

Curriculum vitae

Dr. Manmohanjit Singh

Ph.D. Soils

Director and Chief Scientist

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Academic Qualifications:

Class	% of marks	University / Board / Institute	Year of passing	Division
Ph.D. Soils	73.9	PAU, Ludhiana	2005	First
M.Sc. Soils	79.5	PAU, Ludhiana	1994	First, JRF & Gold Medal
B.Sc.Ag. (Hons.)	83.7	PAU, Ludhiana	1991	First, In merit
Matriculation	77.5	PSEB, Mohali	1986	First

Title of Ph.D. thesis: Soil erodibility as affected by land use under simulated and natural rainfall conditions. Major Advisor: Dr K L Khera, Retired Prof. Soil Conservation, PAU

Title of M.Sc. thesis: Growth and yield of spring Sunflower in response to amount and method of irrigation and fertilizer nitrogen.

Major Advisor: Dr K S Sandhu, Retired Sr. Soil Physicist, PAU

Awards / fellowships / distinctions

- Placed in merit in B.Sc. Agri. (Hons.) program.
- Received Dr. N S Randhawa gold medal for best M.Sc. student in soil science.
- Received junior research fellowship from Indian Council of Agricultural Research for M.Sc. studies.
- Cleared National Eligibility Test (NET) conducted by ICAR.
- Member Fellows Committee of Soil Science Society of America for the period January 1, 2010 to December 31, 2011.

- Chaired session in International Conference on Combating Land Degradation in Agricultural Areas (LANDCON1010) held at Xi'an Shaanxi Province, China from 11 to 15th October, 2010.
- Member Soil Science Applied Research Award Committee of Soil Science Society of America from 1.1.2014 to 31.12.2015.
- Executive Member, Soil Conservation Society of India, New Delhi (2014-16)
- Received Sumer Memorial Best Extension Scientist Award from Soil Conservation Society of India in Feb., 2015
- Invited to deliver lecture in GLAST-2016 (Global Forum of Leaders for Agricultural Science and Technology) at Lingshui, China in December, 2016
- Received Appreciation Certificate from Punjab Agricultural University in March, 2018
- Received best responsive centre award as team leader for All India Coordinated Research Project for Dryland Agriculture for the biennium 2016-2018.
- Executive member, Indian Society of Dryland Agriculture, Hyderabad (2019-21)
- Received Best Outstation Scientist Award from Punjab Agricultural University during 2019.
- Convener of technical session in international conference on soil and water resources management for climate smart agriculture, global food and livelihood security from 5-9 Nov. 2019 at NASC, New Delhi.

Professional Experience:

<i>S.No.</i>	<i>Designation</i>	<i>Pay scale</i>	<i>From</i>	<i>To</i>	<i>Place</i>
1	Asstt. Prof. (Soils)	8000-13500	26.2.1996	10.11.1997	KVK (PAU) Ferozepur
2	District Extension Specialist (Soils)	8000-13500	11.11.1997	14.3.2005	FASS (PAU) Hoshiarpur
3	Extension Specialist (Soils)	15600-39100 GP: 8000	15.3.2005	14.3.2008	FASS (PAU) Hoshiarpur
4	Extension Specialist (Soils)	37400-67000 GP: 9000	15.3.2008	14.3.2013	FASS (PAU) Hoshiarpur
5	Deputy Director (Trg.)	37400-67000 GP: 9000	15.3.2013	7.5.2013	KVK, Bahawal, Hoshiarpur
6	Extension Specialist (Soils)	37400-67000 GP: 9000	8.5.2013	31.3.2014	FASS (PAU) Hoshiarpur
7	Extension	37400-67000	1.4.2014	14.3.2011	FASS (PAU)

	Specialist (Soils)	GP: 9000			Mohali
8	Sr. Extension Specialist (Soils)	37400-67000 GP:10000	15.3.2011	31.3.2015	FASS (PAU) Mohali
9	Director & Chief Scientist	37400-67000 GP:10000	1.4.2015	Till date	RRS, Ballawal Saunkhri

Administrative experience

S. No.	Designation	From	To	Place
1	Deputy Director (Trg.)	15.3.2013	7.5.2013	KVK, Bahawal, Hoshiarpur
2	DES (SM)	30.10.2013	31.3.2014	FASS (PAU) Hoshiarpur
3	Director & Chief Scientist	1.4.2015	Till date	RRS, Ballawal Saunkhri

Specific research / extension interests

- Dryland farming and soil conservation
- Development of decision support system for land use, cropping pattern, fertilizer, water use and other decisions.
- Indexing of soils for soil physical health, introduction of management practices to improve organic matter status and water holding capacity.
- Sustainable productivity on marginal soils
- Soil erosion modeling and management.
- Rainwater harvesting and optimum use of limited available irrigation water

Skills

- Project formulation, implementation and documentations.
- Extension experience for working with medium, small and marginal farmers both under irrigated and rainfed conditions.
- Hand-on experience with GIS and RS technologies.
- Verbal and written communication skills
- Networking skills with NGOs, social organizations & development agencies.

