

Manoj K. Shukla, PhD
Director ACES Global Initiatives Program and Aggies Go Global
Professor of Soil Physics
Plant and Environmental Sciences
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EDUCATION

- 1995-1998 University of Natural Resources and Applied Life Sciences Vienna, Ph.D., Agricultural Engineering (Major: Soil Physics; Minor: Hydraulics) (Collaborative program with UC Davis)
Title of Ph.D. Thesis: Solute transport in porous media with diffusion controlled and surface reaction rate laws: Worked on transport behaviors of solutes through different displacement lengths, optimized global estimates of transport parameters, developed relationship between pore water velocity and coupled diffusion-dispersion
- 1986-1988 J. N. Agriculture University, India, M.Tech., Soil and Water Engineering
Title of Master's Thesis: Seepage and waterlogging problems in command areas- A case study
- 1982-1986 J. N. Agriculture University, B.Tech., Agricultural Engineering
Title of Bachelor's Thesis: Evaluation of head losses due to foot valves

PROFESSIONAL EXPERIENCE

2018-date COLLEGE OF AGRICULTURAL, CONSUMER AND ENVIRONMENTAL SCIENCES, NEW MEXICO STATE UNIVERSITY, Las Cruces, New Mexico.

Director ACES Global Initiatives Program: Lead and manage ACES Global Initiatives for student and faculty, serve on International Working Group of the Provost, explore new opportunities including MOUs, Grants with foreign Universities to facilitate research, teaching, extension and training collaborations. Develop new global priorities collaboratively for the university, serve on university global committees

Director Aggies Go Global: Lead and manage AGG activities, allocate funds for students international travel, approve budget and awards, supervise staff, and seek funding

IALC Executive Board Member: Lead and manage International Arid Lands Consortium initiatives, Lead Representative from NMSU, participate in executive meetings, set up agenda, conferences, and direction

2005-date DEPARTMENT OF PLANT AND ENVIRONMENTAL SCIENCES, NEW MEXICO STATE UNIVERSITY, Las Cruces, New Mexico.

Nakayama Research Excellence Professor and Professor Soil Physics: Lead and manage the soil physics program consisting of undergraduate, graduate students, and Postdocs. Currently supervising eight Ph.D. students, two from CAU China and one from Mexico; 1 MS and 1 UG student. Mentoring three junior faculty and several UG students. Teaching undergraduate and graduate classes regularly and occasionally internationally. Serving on department, college, university, national and international committees.

Associate and Assistant Professor of Soil Physics (2005-13): Graduate and undergraduate advising, teaching undergraduate and graduate classes, grant proposal writing, writing refereed Journal articles, serving on departmental, college, university and society committees

2001-2005 SCHOOL OF NATURAL RESOURCES, THE OHIO STATE UNIVERSITY,
Columbus, Ohio

Research Scientist: Co-Leader of a large grant on Soil C Sequestration from Department of Energy, supervised staff hired through the grant, budget management, report writing, grant proposal writing, publishing, teaching advanced soil physics class and soil physics lab

2000-2001 SCHOOL OF NATURAL RESOURCES, UNIVERSITY OF ILLINOIS, Urbana-Champaign, Illinois

Post-doc Research Associate: conduct research, attend classes, write grant proposal and journal articles

1995-2000 DEPARTMENT OF HYDRAULICS, UNIVERSITY OF AGRICULTURAL SCIENCES, Vienna, Austria

Research Scientist (1999-2000): conduct research on solute transport, teach irrigation management class, write grant proposal, and journal articles

Graduate Research Assistant/ Teaching Assistant: conduct research on solute transport, TA a class on statistical analysis

1990-1995 NATIONAL INSTITUTE OF HYDROLOGY, INDIA

Scientist: conduct research work on soil water and drainage, report and journal article writing, organize and teach during training programs for state engineers, manage and work with ILRI the Netherlands

1989-1990 WATER AND LAND MANAGEMENT INSTITUTE, INDIA

Pool Officer: organize training workshop on water distribution, organize and teach during training programs for state engineers and farmers

ADMINISTRATIVE LEADERSHIP AND SERVICE

August 2018-date Director ACES Global Initiatives Program and Aggies Go Global

August 2018-date Executive Board Member of International Arid Lands Consortium

August 2018-date Member Association of Public Land Grant Universities (Commission on International Initiatives)

January 2019-date: Search Committee member for ACES, Associate Dean of Research

2018- date Attend department heads meeting and present progress report

June 2018 Member Expert Review Panel for China Agricultural University's Agricultural Engineering Program

December 2018 Developed a program "Extension Education" for senior undergraduate students and training the trainers of agriculture for India

2014-2019 Member BHR Expert Panel: U.S. -México Border Health Commission

2014-2020 Member CHIWA group on desalination

2015-2019 Steering committee member for the NMSU Advancing Leaders Program

2016-2017 Member Review Committee for Renewal of John Clark Professorship and Foreman Chair in College of Engineering

2015-2017 University Research Council College of ACES Representative

2016-2017 Chair College of ACES P & T Committee

2015-2017 Member College of ACES P&T Committee

2014-date Member PES promotion and tenure committee

2017 Mentor (rep for Assoc. Dean Academics) Teaching Academy Workshop on P&T portfolio

2016 External Reviewer Plant and Soil Science Graduate Program, Texas Tech Univ., Lubbock

2015-2016 Chair multistate project group 3188

2014-2015 Chair Search Committee for Environmental Soil Microbiology

2012-2013 Chair multistate project group 3128

2009-2012 Chair Awards Committee

2007 Task force 4 coordinator for RGBI meeting

1992-1995 Executive Secretary of Indian Association of Hydrologists

RESEARCH LEADERSHIP AND SERVICE

2017-Present Visiting Professor to China Agricultural University, Beijing, China

2021- date Technical Editor, Soil Science Society America Journal

2020-2021 Chair ASA-CSA-SSA Presentation contest committee

2015-date Executive Committee member, Vadose Zone Journal

2015-date Book Review Editor and Consulting Editor, Vadose Zone Journal

2016-2020 Associate Editor, Soil Science Society America Journal

2015-date Member Unsaturated Zone technical committee, American Geophysical Union

2014-2017 Editor in Chief Journal of Environmental and Analytical Toxicology

2013-2015 Member L.R. Ahuja modeling awards committee of Soil Science Society America

