



Carbon Management and Sequestration Center

Issue 3 | 2015



Sustainable Uses of Soil in Harmony with Food Security

Phetchaburi Province, Thailand

International Soil Conference

Prof. Rattan Lal was an invited speaker at the International Soil Conference on "Sustainable Uses of Soil in Harmony with Food Security," 17-20 August, Phetchaburi Province, Thailand ([Here](#) is a link to Dr. Lal's presentation). The conference was inaugurated by her Royal Highness Princess Maha Chakri Sirindhorn. The World Soil Day is celebrated on 5th December each year, which is the birthday of the King of Thailand, His Majesty Bhumibol Adulyadej. The title "Bhumibol" (Sanskrit/Pali world) means "strength of the soil." It was the King Bhumibol who recommended to the U.N. to declare 2015 as the Year of the Soils. Thus, the conference in Phetchaburi Province was organized to celebrate 2015-IYS.

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Honorary Degree from TUD, Dresden (*cont-...page 2*)





Honorary Degree from Technical University of Dresden

Rattan Lal, an Indian-American expert in soil science, teaching at the Ohio State University as a »Distinguished Professor«, will receive the honorary degree as Doctor of Natural Sciences honoris causa from the TU Dresden on September 23, 2015. “With the granting of this honorary doctorate, our university honors one of the world’s most famous and globally engaged soil scientists. His research topics and spheres of activities go far beyond soil science. Of global importance are Lal’s seminal and often cited publications on the potential for carbon storage in soils connected with global change, food security in a world with growing human population, as well sustainable and integrated management of soil and water resources. Moreover, we honor a person not only of high international standing, but also with a unique and charismatic personality”, says Karl-Heinz Feger, professor at the Institute of Soil Science and Site Ecology and Dean of the Faculty of Environmental Sciences. The laudation will be held by Professor Klaus Töpfer, the former German Federal Minister for the Environment and former Executive Director of the Environmental Program of the United Nations (UNEP). TU Dresden in particular has benefited from engagement with the Ohio State professor. “Rattan Lal has contributed significantly to the establishment of a close partnership between the Faculty of Environmental Sciences and the United Nations University, which has been based in Dresden since 2012 with its Institute for Integrated Management of Material Fluxes and Resources (UNU-FLORES). He provided crucial impetus for the constitution of a joint doctoral program, and was one of the architects of the international »Dresden Nexus Conference« series, says Feger. These joint activities are very important for further development of TU Dresden’s profile line »Energy and Environment«.



Photographed (top of page) from right to left: Prof. Dr. Klaus Töpfer, Exec. Director, IASS, Prof. David Malone (rector, UNU, Under-Secretary-General-UN)
Photographed directly above from right to left: Prof. Rattan Lal, Prof. Dr. Hans-Müller Steinhausen, Rector of TUD, Prof. Dr. Karl-Heinz Feger, Dean, TUD

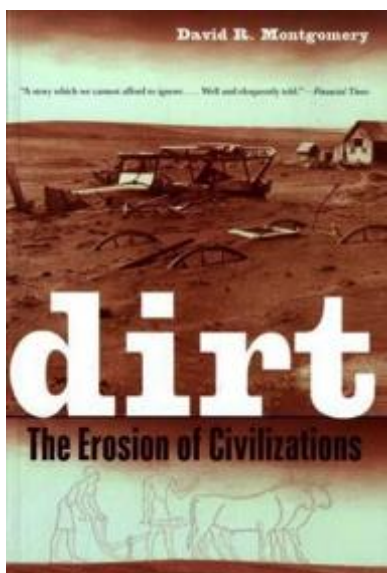
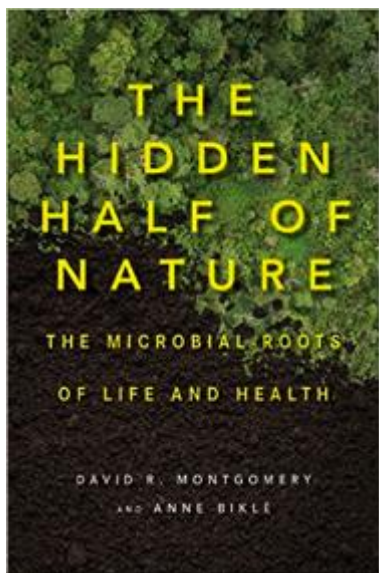