RESEARCH

1. Research projects / schemes

a. Concluded

S. No.	Role	Title of Project	Funding Agency	Duration	Funds (Lakhs)
1	Co-PI	Community managed Bio-industrial Watersheds for Sustainable Land Use of Natural Resources and Enhanced Livelihoods	MSSRF, Chennai	2007-2012	104.65
2	Co-PI	Behaviour and pattern of gully erosion in foothills of lower Shiwaliks”	DST, New Delhi.	2007-2008	12.50
3	Co-PI	Farmers Participatory Action Research Program – Phase -I.”	Ministry of Water Resources, New Delhi	2008-2009	50.0
4	Co-PI	Management of gully erosion in foothills of lower Shiwaliks.”	DST, New Delhi	2008-2010	15.85
5	Co-PI	Farmers Participatory Action Research Program – Phase -II.	Ministry of Water Resources, New Delhi	2010-2011	50.0
6	Co-PI	Evaluating bio-fertilizers for improving nutrient use efficiency in wheat-moong cropping system	The Energy Research Institute, New Delhi	2009-2013	5.62
7	PI	Development and demonstration of runoff farming system on micro-watershed basis in the foothills of lower Shiwaliks	SRTT, Mumbai	2012-2014	31.95
8	Co-PI	Improving nutrient use efficiency in cotton, wheat and maize by coating seed with mycorrhiza and using leaf colour chart (LCC), chlorophyll (SPAD) meter, optical sensor (GreenSeeker)	The Energy Research Institute, New Delhi.	2012-2018	42.68
9	PI	Evaluation of poly-coated urea for improving N use efficiency under stressed and unstressed conditions in cereal crops in Punjab	GSFL, Gujrat	2016-2018	16.18
10	Co-PI	Integrated approaches to conserve the natural resources for sustainable development & to mitigate the effect of climate change in participatory mode.	DST, New Delhi under SARTHI	2015-2018	26.48
11	Chief Scientist	AICRP on Dryland Agriculture Phase-II (ORP)	ICAR, CRIDA	1976-2018	Varies

	(2015-18)				
12	In-charge (2015-19)	Integrated Watershed Management Research in Kandi	State Govt.	1985-2019	Varies
13	PI	Revival of Village Ponds through Scientific Interventions	DST, GOI	2017-2019	28.82

b. On-going

Sr. No.	Role	Name of the project / scheme	Funding agency	Duration	Funds (Lakhs)
1	In-charge since 2015	Establishment of Regional Station, Ballowal Saunkhri (Plan -59)	State Govt.	1978-till date	Varies
2	Chief scientist since 2015	AICRP on Dryland Agriculture	ICAR, CRIDA	1970-till date	Varies
3	PI since 2015	National Initiative on Climate Resilient Agriculture (NICRA)	ICAR, CRIDA	2011-till date	Varies
4	Nodal officer since 2015	Gramin Krishi Mausam Sewa (GKMS)	IMD, Pune	2006-till date	Varies
5	PI	Planning of de-centralized erosion prevention for selected rain water retention measures in Punjab, India under the aspect of the adjustment to climate change	I PRO & GIZ, Germany	2017-2019	43.16
6	In-charge	Diploma in Agriculture at Regional Research Station, Ballowal Saunkhri	PAU	2018 onwards	Varies
7	Co-PI	Inventorization of medicinal plants and prioritized tradable species in selective blocks of kandi region of lower Shiwalik hills.	NMPB	2019	2.50

3. Association with research journals

1. Member Editorial Board:
Journal of Soil and Water Conservation, India
2. Reviewer of:
 - a. Soil Science Society of America Journal
 - b. Land Degradation and Development Journal
 - c. Journal of Hydrologic Engineering (American Society of Civil Engineers)
 - d. Journal of Agricultural Science and Technology
 - e. Agronomy
 - f. Sustainability
 - g. Agricultural Water Management

TEACHING

1. Guided M.Sc students as major advisor:

a. Completed

S. No	Name	Admission no.	Duration	Title of thesis
1.	Jashanjit kaur	L-2015-A-141-M	2015-2017	Medium – term impact of resource conservation technologies in rice-wheat system on physical environment of soil
2.	Harpreet Singh	L-2016-A-141-M	2016-till date	Assessing runoff and soil loss at micro-watershed level in Shiwaliks of Punjab using EROSION-3D model

b. On-going

S. No	Name	Admission no.	Duration	Title of thesis
1	Robinpreet Singh	L-2018-A-147-M	2018-till date	Application of EROSION-3D model for simulation of runoff and sediment yield under different land uses in lower Shiwaliks of Punjab
2	Manpreet singh	L-2019-A-137	2019-till date	

2. Guided M.Sc students as advisory committee member

a. Completed

S.No.	Name	Admission no.	Duration	Title of thesis
1	Davinder Singh	L-2006-A-76-M	2008-2010	Behaviour and management of soil erosion on micro-catchment basis in sub-mountainous tract of Punjab

3. Courses taught

S.No.	Course no and title	Semester & year
1	Soil 52 (2+1) Elementary Soil physics and conservation	2 nd sem.2018
2	SWE 51 (2+1) Farm irrigation and drainage	3 rd sem. 2019
3	Soils 51 (2+1) Elementary Soil Fertility	1 st sem.2019

EXTENSION ACTIVITIES

1. Details of various extension activities conducted:

	Training camps organized	Resource person in training camps	Adaptive research trials	Field demonstrations	Field days	Campaigns	Exposure visits	Exhibitions	Participations in kisan melas / workshops within state
1996-97	22	1	3	3	1	1	1	4	6
1997-98	14	14	7	27	1	1	2	4	9
1998-99	4	20	3	16	3	1	2	4	10
1999-00	7	28	8	4	3	2	2	6	9
2000-01	3	13	1	6	1	2	2	4	2
2001-02	1	1	2	2	1	0	0	0	0
2002-03	0	0	0	0	0	0	0	0	0
2003-04	0	0	0	0	0	0	0	0	0
2004-05	1	1	7	7	2	0	2	2	4
2005-06	2	1	3	2	2	0	2	4	4
2006-07	1	27	1	10	2	0	2	4	7
2007-08	1	14	3	3	2	1	2	4	8
2008-09	9	8	1	21	1	0	2	8	8
2009-10	6	11	3	11	3	0	2	3	8
2010-11	11	9	3	17	6	8	1	3	8
2011-12	3	13	3	18	2	7	2	8	12
2012-13	0	19	3	27	3	8	2	10	6
2013-14	3	9	4	14	3	8	2	7	7
2014-15	0	10	4	11	2	1	0	2	6
2015-16	3	4	0	19	3	0	0	0	3
2016-17	4	9	0	22	2	0	0	0	4
2017-18	4	16	0	25	2	0	0	0	2
2018-19		31	0	0	9				
Total	99	228	59	265	45	40	28	77	123

