
25–29 July 2022
Vienna, Austria
Programme
International Symposium on
Managing
Land and Water for
Climate-Smart Agriculture
#Atoms4Climate
IAEA
Joint FAO/IAEA Centre

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Location of the Event:

International Atomic Energy Agency
Vienna International Centre (VIC)
Building M, BRB/M1
Wagramer Strasse 5
A-1400 Vienna, Austria
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Working Language: English

Resolutions: No resolutions may be submitted for consideration on any subject; no votes will be taken.

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TIMETABLE

MONDAY, 25 JULY 2022

Time	Session No.	Session Title/Break	Venue
09:30–10:30		Opening Session	Board Room B/M1
10:30–11:00		*Coffee/Tea Break*	
11:00–12:40	1	Plant Nutrition and Nutrient Cycling	
12:40–14:00		*Lunch Break*	
14:00–15:30	2	Soil Conservation and Land Management	
15:30–16:00		*Coffee/Tea Break*	
16:00-17:20	2	Continued: Soil Conservation and Land Management	
17:30–19:30		*Welcome Reception*	M-Building – Ground Floor

TUESDAY, 26 JULY 2022

Time	Session No.	Session Title/Break	Venue
09:00–10:30	3	Agricultural Water Management	Board Room B/M1
10:30–11:00		*Coffee/Tea Break*	
11:00–12:40	3	Continued: Agricultural Water Management	
12:40–14:00		*Lunch Break*	
14:00–15:00	Special	Global Soil Laboratory Network GLOSOLAN	
15:00–15:30		*Coffee/Tea Break*	
15:30–17:30	Special	AquaCrop – Development and Way Forward	

WEDNESDAY, 27 JULY 2022

Time	Session No.	Session Title/Break	Venue
09:00–10:30	4	Tracing Agricultural and Industrial Pollutants 4.1. Agricultural Pollutants	Board Room B/M1
10:30–11:00		*Coffee/Tea Break*	
11:00–12:00		Continued: Agricultural Pollutants	
12:00-12:40	4	Tracing Agricultural and Industrial Pollutants 4.2. Antimicrobial Resistance	
12:40–13:40		*Lunch Break*	
13:40–14:30		Continued: Antimicrobial Resistance	
14:30-15:40	4	Tracing Agricultural and Industrial Pollutants 4.3. Agricultural Plastics	

Time	Session No.	Session Title/Break	Venue
15:40–16:10		*Coffee/Tea Break*	
16:10–18:00	4	Tracing Agricultural and Industrial Pollutants 4.4. Nuclear Emergency and Remediation	

THURSDAY, 28 JULY 2022

Time	Session No.	Session Title/Break	Venue
09:00–10:30	5	Greenhouse Gas Emissions	Board Room B/M1
10:30–11:00		*Coffee/Tea Break*	
11:00–12:30	5	Continued: Greenhouse Gas Emissions	
12:30–13:00		*Lunch Break*	
13:00–17:30	Special	Poster All Sessions	

FRIDAY, 29 JULY 2022

Time	Session No.	Session Title/Break	Venue
09:00–10:40	6	Advances of Nuclear-Based Instrumental and Analytical Techniques	Board Room B/M1
10:40–11:10		*Coffee/Tea Break*	
11:10–12:30	7	Digital Technology, GIS, Machine Learning and Modelling	
12:30–13:00		Closing Ceremony	

MONDAY, 25 JULY 2022

09:30-10:30 **OPENING SESSION** **Board Room B/M1**

Chairperson: **Lee Heng, Joint FAO/IAEA Centre**

Time	Name	Member State/ Organization	Title (as applicable: Opening Address; Welcome Address; Keynote Address or Title)
09:30–09:40	Rafael Mariano Grossi	Director General IAEA	Opening Remarks
	Qu Dongyu	Director General FAO	
09:40–10:00	Najat Mokhtar	Deputy Director General IAEA	Welcome
	Maria Helena Semedo	Deputy Director General FAO	
10:00–10:15	Rainer Horn	President Emeritus International Union of Soil Sciences (IUSS)	Keynotes: Soil science research approaches and future needs
10:15–10:30	Qingfeng Zhang	Chief of Rural Development and Food Security Thematic Group, Asian Development Bank	Rethinking food system transformation to meet the continuing demand for safe, nutritious, and affordable food
10:30–11:00	*Coffee/Tea Break*		

MONDAY, 25 JULY 2022

11:00–12:40 **SESSION 1: Plant Nutrition and Nutrient Cycling** **Board Room B/M1**

Chairperson: **Gerd Dercon, Joint FAO/IAEA Centre**

Time	Paper No.	Name	Member State/ Organization	Title
11:00–11:20	290	Roel Merckx	Belgium	Tracing and tracers for climate smart agriculture more than a research tool?
11:20–11:40	1	Xia Liang	Australia	Pursuing sustainable nitrogen management following the “5 Ps” principles: Production, People, Planet, Policy and Partnerships
11:40–11:50	263	Andrea Watzinger	Austria	Drought due to climate change reduced plant production and decelerated carbon and nitrogen cycling in an agroecosystem