2013-2016 Editorial Board member for NACTA Journal

2014-2015 Lead PI on EPSCoR Track II proposal

2015-2016 Lead PI on USDA-AFRI proposal

2011 Panel member for AFRI-USDA program in Washington DC

2010-2012 Organizer and Presiding Officer, Soil Science Society America International Meeting

2016-2008 External reviewer for DOE-NETL and NSF proposals

2010-date New Mexico State Representative Multistate Research Group on soil, water and environment physics at different scales 3188

2010-date New Mexico State Representative Multistate Research Group on microirrigation (W3128)

2010 Co-Convener of WCSS Symposium: Optimizing water use with soil physics for 19th World Congress of Soil Science, Brisbane, Australia

2005-date Member of Curriculum, Graduate studies committee of the PES Department

2010-date External reviewer for International doctoral dissertation and for promotion and tenure

2005-date Mentored AMP students and MARC program

INTERNATIONAL ACTIVITIES

- Austria (1995-2000)
 - Co-Instructor for the Irrigation Management course (545.009) at University of Agricultural Sciences Vienna
 - Co-Instructor for the Indirect Methods in Soil Physics (545.002) at University of Agricultural Sciences Vienna
- Australia (2010)
 - Co-Convener WCSS Symposium at 19th World Congress, Brisbane, Australia, Aug1-6, 2010
 - Served as External Reviewer of a PhD dissertation from the University of Western Australia
- China (2013-continue)
 - Dr. Yanbing Qi Northwest Agriculture and Forestry University, Yangling, Shaanxi is currently working on desertification and soil property interaction
 - Invited speaker at workshop on “Water and food security under changing environment”, June 1 to 7, 2015, China Agriculture University, Beijing
 - Guest lecture during summer school during June 2016 at CAU, Beijing
 - Hosted CAU scientists and organized a workshop at NMSU main campus in 2015
 - Invited speaker during 2016 Yangling International Agri-Science Forum, Nov. 5-7 at Northwest A&F University, Yangling
 - Invited speaker at the College of Resources and Environment, Northwest A&F Univ.
 - Guest lecture (two) to undergraduate students of Natural Resources class, 2016
 - Advised three faculty members from College of Urban and Rural Construction, Agricultural University of Hebei as visiting scholar during 2016-17
 - Organizing summer research training for undergraduate and graduate students from Northwest A& F University, China (2017-18)
 - Taught a class on Natural Resources at NWA&F University summer 2017 and 2018
 - Visited China Agricultural University, Beijing in June (2018; 19), taught in summer school
 - Serve as a Visiting Professor and advice grad students (31 hours/year)
- Costa Rica (2018- Continue)
 - MOU with IICA
 - Participated in discussion and workshops on Digital Agriculture
 - Organizing a undergraduate student trip through Aggies Go Global
- Egypt (2008-2009)
 - Served as an external advisor to a graduate student at Desert Research Council
 - Served as a co-advisor of a student from Desert Research Institute

- Organizing a undergraduate student trip to Egypt through Aggies Go Global
- Greece (2000-continue)
 - MOU with Parrotis College in Progress
 - Study abroad program development with Parrotis College in progress
- India (1989-continue)
 - Served as executive secretary of Indian Association of Hydrologist
 - Served as Associate editor of Jal Vigyan Samachar (1993-1994)
 - Organized training workshops for engineers and growers on water management
 - Visited Agricultural University in India as part of recruiting activities in 2011
 - Attended a conference in Surat on Water Management 2014
 - Attended ISSS conference in Kolkata in Dec. 2017
 - MOU with IIT Kharagpur was signed and working on with other Universities
 - Organized (in 2018, 19 and 20) and attended leadership conference in New Delhi during 26 April- May 1, 2018 for eight ACES students
 - Developing an extension training program for agriculture graduates of Andhra Pradesh
 - Visited several Engineering and Agriculture Colleges in AP and Telangana India, talks, interactions with faculty, administrators and students Feb-March 2019
- Iran (2009)
 - Grant proposal to Iranian National Science Foundation
- Israel (2012)
 - Grant proposal with Ben Gurion University (2014)
 - Visited Israel, Arava, Technion, and Volcani Center with JNF Faculty fellowship program (2017). Gave a talk at Volcani Center
 - Grant proposal with BIRD and Tel Aviv University (2019)
 - Collaborations with Ndrip and Tal-Ya on Water use efficiency (2020-continue)
- Jordan (2019-continue)
 - Developing collaborations with The University of Jordan, MOU under discussion
 - Developing collaborations with Jordan University of Science and Technology and others through a USAID project proposal submitted in 2021
- Latin America (2018-continue): Uruguay, Paraguay, Argentina, Brazil with Mario Allegri
 - Developing collaborations with IICA and TEC and countries of Latin America
 - Several webinars with IICA staff on collaboration
 - Visited several Institutes and Universities in Argentina, Uruguay, Paraguay
 - Building collaborations with ministries, Universities, and farmer organizations
 - Several MOUs signed, grant proposals among others in progress
- Mexico (2006-continue)
 - 100K Strong proposal writing with UACH 2021
 - Collaboration with University of Guadalajara and MOU with City of Chihuahua and Foundation Produce in Chihuahua City Aug 16, 2019.
 - Serve on the PhD committee of Gabriela Mendoza's from University of Juarez, Mexico
 - Visited Foundation Produce headquarter and met with the President and Secretary.

- US-Mexico Border Health Commission meeting in Monterrey, Mexico, Oct. 19-22, 2015
- Key-note speaker during Agronomy Week at University of Durango, Sept. 2015
- Invited speaker at International Organic farming Conference at University of Durango, Venecia, Mexico, 2015
- Member of organizing committee (Research tour to NMSU) for Mexican Soil Science Society meeting in Juarez, Mexico during 2014
- Invited speaker during Agronomy Week at University of Durango, Venecia, Mexico, Sept. 3-5, 2012
- Invited speaker during 37th International Soil Science Conference, Mexican Soil Science Society, Zacatecas, Mexico, 11-16 Nov., 2012
- Invited speaker during International Conference at University of Juarez, 15 March, 2013
Collaborated on projects funded by SCERP, EPA and NMDOH
- Served as co-advisor for four Masters/PhD students at University of Juarez
- Proposals to EPA Border programs and Ciencia Básica
- Hosted a faculty from University of Juarez, Mexico at NMSU during 2011-12
- Saudi Arabia (2019-continue)
 - Developing collaborations with King Abdulaziz University (KAU); MOU is under development
- Turkey (2012-continue)
 - Hosted students from Turkey
 - Hosted a research scholar from Turkey

