officers of Odisha in Soil & Water Conservation and Watershed Management at the Institute. During his interaction with scientists, major focus was given on realistic and scientific watershed planning, de-risking climate change, augmenting long term gain, producing more from less land, etc. He said that empirical studies should be conducted for knowing defects in watershed planning, implementation and after withdrawal of the project from an area. Shri Vinod Kumar, Director, IGFNA, Dehradun drew attention to active involvement of village people in detailed project report preparation of the watershed. He said that integration of all components should be ensured for getting fruitful gains through watershed management. Dr. P.K. Mishra, Director highlighted achievements of the Institute, specially soil and water conservation initiatives and successful watershed cases. His concern was to save soil and water without any adverse effect on environment. Dr. M. Madhu, Head, IISWC Research Centre at Koraput (Odisha) made presentation on soil and water conservation works carried over at different locations of the Odisha state. Dr. D.R. Sena made a presentation on 'Cost Effective Watershed Planning - The State of Art Tools'.



Photo 1.2 : Shri G.C. Pati, Chief Secretary, Government of Odisha and Shri Vinod Kumar, Director, IGFNA, Dehradun interacting with Institute scientist

फोटो 1.2 : श्री जी.सी. पति, मुख्य सचिव, ओडिशा सरकार और डॉ. विनोद कुमार, निदेशक, इंदिरा गांधी राष्ट्रीय वन अकादमी, देहरादून भा.मू.ज.स.संस्थान के निदेशक एवं वैज्ञानिकों से विचार-विमर्श करते हुए

Secretary, ICAR & Additional Secretary, DARE visited ICAR-IISWC Research Centre, Chandigarh

Shri Chhabilendra Roul, Secretary, ICAR & Additional Secretary, DARE visited Research Farm of ICAR-IISWC Research Centre at Chandigarh on January 9, 2016. He visited the Centre's land site proposed for transfer to Haryana Urban Development Authority (HUDA) for construction of road in public interest. He visited the Research Farm, Sloping Agriculture Land Technology (SALT) experiment and vegetation manipulation studies of the centre. He also visited the aonla, ber and peach plantations at the Research Centre. The Secretary, ICAR visited the Research Centre, Main Office (Photo 1.3) on January 11, 2016 and had a meeting with Dr. P.K. Mishra, Director and all scientists. Dr. P.K. Mishra made a presentation about the R&D activities of the Institute. Dr. A.K. Tiwari, Head also provided a glimpse of

activities being taken up by the Research Centre. The Secretary, ICAR appreciated the work of the Institute and its Centre. He emphasized upon assessment of economic viability of research outcomes for benefit of farmers. A meeting was held by the Secretary, ICAR at mini Secretariat, Punjab and discussion was made on the problems related to agriculture and horticulture with Commissioner Agriculture, Director (Agriculture) and Director (Horticulture) of Punjab state along with Dr. P.K. Mishra and Dr. A.K. Tiwari. During the visit, plantation of *Mimusops elongi* (Molsiri) was done by the Secretary, ICAR at Research Farm. The Institute thanked him for his visit and providing useful suggestions.

Deputy Director General (NRM) visited NMSA Project Site

Dr. A.K Sikka, Deputy Director General (NRM), ICAR visited NMSA project site at Village Rasulpur Jatun, Muzaffarnagar on February 27, 2016. He critically observed the ongoing and completed activities - innovative water harvesting structure (Photo 1.4); private tubewells equipped with water conveyance system, PVC pipe line and outlets; operation of rain-gun installed at farmers' fields and; proposed the site of new WHS near Harsauli village. Dr. A.K. Sikka interacted with the farmers and expressed his happiness that farmers are taking interest in adoption of new irrigation system. He also appreciated the Science Driven - project implemented at farmers' field at Rasulpur village, Muzaffarnagar (UP).

