Division of Land and Water Management

Personal Details

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Research Interest

Land and water management

Research Highlights

Rain water management, Canal water management, Ground water management, On farm water management, Conjunctive use of water, Multiple uses of water, Participatory water management, Development of decision support systems, Mathematical modelling of water table fluctuations, Flow through porous media, Irrigation scheduling, Soil physical, chemical, biological properties studies and management, Impact of climate change on land and water resources, Integrated farming system components selection, Prioritization and suggestion, Watershed development and management in participatory mode, Modeling of non point source pollution and management strategy. Land allocation under different interventions , Application of operations research techniques in planning and decision making, Analysis of rainfall and other meteorological parameters to evolve irrigation and drainage criteria.

Memberships / Fellowships

Fellow, Institution of Engineers
Life Member, Indian Society of Agricultural Engineers
Life Member, Indian Association of Soil and Water Conservationists
Life Member, Indian Water Resources Society
Life Member, Indian Society of Coastal Agricultural Research
Life Member, Bihar State Productivity Council

Technology Developed

- Development of optimization of rice transplanting time, resource conservation technologies (RCTs), increasing bund height for rainwater conservation in paddy fields in Bihar
- Development of multiple water use technology for enhancing water productivity by productive utilization of waterlogged/drainage congested areas.
- Development of Low Energy Water Application system.
- Participatory Technology development to form activity based Self Help Groups in order to improve their income and livelihood through training and capacity building.
- Exploration and promotion of conjunctive use options in canal command through demonstration of users' interactive decision support tool developed in Hindi employing Visual basic Platform.

- Encouraged Water Users' to develop low cost wooden gates and got them installed on outlets to control and regulate flow of water and avoid waterlogging.

- Development of Beneficial Crop sequence selection decision support tool in Hindi and English to facilitate farmers in convincingly selecting the beneficial crop sequences and demonstration to farmers.

- Development of Integrated Farming System Components selection decision support tool in Hindi and English to facilitate farmers in convincingly selecting the integrated farming system components and demonstration to farmers.

Publication Details

A. Research papers published in International Journals - 16

1. **Upadhyaya, A.** and Chauhan, H.S. 1998. Solutions of Boussinesq equation in semiinfinite flow region. *Journal of Irrigation and Drainage Engg.,* ASCE, 124 (5): 265-270.

2. Srivastava, R.C. and **Upadhyaya, A.** 1998. Study on feasibility of drip irrigation in shallow ground water zones of eastern India. *Agricultural Water Management*, 36: 71-83.

3. **Upadhyaya, A.** and Chauhan, H.S. 2000. An analytical solution for bi-level drainage design in the presence of evapotranspiration. *Agricultural Water Management*, 45: 169-184.

4. **Upadhyaya, A.** and Chauhan, H.S. 2001. Water table fluctuations due to canal seepage and time varying recharge. *Journal of Hydrology.* 244, (1-2): 1-8.

5. **Upadhyaya, A.** 2001. Discussion on Transient drainage to partially penetrating drains in sloping aquifers by K.N. Shukla, H.S. Chauhan, and V.K. Srivastava, *Journal of Irrigation and Drainage Engg.,* ASCE, 127 (4): 262.

6. **Upadhyaya, A.** and Chauhan, H.S. 2001. Interaction of stream and sloping aquifer receiving constant recharge. *Journal of Irrigation and Drainage Engg.,* ASCE, 127 (5): 295-301.

7. **Upadhyaya, A.** and Chauhan, H. S. 2001. Falling water tables in a horizontal / sloping aquifer. *Journal of Irrigation and Drainage Engg.,* ASCE, 127 (6): 376-384.

8. **Upadhyaya, A.**, and Chauhan, H.S. 2002. Water table rise in sloping aquifer due to canal seepage and constant recharge. *Journal of Irrigation and Drainage Engineering,* ASCE, 128 (3): 160-167.

9. **Upadhyaya, A.,** Singh, A.K., and Sikka, A.K. 2006. Problems and prospects of agricultural production in Mokama Group of Tals in Bihar. *International Journal of Tropical Agriculture*, 24 (3-4): 495-500.