David Montgomery Visits C-MASC Columbus, Ohio, 1st September 2015

Dr. David Montgomery, professor of Earth and Space Sciences at the University of Washington in Seattle, visited C-MASC on 1st September. Dr. Montgomery is well known for his book "Dirt: The Erosion of Civilizations." Dr. Montgomery presented a seminar entitled, "The Hidden Half of Nature: The Microbial Roots of Life and Health." This is also the title of his forthcoming book, coauthored by his wife Anne Birkle.

During his visit to C-MASC, Dr. Montgomery discussed with Prof. Rattan Lal the theme of his new book "Conservation Agriculture." Major points of discussions included the potential of soil carbon sequestration, policy interventions needed, and challenges to global adoption of conservation agriculture, especially by the resource-poor farmers of sub-Saharan Africa, South and South East Asia, the Caribbean, and the Andean Region.

Pictured (above) is Dr. Montgomery during his seminar, and (below) is Drs. Montgomery and Lal.





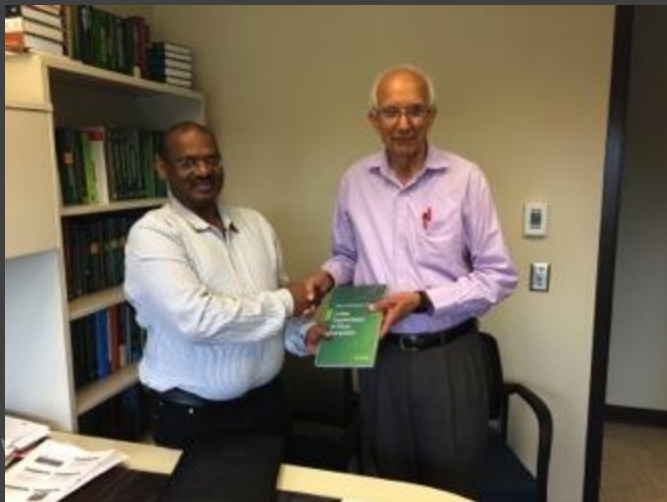
C-MASC Guests



Vice Provost Mike Boehm visits C-MASC

On 29th, July, Vice Provost for Academic and Strategic Planning Dr. Mike Boehm visited C-MASC laboratories and joined for a roundtable discussion about the history of C-MASC and current program objectives.

Prof. Boehm received the Distinguished Teaching Award of The Ohio State University for his excellence in teaching, following which he served as Plant Pathology Chair and presently as the Vice Provost. His visit to C-MASC prompted enthusiastic discussions about the importance of trans-disciplinary approach to C sequestration in the terrestrial biosphere, and mitigating climate change.



Dr. Jasiva Reddithota Krupadam

National Environmental Engineering Research Institute
Nagpur, India

Dr. Jasiva Reddithota Krupadam visited C-MASC on 7th August 2015. Dr. Krupadam is a senior scientist with the National Environmental Engineering Research Institute, Nagpur, India. During his visit to C-MASC, Dr. Krupadam discussed the issue of water quality, especially the transport of P into surface waters through non-point source pollution from agroecosystems.



New Visiting Scholars

Daniella Schatzel

University of Koblenz-Landau

Daniela is an undergrad student of Environmental Sciences at University of Koblenz-Landau in Landau, Germany. Her field of interest is related to soil science and sustainable agricultural practices. She will stay at C-MASC for 12 weeks based on an internship granted by the Research Internships in Science and Engineering (RISE) program of the German Academic Exchange Service (DAAD). She will study the long-term effects of surface residue manipulation on soil properties, improve her technical skills, and learn a lot about the various research activities at C-MASC.