Research Advisory Committee Meeting - 2016 held at Dehradun

The Research Advisory Committee (RAC) meeting of the Institute was held during February 19-20, 2016 at IISWC, Dehradun under the Chairmanship of Dr. B.C. Mal, Professor & Former Head, Department of Agriculture & Food Engineering, IIT Khargpur & Ex-Vice Chancellor, Chhattisgarh Swami Vivekanand Technical University, Bilai (Photo 1.5). Dr. Ranjoodh Singh, Ex-Director (Research) HPKV, Palampur; Dr. S.K. Sharma, Ex-Director, IIFSR, Modipuram; Dr. K.K. Satpathy, Ex-Director, NIRJAFT, Kolkata; Dr. P.S. Pathak, Ex-Director, IGFRI, Jhansi; Dr. Ram Babu, Ex-Head, Economics & Project Planning Division, IISWC, Dehradun; Dr. S.K. Chaudhari, Assistant Director General (S&WM), ICAR, New Delhi also attended the meeting as RAC members. Dr. P.K. Mishra, Director, IISWC briefed the RAC Chairman and Members about achievements of the Institute during 2014-15. All the Heads presented the progress of



Photo 1.3: Shri Chhabilendra Roul, Secretary (ICAR) & Additional Secretary (DARE) visited Centre's Lab during his visit to IISWC RC, Chandigarh

फोटो 1.3: श्री छबिलेन्द्र राउल, सचिव (भा.कृ.अन.प.) और अपर सचिव (कृषि अनुसंधान एवं शिक्षा विभाग) भा.मृ.ज.सं.सं. अनुसंधान केंद्र, चंडीगढ़ के भ्रमण के दौरान केंद्र की लैब का निरीक्षण करते हुए



Photo 1.4: Dr. Ambrish Kumar, Pr. Scientist appraising the progress of NMSA project at Rasulpur Jatun, Muzaffarnagar to Dr. A.K. Sikka, DDG (NRM), ICAR, New Delhi

फोटो 1.4: डॉ. अंबरीश कुमार, प्रधान वैज्ञानिक, डॉ. ए.के. सिक्का, उप-महानिदेशक (प्राकृतिक संसाधन प्रबंधन), भा.कृ.अन.प., नई दिल्ली द्वारा स्थायी कृषि हेतु राष्ट्रीय मिशन परियोजना के अंतर्गत रसूलपुर जाटों (मुजफ्फरनगर) का भ्रमण के दौरान प्रगति मूल्यांकन करते हुए

their respective Divisions and Research Centres. Theme-wise research progress of ongoing projects was presented by respective Theme Leaders. New project proposals submitted to RAC were also discussed for implementing in future. The RAC members expressed their happiness over the sincere efforts made by the Institute in undertaking new initiatives and implementing the recommendations during 2014-15.

ICAR Zonal Sports Meet 2015 Organized by IISWC

ICAR Inter Institutional North Zone Staff Sports meet was organized at IISWC, Dehradun during April 18-21, 2015. The sports meet was inaugurated by Dr. Vinod Kumar, Director, IGNSA, Dehradun (Photo 1.6). The inaugural tune played by Indian Army, Garhwal Regiment made the opening ceremony spectacular and memorable. Dr. P.K. Mishra, Director, ICAR-IISWC welcomed the participants and wished a happy and memorable stay at Dehradun. On this occasion, a souvenir on sports meet highlighting the tournament schedule and tourist places in Dehradun was also released. In the Sports Meet, 850 participants from 23 ICAR Institutes located at Lucknow, Kanpur, Bareilly, Varanasi, Mathura, Meerut, Almora, Nainital, Dehradun, Karnal, Hisar, Ludhiana, Shimla, Solan and Srinagar participated. Twenty categories of track and field events, namely, running, jumping and throwing, 4 categories of indoor games such as badminton, table tennis, carom and chess and 5 categories of outdoor, team games viz.; basketball, football, kabaddi, volleyball (shooting and smashing) were organised. In the closing ceremony, Dr. P.P. Bhojvaid, Director, FRI distributed the shields and medals to winning teams and player as Chief Guest. Mr. Rajnish Kumar and Mr. Sandeep Deswal from NDRI, Karnal and Mrs. Manisha Arya, from VPKAS, Almora were adjudged as best athletes amongst men and women, respectively. NDRI, Karnal won the overall championship by securing maximum points.