Time	Paper No.	Name	Member State/ Organization	Title
11:50–12:00	65	Alberto Sanz Cobena	Spain	Spatial characterization of reactive N flows in the agro-food system of a semiarid Mediterranean region
12:00–12:10	86	Khine Linn	Myanmar	Effect of nitrogen fertilizer on the nitrogen use efficiency and yield of Myanmar local rice varieties under different water system by using ^{15}N isotopic technique
12:10–12:20	144	Jose Zambrano-Mendoza	Ecuador	Efficiency of nitrogen fertilization and native growth-promoting bacteria in corn (Zea mays L), using ^{15}N in the highlands of Ecuador
12:20-12:30	188	Habiba Al-Menaie	Kuwait	Stable isotopes to study the interactive effect of irrigation and fertilization on nitrogen use efficiency in barley
12:30-12:40	32	Crammer Kaizzi Kayuki	Uganda	Effect of a previous legume crop, and tillage on maize yield and nitrogen uptake in two contrasting Agro Ecological Zones (AEZ) in Uganda
12:40–14:00	*Lunch Break*			

MONDAY, 25 JULY 2022

14:00–17:30 **SESSION 2: Soil Conservation and Land Management** **Board Room B/M1**

Chairperson: **Emil Fulajtar, Joint FAO/IAEA Centre**

Time	Paper No.	Name	Member State/ Organization	Title
14:00–14:20	204	William Blake	United Kingdom	Fallout ^{7}Be as a tracer to support soil conservation and climate smart agriculture
14:20–14:40	52	Christine Alewell	Switzerland	Net soil loss assessed with $^{239+240}Pu$ and CSSI - regional-scale studies
14:40–15:00	46	Andrew Swales	New Zealand	Tracing soil erosion sources in upland topo sequences: An enhanced CSSI method for discrimination of upland soil erosion sources by land use and elevation in the landscape, New Zealand

Time	Paper No.	Name	Member State/ Organization	Title
15:00–15:10	51	Paolo Porto	Italy	Can ^{137}Cs and ^{210}Pbex tracers help to detect the impact of climate change on soil erosion? Example from a cultivated site in Southern Italy
15:10–15:20	169	Ratislav Skalsky	IIASA	Use of the ^{137}Cs tracer-based soil erosion data as a benchmark for large-scale soil erosion rate estimates by process-based crop models
15:20–15:30	201	Jalal Bin Sharib	Malaysia	A study of soil erosion and sedimentation in Sembrong catchment using ^{137}Cs
15:30–16:00	*Coffee/Tea Break*			
16:00-16:10	59	Moncef Benmansour	Morocco	Use of nuclear techniques to assess the impact of agricultural practices and climate change on soil erosion and sedimentation in Morocco
16:10–16:20	311	Maral Khododadi	Iran	Using plutonium atom ratios to quantify Chernobyl vs. global fallout contributions of ^{137}Cs reference inventory in western Iran
16:20–16:30	38	Hugo Velasco	Argentina	Relative sedimentary contribution due to new agricultural practices in a hilly semi-arid region of Argentina
16:30–16:40	133	Enrique Munoz Arcos	United Kingdom	Application of fallout radionuclides to assess fine sediment residence time in river channel ecosystems
16:40–16:50	234	Emmanuel Chikwari	Zimbabwe	Use of ^{137}Cs radioisotope in evaluating conservation agriculture practices on soil erosion control in semi-arid areas of Zimbabwe
16:50–17:00	57	Jose Luis Peralta Vital	Cuba	Nuclear techniques supporting the strategy for strengthening the mitigation and the resilience capacity of land management in the national site
17:00–17:10	186	Naivo Rabesiranana	Madagascar	Assessing the impact of climate change on soil erosion in Madagascar upland agro-ecosystems using ^{137}Cs resampling approach

Time	Paper No.	Name	Member State/ Organization	Title
17:10-17:20	300	Samuel Tejeda	Mexico	Application of MUSLE, FRN and HEC-RAS to investigate the soil erosion and sediment transport of La Gavia River, México
17:30-19:30		Welcome Reception		M-Building – Ground Floor