Audrey Konda

São Paulo State University

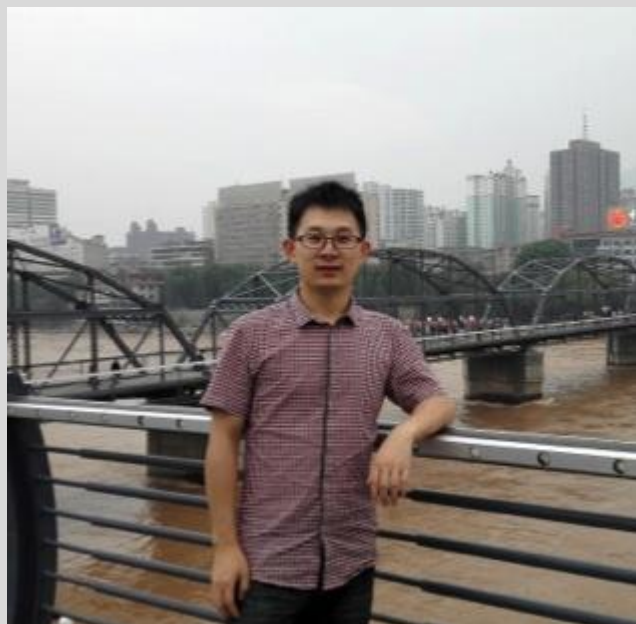
Audrey Konda is a visiting scholar from São Paulo State University (UNESP), Brazil. He is majoring in Agronomic Engineering and is studying the aggregation in an oxisol correlated with the content of organic carbon, under different soil preparation methods and cover crops. His past research includes the study of agricultural entomology and biological pest control in agriculture.

Xin Zhao

Ph.D Student

China Agricultural University

Xin Zhao is a Ph.D student in Agronomy and Biotechnology College, China Agricultural University, Beijing, China. My major is Agronomy and my Ph.D research focus at the effects and potential of soil organic carbon sequestration, greenhouse gases mitigation, and crop production under Conservation Agriculture. The objectives of my research are to conduct a national assessment on crop yields, soil organic carbon and greenhouse gases emissions affected by no-till, residue retention and crop rotation and simulate the potential in China's cropland. It will help to understand how Conservation Agriculture contributes to mitigation climate change and crop production as well as the variation among different site-specific conditions in China. In C-MASC, modeling potential of soil organic carbon sequestration and greenhouse gases mitigation under no-till farming in different cropping system, soil type, and regions in China by DNDC model is my primary task.





Returning and New Students

Pat Bell

PhD Student

Pat is originally from Broken Arrow, Oklahoma. He completed his B.S. in Environmental Science, M.S. in Soil Chemistry, and M.Ag. in International Agriculture at Oklahoma State University. At Ohio State he is studying how farmers in Tanzania can manage their soils to better adapt to climate change. In particular, he is evaluating how the System of Rice Intensification and Conservation Agriculture impact soil quality and water budgeting near Mt. Kilimanjaro.



Nall Moonilall

PhD Student

My name is Nall Inshan Moonilall and I am a first year Ph.D. student in the Environmental Science Graduate Program (ESGP) pursuing an Environmental Science degree here at Ohio State University. Dr. Rattan Lal serves as my advisor. I am originally from Miami, Florida. I graduated my Bachelors of Science in Environmental Studies with focus in Agroecology from Florida International University, in Miami, Florida, in 2013. I recently obtained my Masters of Science in Environmental Science from Ohio State in August of 2015. My thesis research focused on looking at the impact of various amendments on soil properties and agronomic productivity in Guyana, South America. For my Ph.D. dissertation research, I am looking to build upon this research and continue the study I have going on in Guyana.