10. **Upadhyaya, A.,** Singh, A.K., and Sikka, A.K. 2006. Consecutive days maximum rainfall prediction using one-day maximum rainfall. *International Journal of Tropical Agriculture*, 24 (3-4): 501-506.

11. **Upadhyaya, A.**, Singh, A.K. and Sikka, A.K. 2007. Integrated Water Management for Waterlogged Command Areas. *International Journal of Tropical Agriculture,* 25 (1-2): 175-187.

12. **Upadhyaya, A.**, Singh, A.K., Bhatnagar, P.R. and Sikka, A.K. 2007. Prospects of Artificial Ground Water Recharge in India. *International Journal of Tropical Agriculture*, 25 (1-2): 189-195.

13. Singh, A.K., Sikka, A.K., **Upadhyaya, A.,** Bhatnagar, P.R., Dhanphule, S., Singh, M.K. and Singh, S.R. 2008. Scientific perceptions and community responses in a participatory water management endeavor. *Water Resources Management*. : 22:1173-1189.

14. Singh, A.K., Rahman, A., Sharma, S.P., **Upadhyaya, A.** and Sikka, A.K. 2009. Small holders Irrigation – Problems and Options. *Water Resources Management*. : 23:289-302.
15. Singh, A.K., Sharma, S.P, **Upadhyaya, A,** Rahman, A., and Sikka, A.K. 2010. Performance of low energy water application device. Water *Resources Management*, 24:1353-1362.
16. **Upadhyaya, A.** 2012. Hybrid Finite Analytic Solution for Computation of Spacing between Drains in Sloping Lands. *Journal of Irrigation and Drainage Engineering,* 139 (2): 131-136.

B. Research papers published in National Journals - 11

1. **Upadhyaya, A.** 1997. A technique to predict consecutive days maximum rainfall using one day maximum rainfall. *Indian Journal of Soil Conservation,* 25 (1): 24-27.
2. **Upadhyaya, A.** and Singh, S.R. 1997. Graphical and numerical methods to determine design discharge to remove excess water from rice fields at Bhubaneswar. *Journal of Agricultural Engg.*, 34 (4): 31-43.
3. **Upadhyaya, A.** and Singh, S.R. 1998. A scientific approach for water management in rice fields. *Indian Journal of Soil Conservation*, 26 (2): 113-116.
4. **Upadhyaya, A.** and Narasimhaiya, M.K. 1998. Integrated system operation -simulation model approach for real time decision making. *Journal of Indian Water Resources Society*, 18 (4), 3: 35-39.
5. **Upadhyaya, A.** and Singh, S.R. 1998. Estimation of consecutive days maximum rainfall by various methods and their comparison. *Indian Journal of Soil Conservation*, 26 (3): 193-201.
6. Chandra, D., Nanda, P., **Upadhyaya, A.,** Kannan, K., Anand, P.S.B. and Khan, A.R. 2001. Management of rainfed lowland rice – a fragile ecosystem in eastern India. *Journal of the Indian Society of Coastal Agricultural Research,* 18(2): 81-94.
7. Singh, A.K., Sikka, A.K., **Upadhyaya, A.,** Abdul Haris, A. and Batta, R.K. 2004.Role of water conservation techniques and pressurized irrigation system in alleviating water scarcity. *Journal of the Indian Society of Coastal Agricultural Research,* 22 (1&2): 113-115.
8. Singh, S.S, Prasad, L.K. and **Upadhyaya, A.** 2006. Root growth, yield and economics of wheat (*Triticum aestivum)* as affected by irrigation and tillage practices in south Bihar. *Indian Journal of Agronomy,* 51(2): 131-134.
9. Singh, A.K., **Upadhyaya, A.,** Islam, A., Bharali, M.A., and Roy, M. 2006. Flow and manufacturing variation of drippers. *Journal of Agricultural Engineering*. Vol. 43(3): July-September, 2006: 27-30.
10. Bhatnagar, P.R., Sikka, A.K., Singh, A.K., **Upadhyaya, A.** and Dhanphule, S.S. 2006. Participatory mechanism for rice-fish culture in waterlogged lands in canal commands. *Journal of Agricultural Engineering,* Vol. 43 (3): July-September, 2006: 56-61.
11. **Upadhyaya, A.,** Kumar, J., Pramod, Sikka, A.K. 2009. Analysis of rainfall in Patna main canal command employing two parameter gamma probability distribution model. Indian J. Soil Cons. 37(1):17-21.