TUESDAY, 26 JULY 2022

09:00–12:40 **SESSION 3: Agricultural Water Management** **Board Room B/M1**

Chairperson: **Hami Said-Ahmed, Joint FAO/IAEA Centre**

Time	Paper No.	Name	Member State/ Organization	Title
09:00–09:20	118	Rafael Rosolem	United Kingdom	Improving field-scale root-zone soil moisture estimates worldwide with the establishment of a global Cosmic-ray soil moisture observing system
09:20–09:40	342	Trenton Franz	United States of America	Opportunities and challenges for the integration of hydro-geophysical sensors in precision agriculture
09:40–09:50	258	Gabriele Baroni	Italy	Integration of new non-invasive soil moisture observations for supporting water management and agricultural activities
09:50–10:00	49	Leticia Gaspar	Spain	Cosmic ray neutron sensor and fallout ^{137}Cs to explore the connection of soil moisture with soil redistribution on an agroforestry hillslope
10:00-10:10	321	Xurong Mei	China	Precisely detecting water status of wine grape with the combination of Cosmic Ray Neutron Sensor and UAV thermography in North China
10:10–10:20	58	Francisco Javier Gaxiola Ortiz	Mexico	Use of a cosmic-ray neutron sensor to estimate soil moisture in a flood irrigated semi-arid farmland
10:20–10:30	227	John Patrick Stowell	United Kingdom	Boron-based neutron sensing and COSMIC-SWAMP
10:30–11:00	*Coffee/Tea Break*			

Time	Paper No.	Name	Member State/ Organization	Title
11:00–11:10	274	Roland Rallos	Philippines	Partitioning evaporation and transpiration in rice paddies under different irrigation schemes through ^{18}O isotope-based method
11:10–11:20	207	Mathilde Vantyghem	Belgium	Validating two banana drought stress proxies on-farm in the Kilimanjaro region, Tanzania
11:20–11:30	36	Ahmed Khalifa	Sudan	Effect of irrigation methods and mulching on growth, yield attributes and water productivity of tomato (Lycopersicon esculentum Mill.) under Kassala State conditions, Sudan
11:30–11:40	192	Kouman Koumanov	Bulgaria	Application efficiency and water extraction across the root zone of a microsprinkler irrigated almond tree
11:40–11:50	74	Kelvin Wafula Mukhebi	Kenya	In-situ water harvesting techniques and fertilizer improves water productivity, water use efficiency and yield of maize under semi-arid conditions
11:50–12:00	103	Ashebir Haile Tefera	Ethiopia	Low cost and water saving on-farm water management technique for improved water use efficiency and crop productivity at a smallholder farmer's field in Ethiopia
12:00-12:10	82	Naem Mazahrih	Jordan	Crop water requirement and crop coefficients of date palm trees in the Jordan Valley
12:10-12:20	145	Burcu Yazici	Turkey	WATERMED platform as an agricultural decision support system
12:20-12:30	256	Giacomo Manessi	Italy	W-PIE: a cosmic neutron spectrometer for smart water management
12:30-12:40	171	Cristina Chinchilla-Soto	Costa Rica	Soil δ^2H and $\delta^{18}O$ profiles aid in understanding water use efficiency in two varieties of common bean (Phaseolus vulgaris L) under irrigation and induced drought in Costa Rica
12:30–14:00	*Lunch Break*			

TUESDAY, 26 JULY 2022

14:00–15:00 **SPECIAL SESSION: Global Soil Laboratory Network GLOSOLAN** **Board Room B/M1**

Chairperson: **Gerd Dercon, Joint FAO/IAEA Centre**

Time	Paper No.	Name	Member State/ Organization	Title
14:00–14:05		Lifeng Li	FAO	Opening
14:05-14:15	326	Lucrezia Caon	FAO	The Global Soil Laboratory Network (GLOSOLAN) and its initiative on soil spectroscopy
14:15–14:25	331	Raphael Viscarra Rossel	Australia	Global spectroscopic modelling of soil carbon for cost-effective local fitting
14:25–14:35	328	Franck Albinet	France	What is the role of Artificial Intelligence in MIRS based soil analysis?
14:35–14:45	325	Isabel Luotto	FAO	Thinking globally, acting locally: A country-driven global soil information system
14:45-15:00				Q&A
15:00–15:30	*Coffee/Tea Break*			

TUESDAY, 26 JULY 2022

15:30–17:30 **SPECIAL SESSION: AquaCrop – Development and Way Forward** **Board Room B/M1**

Chairperson: **Maher Salman, FAO**

Time	Paper No.	Name	Member State/ Organization	Title
15:30–15:35		Lifeng Li	FAO	Welcome
15:35–15:55	334	Maher Salman Margarita Garcia-Villa	FAO Spain	Lessons learnt from 10 years of AquaCrop development / application and the way forward
15:55–16:10	335	Elias Fereres	Spain	Simulating climate change impacts on agricultural production with AquaCrop
16:10–16:30	322	Gabrielle De Lannoy	Belgium	Upscaling AquaCrop towards satellite-based data assimilation
16:30-16:50	337	Joost Wellens	Belgium	

Time	Paper No.	Name	Member State/ Organization	Title
	338	Timothy Foster	United Kingdom	AquaCrop on the ground: Case studies from worldwide experiences
	339	Margarita Garcia-Villa	Spain	
16:50-17:05	340	Dirk Raes	Belgium	AquaCrop – New development and way forward
17:05-17:25		Pasquale Steduto	FAO	Questions and Answers
17:25-17:30		Lee Heng	Joint FAO/IAEA Centre	Closing Remarks

WEDNESDAY, 27 JULY 2022

09:00–12:00 **SESSION 4: Tracing Agricultural and Industrial Pollutants** **Board Room B/M1**