Chris Eidson

PhD Student

My name is Chris Eidson and I am a first semester PhD student working here at C-MASC. I completed my BS in Environmental Science in 2013 with a focus on soil resources and sustainability here at the OSU School of Environment and Natural Resources. I then enrolled in the Environmental Science Graduate Program and joined Dr. Rattan Lal's group as a Master's student. I completed an MS thesis on the affect of winter rye cover crop on soil quality in the U.S. Corn Belt. Additionally, I earned a graduate level minor in Statistical Data Analysis during this span. I am a native Buckeye, born in raised in the small Ohio city of Bucyrus where I still live with my wife, Marcie, two children, Zack and Sophia and our Rhodesian Ridgeback, Lincoln.



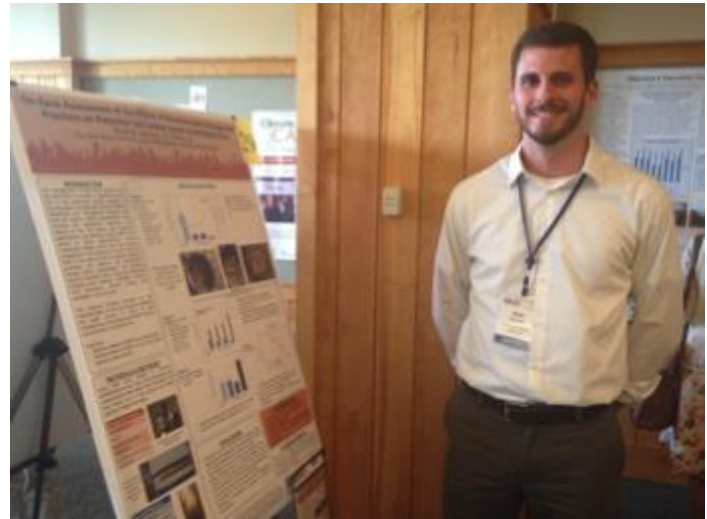


Returning and New Students

Reed Johnson

MSc Student

Reed received a B.S. in Environmental Science/Soil Science from The Ohio State University in 2014. Shortly after graduation he joined CMASC, began work as a teaching assistant in SENR, and pursuing a M.Sc. through the Environmental Science Graduate Program. He is currently in the 2nd year of his graduate program studying the effects of Best Management Practices (BMP's) on soil quality and working as a research assistant. His research is based on cooperation with farmers in western Ohio and focuses primarily on soil structure, carbon, and SQI use.



Ellen Maas

MSc Student

I'm from St Louis, Missouri where I lived with my family as a computer programmer for a school for many years. After a lifetime of environmental activism as a hobby, I was ready for a career change to do something about addressing the issue of climate change.

Blending my goals and current skill set, I will be working on carbon modeling for my research.



Eric Stein

MSc Student

Eric is pursuing a Masters in Environment and Natural Resources (MENR) at OSU. He has spent the past semester at the Sokoine University of Agriculture (SUA) researching the topic of "Assessing Land-based Carbon sinks of the Tanganyika region of Tanzania" under the supervision of Dr. Didas Kimaro of SUA.



Henry Anton Peller

MSc Student

Henry pursues masters work in Southern Belize, where he works on soil management and land use issues in Mayan territories. He was raised on a small farm in Appalachian Ohio. As an undergraduate, he was trained in agronomy and in political economy, and studied these topics in both Haiti and Cuba. Outside of his work in soil science, Henry engages with community organizing, reads philosophy and literature, cooks, gardens and plants trees. He is grateful to be a part of the CMASC team, and appreciates the mentors and friends here.



Exiting Visiting Scholars

Dr. Meiling Zhang

Associate Professor
Gansu Agricultural University
Lanzhou, China

Dr. Zhang joined C-MASC from June 2014 to July 2015 from the Center for Quantitative Biology, Gansu Agricultural University. Her research interest area is ecological model and carbon cycle.

Dr. Zhang's family joined her for her final C-MASC seminar entitled, "Response of grassland net primary production to climate change in China."



