

## BIODATA OF Dr. S.K. KAMRA



1. Name in full: **KAMRA, SUSHIL KUMAR**  
(Surname followed by forename)
2. Date of Birth : 30 – 12 – 1954
3. Field of specialization
  - (i) Major discipline : Agricultural Engineering
  - (ii) Subject of specialization: Soil and Water Conservation Engineering
  - (iii) Scientific interests and capabilities : Subsurface drainage, groundwater recharge, hydro- salinity modeling
4. Designation: Principal Scientist (Groundwater) and Head
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### 6 (a) Academic career

Degree	University/Institute	Year	Distinction, if any
B. Tech. (Agril. Engg.)	Punjab Agricultural University, Ludhiana (India)	1976	University Merit Scholarship holder for 4 years, rated 3 <sup>rd</sup> best student among more than 100 students
Ph.D. (Agril. Engg.) Major: Soil & Water Engg. Minor: Mathematics	--do---	1989	OGPA: 3.82/ 4.00 (Integrated Ph.D. Programme after B. Tech.)
Post- Doctoral Research	University of Kiel, Kiel (Germany)	1995-97	Alexander von Humboldt Fellowship

## 6(b) Employment record

Designation	Pay Scale	Nature of work	Organization	Institution & Place of posting	Period (From – to)
Head, Division of Irrigation and Drainage Engineering	Pay Band IV (Rs. 39000-67000) + Grade Pay of Rs. 10000/	Research Management	ICAR	CSSRI, Karnal, India	30.4. 2009-till date (regular); 12.6. 2007-29.4. 2009 (officiating)
Principal Scientist (Soil & Water Cons. Engg.)	Rs. 16400 - 22400	Research*	ICAR	- do-	28.7.1998-till date
Sr. Scientist (Soil & Water Cons. Engg.)	Rs. 3700 – 5700	Research	-do-	- do-	1.1.1986-28.7.1998
Scientist S-2 (Soil & Water Cons. Engg.)	Rs. 1100 – 1600	Research	-do-	- do -	01.7.1983-31.12.1985
Scientist S-1 (Soil & Water Cons. Engg.)	Rs. 700 – 1300	-do-	-do-	- do -	01.9.1977-30.6.1983

\*During June 2000– April 2005, I coordinated as Principal Investigator of a 5- location NATP involving considerable research management and administrative duties

## 6(c) Awards

- (i) Elected Fellow (2009), Indian National Academy of Engineering (INAE)
- (ii) Rafi Ahmed Kidwai Award (2008), Indian Council of Agricultural Research (ICAR)
- (iii) Elected Fellow (2003), National Academy of Agricultural Sciences (NAAS)
- (iv) Awarded **Alexander von Humboldt fellowship** for 22 months (April 1995- Jan. 1997) at University of Kiel, Kiel in Germany
- (v) Selected as one of the 10 Asian Senior Professional Research Fellows for International Action Research Program on '**Groundwater Governance in Theory and Practice**' organized by International Water Management Institute (IWMI), Sri Lanka at Kansas University, Lawrence, **USA** (November 27- December 15, 2006)

## 6(d) Peer Recognition

- (i) **Visiting Scientist** in the field of 'Computer simulation modeling of salt movement in agricultural soils' at Department of Bioresource Engineering, **McGill University**, Ste- Anne- de- Bellevue, QC, **Canada**, June- August 2008.