4.1. Agricultural Pollutants

Chairperson: **Joseph Adu-Gyamfi, Joint FAO/IAEA Centre**

Time	Paper No.	Name	Member State/ Organization	Title
09:00–09:20	137	Grzegorz Skrzypek	Australia	What stable isotopes can do for you in water pollution studies?
09:20–09:40	279	Gwenael Imfeld	France	Compound-specific isotope analysis (CSIA) of pesticide residues in soil to evaluate in situ degradation over space and time
09:40–09:50	241	Martin Elsner	Germany	Pesticide leaching and unexpected degradation dynamics in soil revealed by compound-specific isotope analysis
09:50-10:00	81	Duc Nhan Dang	Viet Nam	Sources apportionment for contaminants and tracking dissolved sulfate in the aquatic environment of Ha Noi city (Viet Nam) by the use of dual isotopic fingerprintings of sulfur (^{34}S-SO_4) and oxygen (^{18}O-SO_4)

Time	Paper No.	Name	Member State/ Organization	Title
10:00–10:10	159	David Saka	Ghana	Disentangling nitrate pollution sources and transport pathways in an agricultural ecosystem using hydrochemistry, stable isotopes and MixSIAR model: A case study in the Densu River Basin of Ghana
10:10–10:20	143	Radouan Saadi	Morocco	A multi-isotopic approach for water assessment and fingerprinting nitrate sources in groundwater of the Gharb plain
10:20–10:30	185	Vesna Zupanc	Slovenia	Determination of groundwater quality using stable isotopes
10:30–11:00	*Coffee/Tea Break*			
11:00–11:10	62	Hanqing Yu	China	Novel source fingerprinting total nitrogen and phosphorus in sediment: A case study of an agricultural catchment in North China
11:10–11:20	270	Federica Tamburini	Switzerland	Dissemination of technique and theory for using oxygen isotopes in phosphate as a tracer of sources in the environment
11:20-11:30	148	Anhettigama Chandrapala	Sri Lanka	Assessment of $\delta^{18}OP$ in soil, water, stream sediments and other water quality parameters under different land uses in Central Highlands of Sri Lanka
11:30-11:40	214	David O'Connell	Ireland	Molecular level P speciation dynamics in the fluvial suspended sediments along an agricultural catchment stream
11:40-11:50	284	Hari Ram Upadhayay	United Kingdom	Environmental factors associated with isotopic ratios transformation in organic matter of stream sediment: uncertainties in sediment source apportionment
11:50-12:00	122	Claudio Bravo-Linares	Chile	Tracing agricultural-industrial sediments and associated pollutants to assess their threats to a hydropower basin in Central Chile

WEDNESDAY, 27 JULY 2022

12:00–14:30 **SESSION 4:** **Board Room B/M1**
4.2. Antimicrobial Resistance

Chairperson: **Joseph Adu-Gyamfi, Joint FAO/IAEA Centre**

Time	Paper No.	Name	Member State/ Organization	Title
12:00–12:20	347	Junxia Song	FAO	Addressing antimicrobial resistance (AMR) in agrifood systems through One Health approach
12:20–12:40	217	Martin Elsner	Germany	Isotopic techniques for assessing the persistence of antibiotics through the environment in agricultural catchments
12:40–13:40	*Lunch Break*			
13:40–14:00	266	Fang Wang	China	Understanding and reducing transmission of antibiotic resistant genes from manure amended soil to plants in agricultural systems
14:00–14:10	150	Jim He	Australia	Transmission of antibiotic resistance genes in soil-plant systems
14:10-14:20	350	Thi Nga Vu	Viet Nam	Identification of Priority Antibiotics and its Persistence in Relation to Antimicrobial Resistance (AMR) in Agricultural Systems Using Isotopic and Related Techniques
14:20-14:30	90	Oleg Meniailo	Joint FAO/IAEA Centre	Nuclear Techniques to Fight Antimicrobial Resistance (AMR): Uncovering the Fate of Sulfamethoxazole in Agricultural Soils with Stable Isotopes

WEDNESDAY, 27 JULY 2022

14:30–15:10 **SESSION 4:** **Board Room B/M1**
4.3. Agricultural Plastics

Chairperson: **Oleg Meniailo, Joint FAO/IAEA Centre**

Time	Paper No.	Name	Member State/ Organization	Title
14:30-14:50	324	Giulia Garcasci	FAO	FAO work on agricultural plastics
14:50-15:10	348	Natalia Ivleva	Germany	On the potential of stable Isotope Raman Microspectroscopy for analysis of microbial degradation of microplastics in soils
15:10-15:20	293	Heng Gui	China	Microplastics: An emerging threat and their fate in plant-soil systems
15:20-15:30	343	Evgenia Blagodatskaya	Germany	Decomposition of bio-based and biodegradable plastic and its consequences on soil organic carbon stock
15:30-15:40	264	Evelyne Ivy Kabasuga	Uganda	Microplastics occurrence in surface waters and sediments in Lakes Edward and George in Uganda
15:40–16:10	*Coffee/Tea Break*			