Dr. João Carlos de Moraes Sá

Associate Professor
State University of Ponta Grossa
Ponta Grossa-Paraná, Brasil

Dr. Sá has been working on conservation agriculture with emphasis in no-till since 1981. His expertise on soil carbon dynamics, soil fertility management, cropping systems, focusing in soil organic carbon sequestration and greenhouse gases mitigation. He has coordinated a research team and a laboratory of soil organic matter (LABMOS – www.labmos.com.br) with 16 people including Post-Doctoral, Ph.D, MS and undergraduate students of agronomy course. Our research program is based on five topics: (1) Mechanisms of C-protection in the aggregates and particle size fractions affected by soil management, (2) C sequestration potential in subtropical and tropical no-till soils; (3) C-saturation point in response to diverse biomass-C input by NT cropping systems; (4) Carbon footprint and C offset in no-till farming (inventory and mapping scaling up); (5) Industrial Organic Waste recycling use in conservation agriculture and C-offset.

Dr. Sá joined C-MASC from February 2015 to August 2015. He gave a final seminar on "Low-Carbon Agriculture in South America to Mitigate Climate Change and Enhance Food Security."





Exiting Visiting Scholars

Maria Munoz Garcia

PhD Scholar
Technical University of Cartagena



Maria visited C-MASC from May 2015 through September 2015.

The seminar “Effects of biochar and marble mud on soil physical properties to reclaim mine ponds” was held the last 27th August by Dr. Maria Angeles Munoz from Technical University of Cartagena (Spain). The main results about physical soil properties and carbon contents in amended mine waste were shown. As conclusion, the marble mud mixed with biochars from pig manure and cotton residue

exhibited the best performance in improving physical quality on mine waste for reclamation. This work was supported by the Programme Jimenez de la Espada of Mobility, Cooperation and Internationalization (Ref. 19619/E/14) from Fundación Séneca (Agencia de Servicio Exterior) from Fundación Séneca (Agencia de Servicio Exterior) of Spain) and the Carbon Management and Sequestration Center (C-MASC) from Ohio State University.