2. Recommendations

- Mulching and optimum irrigation schedule for hybrid chilli.
- Nitrogen requirement of hybrid chilli.
- Mosaic sulphated P fertilizer as a source of S in raya.
- Mosaic sulphated P fertilizer as an alternative source of sulphur and phosphorous for soybean.
- Mosaic sulphated P fertilizer as an alternative source of sulphur and phosphorous for maize.
- Need based N management in maize using leaf colour chart.
- Application of rice husk ash and baggase ash for improving yield and soil health in wheat-rice cropping system.
- Need based fertilizer N management in timely sown wheat using leaf colour chart.

3. Radio talks

S.N.	Topic	Date of Recording / Telecast / Broadcast	Location
1	Fertilizer and water management in rabi crops	9.11.2011	AIR Jalandhar
2	Khadan di sahi varton te patta rang chart	22.7.2014	AIR, Jalandhar
3	Patta rang chart di varton	15.7.2015	AIR, Jalandhar

4. Surveys Conducted

Sr.No.	Details	Year	Location
1	Survey on Cu deficiency in fodder crops	1996	Fazilka & Khuhian Sarwar
2	Crop survey for nutrition deficiencies	Rabi 1997-1998	Hoshiarpur
3	Crop survey for nutrition deficiencies	Kharif 1998	-do-
4	Crop survey for nutrition deficiencies	Rabi 1998-1999	-do-
5	Crop survey for nutrition deficiencies	Kharif 2000	-do-
6	Crop survey for nutrition deficiencies	Rabi 2001-2002	-do-
7	Crop damage by polluting industrial unit	2014	Dera Bassi block
8	Prospect of wheat crop in Mohali	2014	Mohali
9	Status of resource conservation technologies	2014	Mohali

5. Miscellaneous activities

- Organized two kisan melas each year at RRS, Ballawal Saunkhri since 2015.
- Member of various committees for organizing Kisan Melas at RRS, Ballawal Saunkhri before 2015.
- Participation in monthly review meeting of research and extension held at Directorate of Extension, PAU & district production committee meetings held at DC office
- Member SAC of four regional KVKs and attended meeting of SAC
- Sale of university seed and university literature
- Organized activities of PNKS at FASS, Hoshiarpur
- Established soil testing laboratory at KVK, Hoshiarpur

Publications

A. Research papers in referred journals

1. **Singh MJ** and Khera KL (2006) Runoff and soil loss as affected by land use, rainfall intensity and antecedent soil moisture content under simulated rainfall conditions. *Indian Journal of Soil Conservation* **34** (3) 254-256.
2. **Singh MJ** and Khera KL (2006) Runoff and soil loss under different land uses in the sub-montaneous tract of Punjab. *Indian Journal of Ecology* **33**(2) 126-128.
3. **Singh MJ** and Khera KL (2007) Soil erodibility in relation to physical and physico-chemical characteristics of soils of submontane Punjab. *Journal of the Indian Society of Soil Science* **55**(3) 340-348.
4. **Singh MJ** and Khera KL (2008) Soil erodibility indices under different land uses in lower *Shiwaliks*. *Tropical Ecology* **49**: 113-119.
5. **Singh MJ** and Khera KL (2009) Physical indicators of soil quality in relation to soil erodibility under different land uses. *Arid Land Research and Management* **23**:152-167.
6. **Singh MJ** and Khera KL (2009) Nomographic estimation and evaluation of soil erodibility under simulated and natural rainfall conditions. *Land Degradation and Development* **20**: 471-480.
7. **Singh MJ**, Dhillon SK and Dhillon KS (2010) Selenium concentration in fodder crops as affected by the application of gypsum and phosphate fertilizer. *The IUP Journal of Plant and Soils* **3**:65-71.
8. DS Sran, SS Kukal and **MJ Singh** (2010) Soil Physical Properties and Landslope Relations in Shiwaliks of Lower Himalayas. *Indian Journal of Ecology* **38**: 63-66.
9. **Singh MJ**, Toor AS and Gurbax Singh (2011) Extent of fertilizer use and its requirement in Hoshiarpur district of Punjab (India): A case study. *Indian Journal of Fertilizers* **7**: 58-61.
10. **Singh MJ** and Khera KL (2011) Evaluation and estimation of soil erodibility by different techniques and their relationships. *Journal of Soil and Water Conservation, India*.**10**: 208-212.
11. **Singh MJ** and Khera KL (2011) Portable Micro-sprinkler based Rainfall Simulator for In-situ Soil Erosion studies. *Journal of Soil and Water Conservation, India*. **10**: 108-112.
12. **Singh MJ**, Khera KL and Priyabrata-Santra (2012) Selection of soil quality indicators in relation to soil erodibility. *Archives of Agronomy and Soil Science* **58**: 657-672.
13. DS Sran, SS Kukal and **MJ Singh** (2012) Soil physical properties and landscape relations in Shiwaliks of lower Himalayas. *Archives of Agronomy and Soil Science* **58**: 1317-1327.
14. Varinderpal Singh, Bijay-Singh, H S Thind, Yadvinder-Singh, R K Gupta, Satinderpal-Singh, Meharban-Singh, Satwinder-Kaur, **MJ Singh**, J S Brar, Angrez-Singh, Jagmohan-Singh, Ajay-Kumar, Sukhwinder-Singh, Amanpreet-Kaur and V Balasubramaniam (2014) On-farm evaluation of leaf colour chart for need-based nitrogen management in rice, maize and wheat in North-western India. *Journal of Research, PAU, Ludhiana*.
15. A.K. Khokhar, Satvinder Singh, Vijay Kumar, S.C. Sharma, S.S. Bawa, Sher Singh, Vivek Sharma, and **MJ Singh** (2016) Seed priming and foliar spray of thiourea for