WEDNESDAY, 27 JULY 2022

16:10–18:00 **SESSION 4:** **Board Room B/M1**
4.4. Nuclear Emergency and Remediation

Chairperson: **Gerd Dercon, Joint FAO/IAEA Centre**

Time	Paper No.	Name	Member State/ Organization	Title
16:10-16:30	224	Yuichi Onda	Japan	Evaluation of the contamination of the leafy vegetables during early stage of nuclear emergencies
16:30-16:50	203	Tetsuya Eguchi	Japan	Indices derived from quantity/intensity relationship analysis to detect soils with difficulty to manage radiocaesium uptake risk by crops based on exchangeable potassium

Time	Paper No.	Name	Member State/ Organization	Title
16:50-17:00	239	Floris Abrams	Belgium	Minimizing the impact of radiological emergencies on agricultural production using a spatio-temporal clustering approach under a budget constraint.
17:00-17:10	247	Hayato Maruyama	Japan	Exchangeable ^{137}Cs of soil is a crucial factor to explain the difference of ^{137}Cs transferability from soil to plant
17:10-17:20	190	Franck. Albinet	France	Prediction of exchangeable potassium in soil through mid-infrared spectroscopy and deep learning: from prediction to explainability
17:20-17:30	209	Shigeto Fujimura	Japan	Yearly changes in grain ^{137}Cs-activity concentration in rice and soybean after the accident at the FDNPP
17:30-17:40	223	Asmae Nouira	Morocco	Characterization and analysis of Moroccan agricultural soils to investigate and predict Cs and Sr behaviour
17:40-17:50	250	Avaneesh Rai	India	Current status of understanding of soil to plant transfer of ^{137}Cs and related chemical properties of agricultural soil in a typical tropical monsoonal climate
17:50-18:00	167	Yuri Putyatin	Belarus	Measures to adapt plant production on agricultural lands contaminated with Chernobyl fallout radionuclides to climate warming in Belarus

THURSDAY, 28 JULY 2022

09:00–12:30 **SESSION 5: Greenhouse Gas Emissions** **Board Room B/M1**

Chairperson: **Mohammad Zaman, Joint FAO/IAEA Centre**

Time	Paper No.	Name	Member State/ Organization	Title
09:00-09:20	245	Tim Clough	New Zealand	Using stable isotopes to understand soil carbon and nitrogen interactions

Time	Paper No.	Name	Member State/ Organization	Title
09:20-09:40	34	Dong-Gill Kim	Ethiopia	Response of soil greenhouse gas emissions to soil salinization and its implication for climate-smart agriculture: a review
09:40-10:00	156	Christoph Müller	Germany	Comprehensive experimental field set up to quantify in-situ N transformation pathways and effects of hot spots on N_2O and N_2 emissions in an undisturbed grassland soil via stable isotope tracing
10:00-10:10	28	Mohammad Jahangir	Bangladesh	Estimation of Denitrification Product Ratio using ^{15}N Tracer Techniques and Mitigation of Greenhouse
10:10-10:20	316	Eduardo Aguilera	Spain	Co-design and pilot application of a carbon footprint calculation tool for agricultural systems
10:20-10:30	45	Quynh Vu Duong	Viet Nam	Climate-smart paddy rice cultivation practices developed and adopted for enhanced rice productivity through C sequestration and GHG mitigation in Vietnam
10:30–11:00	*Coffee/Tea Break*			
11:00-11:10	39	Abhishri Gupta	Joint FAO/IAEA Centre	The role of ^{15}N in developing climate smart agricultural practices
11:10-11:20	37	Segundo Urquiaga	Brazil	Arachis pintoi cv Belmonte: A stoloniferous forage legume for dairy productive and low GHG emission livestock production
11:20-11:30	6	Weixin Ding	China	Combined application of biochar and urease plus nitrification inhibitors mitigated NH_3 and N_2O emissions and N leaching in paddy fields
11:30-11:40	301	Patrick Namulisa	Austria	Greenhouse gas emissions from worm-compost-biochar combinations; a potential peat alternative?
11:40-11:50	92	Ana Pérez-Castillo	Costa Rica	Effect of urea-NBPT on the N losses as ammonia and nitrogen use efficiency in a rice crop under different tillage systems in the Central Pacific, Costa Rica

Time	Paper No.	Name	Member State/ Organization	Title
11:50-12:00	89	Oleg Meniailo	Joint FAO/IAEA Centre	Direct and reverse microbial priming for clarifying the role of ectomycorrhizae in the turnover of soil carbon under Arolla pine (Pinus sibirica)
12:00-12:10	313	Youssef Brouziyne	Morocco	Mitigation co-benefits of climate-smart agriculture in Morocco: Status, prospects, and avenues for isotope techniques
12:10-12:20	94	Khadim Dawar	Pakistan	Effect of farmyard manure and urea fertilization with nitrogen inhibitors on greenhouse gas emissions, fertilizer use efficiency and soil fertility under semiarid climate
12:20-12:30	111	Juan Cruz Colazo	Argentina	Developing climate smart agricultural (CSA) practices for mitigation of greenhouse gases in the central semiarid region of Argentina
12:30–13:00	*Lunch Break*			
13:00-17:30				**Poster All Sessions**