Ahmad Nawaz

PhD Scholar
University of Agriculture, Faisalabad, Punjab, Pakistan

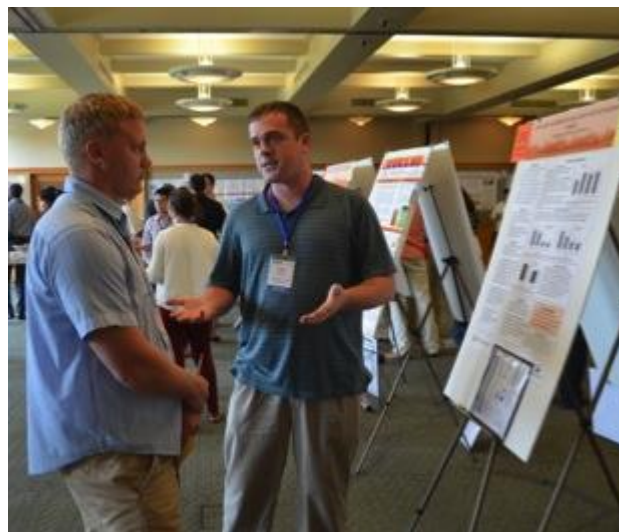
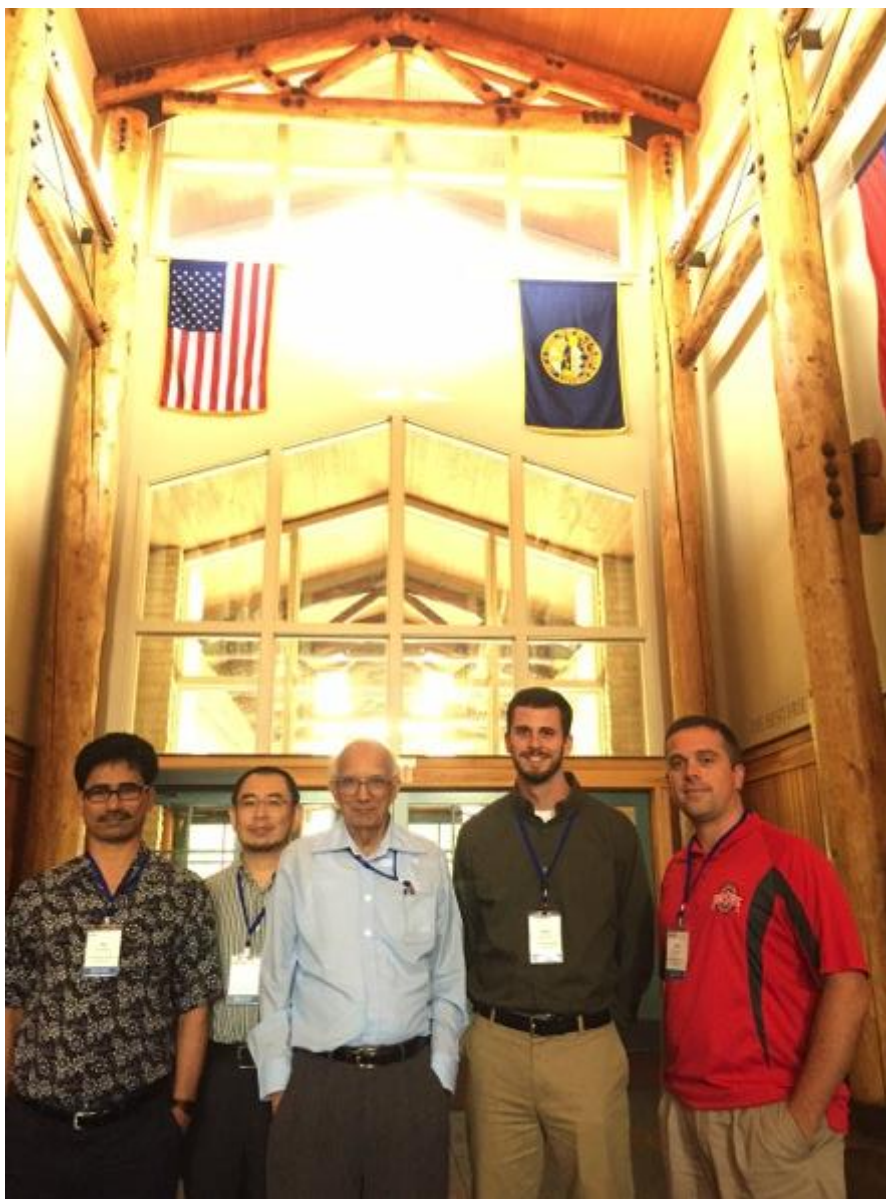
Ahmad Nawaz, a PhD Scholar, joined C-MASC for six months after being selected to receive support from the month International Research Support Initiative Program (IRSIP) funded by the Higher Education Commission of Pakistan. Ahmad is working on the weed dynamics, soil health and system productivity of rice-wheat cropping system in my PhD studies in Pakistan. His other research interest includes the use of allelopathy in alleviating the stress induces yield losses in cereals. For his final C-MASC seminar, he presented on "Role of Allelopathy in Crop Production."





CS-CAP Annual Conference

Nebraska City, NE
3-4 August 2015



The Annual meeting of the CS-CAP project was held from 3-5 August 2015 at the Lied Lodge and Conference Center. Staff and students of C-MASC who attended the meeting (above left to right) included Raj Shrestha, Richard Liu, Rattan Lal, Reed Johnson, and Chris Eidson. Photographed (above right), Chris Eidson presented a poster, which received an award (see page 11). Pictured (below right) Reed Johnson also presented a poster which was visited by many interested participants.