AWARDS RECEIVED

- Fellow Soil Science Society of America (2020)
- Award “Leaders of Excellence” at the Annual WEF (2018)
- Award of Appreciation by Soil Science Society of America for serving as Book Review Editor for Vadose Zone Journal (2014-2017)
- National Water and Energy Conservation (Team) award (2017)
- Received Israel Faculty Fellowship (2017)
- Nakayama Research Excellence Professor (2014)
- Team Award for outstanding wastewater management integrated program (2014)
- Award of Excellence for Microirrigation multistate project (Team; W2128) (2014)
- Graduate Research Award of NMSU AES (2014)
- Key-note speaker Agronomy week in Durango, Mexico (2015)
- Nominated to Mahatma Gandhi Pravasi Samman London NRI Welfare Society of India (2013)
- Invited speaker at Mexican Soil Science Society meeting in Zacatecas, MX (2012)
- Award of Excellence for outstanding contribution to Western Regional Multistate Research (W-2188, 2011)
- Patricia Christmore Faculty Teaching Award (2009)

- North American Colleges and Teachers of Agriculture (NACTA) and ACES College Teaching Award (2009)
- Certificate of appreciation from NM Alliance for Minority Participation (2009)
- Water Resources Team Award for outstanding integrated program (2007)
- Soil Science Society America Journal Appreciation Award for serving as Associate Editor (2006)
- Nominated for Distinguished College Teaching Award (2008)
- Nominated for Distinguished College Research Award (2011)
- Nominated to *Gamma Sigma Delta*, Honor Society of Agriculture, NMSU Chapter (2005)
- Received *Certificate of Appreciation* for mentoring program at OSU (2005)
- Received *Certificate of Appreciation* for BAYOU mentoring program at OSU (2002)
- Invited Speaker *Soil and Water Resource Field Night* for farmers, Piketon, the Ohio State University (2003) and several conferences and meetings

LEADERSHIP WORKSHOP AND SERVICE

- Completed Aggies Leadership Training Academy (ALTA) year round course 2020
- Attended Administrators meeting with delegates from Costa Rico (Dec) 2018
- Completed Advancing Leadership Program (ALP) at NMSU during 2014-2015 (one year)
- Executive Committee member of Advancing Leadership Program during 2015-18
- Participated in other leadership workshops and invited lectures (2018-date)
- Leadership talks on “Dunning Kruger effect” (2016-17)
- Leadership talk on “how to start a talk” (2017-18)
- Served on several panels (forums) on a wide ranging leadership issues (2015-date)
- Leadership talk “Career readiness through Colleges: opportunity & challenges” (2018)
- Attending ALTA workshop at NMSU (2020)

MEMBERSHIP OF PROFESSIONAL SOCIETIES

- American Geophysical Union
- Soil Science Society of America
- American Society of Horticulture Science
- American Society of Agricultural and Biological Engineering
- Gamma Sigma Delta: the Honor Society of Agriculture
- Indian Association of Hydrologists

TEACHING

International Teaching

- 2018-2017: Northwest A&F University, China: Natural Resources (July-August)
- 2018: China Agricultural University, summer school (June)

- 1998: Irrigation Management- 545.009 at Univ. of Agricultural Sciences Vienna (co-Instructor)
- 1998: Indirect Methods in Soil Physics-545.002 Univ. of Agric. Sciences Vienna (co-Instructor)
- 1999: Project Work on Irrigation- 545.001 Univ. of Agric. Sciences Vienna (Teaching Assistant)

At NMSU:

Teaching appointment averaged between 30% and 40% since 2005. Designed and taught three new classes. Teaching evaluations for most attributes ranged from 88-100%.SOILS 477- Environmental Soil Physics (3 Cr, Every Fall)

- SOILS 477+L- Environmental Soil Physics (3 Cr) +Lab (1 Cr) (Every Fall)
- SOILS 652- Advanced Soil Physics (3 Cr, Every Spring)
- SOIL 655- Contaminant Transport Modeling (3 Cr, Spring)
- SOIL 650- Spatial Variability Analysis (3 Cr, On Occasion)
- SOIL 598- Soil Physics Calculus (3 Cr, Spring 2011)
- ES/SOIL 370- Environmental Soil Science (3 Cr, Every Spring)
- ES 391- Internship (3 Cr, Fall, Spring)
- SOILS 252- Introductory Soils (3 +1 Cr, On Occasion)

At Ohio State University (2004-05):

- Soil Science- 871-Advanced Soil Physics at the Ohio State University (Instructor)
- Soil Science- 671- Soil Physics Lab at the Ohio State University (Instructor)

TEACHING PUBLICATION

Shukla M.K. and T. Sammis. 2012. Advanced soil physics class develops research and teaching skills. NACTA Journal. 56 (1): 2-7.

TEACHING PRESENTATIONS

Shukla M.K. 2016. Agriculture water management. Summer School, China Agriculture University, Beijing. June 5.

Shukla M.K. 2016. Agriculture water management. Northwest A&F University, Yangling, Nov. 8.

Shukla M.K. 2016. Soil erosion. Northwest A&F University, Yangling, Nov. 10.

Shukla M.K. 2018. How to prepare a manuscript. China Agricultural University

TEACHING SERVICE

Editorial Board member for NACTA Journal (2013-2016)

ADVISING:

- **Postdoc:** Dr. Amir Gonzalez, Postdoctoral Research Associate (2013-2016)
Dr. Sanjit Deb, Postdoctoral Research Associate (2009- 2013)
Dr. Akram Benali, Research faculty (2021-present)

Dr. Hui Yang, Research Scientist, (2021-Present)