Jai Kisan Jai Vigyan Week Celebrated

The ICAR-IISWC celebrated *Jai Kisan Jai Vigyan* week during December 23-29, 2015 at Dehradun, Bellary Chandigarh and Koraput. At Dehradun, an interface meeting among different stakeholders including scientists, field level extension officers, soil conservation officers, forest officers representing eight states (West Bengal, Madhya Pradesh, Punjab, Uttarakhand, Nagaland, Maharashtra, Chhattisgarh and Uttar Pradesh) of the country was organised on December 23, 2015. Dr. P.K. Mishra, Director on this occasion stressed upon diversifying science for the benefit of



Photo 1.5: Research Advisory Committee meeting in progress under the Chairmanship of Dr. B.C. Mal held during February 19-20, 2016 at Dehradun

फोटो 1.5: अनुसंधान सलाहकार समिति की बैठक डॉ.बी.सी. मल की अध्यक्षता में फरवरी 19-20, 2016 को देहरादून में हुई



Photo 1.6: Dr. Vinod Kumar, Director, IGNSA, Dehradun during inaugural ceremony of ICAR Zonal Sports Meet 2015 organized by IISWC, Dehradun on April 18, 2015

फोटो 1.6: भा.मृ.ज.स.सं., देहरादून द्वारा 18 अप्रैल 2015 को आयोजित भा.कृ.अनु.प. क्षेत्रीय खेल-कूद प्रतियोगिता के उद्घाटन समारोह के अवसर पर मुख्य अतिथि डॉ. विनोद कुमार, निदेशक, इंदिरा गांधी राष्ट्रीय वन अकादमी, देहरादून

the farmers. Er. K.P. Tripathi, former Principal Scientist and Secretary, Agri-Innovation Foundation, Lucknow focused on need of agriculture knowledge management, for making technologies simple. He said that farmers are also scientists as they have lot of practical experience and wisdom. He shared few examples of traditional knowledge and ancient history of water management for drinking and irrigation purpose. A farmers training on S&WC was organized on December 28, 2015 for 35 farmers (Photo 1.7). On the occasion, Dr. P.K. Mishra, said that scientists have analytical ability and farmers have traditional wisdom and application ability. He advised the farmers and scientists to come together for solving their problems and issues through socially acceptable technological empowerment. During training course, a group of 60 students from Baba Farid Institute of Technology, Dehradun joined and learnt about the S&WC concept. During December 28 and 29, 2015, a display of S&WC technologies, including integrated farming systems, fish farming, participatory water resource development, mine spoiled rehabilitation work, bio-engineering, agronomical and combination of measures was also done for the farmers and students.



Photo 1.7: Farmers and students learning S&WC concept during training organized at Institute HQ on December 28, 2015 on the occasion of Jai Kissan Jai Vigyan celebration week

फोटो 1.7 : कृषक और छात्रों हेतु जय किसान जय विज्ञान उत्सव सप्ताह के अवसर पर 28 दिसंबर, 2015 को संस्थान मुख्यालय पर आयोजित मृदा एवं जल संरक्षण अवधारणा पर प्रशिक्षण

At Bellary, an interaction meeting was organized for farmers at Chellagurki village. Scientists and farmers interacted on S&WC, improved crop management and latest developments in agriculture. At Chandigarh, the programme was organized at villages Aganpur and Bhagwasi in Patiala district (Punjab) to create awareness among farmers and aiming to showcase and demonstrate latest technologies to enhance productivity and profitability. At Koraput, a one-day training was organized at village Jogiput adopted under Mera Gaon Mera Gaurav Programme to have interaction, understanding needs of villagers and providing scientific input/solution to existing needs with major emphasis on significance of soil testing and fertilizer application.