- (ii) Coordinating since February 2008 as **PI** a Ministry of Water Resources (GOI) funded project 'Farmers' Participatory Research on Enhancing Groundwater Recharge and Water Productivity in North West India'. The project has a budget outlay of **Rs. 50 lakh** and involves transfer and evaluation of CSSRI technologies on groundwater recharge and integrated farming system on farmers' fields at **100 sites** in the states of Haryana, Punjab, Uttar Pradesh and Gujarat over a two year period.
- (iii) Successfully completed as the **PI a NATP** 'Technologies for skimming and recharging fresh water in saline groundwater regions' having budget outlay of **Rs. 1.40 crore** during June 2000- April 2005. CSSRI was the lead centre in Haryana and there were 4 collaborating centres in the states of Andhra Pradesh, Tamil Nadu and Gujarat. The project has paved the way for **commissioning** of large groundwater skimming and recharging projects in these four states.
- (iv) Has been/ is a **reviewing referee** for International Journals (*Water Resources Research, Agricultural Water Management, J. Hydrological Processes, J. Porous Media, Environment Modelling and Software, Irrigation Science,*) as well as more than half a dozen national journals.
- (v) Developed a 2- dimensional numerical model and software '**DRAINSAL**' that provides decision support for environmentally safe design of sub- surface drainage systems in waterlogged- saline soils. The model's computer code and users' manual has been sent to a number of demanding researchers in India and abroad.
- (vi) Presented research papers in more than **12 international conferences/ symposia** in India and abroad (Pakistan, The Netherlands, Slovenia, Italy). Besides a number of short/ long-term **overseas** assignments/ working visits have been undertaken to USA, Germany, France, Switzerland and Australia.
- (vii) A paper 'Effect of drain- depth on salinity control in irrigated lands of semi- arid regions' presented by the applicant in the **5<sup>th</sup> International Drainage Workshop** at Lahore, Pakistan (Feb. 8- 15, 1992) was **referred in the session report** and its contents reiterated in final general report of the workshop. The paper contributed to the **abandoning of critical watertable concept** in favour of the net downward water flux for deciding drain depth and consequent **acceptance of shallower drains in arid and semi- arid regions**.
- (viii) Acted as a member of an ICAR sub- group (1992- 93) for appraisal reporting on the extent of waterlogging and soil salinity and required mitigation measures for Stage I areas of IGNP in Rajasthan.
- (ix) Occasionally officiated as Project Manager, Indo- Netherlands Project on Land Drainage, operational at CSSRI from 1984- 1995. Also coordinated the drainage research activities of the Hanumangarh (Rajasthan) centre of Indo- Dutch Network Project on Drainage and Water Management at CSSRI, Karnal from 1997- 2001.
- (x) Have been regularly working as external examiner for M.Tech/ Ph.D thesis of PAU, HAU, TNAU, IARI students; consistent reviewing referee for funding of ICAR adhoc schemes, NATP etc.

#### **6(e) Significant research achievements and impact**

- (i) **Special Attainments**

Category	Title	Year	Details	Additional Information
<b>Technologies developed</b>	(i) Subsurface Drainage	1982-1995	Reclamation projects for waterlogged saline soils in Haryana and Rajasthan	Collaboratively
	(ii) Evaporation pond	1989-1997	Management of saline drainage effluent in Haryana and Punjab	Collaboratively
	(iii) Computer model and Software 'DRAINSAL'	1985-1989	2- D finite element water and solute transport model for subsurface drainage systems	Individually
	(iv) Semi- analytical model	1998-2000	Salute dynamics in a tubewell drainage system	Collaboratively
	(v) Community based groundwater skimming cum recharging system	2000-2006	Facilitates separate/ combined pumping from or recharging of two cavity tubewells installed at different depths/ groundwater quality zones in Haryana	Collaboratively
	(vi) Pumping cum recharging system/ recharge shaft	2000-2006	Individual farmer based pumping and recharging structures for falling/ marginally saline groundwater in Haryana	Collaboratively
<b>Technologies Propagation</b>	<p>The applicant successfully completed as the <b>PI a NATP</b> 'Technologies for skimming and recharging fresh water in saline groundwater regions' during June 2000- April 2005. CSSRI was the lead centre in Haryana and there were 4 collaborating centres in the states of Andhra Pradesh, Tamil Nadu and Gujarat. The project is paving the way for <b>commissioning</b> of large groundwater skimming and recharging projects in these states.</p> <p>Some of the <b>robust groundwater recharge technologies</b> of this project are being <b>propagated to farmers' fields at 100 study sites</b> in the states of Haryana, Punjab, Uttar Pradesh and Gujarat under a recent Ministry of Water Resources funded project.</p>			