- **Research Associate:** Vanaja Kankarla (2020- 2021);
Adam Gonzalez (2020-present)
- **Scholar:** Dr. Yanbing Qi, Northwest A&F University, China (2013-2014)
Dr. Juan Pedro Flores Margez, University of Juarez, Mexico (2011-12)
Dr. Hui Xia, Agriculture University of Hebei, China (03/2016-09/2016)
Dr. Lili Sheng, Agriculture University of Hebei, China (03/2016-09/2016)
Dr. Gao Huiyan, Agriculture University of Hebei, China (11/2016-04/2017)
Dr. Li Peiling, Jiangxi Agriculture University, China (12/01/2017-11/30/2018)
- **Student:** Mr. Joel Hernandez, University of C. Juarez (9/01/16-11/30/16)
Ms. Hui Yang, China Agricultural University, China (10/01/2017-10/30/2018)
Mr. V. Bedirhanoglu, Ataturk University, Turkey (12/27/2017-06/05/2018)
Mr. Xingwang Wang, China Agricultural University (10/01/2018-10/30/2019)
Mr. Changian Ma, China Agricultural University (12/01/2018-12/31/2019)
Ms. Yin Zhou, China Agricultural University (10/05/2019-12/31/2020)
Mr. Chang Liu, China Agricultural University (12/30/2020-01/15/2021)
- **Faculty:** Blair Stringam, K.C. Carroll, Colby Brungard, Rajan Ghimire, PES
Nick Webb, PES/USDA; Hatim Geli, ANRS
- **Undergraduate Students:** Several undergraduate students of Environmental Science and Soil Science programs
- **Graduate Students:** Advised following students as the chair/co-chair of their graduate committees. Also, served on the committees of more than 28 more graduate students

	Name of Student	Degree	Year Completed	Advising as
1	Mike Babcock	M.Sc.	2007	Chair
2	Guillermo Ortiz	M.Sc.	2007	Chair
3	Tran Tri Dung (Civil Engg.)	M.Sc.	2007	Co-Chair
4	Parmodh Sharma	M.Sc.	2008	Chair
5	Pradip Adhikari	M.Sc.	2008	Chair
6	Amir Samani	M.Sc.	2010	Co-Chair
7	Bernice Hernandez (Univ. of Juarez)	UG Thesis	2010	Co-Chair
8	Ashraf El Sadek	Ph.D.	2011	Co-Chair
9	Amir Gonzalez	Ph.D.	2011	Chair
10	Parmodh Sharma	Ph.D.	2011	Chair
11	Pradip Adhikari	Ph.D.	2013	Chair
12	Ankit Bansal	M.Sc.	2011	Chair
13	Harmandeep Sharma	M.Sc.	2014	Chair
14	Joel Hernandez	M.Sc.	2014	Co-Chair
15	Mireya Rios, Mexico	M.Sc.	2014	Co-Chair
16	Janet Moncada, Mexico	UG Thesis	2014	Co-Chair
17	Nadia Rodriguez M, Mx	M.Sc.	2015	Co-Chair
18	Savitoz S. Sidhu	Ph.D.	2014	Co-Chair

19	Alison Flores	M.Sc.	2015	Chair
20	Darby Kellum	M.Sc.	2016	Chair
21	Gurjinder Singh	M.Sc.	2016	Chair
22	Omer F Ozturk	M.Sc.	2016	Chair
23	J. Fernandez	M.Sc.	2017	Chair
24	Saman Mostafazadeh	M.Sc.	2018	Co-Chair
25	Joel Hernandez	Ph.D.	2018	Co-Chair
26	Vanaja Kankarla	Ph.D.	2019	Chair
27	Akram Ben-Ali	Ph.D.	2021	Chair
28	Bauldwin Monie	M.Sc.	2018	Co-Chair
29	Sarah Cerra	Ph.D.	On-going	Chair
30	Darby Kellum	Ph.D.	On-going	Chair
31	Gabriela Mendoza UACJ, Mexico	Ph.D.	On-going	Co-Chair
32	Hana Hernandez	MS	On-going	Chair
33	Sumeet Sharma	MS	On-going	Chair

RESEARCH

Research appointment has averaged between 35% and 55% from 2005. Following are the areas of research interest

- Use of unconventional waters (brackish groundwater, produced water and RO concentrate) for sustainable agriculture (Pecan, chile peppers, tomato, and halophytes), mechanisms and impacts on evapotranspiration, groundwater, soil contamination, yields, and quality
- Measurement and modeling of water and energy (heat) transport in unsaturated porous media for horticulture and tree crops, improving water use efficiency
- Transport of solutes including herbicide, and irrigation efficiencies through unsaturated field and greenhouse soils under chile, onion, cotton, and pecan

RESEARCH FUNDING

Total funding received to date is more than \$3 million

- Carbon sequestration in reclaimed mined soils of Ohio; Department of Energy-NETL; 2003-2006; (co-PI with Lal) \$756,000
- Interactions of vadose zone properties at multiple scales in arid land soils, by USDA- HATCH Grant (PI) (\$50,000 for five years)
- Mapping of airborne particulate matter under agriculture and unpaved road, Southwest Consortium for Environmental Research and Policy (SCERP) (PI) (2007-2009 \$140,000)
- Killed Mulch Cover Crop Systems and Water Management in Southern NM: Irrigation Water Management for Monitoring and Modeling on Farm Soil Salinity- Rio Grande basin Initiative (RGBI) (PI) (\$62,500)
- Land application of industrial effluent on a Chihuahuan Desert ecosystem: Impact on soil physical and hydraulic properties. NMWRRI 2006 Seed Money Research Program Award (PI) (\$67,000)
- Self-Sealing Liners for Desalination Evaporation Ponds. Sandia University Research Partnership (SURP) (PI) 2006 (\$40,000)