C. Important Book chapters/Papers published in Proceedings - 15

1. **Upadhyaya, A.** and Chauhan, H.S. 1998. Ground water mound formation due to recharge in sloping aquifers. Proceedings of Seminar on Artificial Recharge of Ground Water, New Delhi, Dec 15-16, 1998, pp. I 21-I 30.
2. **Upadhyaya, A.** and Chauhan, H.S. 2000. Solutions for subsurface drainage of sloping lands. Proceedings of 8th International Drainage Workshop, New Delhi, Jan 31-Feb. 4, 2000, Vol. II, pp 223- 236.
3. **Upadhyaya, A.** and Chauhan, H.S. 2000. Drain spacing computation in sloping lands- An analytical approach. Proceedings of International Conference on Integrated Water Resources Management for Sustainable Development, New Delhi, India, 19-21 December, 2000, pp. 219-228.
4. **Upadhyaya, A.** and Chauhan, H.S. 2001. Design of subsurface drainage system considering upward seepage and evapotranspiration. Proceedings of National Seminar on Water and Land management including CAD for socio economic upliftment of NE region, Guwahati, 22-23rd November, 2001pp. 179-187.
5. **Upadhyaya, A.**, Chauhan, H.S. and Singh, S.R. 2002. Modeling of water table owing to recharge and upward leakage in the aquifer. Proceedings of International Groundwater Conference on Sustainable development and management of groundwater resources in semi-arid region with special reference to Hard Rocks, Dindigal, Tamil Nadu, 20-22 Feb, 2002, pp. 497-503.
6. **Upadhyaya, A.**, 2002. Problems of water distribution in Patna canal command. Proceedings of International Conference on Hydrology and Watershed Management with a focal theme on water quality and conservation for sustainable development, Hyderabad, A.P., 18-20 Dec., 2002. Vol II, pp. 163-171.
7. Khan, A.R., **Upadhyaya, A.**, Bhatnagar, P.R., Gautam, U.S., Singh, S.K., and Singh, S.R. 2002. Strategies for resource management to improve agricultural productivity in Bariarpur Tal area in Bihar (India), IC/IR/2002/13. The Abdus Salam International Center for Theoretical Physics, Trieste, Itely.
8. **Upadhyaya, A.** , Chauhan, H.S. and Singh, S.R. 2002. Hybrid finite analytic solution for stream aquifer interaction. Proceedings of the International Groundwater Conference on Sustainable Development and Management of Groundwater Resources in Semi-Arid Region with Special Reference to Hard Rocks. *Eds.:* M. Thangarajan, S.N. Rai, and V.S. Singh. A.A. BALKEMA PUBLISHERS LISSE /ABINGDON/EXTON (PA)/TOKYO. 105-112.
9. **Upadhyaya, A.,** Singh, A.K., Roy, M.K. and Singh, S.R.2005. Importance and applicability of filters for different quality of irrigation water- A review. In Book: Drainage and Irrigation Water Management, eds: Virendra Kumar, Jaspal Singh, S.R. Bhakar, and Himanshu, 2005, xii, 315 p, ISBN: 81-7906-099-3, Vedams Book.
10. Molden, D., Oweis, T.Y., Steduto, P., Jacob, W.K., Hanjra, M.A., Bindraban, P.S., Bouman, B.A.M., Cook, S., Olaf, E., Hamid, F., Ahmed, H., Hoogeveen, J., Mahoo, H., Nangia, V., Peden, D., Sikka, A.K., Silva, P., Turral, H., **Upadhyaya, A.,** and Zwart, S. 2007. Pathways for increasing agricultural water productivity. *Water for food Water for life: A Comprehensive Assessment of Water Management in Agriculture.* London: Earthscan, and Colombo: International Water Management Institute, 279-310.
11. **Upadhyaya, A.** 2007. Determining water management problems through direct observation and community dialogue. Participatory Irrigation Management. *Eds:* U.S. Gautam, A.K. Singh, A.K. Sikka, Abhay Kumar and Ujjwal Kumar. Agrotech Publishing

Academy, Udaipur, India: 80-92.