- improving growth and productivity of rainfed wheat in Kandi region of Punjab. *The Bioscan* **11(3)**: 1693-1696.
16. Yousaf A and **MJ Singh** (2016) Runoff and soil loss estimation using hydrological models, remote sensing and GIS in Shiwalik foothills: A review. *Journal of Soil and Water Conservation, India*. **15**: 205-210.
 17. Vivek Sharma, Vijay Kumar, S C Sharma, R K Sharma, Anil Khokhar and **MJ Singh** (2017) Climatic variability analysis at Ballowal Saunkhri in Submontane Punjab (India) *Climate Change and Environmental Sustainability* **5**:83-91.
 18. Vivek Sharma, Amit Salaria, **MJ Singh**, Vijay Kumar, Sukhvinder Singh, Anil Khokhar, S.C. Sharma, G. Ravindra Chary and P.S. Sandhu. 2017. Impact of improved dryland technologies on sustainable crop productivity and efficient utilization of resources in submontane Punjab. *Indian Journal of Dryland Agricultural Research & Development* **32**: 34-43.
 19. Vivek Sharma, **MJ Singh**, Vijay Kumar and Anil Khokhar (2018) Response of integrated nutrient management on growth, seed yield and economics of sesame (*Sesamum indicum* L.) under rainfed conditions. *Indian Journal of Dryland Agricultural Research and Development* **33**:45-48
 20. **Singh MJ**, Abrar Y , S.C. Sharma, S.S. Bawa, Anil Khokhar, Vivek Sharma, Vijay Kumar, Satvinder Singh and Sher Singh (2017) Evaluation of vegetative barriers for runoff, soil loss and crop productivity in Kandi region of Punjab. *Journal of Soil and Water Conservation, India* **16**: 325-332.
 21. Khokhar AK, SS Bawa, Satvinder Singh, Vivek Sharma, SC Sharma, Vijay Kumar, GR Chary and **MJ Singh** (2018) Tillage and nutrient management practices for improving the productivity and soil physico-chemical properties in maize (*Zea mays* L.)-wheat (*Triticum aestivum* L.) cropping system under rainfed conditions in Kandi region of Punjab. *Indian Journal of Agronomy* **63**:278-284
 22. Jonas Lenz, Abrar Yousuf, Marcus Schindewolf, Michael von Werner, Kerstin Hartsch, **MJ Singh** and Jürgen Schmidt (2018) Parameterization for EROSION-3D Model under Simulated Rainfall Conditions in Lower Shivaliks of India. *Geosciences* **8**:396
 23. Navneet Kaur and **MJ Singh** (2019) Verification of medium range weather forecast for the *Kandi* region of Punjab. *Mausam* **70**:551-560.
 24. Sapna Sharma, Sandeep Sharma, Anirudh Thakur and **MJ Singh** (2020) periodic change in arbuscular mycorrhizal fungi in the rhizospheric soil of fruit plants. *Agric Res. J.***55**:685-690.

B. Full length papers published in proceedings of workshops / conferences

1. **Singh MJ** and Khera KL (2005). Soil and sediment characteristics under different land uses in the submontaneous tract of Punjab. In: (Eds. Sharda et al.) 'Resource Conserving Technologies for Social Upliftment', IASWC, Dehradun, India, pages 133-136.
2. **Singh MJ** and Khera KL (2010) Community Managed Bio-industrial Watershed for Sustainable Use of Natural Resources. Paper presented at 3rd International Conference on Hydrology and Watershed Management held at JNTU, Hyderabad from 3 to 6 February, 2010

3. **Singh MJ** (2010) Farmer field demonstrations on water conservation technologies in Hoshiarpur district of Punjab. In: Rao M S, Suhas Khobragade, Bhishm Kumar, Singh RD (Eds.) Proceedings of the regional workshop on 'Water Availability and Management in Punjab' National Institute of Roorkee. pp 207-211.
4. **Singh MJ** and Hadda MS (2012) Bio-industrial watershed concept for livelihood security – a case study. In: Sandhu, SK et al (eds) *Proceedings of International Conference on Sustainable Agriculture for Food and Livelihood Security*, November 27-29, 2012, Ludhiana, India: Crop Improvement Vol. **39** (Spl. Issue), p 1667.
5. **Singh MJ** S S Kukal and Anil Khokhar (2015) Soil and Water Conservation Research in Shiwaliks of Punjab. Paper published in Proceedings of National Workshop on Natural Resource Management for Climate Resilient Agriculture in Lower Himalayas (NWNRM 2015) held at RRS, Ballawal saunkhri on Dec. 22-23, 2015.
6. Kumar Vijay, **MJ Singh**, Vivek Sharma, Khokhar A, Amit Salaria and Yogesh Khokhar (2015) Problems and Prospectus of farming in Kandi Region of Punjab. In proceedings of National Workshop on Natural Resource Management for Climate Resilient Agriculture in Lower Himalayas organized at Regional Research Station, Ballawal Saunkhri w.e.f. 22-23 Dec., 2015. Pp: 3-12.