- Modeling the transport of DU particles by saltation mechanism, Physical Science Laboratory (PI) 2007 (\$5000)
- Evaluation of the 'Pecanigator' as an aide to irrigation scheduling for pecans in the Mesilla Valley and west Texas. White, Heerema, Sammis, Shukla, Mexal, Iglesias 2007 (\$8000)
- Soil Salinity Management and Onion Cultivar Screening for Salt Tolerance. Shukla and Cramer. NMDOC, March 2007 (\$22,500 for two years)
- Effect of salinity and crusting on hydraulic conductivity of soil. AES, February 2008, Equipment (\$5000)
- Advanced sensing and control technologies to optimize resource management in specialty crops. 2008. USDA-CSREES (NMSU, TAMU, UCDAVIS total about \$5 million) ~ (PI) 2M for NMSU; \$633K Shukla, Mexal) (2009-12)
- Soil Water Extraction and Rooting Patterns in Pecan Orchards. 2008. Shukla, Mexal, Heerema, USDA-ARS (\$29,000)
- Winter Production of Leafy Greens in the Southwestern USA using High Tunnels. Guldan, Uchanski, Falk, Shukla, Western SARE Competitive Grant (2009-13) (\$194,000)
- Land application of industrial effluent on a Chihuahuan Desert ecosystem: Impact on soil physical and hydraulic properties. Shukla, Mexal, WRRI, (PI) \$30,000 for 1 year (2009-10)
- Land-based Sources of Air Quality Contamination in the Binational Border Region of Southwestern New Mexico, Northwestern Chihuahua and West Texas. New Mexico Department of Health. Dubois, Wang, Shukla, Sammis, et al. 2010 (\$800K).
- Comparison of Gramineous crops for control of Verticillium in Chile. New Mexico Chile Commission. Sanogo, Idowu and Shukla 2010-11 (\$7500)
- Interactions of vadose zone properties at multiple scales in arid land soils, by USDA- HATCH Grant 2010-15 (\$50,000 for five years) (PI)
- VPR Research Grant and GREG Award Shukla Lambis, Bawazir (PI) 2011-12 (\$35K)
- Compensated Root Water Uptake and Transpiration in Pecans: Measurements and Modeling for Sustainable Irrigation, , Shukla, 2011-13 (PI) (\$22K)
- Soil properties at BRGNDRF, Bureau of Reclamation, 2013 (Co PI) (\$2500)
- Land-based sources of air quality contaminants in the Binational Border Region of Southwestern New Mexico, Northwestern Chihuahua and West Texas", NM Department of Health, (Co PI) 2013-14 (\$69,450.00) Total award: \$231,500.00.
- Desalination concentrate management for sustainable agriculture: a preliminary study on transport behavior and plant viability at BGNDRF, Bureau of Reclamation, Shukla, Ulery, Picchioni, Schutte, Rastegary 2013-14 (PI) (\$50K)
- Graduate Research Award. Effects of water and salinity stresses and yield and quality of New Mexico specialty crops. AES. 2014-16 (PI) (\$40K)
- Growth and Yield Responses to Irrigation Water Salinity for Drip Irrigated Chile. AES 2015-17 (\$16000).
- Leaching of Indaziflam in Sandy Loam Soil: Quantification and Management. Bayer CropScience, 2013-17 (\$180K)
- Assessment of water table and water quality variations with respect to river flow along Rio Grande River between Garfield NM and Fabens TX, NM WRRI Faculty Water Research Grant Program. 2014-15 (Co-PI) (\$48K)
- Soil Geomorphic Institute. USDA- NRCS workshop 2016-17 (\$40K)

- Determining Impacts of Long Term Use of RO Concentrate on *Atriplex* Species, Soil characteristics and Microbial Habitats. US Depart. Of Interior, Bureau of Reclamation, Hosler, Shukla, Cerra, 2017-19 (\$150K)
- Irrigation with brackish groundwater and concentrate: effect on soil microbial properties, plant uptake, and ion deposition, Shukla, Schutte, Picchioni, WRRRI-BOR, 2017-18 (\$74K)
- Commodity Exchange Market, Cochran Fellowship Program for Malawi, USDA FAS, Shukla (PI), Acharya, Townsend (AEAB), 2018 (\$75K).
- NMSU Mexico F2F Agriculture Volunteer Opportunity Project (AVOP) Small Grants Program, Gutierrez and Shukla, 2018 (\$720K)
- Shukla M.K. (Principal), W. Pedio, N. Flores, E. Delgado (FACS), R Acharya. 2018. Capacity Building of Risk-based SPS Systems and Trade Facilitation in Colombia. USDA-FAS, PI, \$286,000
- Acharya (PI), Shukla, Ghimire, Djaman 2018. Tunisia Market Reform within the Wheat Value Chain, Cochran Fellowship Program, USDA FAS, \$60K
- NMSU Costa Rica F2F Agriculture Volunteer Opportunity Project (AVOP) Small Grants Program, Gutierrez and Shukla, 2018 (\$720K)
- Shukla M.K. (PI), A. King, R. Ghimire 2021. Soil Health Principles and Fallowed Land Management. NMDA (\$10K).
- Shukla M.K (2021). Produced water for agriculture. HPOC Company (\$12700)
- Picchioni G.A. (Principal), Schutte, B. J. (Co-Principal), Shukla, M. K. (Co-Principal), Guzman, I. (Co-Principal). Exploring the Benefits of Brackish Water and Halophytes for Human Health. USDA/NIFA/AFRI. Research Credit (PI): \$76,000. Total Award: \$190,000. Current Status: Funded. (January 15, 2021 – January 14, 2023).
- Shukla M.K. (PI), R. Ghimire (Co-PI). 2021. Can we increase soil organic C sequestration by efficient rangeland management? NGL, Energy Partners LP, (\$132K)
- Shukla M.K. (PI).2021. Lower Rio Grande Land Management Practices for Uncultivated Agricultural Fields. NMDA and ISC (\$135K)

Major Interdisciplinary/ Multi-institutional Grants Lead as PI

- Hydrology in Arid Regions: An Assessment of the Potential of GPS Surface Reflection to Detect Soil Moisture at Landscape Scale (PI)- NASA (\$98,000) Shukla, Bleiweiss, Schmutge, NMSU and Katzberg, NASA (2009)
- Shukla, M. K. (Principal), NMSU, KSU, TSU Sponsored Research, "Developing Decision Support Tools for Improving Nitrogen and Water Use Efficiency to Reduce Nitrous Oxide Gas Emissions in Cereal Crops", Sponsoring Organization: USDA/NIFA/ Agriculture and Food Research Initiative, Sponsoring Organization Is: Federal, Research Credit: \$1,977,738.36, PI Total Award: \$4,944,345.89.
- Shukla, M. K. (Principal), Sammis, T. W. (Principal), UCD, TAMU. Sponsored Research, "Advanced Sensing and Control Technologies to Optimize Resource Management in Specialty Crops: Studies of Water and Nitrogen Management in Deciduous Crops under Normal and Resource-Limited Conditions", Sponsoring Organization: University of California, Davis, Sponsoring Organization, Research Credit: \$381,465.20, PI Total Award: \$1,907,326.00.
- Shukla, M. K. (Principal), NMSU, TTU, UW, OSU. "RII Track-2 FEC: Infrastructure Development for Enhancing Arid and Semi-Arid Systems (IDEAS) for Food and Water

Security", Sponsoring Organization: National Science Foundation, Sponsoring Organization, Research Credit: \$1,189,244.60, PI Total Award: \$5,946,223.00.