Annual Meeting of the Soil and Water Conservation Society

Greensboro, North Carolina

28th July 2015



Prof. Rattan Lal, with Dr. Mark Berkland (left, President of SWCS) and Mr. Jim Gulliford (right, Executive Director of SWCS) at the annual meeting of the Soil and Water Conservation Society in Greensboro, North Carolina on 28th July 2015. Prof. Lal received the 2015 Editor's Choice Award in recognition of the article of excellence "[Lal, R. 2014. Societal value of soil carbon. Journal of Soil and Water Conservation 69:186A-192A.](#)" The article had 951 downloads in the first month of its publication and with a total of 2375 downloads in 6 months. The article focuses on the criteria of evaluating the societal value of C, which may be pertinent to the process of regulating carbon emissions.



Rattan Lal with Prof. Ken Olson of the University of Illinois (left) and Prof. Birl Lowery of the University of Wisconsin (right). Prof. Lowery received the award of "Fellow of SWCS" on the 28th July at the annual meeting of SWCS in Greensboro, NC. He has served as Prof. of soil physics and a Senior Associate Dean of the University of Wisconsin.



Congratulations to Chris Eidson!

PhD student, Chris Eidson received an prize for his poster from Lois Morton, Director of CS-CAP. His presentation was entitled, "Soil quality as affected by rye under no-till corn-soybean rotation." In October, Chris will be traveling to Washington, DC to present a poster to the USDA .





Annual Meeting of the Japanese Society of Soil Science and Plant Nutrition Kyoto, Japan 9-11 September 2015

Prof. Dr. Takashi Kosaki of the Tokyo Metropolitan University, and past President of the JSSPN (front row, 3rd from right) invited Prof. Lal to attend this meeting. On 9th September, Prof. Lal met with graduate students in soil science and talked to them about the future research priority in soil science. This session was chaired by Dr. Atsu Kadono (front row, center), who was a PDR at C-MASC. Dr. Toru Nakijima (front row, right) was also PDR at C-MASC from 2012 to 2014.

Prof. Rattan Lal was the invited plenary speaker at the annual meeting of the Japanese Society of Soil Science and Plant Nutrition. The meeting, attended by about 500 participants, was held at the Kyoto University, Kyoto, Japan from 9-11 September 2015.

The Plenary Lecture (**Soil and Sustainability**) presented Prof. Lal was moderated by Prof. Dr. Kazuyuki Inubushi (Chiba University, Japan). Prof. Inubushi is a member of the IUSS council and of the Management Committee of the JSSSPN conference.





C-MASC Alumni and Announcements



Sardar Patel Outstanding Research Award

Dr. Ch. Srinivasarao, Director of CRIDA, receiving an award from Honorable PM of India, Sri Narendra Modi on 25th July 2015 in Patna, Bihar, India. The award was to recognize "Central Research Institute for Dryland Agriculture" (CRIDA) by the "Sardar Patel Outstanding Research Award" for its research on dryland farming in India.



Jawaharlal Nehru Award to Dr (Mrs) Samanpreet Kaur

Dr Samanpreet Kaur, Assistant Research Engineer, Punjab Agricultural University, received the prestigious "Jawaharlal Nehru Award 2014" from the ICAR. Dr. Samanpreet Baweja was a visiting scholar at C-MASC, The Ohio State University from 15th Jan 2014 to 15th March 2014. The award is given to Dr Samanpreet for her outstanding doctoral thesis on "Modelling the impact of climate change on groundwater resources in central Punjab". She developed a methodology for assessing climate change impact on crop yield and water in agriculture by interlinking climate, soil-water-vegetation and groundwater models. Her research is of great use to assess cross-sectoral impact of climate change and formulate adaptation technologies for enhancing water productivity; sustenance of crop yield and water resources in the 21st century.

Photo (Right): Dr Samanpreet Kaur receiving Jawaharlal Nehru Award 2014 from Dr Sanjeev Balyan, Minister of State for Agriculture, for outstanding doctoral thesis in Natural Resource Management



Congratulations to Laura and Ian



Laura and Ian were married on 3rd October 2015 in Columbus, Ohio. A wedding shower, organized in the 28th September, was attended by about 25 friends and colleagues, who came to wish them all the best.