FRIDAY, 29 JULY 2022

09:00–10:40 **SESSION 6: Advances of Nuclear-Based Instrumental and Analytical Techniques** **Board Room B/M1**

Chairperson: **Christoph Müller, Germany**

Time	Paper No.	Name	Member State/ Organization	Title
09:00-09:20	5	Christoph Müller	Germany	Advanced tool for analyzing ^{15}N tracing data
09:20-09:40	56	Enrico Yepez	Mexico	Large spatial soil moisture and evapotranspiration measurements at a recently abandoned agricultural pasture
09:40-09:50	240	Aoife Canavan	Germany	Synthesis of 13C-stable isotope-labelled sulfamethoxazole for field experiments
09:50-10:00	253	Ruthger van Zwieten	Netherlands	Automation of sample delivery to Picarro isotope and gas concentration CRDS analyzers with the AS-210 gas autosampler

Time	Paper No.	Name	Member State/ Organization	Title
10:00-10:10	341	Zdenko Machala	Slovakia	Non-thermal plasma and plasma-activated water technologies for smart agriculture
10:10-10:20	238	Jane Omenda	Kenya	Climatic controls on the precipitation stable isotopic composition and variability in the dry zones of central highlands of Kenya
10:20-10:30	255	Javad Pirvali Beiranvand	Iran	A novel approach for estimation of crop yield losses arising from natural disasters by using neutron probe instruments
10:30-10:40	15	Mohamed Abdelkader	Egypt	Chromium isotope fractionation during the Cr (VI) reduction by Shewanella oneidensis MR-1 in the presence of hematite and humic acid
10:40–11:10	*Coffee/Tea Break*			

FRIDAY, 29 JULY 2022

11:10–12:30 **SESSION 7: Nuclear Techniques Digital Technology, GIS, Machine Learning and Modelling** **Board Room B/M1**

Chairperson: **Gerd Dercon, Joint FAO/IAEA Centre**

Time	Paper No.	Name	Member State/ Organization	Title
11:10-11:30	183	Modou Mbaye	Senegal	Deep neural network for cosmic-ray neutron sensors calibration
11:30-11:50	196	Hami Said-Ahmed	Joint FAO/IAEA Centre	High-resolution soil moisture map using Cosmic-Ray Neutron Sensors data and Sentinel-1
11:50-12:10	318	Arnulf Schiller	Austria	Improved vegetation and topographic correction in air drone borne gamma ray spectrometry
12:10-12:20	107	Nina Kickinger	UNOOSA	The Space4Water Portal – A resource on space-based solutions for sustainable water management in agriculture
12:20-12:30	299	Satyajit Dwivedi	India	GIS-based mapping of digital agricultural potential in India for irrigation water management

FRIDAY, 29 JULY 2022

12:30-13:00 **CLOSING SESSION** **Board Room B/M1**

Chairperson: **Lee Heng, Joint FAO/IAEA Centre**

Time	Name	Member State/ Organization	Title (as applicable: Opening Address; Welcome Address; Keynote Address or Title)
12:30–13:00	Hua Liu	Deputy Director General Department of Technical Cooperation IAEA	Closing Remarks
	Ismahane Elouafi	Chief Scientist FAO	
	Qu Liang	Director Joint FAO/IAEA Centre	

Annexure: Posters

SESSION 1: Plant Nutrition and Nutrient Cycling

Paper No.	Name	Member State/ Organization	Title
11	J. Shah	Pakistan	Banana Residue Management through Composting and Mulching for Crop Fertilization and Production
14	M. A. Hekal	Egypt	Techniques for Improving Nitrogen and Water Use Efficiency in wheat and Maize Grown on Sandy Soil with the Aid of 15N Stable Isotope
16	C. Phy	Cambodia	Optimizing Rice Yield and Fertilizer Nitrogen Use Efficiency in Rice Production System through Application of 15N Stable Isotopic Technique
17	N. A. Kouassi	Côte d'Ivoire	Wetlands planted with oil palm as a response to land scarcity and rainfall shortage in southern Côte d'Ivoire
18	T. Bachtiar A. Citraresmini	Indonesia	Assessing Nitrogen Use Efficiency of Rice Mutant Variety
19	S. Pansiri	Thailand	Nutrient Management Using 15N Labelled Fertilizer for Enhancing Rice Production
21	S. Phommalath	Lao PDR	The efficient use of nitrogen for soil improvement and good rice productivity in Lao PDR
29	G. Tiruneh	Ethiopia	Soil spectral reflectance in estimating texture and fertility affected by land management practices in Ethiopian tropical highland
35	A. Babiker	Sudan	Effect of different rate of urea on yield and yield components of onion applied by fertigation using 15N techniques
41	E. Kosh-Komba	Central Africa Republic	Effect of the application of complete mineral fertilizer N.P.K and organic manure (cow dung) for the performance of the pure cultivation of Manihot esculenta Crantz in a forest area (municipality of Pissa) Central African Republic
47	N. Amenzou	Morocco	Nitrogen Use Efficiency in maize under organic mulch practice and nitrogen fertilizer doses
53	S. Rahman	Malaysia	Nuclear and isotopic techniques in development of rice management package in Malaysia
61	N. Bani Hani	Jordan	Effect of nitrogen fertilizer on enhancing crop productivity and water use efficiency of Okra (Abelmoschus esculentus) and Corn (Zea mais) under soil salinity stress