- Shukla, M. K. (Principal), NMSU, TTU, UCR, UW. Sponsored Research, "Use of nontraditional water resources for sustainable food security", Sponsoring Organization: USDA/NIFA/ Agriculture and Food Research Initiative, Sponsoring Organization Is: Other, Research Credit: \$1,495,130.80, PI Total Award: \$4,986,088.00.
- Shukla M.K. (PI), Xu P. (Co-PI), Epel J., O. Distel, others from USA and Israel. U.S. - Israel Center of Excellence in Energy, Engineering and Water Technology. 2019. Total Award \$20M.
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Consultancy

- Hydraulic conductivity of evaporation ponds. Sapphire Inc.
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- Herbicide transport, Bayer Crop Sciences
- Saltation modeling project, through PSL for the DOE
- Meter Group sensor testing
- Local Pecan growers
- Zeigler Geologic Consulting LLC on soil hydraulic properties
- NGL Energy Partners LP on Produced water for agriculture and C sequestration
- HPOC LLC an oil and gas company on use of produced water for agriculture

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IN REVIEW

Three manuscripts in various Journals

WHITEPAPER

Shukla et al. 2020. Beneficial Reuse of Produced Water for Agriculture: Risks, Benefits, and Approaches for Enhancing Water Security. (Currently in Review- in Climate- MDPI

BOOK-CHAPTERS

1. Shukla M. K. and R. Lal. 2006. Air permeability of soils. Encyclopedia of Soil Science. (Ed.) R. Lal. Marcel Dekker, Inc., 270 Madison Ave., NY, p. 60-63.
2. Shukla M. K. and R. Lal. 2006. Water infiltration in soils. Encyclopedia of Soil Science (Ed.) R. Lal. Marcel Dekker, Inc., 270 Madison Ave., NY, p. 1855-1857
3. *Deb S. and M.K. Shukla. 2011. An overview of some hydrological watershed models. (Ed.) M.K. Shukla, Soil Hydrology, Land Use and Agriculture: Measurement and modeling. CAB International, Wallingford, UK. p.5-116.
4. Shukla M.K. 2011 Introduction to soil hydrology. Ed. M.K. Shukla, Soil Hydrology, Land Use and Agriculture: Measurement and modeling. CABI, Wallingford, UK. p1-23.
5. *Deb S. and M.K. Shukla. 2011. Variability of hydraulic conductivity due to multiple factors. In Tech Publishers. P75-116.
6. Margez J.P.F., M. K. Shukla. 2012. Particle Matter Dispersed by Vehicles on Unpaved Roads. H. Knudsen and N. Rasmussen (Eds.): Particulate Matter: Sources, Emission Rates and Health Effects. Nova Science Publishers, Inc. p117-140.
7. Shukla M.K. and J. P. Margez. 2012. Organic Farming in Semi-Arid Southern New Mexico. Organic Agriculture, Mexican Soil Science Society. Agricultura Organica. 45-58.
8. Margez J.P.F., CV. Cordoba, P.O. Avial, B.C. Diaz, M. K. Shukla, E.S. Sosa. 2012. Soil texture and type of irrigation water in the availability of Phosphorus of cattle manure. Organic Agriculture, Mexican Soil Science Society (Accepted).
9. Shukla M.K. 2015. Sustainability of organic farms under different farming durations in semi-arid southern New Mexico. Agricultura Organica en Mexico. p411-428.

PROCEEDING PAPERS

- *Ikemura Y. and M.K. Shukla. 2006. Soil quality in a minimum tilled field in southern New Mexico. p.221-229 In R.C. Schwartz, R.L. Baumhardt, and J.M. Bell (eds.) Proc. 28th Southern Conservation Systems Conf., Amarillo, Texas. June 26–28, 2006, USDA-ARS Conservation and Production Research Laboratory Report No. 06-1, Bushland, TX.
- *Ochoa C. G. and M. K. Shukla. 2006. Macroaggregate associated available water and carbon In Alfisol fields. International Symposium Soil Physics and Rural Water Management, progress, needs and challenges. 28-29th Sept. 2006, Vienna, Austria, pp.57-61.
- *Deb S.K., M. K. Shukla, and P. Sharma. 2010. Numerical analysis of coupled liquid water, water vapor, and heat transport in a sandy loam soil. The 19th World Congress of Soil Science on “Soil Solutions for a changing a world”, International Union of Soil Science, August 1–6, 2010, Brisbane, Australia. 121-124.
- *Deb S.K., *P. Sharma, M. K. Shukla, J. G. Mexal, T. W. Sammis, and R. St. Hilaire. 2010. Patterns of soil moisture depletion in mature pecan orchards on the Rio Grande Plains, Las Cruces. American Society of Agricultural and Biological Engineers (ASABE) Annual International Meeting, June 20–23, 2010, Pittsburgh, PA. (Accepted).
- Maier B., M.P. Bleiweiss, D. W. DuBois, and M.K. Shukla. 2012. Wireless sensor technology for enhanced spatial and temporal knowledge of crop growing conditions. USCID Water Management Conference Proceedings. P105-114, Nov 13-16, Reno NV.
- Adhikari P., M. K. Shukla, and J. G. Mexal. 2012. Impact of wastewater application uniformity on spatial variability of hydraulic conductivity. USCID Water Management Conference Proceedings. P449-462, Nov 13-16, Reno Nevada.

- Deb S.K., M.K. Shukla, M.E. Uchanski, and P.W. Bosland. 2012. Evaluation of compensated root water uptake pattern of greenhouse drip irrigated chile. 2012 Irrigation Show & Education Conference, Agriculture Track-1, Nov. 2-6, Orlando, Florida.
- Schutte, B. J., N. Klypina, Shukla, M. K. 2013. Soil moisture effects on viability of physically dormant weed seeds (vol. 66). Proceedings of the Western Society of Weed Sci.
- *Sharma H., *S.K. *Deb, M.K. Shukla, P Bosland, B. Stringam and M. Uchanski. 2013. Chile root water uptake under partial root drying: a greenhouse drip irrigated study. 2013 Irrigation Show & Education Conference, Nov. 4-8, Austin, TX.
- *Sharma H., M.K. Shukla and *S.K. Deb. 2013. Water conservation using partial root drying for drip irrigated Chile. USCID Conference, October 22-25, Denver, Colorado.
- Shukla M.K. 2015. Water resource management for semi-arid areas: status, problems and opportunities. 27th International Agronomy Week, Sept. 7-11, Durango, Mexico.
- Stringam, B., D. Berg, M. Shukla, K. Grover. 2015. Using the TI 84 for irrigation scheduling training. Emerging Issues in Water Management Governance. *USCID Water Management Conference*. Albuquerque, New Mexico November 17-20, p. 69-76.