C. Invited research papers for presentation

1. **Singh MJ** (2010) Soil sustainability in relation to soil erosion in Shiwaliks of Lower Himalayas. Paper presented in International Conference on Combating Land Degradation in Agricultural Areas (LANDCON1010) held at Xi'an Shaanxi Province, China from 11 to 15th October, 2010.
2. **Singh MJ** (2014) Evaluation of in-situ moisture conservation technologies under rainfed agriculture. Paper presented at National Symposium on Natural Resource Management and Sustainable Hill Farming Systems for Livelihood Security held at SKUAST, Jammu from 23 to 24th July, 2014.
3. Kukal SS and **Singh MJ** (2014) Integrated watershed management for runoff farming – A success story in Shiwaliks region of Northwest India. Paper presented at National Symposium on Natural Resource Management and Sustainable Hill Farming Systems for Livelihood Security held at SKUAST, Jammu from 23 to 24th July, 2014.
4. **Singh MJ**. 2016. Agricultural Technologies for Poverty Reduction of Small and Marginal Farmers. Invited paper presented in 5th GLAST (Global Forum of Leaders for Agricultural Science and Technology, GLAST-2016) held at Lingshui, China from 13-15 December, 2016
5. **Singh MJ**. 2017. Land and Water Management Techniques for Poverty Reduction in Small and Marginal Farmers. Invited paper presented in 1st Asian conference on "Water and land management for food and livelihood security" held at Raipur (Chhattisgarh) on January 20-22, 2017.
6. **Singh MJ**, Yousuf A and Rana DS (2017) Scientific interventions for rainwater management in lower Shiwaliks under changing climatic scenario. 26th National Conference on Natural Resource Management for Climate Smart Sustainable Agriculture, Barapani, Meghalaya (11-13 September 2017)

D. Presented research papers

1. **Singh MJ** and Sandhu KS (1995) Amount and method of irrigation and fertilizer nitrogen effects on sunflower growth and N update. Paper presented at 60th Annual convention of Indian Society of soil science held at PAU Ludhiana.
2. **Singh MJ** and Sandhu KS (1997) Effect of amount and method of nitrogen application on growth and yield of Sunflower in lysimetric study. Paper presented at 62nd annual convention of Indian Society of Soil Science held at Science city Calcutta.
3. **Singh MJ** and Boparai BS (1997) Studies on correction of manganese deficiency in wheat. Paper presented at 62nd annual convention of Indian Society of Soil Science held at Science city Calcutta.
4. **Singh MJ** and Khera KL (2005) Physical and physico-chemical characteristics of *Kandi* belt soils of Punjab under different land uses. Paper presented at 70th annual convention of Indian Society of Soil science held at Coimbatore from 28th Sep. to 1st Oct. 2005.
5. Sharma SC, Rana DS, Nilesh-Biwalkr and **Singh MJ** (2007) Hydrological behaviour of Shiwaliks catchments of Punjab – Water resource development. Paper presented at State Level Workshop on Catchments Treatments of River Valley and Flood Prone Areas in Himachal Pradesh on 24th March, 2007 at Y S Parmar University of Horticulture and Forestry, Nauni, Solan, H.P.
6. **Singh MJ** and Khera KL (2007) Soil erodibility indices in relation to soil loss under different land uses in lower Shiwaliks. Paper presented in National Conference on 'Environmental and Livelihood Security Through Resource Management in Northern India (ELSTRM-2007) organized by Indian Association of Soil & Water conservationists held from 29 to 31 October, 2007 at Chandigarh.
7. Khera KL, **Singh MJ** and Rajkumar (2007) Morphological characterization of *kandi* belt soils of Punjab under different land uses. Paper presented in National Conference on 'Environmental and Livelihood Security Through Resource Management in Northern India (ELSTRM-2007) organized by Indian Association of Soil & Water conservationists held from 29 to 31 October, 2007 at Chandigarh.
8. **Singh MJ**, Toor AS and Gurbax-Singh (2008) Extent of fertilizer use and its requirement in Hoshiarpur district of Punjab (India): a case study. Paper presented at National Seminar on "Policy Interventions for Promotion of Balanced Fertilization and Integrated Nutrient Management" held on April 10-11, 2008 at Himachal Pradesh Krishi Vishvavidyalaya, Palampur, HP.
9. **Singh, MJ**, Khera KL and Hadda MS (2008) PCA analysis of soil quality indicators in relation to soil erodibility. Paper presented at Joint Annual Meeting of SSSA-ASA-CSSA-GSA from 5 to 9th October, 2008 at Houston, Texas, USA.
10. **Singh, MJ** and Khera K L (2009) Modification of soil erodibility nomograph for estimation of soil erodibility under simulated and natural rainfall conditions. Paper presented at 9th Agricultural Science Congress held at Srinagar from 22 to 24th June, 2009.
11. **Singh MJ** (2009) Fertilizer use trends and awareness about Soil Testing of Farmers of Hoshiarpur District of Punjab. Paper presented at Annual Convention of Indian Society of Soil Science held at New Delhi from 23 to 25 December, 2009.
12. **Singh MJ** and Khera K L (2009) Portable Rainfall Simulator for In-situ Soil Erosion and Hydrologic Studies. Paper presented at Annual Convention of Indian Society of Soil Science held at New Delhi from 23 to 25 December, 2009.
13. **Singh MJ** and Khera K L (2010) Evaluation and estimation of soil erodibility by different techniques and their relationships. Paper presented at World Congress of Soil Science held at Brisbane (Australia) from 1-6 August, 2010.