Mera Gaon Mera Gaurav Programme Successfully Executed by IISWC

The flagship programme of ICAR 'Mera Gaon Mera Gaurav' was successfully executed by scientists and staff of the Institute at its HQ Dehradun and Research Centres located in different agro-ecological regions of the country in selected villages to provide information to farmers on technical and other related aspects in a time frame through personal visits (Photo 1.8). To execute Mera Gaon Mera Gaurav programme effectively, total 87 scientists in position at different locations were classified in 22 groups (3 to 5 scientists in each group) to 108 identified villages in all covering on an average 5 villages by each group of scientists. In general, 2 groups of scientists at each Division at Institute HQ as well as at eight Research Centres are implementing the programme.



Photo 1.8: Scientists with farmers during Mera Gaon Mera Gaurav programme at Semalta, Dehradun

फोटो 1.8 : सेमल्टा गाँव, देहरादून में मेरा गाँव मेरा गौरव कार्यक्रम के अंतर्गत किसानों के साथ वैज्ञानिक

International Yoga Day Celebrated with Great Enthusiasm

The International Yoga Day, which has now made the ancient Indian invention well recognized for attaining good health of mind and body, was enthusiastically celebrated by scientists and staff as well as their families on June 21, 2015 at ICAR-IISWC HQ at Dehradun, and Research Centres at Agra and Kota (Photo 1.9). At Dehradun, adults and children gathered in a ground of the Institute campus in dawn of the celebrated day under the guidance of Shri Vijay Kumar Arya, a Yoga Teacher affiliated to Patanjali Yogpeeth, Haridwar and performed various 'asanas', 'pranayam' and relaxation exercises. Many of the participants, who had not practiced Yoga, enthusiastically followed the instructions of the Yoga Teacher and tried to emulate their fellow participants who are regular practitioners of Yoga. The one hour celebration ended with a round of open hearted laughter and a prayer for all-round peace. Some of the participants interacted with the Yoga Teacher for clarifying their doubts. At Research Centre Agra, Dr. R.P. Singh, a distinguished Yoga Teacher affiliated with Patanjali Yogpeeth, Haridwar emphasized on importance of Yoga for attaining good health of mind, body, and soul. At Kota, the Head and the staff of the Centre actively participated in the celebrations organized by Jawahar Lal Nehru Rajkiya Ooch Madhyamik Vidyalaya, Kota.



Photo 1.9: Institute staff practicing Yoga on International Yoga Day celebration under the guidance of a Yoga teacher affiliated to Patanjali Yogpeeth, Haridwar
फोटो 1.9: संस्थान के कर्मचारियों द्वारा पतंजलि योगपीठ, हरिद्वार से संबद्ध योग शिक्षक के मार्गदर्शन में अंतरराष्ट्रीय योग दिवस के आयोजन पर योगाभ्यास