INVITED PRESENTATIONS

- Shukla M.K. 2020. Robotics for monitoring real time abiotic stresses in soil and plant for sustainable agriculture. IICA, Costa Rica, Nov 24.
- Shukla M.K. 2020. Facebook live event on 100K Strong program with La Salle and U.S. Embassy Bogotá, Colombia, Oct 15.
- Shukla M.K. 2020. NMSU Mexico Collaborations. 1st International Food Research Workshop in the Chihuahua Desert Region of North America. Nov., 6.
- Shukla M.K. 2020. Nayra A. and M.K. Shukla. 2020. Aggies Go Global. AMP Workshop, Oct. 9.
- Shukla M.K. 2020. Shukla M.K. 2020. Sustainable use of brackish water for arid agriculture. 3rd annual WIN workshop, BGNDRF, Alamogordo, Sept. 23.
- Shukla M.K. 2019. Use of brackish water and concentrate for agriculture in arid areas. 2nd annual WIN workshop, BGNDRF, Alamogordo, Oct. 28-29.
- Shukla M.K. 2019. Irrigation with Brackish groundwater and RO. CAU, China.
- Shukla M.K. 2019. Salt tolerant crops. Two Nation One Water Conference, WRRI, Las Cruces.
- Shukla M.K. 2019. Irrigation scheduling. EBID workshop with growers, Las Cruces.
- Shukla M.K. 2018. ACES Global initiatives program. NTU, Crownpoint, Oct 2018.
- Shukla M.K. 2018. Sustainable management of soil water. China Agriculture University, June 2018.
- Shukla M.K. 2018. Sustainable management of soil salinity. China Agriculture University, June 2018
- Shukla M.K. 2017. Irrigation water management for water scarce New Mexico. Volcani Center, Israel, June 14.
- Shukla M.K. 2016. Managing our salt. Wells, Pumps, etc... Civil Engg. Department, March 11, 2017.
- Shukla M.K. 2016. Soil organic carbon under different land uses. Yangling International Agri-Science Forum, Northwest A&F University, Yangling, Nov. 5-7.

- Shukla M.K. 2016. Irrigation water management for semi-arid areas: opportunities for augmenting water resources and improving water use efficiency. College of Natural Resources and Environment, Northwest A&F University, Yangling, Nov. 8.
- Shukla M.K. 2016. Water management for semi-arid areas: opportunities for augmenting water resources. Using brackish water and RO concentrate. China Agricultural University, Beijing, June 5.
- Shukla M.K. 2015. Water resource management for semi-arid areas: status, problems and opportunities. 27th International Agronomy Week, Sept. 7-11, Durango, Mexico. (Key-note Address)
- Shukla M.K. 2015. Irrigation water management for water scarce semi-arid areas: opportunities for augmenting water resources and improving water use efficiency. Water and Food Security under Changing Environments. China Agricultural University, Beijing, China, June, 1-7.
- Shukla, M.K. 2015. Water balance in the rootzone of soil under contrasting texture. International Conference on organic farming. Torreon, Mexico, April 29-20.
- Shukla M.K. and J. P. Margez. 2012. Organic farming in New Mexico-sustainability based on soil properties. Organic Agriculture, Mexican Soil Science Society, November, 12-16, 2012.
- Shukla M.K. 2012. Sustainability of organic farming in New Mexico. 24th International Agronomy Week, University of Durango, Venecia, Mexico. Sept 4-6, 2012.
- Shukla, M.K. 2006. Variability of soil properties and processes at multiple scales: assessment and modeling: Mars Technical committee, October3-4. Wooten Hall.
- Soil Physics Group, 2006. Soil physics and environmental quality. Poster presented at University Research Council (URC) Fair in Corbett Center.
- Shukla M.K. 2006. Modeling the transport of DU particles by saltation mechanism. Semi-annual review meeting, Picatinny Arsenal, Annual Review Meeting. 29-30 November.
- Shukla, M.K. 2007. Variability of vadose zone hydrological properties: assessment and modeling: NM tech, January 29. Socorro.
- Shukla M.K. 2007. Assessment and modeling of vadose zone properties at multiple scales. UTEP, March 23, El Paso.
- Shukla M.K., T.R. Ellsworth, R.J. Hudson and D.R. Nielsen. 2001. Dependence of dispersivity on average pore water velocity. 65th Annual SSSA meeting in Charlotte, North Carolina, Oct. 21-25.
- Shukla, M.K. 1998. Recent research with soil erosion models. International Conference on Experiences with Soil Erosion Models. Prague. 5-8 May.
- Shukla M.K. 1996. Estimation of saturated hydraulic conductivity. Preceding 6th ICID.CIID international workshop on Drainage and Environment. Ljubljana, Slovenia April 21-29.
- Shukla, M.K. and G.C. Mishra. 1994. Canal discharge and seepage relationships. Preceding of VI National Symposium on Hydrology at Shillong, Meghalaya, April 10 - 24, p. 263-279.