14. **Singh M J**, Kukal S S and Naveen-Gupta (2010) Pattern and behavior of gully erosion in *Shiwaliks* of lower Himalayas. Paper presented at World Congress of Soil Science held at Brisbane (Australia) from 1-6 August, 2010.
15. **Singh M J** (2012) Sustainable agricultural water management under climate change. Paper presented at National Conference held at BAM College, Garshankar, Hoshiarpur from 14 to 16th Feb. 2012.
16. **Singh M J**, Khera K L & Raj-Kumar (2012) Mineralogical characteristics of kandi belt soils of Punjab under different land uses. Paper presented at Annual Convention of Indian Society of Soil Science held at PAU Ludhiana from 3 to 6th December, 2012.
17. **Singh M J**, Kukal S S & Bawa S S (2012) Traditional and alternate gully management practices in kandi area of Punjab. Paper presented at Annual Convention of Indian Society of Soil Science held at PAU Ludhiana from 3 to 6th December, 2012.
18. **Singh MJ** and SS Kukal (2013) An appraisal of traditional technical knowledge of farmers for soil and water conservation. Paper presented at National Seminar on Sustainable Development of Rural India by 2022 held at NITTTR, Chandigarh from 7 to 8 March, 2013.
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L. Annual Reports

1. AICRP-ORP : 2015-16, 2016-17, 2017-18,
2. AICRP- Dryland Agriculture: 2015-16, 2016-17, 2017-18
3. NICRA : 2015-16, 2016-17, 2017-18, 2018-19
4. RRS, Ballawal Saunkhri : 2015-16, 2016-17, 2017-18, 2018-19
5. Plan 59: 2015-16, 2016-17, 2017-18, 2018-19
6. Plan 60: 2015-16, 2016-17, 2017-18, 2018-19
7. Evaluation of poly coated area project : 2016-17, 2017-18
8. GKMS : 2015-16, 2016-17, 2017-18, 2018-19
9. Erosion 3D Project : 2017-18, 2018-19
10. Diploma in Agriculture Project : 2018-19

Other Reports

1. Daily weather of RRS, Ballawal Saunkhri: 1983-88, 1989-93, 1994-98, 1999-2003, 2010-14

MISCELLANEOUS

1. Specialized trainings attended in India and abroad

S. No.	Title	Venue	Dates	Duration (days)
1	Induction training course by Human Resource Development cell	PAU, Ludhiana	12 to 30.5.1997	19
2	Specialized training course on production technology & quality aspects of durum wheat	PAU, Ludhiana	26 to 29-8-1997	4
3	Rainfed crop production technology for kharif crops	RRS, Ballawal Saunkhri	10 to 11-3-1998	2
4	Short-term training course in soil testing	PAU, Ludhiana	28 to 29-4-1999	2
5	Training workshop on enhancing science coverage in mass media	PAU, Ludhiana	6 to 9-11-2001	4
6	Refresher course in 'Energy audit, conservation and renewable energy conservation'	COAE, PAU, Ludhiana	July 15 to Aug. 5, 2002	22
7	Faculty training course in 'Advances in information technology and its applications in scientific research'	COAE, PAU Ludhiana	Dec. 30, 2002 to Jan. 22, 2003	24
8	Training course on 'Efficient nutrient management for sustaining crop productivity'	Deptt. Of Soil Science, PAU, Ludhiana	Dec. 2 to Dec. 22, 2004	21
9	Winter school on 'Remote sensing applications in agriculture with special emphasis on draught management'	Division of Agril. Physics, IARI, New Delhi	March 23 to April 16, 2005	35

10	National training program on efficient management and use of water resources for sustainable agriculture	Ministry of Water Resources, GOI at PAMETI, PAU, Ludhiana	6 to 11 Feb. 2006	6
11	Training course on 'Soil health enhancement through improved technology' organized	Deptt. of Soil Science, PAU, Ludhiana	Aug. 28 to Sep. 1, 2006	5
12	Training course on soil productivity management	PAMETI, PAU, Ludhiana	March 5to 10, 2007	6
13	Short course on 'Integrated watershed approach for natural resource management and sustainable crop production in rainfed region'	Marathwada Agricultural University, Parbhani (Maharashtra)	Jan. 2 to 11, 2008	10
14	Training program on Decision Support Systems for Geo-spatial Knowledge Management for Sustainable Livelihood Security	NAARM, Hyderabad	June 4 to 13, 2008	10
15	Training program on Soil Physical Properties and Processes under Climate Change	The Abdul Salam ICTP, Trieste, Italy.	30th August to 10th September, 2010	12
16	Training course on Soil & Water conservation and Ecosystem restoration	Institute of Soil & Water Conservation, Yangling, China	14 to 29 Sep., 2018	16

2. Participation in workshops / conferences / conventions / symposiums etc.

S. No.	Title	Duration	Venue
1	62 nd Annual convention of Indian Society of Soil Science	18-21.10.1997	Science City, Calcutta
2	Workshop for extension workers on the use of balanced fertilizers	15-16.12. 1997	PAU, Ludhiana
3	Zonal research and extension advisory committee workshop	14.7.1998	ZRSKA, Ballawal Saunkhri
4	State level workshop on latest technology for rabi crops and alternative to rice-wheat	22-23.10.2001	PAU, Ludhiana
5	70 th Annual Convention of Indian Society of Soil Science	28.9.2005 to 1.10. 2005	TNAU, Coimbatore
6	International symposium on balanced fertilization	22-25.11. 2006	PAU Ludhiana
7	State level workshop on Catchments treatments of river valley and flood prone areas in Himachal Pradesh	24.3. 2007	Nauni, H.P.
8	International conference on 'Water management strategies for food security and environmental quality'	17-19.9. 2007	PAU, Ludhiana
9	Workshop on 'Nutrient and water management in wheat'	21.12.2007	PAU, Ludhiana
10	National Conference on 'Environmental & Livelihood security through resource management in Northern India – ELSTRM-2007'	29-31.10.2007	Chandigarh
11	Inception workshop of 'Community managed Bio-industrial Watersheds for Sustainable Land Use of	31.1.2008 -4.2. 2008	MSSRF, Chennai