12. **Upadhyaya, A.** and Khan, M.A. 2009. Strategies for sustainable land and water resources management. Proceedings of the International Workshop on Water Quality Research To Evaluate The Effects Of Agricultural Conservation Practices Utilized In The United States And India, September 7-8, 2009, eds: M. Imtiyaz, D.M. Denis and C.J. Wesley, 2010. Macmillan Publishers India Ltd. pp 37-42
13. **Upadhyaya, A**. 2009. Beneficial crop sequence selection model. Proceedings of the International Workshop on Water Quality Research To Evaluate The Effects Of Agricultural Conservation Practices Utilized In The United States And India, September 7-8, 2009, eds: M. Imtiyaz, D.M. Denis and C.J. Wesley, 2010. Macmillan Publishers India Ltd. pp 43-47.
14. **Upadhyaya, A**. 2009. A decision support tool to explore and promote conjunctive use options in canal command. Proceedings of the International Workshop on Water Quality Research To Evaluate The Effects Of Agricultural Conservation Practices Utilized In The United States And India, September 7-8, 2009, eds: M. Imtiyaz, D.M. Denis and C.J. Wesley, 2010. Macmillan Publishers India Ltd. pp 43-47.
15. **Upadhyaya, A**. 2012. Decision support systems for enhancing agricultural productivity and livelihood security. In Book: ICT for agricultural development in changing climate, eds: K. M. Singh and M.S. Meena. Narendra Publishing House. pp 123-131.

D. Bulletins – 7

1. Singh, A.K., Sikka, A.K., **Upadhyaya, A.** and Bhatnagar, P.R. 2005. Exploring options for better use of water at RPC-V. Technical Bulletin No. R-14/Pat-5, ICAR Research Complex for Eastern Region, Patna, pp. 19.
2. Bhatnagar, P.R., Sikka, A.K., Singh, A.K. and **Upadhyaya, A**. 2005. Utilization of poorly utilized land and water resources through multiple uses: Experiences of RPC-V command. Technical Bulletin No. R-16/PAT-7, ICAR Research Complex for Eastern Region, Patna, pp. 1-15.
3. Bhatnagar, P.R., Sikka, A.K., **Upadhyaya, A**., Saha, B. and Singh, A.K. 2005. A. simple water balance tool for participatory evaluation of water management options in the canal command. Technical Bulletin No. R-17/PAT-8, ICAR Research Complex for Eastern Region, Patna, pp. 1-19.
4. Sikka, A.K., Singh, A.K., **Upadhyaya, A.,** Bhatnagar, P.R., Saha, B., Singh, R.D., Gautam, U.S., Jones, R.P. and Gaunt, J. 2004. Practical ways forward for participatory land and water management in canal irrigated areas. Theme Report 2, DFID-NRSP, pp. 1-8.
5. Chandra, R., Gupta, R.K., Sikka, A.K., **Upadhyaya, A.** and Shaktivadivel, R. 2007. Impact of Resource Conservation Technologies on Water Use and Water Productivity in Pabnawa Minor of Bhakra Canal System. Rice Wheat Consortium, pp.24.
6. **Upadhyaya, A.** 2012. Exploring options for conjunctive use of surface and ground water in canal command of Bihar. Technical Bulletin No. R-36/PAT-24, ICAR Research Complex for Eastern Region, Patna, pp.22.

Upadhyaya, A. 2012. Integrated organic farming model for an acre farm plot. Technical Bulletin No. R-37/PAT-25, ICAR Research Complex for Eastern Region, Patna, pp.22.