IMPORTANT PUBLICATIONS

- ◆ Annual Report 2014-15, ICAR-IISWC, Dehradun.
- ◆ IISWC News, No.7 (October 2014 to March 2015). ICAR-IISWC, Dehradun (Half yearly Newsletter).
- ◆ IISWC News, No.8 (April to September 2015). ICAR-IISWC, Dehradun (Half yearly Newsletter).
- ◆ Background Note - Agro-climatic Zone I (H.P., J&K and Uttarakhand) for Workshop on 'Providing Technological Support, Extension and Demonstration Services to Farmers' held at SKUAST, Jammu on 4th November, 2015. ICAR-IISWC, Dehradun : 49p.
- ◆ Integrated Plant Nutrient System for Maize (*Zea mays* L.) with Reference to Phosphorous Nutrition. Lambert Academic Publishing, Germany (ISBN.No.978-3-659-71208-1, Rajan *et al.*).
- ◆ 60 Years of Research on Soil and Water Conservation in North-West Himalaya - Plant Science (2016). Division of Plant Science, ICAR-IISWC, Dehradun : 100p. (Chaturvedi *et al.*).
- ◆ 60 years of research on soil and water conservation in North-West Himalaya - Conservation Agronomy & Soil Science (2016). Division of Soil Science & Agronomy, ICAR-IISWC, Dehradun : 114p. (Sharma *et al.*)
- ◆ Status of Community Based Water Storage Structures in Gujarat (2015). Bulletin No. T-62/V-5. ICAR-IISWC, Research Centre, Vasad (Gujarat) : 38p. Pande *et al.*).
- ◆ Bamboo based resource conservation - A viable technology for reclamation of Yamuna ravines (2015). Technical bulletin No.T-67/A-01. ICAR-IISWC, Research Centre, Agra : 18p. (Singh *et al.*).
- ◆ *Sankar Napier - Uttar Paschim Himalay Kshetra Me Chara Uttapadan Evam Sansadhan Hetu Ek Upukat Vikalp* (2015). Technical Bulletin No. T-70/D-41, IISWC, Dehradun : 36p. (Singh *et al.*).
- ◆ Peripheral bund : Controlling measures for ravine formation in arable land (2016). Technical bulletin No. T-71/A-02. ICAR-IISWC, Research Centre, Agra : 16p. (Singh *et al.*).

- ◆ Fodder and Firewood Production from Managed Silvipastoral System Raised on Old River Bed Lands in the North-West Himalayas (2015)– Brochure. CSWCRTI, Dehradun : 8p. (Singh et al.).
- ◆ Souvenir & Programme - ICAR Zonal Tournament (North Zone) : April 18-21, 2015. ICAR-IISWC, Dehradun : 26p.

IMPORTANT MEETINGS

- ◆ 47th Meeting of Institute Management Committee at Dehradun on March 3, 2016.
- ◆ Research Advisory Committee (RAC) meeting of the Institute held at IISWC, Dehradun during February 19-20, 2016.

TRAINING PROGRAMMES

During the year, two batches of regular training course were conducted at Dehradun in which 47 officers were trained. So far, 2816 officers have been trained at Hqrs. Dehradun and Regional Research Centres at Bellary and Kota.

In addition, the institute also organized 104 short courses at Dehradun and its research centres at Chandigarh, Udthagamandalam, Agra, Kota, Vasad, Datia Bellary and Koraput in which 328 officers were trained (in 15 courses) and 3206 assistants / watershed functionaries / farmers (in 89 courses) conducted at institute / research centre's campus as well as in the selected villages under *Mera Gaon Mera Gaurav* programme.

RESOURCE GENERATION

For the Institute, revenue worth ₹ 131.75 lakhs was generated during 2015-16. Highest revenue was generated through sale of farm produce, fish & poultry (₹ 72.06 lakhs) followed by internal resource generation (training & consultancy) activities (₹ 57.99 lakhs), sale of publications (₹ 0.82 lakhs) and lab analysis (₹ 0.88 lakhs). It is attributed to efficient management of resources at Research Farms, organization of 88 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
CSWCRTI, Dehradun and its 8 Research Centres	Non-plan	4529.29	4518.99
	Plan	470.00	458.86
	Total	4999.29	4977.85

STAFF

The strength of sanctioned staff as on 31.3.2016 including filled and vacant positions is given as follows :

Category	Sanctioned	In position			Vacant
		Total	SC	ST	
RMP	01	01	--	--	--
Head	12	7	--	--	5
Principal Scientist	03	0	--	--	3
Sr. Scientist	28	18	1	1	10
Scientist	85	73	12	7	12
Administrative	83	63	10	2	20
Technical	176	127	27	7	49
Supporting	204	134	36	8	70
Total	592	423	86	25	169