	Natural Resources and Enhanced Livelihoods”		
12	National seminar on balanced fertilizers	10-11.4. 2008	Palampur
13	Training workshop	21-22.5. 2008	MSSRF, Chennai
14	Joint Annual Meeting of SSSA-ASA-CSSA-GSA	5-9.10. 2008	Houston, Texas, USA
15	Project review workshop	16-17.6. 2009	MSSRF, Chennai
16	9 th Agricultural Science Congress	22-24.6. 2009	Srinagar
17	Workshop on Gender Mainstreaming and People Participation	10-13.11. 2009	Jeypore (Orissa)
18	74 th Annual convention of Indian Society of Soil Science	22-25.12.2009	N. Delhi
19	3 rd International Conference on Hydrology and Watershed Management	3-6.2. 2010	JNTU, Hyderabad
20	19 th World Congress of Soil Science	1-6.8. 2010	Brisbane (Australia)
21	International Conference on Combating Land Degradation in Agricultural Areas (LANDCON1010)	11-15.10. 2010	Shaanxi Province, China
22	Regional workshop on Water Management	13-15.12.2010	PU, Chandigarh
23	National Conference on Climate Change	14-16.2.2012	BAM College, Hoshiarpur
24	International conference on sustainable agriculture for food and livelihood security	27-29.11.2012	PAU, Ludhiana
25	77 th Annual convention of Indian Society of Soil Science	3-6.12. 2012	PAU, Ludhiana
26	National Seminar on Sustainable Development of Rural India by 2022	7-8.3. 2013	NITTTR, Chandigarh
27	National Conference on Farming System and Bio-industrial Watershed Management for Food Security and Enhancing Income of the Farming Community	16-17.4.2013	Lucknow, UP
28	Recent advances in watershed management	5-6.9. 2013	Ahmednagar (Maharashtra)
29	Indian Science Congress	3-7.2. 2014	Jammu
30	National Symposium on Natural Resource Management and Sustainable Hill Farming Systems for Livelihood Security	23-24.7. 2014	SKUAST, Jammu
31	77 th Annual convention of Indian Society of Soil Science	24-27 Nov., 2014	Hyderabad
32	International Potato Expo	15 to 16 th January, 2015	Chandigarh
33	International conference on Livelihood Security	10-13 February, 2015	New Delhi
34	Project inception workshop of DST	27-28 May, 2015	PAU, Ludhiana
35	3 rd Annual review workshop of AICRPDA-NICRA	22 to 23 Aug., 2015	Anantapur, AP
36	National Workshop on Natural Resource Management for Climate Resilient Agriculture	22-23 Dec., 2015	RRS, Ballawal Saunkhri
37	15 th working group meeting of AICRPDA	24 to 27 Dec., 2015	Biswanath Chariali (Assam)
38	Regional coordination meeting of ICARDA	26.2.2016 to 1.3.2016	Kathmandu, Nepal
39	4 th Annual review workshop of AICRPDA-NICRA	3 to 6 May, 2016	Kovilpatti, TNAU

40	National workshop on 'Revival of village ponds'	22.06.2016	PAU, Ludhiana
41	GLAST-2016 (Global Forum of Leaders for Agricultural Science and Technology)	13-15 Dec., 2016	Lingshui, China
42	XXV Biennial Workshop of AIRPDA	17-21 January, 2017	Akola, Maharashtra
43	1 st Asian conference on "Water and land management for food and livelihood security"	January 20-22, 2017	Raipur (Chhattisgarh)
44	5 th Annual review workshop of AICRPDA-NICRA	26 to 27 May, 2017	CRIDA, Hyderabad
45	Take off workshop of project "Revival of village ponds"	21 & 22 nd July 2017	PAU, Ludhiana
46	26th National Conference on Natural Resource Management for Climate Smart Sustainable Agriculture	11-13 September 2017	Shillong
47	2nd Himachal Pradesh Science Congress	20-21 Nov. 2017	Shimla
48	AICRPAM meeting	26 & 27 Nov., 2017	Jammu
49	Research Review Meeting of DST project "Revival of Village pond	24.01.2018	IARI New Delhi
50	XXVI working group meeting of AICRPDA	1-5 February 2018	Jagdalpur (Chhattisgarh)
51	QRT review meeting of AICRPDA	12-13 March, 2018	Junagarh (Gujrat)
52	6 th Annual review workshop of AICRPDA-NICRA	24 to 27 May, 2018	CRIDA, Hyderabad
53	Project review of DST village pond project	16 to 22 June, 2018	Delhi and Bengaluru
54	Organized workshop on Application of Hydrological Modles for Soil erosion management.	17 Oct, 2018	RRS, Ballawal Saunkhri
55	Organized review meeting of Networking project on 'Revival of Village Ponds through Scientific Interventions'	28-29 Nov, 2018	PAU Ludhiana, RRS Ballawal Saunkhri
56	28 th National Conference on Soil Society of India.	31 Jan 2019 to 2 Feb 2019.	Udhagamandalam, Ooty, Tamil Nadu.
57	Workshop on Strengthening of traditional RIFS (Stakeholder consultation)	19 March, 2019	Tabba, Garhshankar, Hoshiarpur
58	Brainstorming Session On "Scope of Medicinal Plants in Kandi Region of Punjab"	12 Apr, 2019	RRS, Ballawal Saunkhri
59	Stakeholders meeting by Regional Centre, Jogindernagar of National Medicinal Plants Board	3 May, 2019	Dharamshala, HP
60	Workshop on Building Climate Resilient Agriculture	5-9 May, 2019	Dhaka, Bangladesh
61	Annual Review meeting of AICRPDA NICRA	26-28 May, 2019	CRIDA, Hyderabad.
62	Meeting of networking project on 'Revival of Village Ponds through scientific Interventions'	14-15 June, 2019	NIH, Roorkee
64	International conference on soil and water management for climate smart agriculture and global food security	5 Nov, 2019	NASC, New Delhi
65	GeoSmart India conference conducted in Collaboration with DST.	2 Dec, 2019 to 6 Dec, 2019	HICC Hyderabad.