Paper No.	Name	Member State/ Organization	Title
75	M. Mousavi Shalmani	Iran	Effect of nitrification inhibitor DMPP on nitrogen uptake from fertilizer and soil sources under different drought stress in wheat using 15N stable isotope
76	M. Mousavi Shalmani	Iran	Impacts of nitrification inhibitor and crop residue on wheat yield and nitrogen use efficiency by 15N double-labeling technique
91	M. Semiani	Algeria	Evaluation of nitrogen fertilizers use efficiency for potato (Solanum tuberosum) using the 15N technique
98	R. Sharma	India	Impact of different mulch materials on soil health and their effect on weed control
106	R. Vecatasamy	Republic of Mauritius	Determining the yield and fertilizer use efficiency of open-field grown French bean and potato under gravity-fed drip fertigation system using 15N Tracer
121	Y. Bolozogola	Mali	Evaluation of DSSAT model in transitioning conventional to organic systems with improved sorghum varieties
125	J. Villarreal	Panama	Improving the efficiency of nitrogen fertilizer use by rice through application of fungi and bacteria that promote plant growth
130	S. Ramakhanna	Lesotho	Mapping cropland soil organic carbon stock and potential for increased soil and crop productivity in Lesotho
131	S. Mofolo	Lesotho	Maximizing biological nitrogen fixation and nitrogen use efficiency by beans cultivars in maize-based cropping systems for enhanced crop and soil productivity in Lesotho using 15N isotopic dilution method
140	O. Abidine Traore	Burkina Faso	Cowpea (Vigna unguiculata) N2 fixation as affected by the diversity of farming practices in the centre-west area of Burkina Faso
141	O. Abidine Traore	Burkina Faso	Nitrogen and phosphorus uptake from isotope-labelled fertilizers by sorghum and soil microorganisms
149	S. de los Santos Villalobos	Mexico	Improving wheat yield and nitrogen use efficiency by the inoculation of a native bacterial consortium in the Yaqui Valley, Mexico
151	F. Parra Cota	Mexico	Simulation of grain yield in durum wheat under different doses of urea in the Yaqui Valley, México, by using the Aquacrop model
152	M. Vezzone	Brazil	Evaluation of Nitrogen use efficiency and nitrogen nutrition index in Marandu grass

Paper No.	Name	Member State/ Organization	Title
155	S.K. Lam	Australia	Enhanced efficiency nitrogen fertilizers: Progress and prospects
168	C. Suh	Cameroon	Intercropping and botanicals for climate smart agriculture and control of maize streak virus
172	D. Joseph	Haiti	Nitrogen use efficiency by three rice (Oryza sativa L.) phenotypes on Mauger farm, Artibonite valley, Haiti
178	T. Razafimbelo	Madagascar	Tracing soil organic carbon dynamics in ecosystem degradation using 13C isotope
180	W. Wanek	Austria	Soil microbial nitrogen use efficiency is driven by climate- and bedrock-related factors constraining soil organic N availability at the continental scale
187	C. Gnacadja	Gabon	The impact of three soil biofertilizers on tomato yield in Gabon
189	S. Mehetre	India	Evaluation of different organic inputs for soil health improvement under field conditions with reference to organic carbon
199	M. Izaguirre-Mayoral	Ecuador	Attempts to replace nitrogen fertilization for effective symbiotic N2 fixation in grain legume crops in Ecuador
208	P. Khan	Pakistan	Prospects of vertical farming for vegetable production in Khyber Pakhtunkhwa, Pakistan
216	M. Masoudi	Hungary	Soil organic matter variation among four different land uses
228	C. Samarawickrema	Sri Lanka	Managing land and water for climate smart agriculture
229	B. Shoukat	Pakistan	Effects of different tillage methods, residue conservation and nitrification inhibitor on irrigated maize-maize rotation under subtropical conditions
230	W. Ishaque	Pakistan	Nitrogen use efficiency and 15N balance in flooded rice under semi-arid subtropical conditions
233	M. Toro	Venezuela	Potential of biological nitrogen fixation by Rhizobium spp. and Bradyrhizobium spp. inoculated with arbuscular mycorrhizae in Phaseolus vulgaris and Vigna unguiculata using 15N isotopic technique
243	J. Vera Nunez	Mexico	Functional bacterial diversity in the absorption of 32P-liquid fertilizer by sugarcane plant (Saccharum officinarum)