C-MASC Publications

Journal Articles

- Bandyopadhyay, K.K. and R. Lal. 2015. Effect of land use management practices on distribution of C and N pools in water stable aggregates. *J. Soil Indian Soc. Soil Science* 63(1):53-63
- Gelaw AM, Lal R, Singh B R. 2015. Carbon Footprint and Sustainability of Smallholder Agricultural Production Systems in Ethiopia. *Journal of Crop Improvement* 28(5): 700-714
- Mengistu, D., R. Lal. 2015. Conservation effects on soil quality and climate change adaptability of Ethiopian watersheds. *Land Degradation and Development*, DOI: 10.1002/ldr.2376
- Nakajima, T. and R. Lal. 2015. Comparison of greenhouse gas emissions monitored with a photoacoustic infrared spectroscopy multi-gas monitor and a gas chromatograph from a Crosby silt loam. *Carbon Management*: 1-8. doi:10.1080/17583004.2015.1080473.
- Nath, A.J., R. Lal, A.K. Das. 2015. Ethnopedology and soil properties in bamboo (*Bambus* sp.) based agroforestry system in North East India. *Catena* 135:92-99
- Ortas, I. and R. Lal. 2015. Long-Term Fertilization Effect on Agronomic Yield and Soil Organic Carbon Under Semi-Arid Mediterranean Region. *Amer. J. Expl. Agric.* 4(9):1086-1102
- Vilmundardóttir, O.K., Gísladóttir, G., Lal, R. 2015. Soil carbon accretion along an age chronosequence formed by the retreat of the Skaftafellsjökull glacier, SE-Iceland. *Geomorphology* 228:124-133
- Zhang, H., X. Zhao, X. Yin, S. Liu, J. Xue, C. Pu, R. Lal, F. Chen. 2015. Challenges and adaptations of farming to climate change in the North China Plain. *Climatic Change* 129:213-224.

Invited Keynote Presentations

- Lal, R. 2015. Carbon Sequestration in Soils: A Challenge for Food Security and Climate Action. INRA, Paris, France, 7th July 2015
- Lal, R. 2015. Soil Quality. Annual CS-CAP Meeting, Lied Lodge, Nebraska 3-5 August 2015.
- Lal, R. 2015. Soil Carbon Pool as an Environmental Indicator. International Conference on Environmental Indicators (ICEI), Windsor, Canada, 2-5 August 2015.
- Lal, R. 2015. Integrated Resource Management for Efficient Food Production. International Soil Conference on "Sustainable Uses of Soil in Harmony with Food Security (ISC2015), Phetchaburi Province, Thailand, 18-21 August 2015.
- Lal, R. 2015. Soil Science and Societal Challenges in the FACCE Remit. Thematic Annual Programming on Improving Soil Quality Workshop. FACCE-JPI Wageningen, Netherlands 24th August 2015.
- Lal, R. 2015. Saving Oil by Managing Soil. Soil Not Oil International Conference, Richmond, California, 4-5 September 2015.
- Lal, R. 2015. Soil and Sustainability. Annual Meeting of the Japanese Society of Soil Science, Kyoto, Japan, 9-11 September
- Lal, R. 2015. Future Priorities in Soil Science. Annual Meeting of the Japanese Society of Soil Science, Kyoto, Japan, 9-11 September
- Lal, R. 2015. Soil Restoration for Ecosystem Services. IUSS Sustain 2015 Conference, University of Kiel, Germany, 21-24 September 2015
- Lal, R. 2015. The Societal Value of Soil Organic Matter and Ecosystem Services. 5th International Symposium on Soil Organic Matter, Göttingen, Germany 20-24 September 2015.
- Lal, R. 2015. Land Use Effects on Coupled Cycling of Carbon and Water in a Changing Climate. Honorary Doctorate Award Ceremony, Technical University, Dresden Germany 23rd September 2015.

**Do you have contributions for our next newsletter?
Please contact us!**

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