### (ii) Externally Funded Projects

PI/Co-PI	Title	Year	Amount	Funding agency
Co- PI	Indo- Dutch Project on Land Drainage	1984- 1995	Rs. 2.5 crore	The Netherlands Govt.
Co-PI	Indo- Dutch Network Project on 'Research on the Control of Waterlogging and Salinization in Irrigated Agricultural Lands'	1996- 2002	Rs. 14.68 crore	The Netherlands Govt.
PI	NATP on 'Technologies for Skimming and Recharging Fresh Water in saline Groundwater Regions'	June 2000- April 2005	Rs. 1.40 crore	ICAR – World Bank
PI	Farmers' Participatory Research on Enhancing Groundwater Recharge and Water Productivity in North West India	February 2008- February 2010	Rs. 50 lakh	Ministry of Water Resources (GOI)

### (iii) Summarized Achievements

Dr. S.K. Kamra has made significant contributions in developing **subsurface drainage technology** for amelioration of waterlogged saline irrigated lands in India. For areas without natural outlets, **evaporation pond technology** propagated by him can provide interim solutions for management of saline drainage effluent. These studies led to commissioning of mechanically- installed subsurface drainage projects in 7500 ha area in farmers' fields in Haryana where annual potential loss due to waterlogging and soil salinity is estimated at more than Rs. 200 crore. The technology provides a net present worth of about Rs. 50000/ ha with benefit cost ratio of 1.76 and internal rate of return 20 %. Similar large scale mechanized drainage projects have been also undertaken in Rajasthan, Punjab, Maharashtra, Karnataka, Andhra Pradesh and Gujarat.

Dr. S.K. Kamra has developed a 2- dimensional water and solute transport model that can be applied for optimal drainage designs and to predict long- term salinity of drainage water for devising its environmentally safer disposal/ management options. The scope of the model was extended for pesticides during his **Alexander von Humboldt Fellowship** in Germany. During 2006, he was selected through global competition as one of the 10 Asian Senior Professional Research Fellows for IWMI's International Action Research Program on '**Groundwater Governance in Theory and Practice**' at Kansas University, Lawrence, USA.

Recently Dr. S.K. Kamra successfully completed as **Principal Investigator** multi- location research project on groundwater skimming (selective abstraction) and recharging of fresh water in saline groundwater regions of **Haryana, Gujarat, Andhra Pradesh and Tamil Nadu**. The impressive accomplishments of the project are paving the way for commissioning of large groundwater skimming and recharging projects in these four states. Some of the robust groundwater recharge technologies of this project have been propagated to farmers' fields at **80 study sites in the states of Haryana, Punjab, Uttar Pradesh and Gujarat** under a recent Ministry of Water Resources funded project.

### (iv) International Exposure

Country	Purpose /subject title	Year	Duration	Sponsor
Canada	Visiting Scientist in the field of 'Computer simulation modeling of salt movement in agricultural soils' at Department of Bioresource Engineering, <b>McGill University</b> , Ste- Anne- de- Bellevue, QC, <b>Canada</b>	2008	3 months (June- August)	McGill University, Canada
USA	Participation as a Senior Professional Research Fellow in International Action Research Program on ' <b>Groundwater Governance in Theory and Practice</b> '	2006	3 weeks (Nov. 27- Dec. 15)	IWMI, Sri Lanka
Australia	International Training cum study tour on 'Natural and Enhanced Groundwater Recharge'	2004	6 weeks (August 17- Sept. 28)	NATP
Germany	Post doctoral research on 'Uncertainty Analysis of Pesticide Leaching in Heterogeneous Soils', Univ. of Kiel, Kiel	1995- 1997	22 months (April 1995- Jan. 1997)	<b>Alexander von Humboldt Fellowship</b>