CONFERENCE PAPERS (INCLUDING ABSTRACT)

More than 80 (can be made available upon request)

RESEARCH REPORTS and MANUALS:

1. Shukla M.K. and A. Flores. 2015. Desalination Concentrate Management for Sustainable Agriculture: A Preliminary Study on Transport behavior and Plant Viability at BGNDRF, BOR DOI. Project Completion report
2. Stringam B., M. K. Shukla and B. N. Kuffour. 2015. Assessment of Water Table and Water Quality Variations with Respect to River Flow along Rio Grande between Garfield NM and Fabens TX. WRRI, NMSU. Project Completion Report.
3. Shukla M.K. and J. P. Margez. 2013. Final report for Particulate matter emission due to various land uses to SCERP.
4. Gonzalez, A. and M.K. Shukla. 2011. Final report for Sandia University Partner Project on Developing low cost self-healing liners for evaporation pond
5. Shukla M.K. 2007. Interactions of Vadose Zone Properties at Multiple Scales under Organic Farming in Arid Land Soils. CRIS report for 2005-13.
6. Shukla M.K. 2007. Interactions of Vadose Zone Properties at Multiple Scales under Organic Farming in Arid Land Soils. CRIS report for RCC W2128 2009.
7. Shukla M.K., J. Pedro-Margez. 2008. Pre-final SCERP report.
8. Shukla M.K. 2009. Mapping of airborne particle from two land uses. Final SCERP report.
9. Shukla M.K., J. Mexal, T. Sammis, M. Babcock and P., Adhikari. 2009. Effect of treated wastewater on soil properties. Final report to New Mexico WRRI.
10. Shukla M.K. 2005. Soil Physics- Laboratory manual for soil 477L.
11. O'Neil M., *K. Lombard, B. Onken, A. Ulery, M.K. Shukla. 2006. Power Plant Combustion Byproducts for Improved Crop Productivity of Agricultural Soils- Final report- June 2006. U.S. Department of Energy National Energy Technology Laboratory, The Combustion Byproducts Recycling Consortium.
12. Lab manual for SS-671 at Ohio State University.
13. Estimation of hydrological soil properties for design of drainage system for Bulandshahar (CS-94).
14. Effect of Urbanization on runoff (TN-93).
15. Status report on Urban Hydrology (SR-15).
16. Inter-comparison of Urban Watershed Model (TR-144).
17. Design of Surface Drainage for a command in Bulandshahr.
18. Soil salinization and reclamation in command areas.
19. Urban watershed modeling- A comparative study (CS/AR-140).
20. Estimation of soil hydrological properties of a doab in Narsingpur M.P. of Narmada river basin.
21. Effect of Urbanization on runoff hydrograph.
22. User's manual for design of sub-surface drainage system under unsteady and steady state conditions of recharge.
23. Interim report on Sub surface drainage investigations in stage II of IGNP at RD 838.

OTHER SPEECHES AND TALKS

1. Shukla M.K. 2018. ACES Global initiatives program. NTU, Crownpoint, Oct 17.

2. Shukla, M.K. 2006. Variability of soil properties and processes at multiple. . scales: assessment and modeling: Mars Technical committee, October3-4. Wooten Hall.
3. Soil Physics Group, 2006. Soil physics and environmental quality. Poster presented at University Research Council (URC) Fair in Corbett Center.
4. Shukla M.K. 2006. Modeling the transport of DU particles by saltation mechanism. Semi-annual review meeting, Picatinny Arsenal, Annual Review Meeting. 29-30 Nov.
5. Shukla, M.K. 2007. Variability of vadose zone hydrological properties: assessment and modeling: NM tech, January 29. Socorro.
6. Shukla M.K. 2007. Assessment and modeling of vadose zone properties at multiple scales. UTEP, March 23, El Paso.
7. Shukla M.K. 2007. Task 4: On farm irrigation system management. 2007 Annual conference, Joint Rio Grande basin Initiative. South Padre Island; May 14-17.
8. Shukla M.K. 2007. Salinity management in onion research. Onion Field Day. May 23.
9. Shukla M.K. 2008. Soil salinity management and onion cultivar screening for salt tolerance. Annual Review Meeting of NM Onion Commission. March 04, 2008.
10. Shukla M.K. 2009-date. W-3128 meeting annual report presentation (every year Oct./Nov.).
11. Shukla M.K. 2010-date. W-3188 meeting annual report presentation (every year in January).

EXTENSION/ OUTREACH PUBLICATIONS

- Sammis T., M.K. Shukla, J. Mexal, J. Wang and D. Miller. 2013. Pecan Research and Outreach in New Mexico: Logic Model Development and Change in Communication Paradigms. *Journal of Higher Education Outreach and Engagement*. 17(1) 27-41.
- Sammis T., M.K. Shukla, J. Mexal, P. Bosland and L. A. Daugherty. 2008. Case study on Improving Chile Industry of New Mexico through Industry, Agriculture Experiment Station and Cooperative Extension Services Collaboration. *Journal of Extension*. 47:1-7.
- Shukla M.K. 2017. Pecan research at ACES-NMSU. University-Grower conference.
- Deb S.K., M.K. Shukla and J. Mexal. 2012. A peak at the other half of your orchard: The roots. 46th Annual Western Pecan Growers Association Conference. March 4-6, 2012 Hotel Encanto de Las Cruces, Las Cruces, NM.
- Sharma P. and M.K. Shukla. 2007. Monitoring soil moisture and soil salinity in agriculture fields under furrow and drip irrigation systems. October 15-18, Water Quality Conference, Fayetteville, Arkansas.
- Sharma, P., M. K. Shukla and T. Sammis. 2007. Predicting Soil Temperature from Air Temperature for Chile Crop. 2007 New Mexico Chile conference.
- Ikemura Y. and M.K. Shukla. 2006. Soil quality in a minimum tilled field in southern New Mexico. Southern Conservation Tillage Systems Conference. Bushland (Amarillo), Texas. June 26-28, 2006.
- Participates regularly in Field days organized by ACES in Las Cruces

ONLINE MEETINGS

Zoom meeting with NDrip and local Pecan growers followed by visit to the farm in August 2020.

Several others related to proposal writing and MOU development were also organized throughout the year.

RADIO TALK

Gave a talk on National Public Radio, KTEP 88.5 FM, in El Paso on Sunday, March 25 at 7:00 PM on Soil Physics. The talk was also streamed at www.ktep.org

YOUTUBE VIDEO

NMSU professor experiments with desalination concentrate, disposal.

<https://www.youtube.com/watch?v=BNmUAowyTxY>

Novel technologies for efficient water use

<https://www.youtube.com/watch?v=cDF5Ys02OqE>

NEWSPAPER ARTICLES

- NMSU researchers want to use satellites to help pecan groups. 2009. Las Cruces Sun News
- Regional project works on Microirrigation. 2014. Las Cruces Sun News
- Professor experiments with desalination concentrate disposal: 2015. Las Cruces Sun News
- Ag uses for highly saline water researched: 2015. Albuquerque Journal
- Is saline water an answer to drought: 2015. Las Cruces Bulletin
- Viable farming and water: 2015. Deming Headlight

LANGUAGES: English, German, and Hindi (speak and read all three well; write English)