3. Membership of scientific societies / associations:

- Life member – World Association of Soil and Water Conservationists.
- Life member – Indian Society of Soil Science
- Life member – Indian Association of Soil and Water Conservationists
- Life member–Soil conservation Society of India
- Life member – Indian Science Congress
- Life member – Indian Society of Remote Sensing
- Life member – Indian Society of Dryland Agriculture
- Member – Soil Science Society of America

Annexure – F

Administrative works

1. MAJOR ACTIVITIES

- **National Workshop on Natural Resource Management (NWNRM):** A national workshop on natural resource management was organized first time at RRS, Ballawal Saunkhri on 22 and 23 December, 2015. More than 70 scientists from 6 states of India participated in it.
- **International Training:** A training program of one month duration was organized on Watershed Management during the month of March, 2016 with the financial assistance from ICARDA. Nine students from Afghanistan participated in it.
- **Stakeholders Workshop:** A stakeholder workshop was organized on 19 Nov., 2015 under AICRPDA project in which PC, SDM and more than 60 representatives of agriculture, horticulture, forestry, soil conservation and other development departments participated.
- **Diploma Course in agriculture:** Two year diploma course in agriculture started at RRS, Ballawal Saunkhri from the academic session of 2017-18. All 30 seats have been filled. Hostel facility for boys and girls has been provided.
- **Seed sale from the station:** Sale of wheat and maize seed was done from the station in addition to sale during the kisan melas. Total 30.15 quintals of seed of wheat worth 1.2 lakhs and about 40 quintals of seed of Maize PMH-1 worth about 7.0 lakhs was sold/used for demonstrations from the station

2. ACADEMIC / RESEARCH ACTIVITIES:

- **Testing of new crops:** Trials on new crops like ginger, rajmash, zimikand, apple, dragon fruit, walnut, persimmon, olive, moringa, casuarina, chaukhal, etc. are being conducted.
- **Publications and data compilations:** Weather data for the last 32 years was compiled and published in the form of booklet. The data on runoff and soil loss of three locations for about 30 years is being compiled. Scientists were encouraged to document all research as a result average annual publications from the station more than doubled as compared to previous years. Annual reports of all projects were compiled and from 2015-16 onwards a comprehensive annual report of RRS, Ballawal Saunkhri was compiled every year.
- **Strengthening of laboratories:** Plant pathology lab, Agronomy lab, Horticulture lab, Soil testing lab, Soil & Water Engineering lab and Forestry labs were strengthened with new instruments. The soil and water testing research lab of the station has been opened for testing samples from farmers' fields also.

- **Submission of projects:** Scientists were encouraged and guided to submit projects for funding. More than 25 projects were submitted from the station since 1.4.2015.

3. FINANCIAL PROGRESS:

- **Grant outlay:** There is increase in grant outlay under various schemes (Table 1) as compared to 2014-15. Although the funding from plan schemes was reduced but extra funding was arranged from adhoc projects and ICAR schemes.

Table: Grants received from various sources (in Lakhs)

S.No.	Source	2014-15	2015-16	2016-17	2017-18	2018-19
1	ICAR Projects	115.5	151.8	141.8	181.0	152.7
2	Plan schemes	316.6	151.8	376.7	288.2	84.6
3	Adhoc/Misc Projects	19.7	26.9	29.9	57.9	40.0
4	RKVY	11.0	7.5	15.0	7.0	34.0
	TOTAL	462.8	557.3	563.4	534.1	311.3

- **Income generation:** There is significant increase in income of the station (Table 2) as compared to year 2014-15.

Table: Income generated from various sources (in Lakhs)

S. No.	Source	2014-15	2015-16	2016-17	2017-18	2018-19
1.	Farm produce	1.88	1.74	1.71	2.95	3.40
2.	Fuel wood sale	0.61	3.35	0.28	5.24	1.76
3.	Fruit and nursery	1.22	1.38	2.17	1.49	1.99
4.	Sale of unserviceable items	0.15	1.90	NIL	0.33	1.28
5.	Kisan Mela income	3.03	3.13	4.35	5.48	5.30
6.	Auction of trees	0.00	6.70	NIL	NIL	NIL
7.	Guest houses	0.59	1.21	1.34	0.40	0.16
8.	Misc.	1.95	1.62	8.42	2.12	3.03
	Total	9.43	21.03	19.27	18.10	17.14

Table: Seed sale income on kisan melas (Lakhs)

Sep. 15	March 16	Sep. 16	March 17	Sep. 17	March 18	Sep. 18	March 19	Sep. 19
7.40	4.71	10.88	5.62	9.36	6.06	8.58	4.74	3.46

4. INTERACTION AND EXTENSION ACTIVITIES:

- Eight kisan melas were organized since 1.4.2015 and in every kisan mela, the number of farmers and farm women is increasing.
- The institutes like CSKHPKV, Palampur, KVK, Kangra and Chandigarh centre of Indian Institute of Soil and Water Conservation, Dehradun were visited for collaborations.
- Active rapport has been established with KVKs of the region (Bahawal, Langroya, Ropar, Mohali, Kathua and Una) and with various development departments.
- During the period more than 20 interactive meetings were conducted with the progressive farmers / sarpanches of the region at RRS, Ballawal Saunkhri.
- Active linkage has been established with local press and media.
- Farmers of the region were provided with latest seeds of various crops.