	(a) Presentation of a paper in 6 <sup>th</sup> International Drainage Workshop, Ljubljana, <b>Slovenia</b>	1996	5 days (April 21-25)	--- do ---
	(b) Working visit to Institute of Terrestrial Ecology, Swiss Federal Institute of Technology, Schlieren (Zurich, <b>Switzerland</b> ).	1996	4 days (May 28-31)	--- do ---
	(c) Presentation of a paper in International Symp. On Pesticide, Castelnuovo Fogliani- Piacenza, <b>Italy</b>	1996	3 days (Sept. 30-Oct. 2)	--- do ---
	(d) Working visit to Drainage Division, CEMAGREF, Antony Cedex, <b>France</b>	1996	5 days (Nov. 18-22)	--- do ---
	(e) Participation in Jubilee Symp. Of the International Institute for Land Reclamation and Improvement (ILRI), Wageningen, <b>The Netherlands</b>	1996.	3 days (Nov. 25-27)	--- do ---
<b>The Netherlands</b>	Presentation of a paper in the 15 <sup>th</sup> ICID Congress at The Hague and participate in post- congress and study tour	1993	3 weeks (Sept. 3-23)	Indo- - Dutch Project
<b>Pakistan</b>	Presentation of a paper in 5 <sup>th</sup> International Drainage Workshop, Lahore followed by post conference and study tour	1992	2 weeks (Feb. 6- 20)	Indo- - Dutch Project
<b>USA</b>	Study tour cum training on 'Hydro Salinity Modeling', Cornell University, Ithaca (New York)	1989	4 months (March 3- July 2)	FAO (UNDP)

## 7. Publications

(i) Research (Journals)	27
(ii) Books	3
(iii) Book Chapters	14
(iv) Seminar/ Symposia	31
(v) Popular articles/ Bulletins/Technical Reports/ extension brochures	19

**Total      94**

### *Ten significant publications*

1. Singh, G., Bundela, D.S., Sethi, M., Lal, K. and Kamra, S.K. 2009. Remote sensing and geographical information system for appraisal of salt affected soils in India. *J. Environmental Quality*, 39(1): 5- 15. [NAAS Journal Rating: 8.7]
2. Ram, J., Garg, V.K., Toky, O.P., Minhas, P.S., Tomar, O.S., Dagar, J.C. and Kamra, S.K. 2007. Bio-drainage potential of *Eucalyptus tereticornis* for reclamation of shallow water table areas in north-west India. *Agro-forestry System*, 69: 147- 165. [NAAS Journal Rating: 8.0]
3. Kamra, S.K. and Lennartz, B., 2005. Quantitative indices to characterize the extent of preferential flow in soils. *J. Environmental Modelling and Softwares*, 20(7), 903- 915. [NAAS Journal Rating: 8.5]
4. Pathak, H., Ladha, J.K., Aggarwal, P.K., Peng, S., Das, S., Singh, Yadvinder, Singh, Bijay, Kamra, S.K., Mishra, B., Sastri, A.S.R.A.S., Aggarwal. H.P., Das, D.K. and Gupta, R.K., 2003. Trends of

climatic potential and on-farm yields of rice and wheat in the Indo-Gangetic Plains. *Field Crops Research*, 80: 223-234. [NAAS Journal Rating : 8.4]

5. Kamra, S.K., Lal, K., Singh, O.P. and Boonstra, J. 2002. Effect of pumping on temporal changes in groundwater quality. *Agricultural Water Management*, 56(2), 169- 178. [NAAS Journal Rating: 8.1]
6. Kamra, S.K., Lennartz, B., Van Genuchten, M.Th., Widmoser, P. 2001. Evaluating non- equilibrium solute transport in small soil columns. *J. Contaminant Hydrology*, 48 (3/4): 189- 212. [NAAS Journal Rating: 8.4]
7. Kelleners, T.J., Kamra, S.K., Jhorar, R.K. 2000. Modeling of drainage water salinity of pipe drains. *J. Hydrology*, 234: 249- 263. [NAAS Journal Rating : 8.6]
8. Kamra, S.K., Singh, Sita Ram and Rao, K.V.G.K., 1994. Effect of depth of impervious layer and adsorption on solute transport in tile-drained irrigated lands. *J. Hydrology*, 155: 251- 264. [NAAS Journal Rating: 8.6]
9. Kamra, S.K., Singh, S.R., Rao, K.V.G.K., and van Genuchten, M. Th., 1991. A semi- discrete model for water and solute movement in tile- drained soils: I. Governing equations and solution, *Water Resources Research*, 27(9): 2439-2447. [NAAS Journal Rating: 8.5]
10. Kamra, S.K., Singh, S.R., Rao, K.V.G.K., and van Genuchten, M. Th., 1991. A semi-discrete model for water and solute movement in tile-drained soils: II. Field validation and applications, *Water Resource Research*, 27(9): 2448-2456. [NAAS Journal Rating: 8.5]

**Total of 10 publications: NAAS Journal Rating: 84.3**