Paper No.	Name	Member State/ Organization	Title
244	T. Muraoka	Brazil	Nitrogen fertilizer (15N) associated with plant growth-promoting bacteria on agronomic performance and nutrition of corn in Brazilian Cerrado Oxisol
246	L. Garcia Centeno	Nicaragua	Biological nitrogen fixation in the symbiosis rhizobium spp.-cultivars of red-fortified beans (Phaseolus vulgaris L) fertilized with N “starter” using the 15N isotopic dilution technique under field conditions
251	E. De La Cruz Torres	Mexico	Improving fertilization practices in crops through the use of efficient genotypes in the use of macronutrients and plant growth promoting bacteria in Latino America and the Caribbean
262	A. Nduwumuremyi	Rwanda	Untapped potential of using nuclear techniques to improve cassava productivity and adoption of climate smart agriculture innovations
275	R. Rallos	Philippines	Fertilizer rate optimization and split application improve rice productivity and nitrogen use efficiency
280	A. Phirum	Cambodia	Optimizing rice yield and fertilizer nitrogen use efficiency in rice production through application of 15N stable isotopic technique
282	J. Bayuelo Jimenez	Mexico	The influence of land-use changes on phosphorus cycling in a volcanic ash-derived soil of Mexico
291	J. Uwimana	Rwanda	Effects of different cassava stem cuttings and substrates on cassava vegetative development
294	R. Hood-Nowotny; M. Heiling	Austria	Stable isotopes can help understanding processes of carbon turnover and storage in soils: Results of a ten-year long-term trial in Austria
298	U. Od Baatar	Mongolia	Assessment of nutrient elements in the arable soils of Mongolia
303	P. Houngnandan	Benin	Improving legumes productivity through rhizobial inoculation in cereal-livestock cropping systems in Benin
304	C. Zoundji	Benin	Improvement of Bambara groundnut (Vigna subterranea L.) productivity in Benin by the use of efficient nitrogen fixing bacteria
315	A. Nario	Chile	Evaluation of Bacterial use efficiency as biofertilizers in maize using isotopic technique (15N)

Paper No.	Name	Member State/ Organization	Title
320	M. Hangula	Namibia	Compound Nitrogen, Phosphorus and Potassium Synthetic Fertilizers Improved Pearl Millet Grain Yield in Namibia
351	D. Nguyen	Vietnam	Using 15N isotope techniques to assess nitrogen use efficiency of rice and maize on different soil types in Vietnam
359	S. Blagodatsky	Germany	Dynamics of carbon accumulation in soil profile after land conversion from paddy rice to upland sugarcane

SESSION 2: Soil Conservation and Land Management

Paper No.	Name	Member State/ Organization	Title
10	R. Yadav	India	Earthworms as protagonists for soil health and crop production
12	Y.Tadesse	Ethiopia	Erosion: Conceptualization Based on Spatial Unit of Movement and Deposition
20	N. A Kouassi	Côte d'Ivoire	Using 137Cs to Assess Soil Conserving Efficiency of Pueraria Cover Crop on Oil Palm (Elaeis guineensis) Plantations In Côte D'ivoire
24	M.E Haque	Bangladesh	Study on Sediment Source in a Small Watershed in Bangladesh by Compound Specific Stable Isotope (CSSI) technique
27	T. Akplo	Benin	Use of mulch-based technology as a climate-smart agricultural practice in Benin: A case study of the Zou Watershed
44	C. Kaizzi Kayuki	Uganda	Soil erosion and deposition rates assessment in Southwestern highland of Uganda using fallout radionuclides (caesium – 137)
54	J. Peralta Vital	Cuba	Adaptation and mitigation of the negative impacts of climate change and the sustainable management of land and water through the integrated use of nuclear techniques
55	J. Peralta Vital	Cuba	Integrated application of nuclear techniques (FRN, CSSI, isotope hydrology) to assess the degradation of land and water resources of an important Cuban hydraulic facility.
68	A. Gloutney	Canada	Erosion assessment of cultivated Histosols using caesium-137 measurements
69	N. Oduor	Kenya	Nutrient and organic carbon losses by erosion, and their economic and environmental implications in the drylands of Kenya

Paper No.	Name	Member State/ Organization	Title
78	A. Biratu	Ethiopia	Implications of land management practices on selected ecosystem services in the agricultural landscapes of Ethiopia
97	K. Mubiru	Uganda	Multi-objective budget allocation model for climate-smart agricultural resources
104	B. Jintaridth	Thailand	Assessing soil and water quality for agricultural management in the area of soil erosion by using nuclear techniques
109	F. Alladassi	Benin	Quantification of water related soil erosion in southern Benin using radionuclides fallout and Universal Soil Loss (USLE) Models
128	A. Biratu	Ethiopia	Ecosystem service valuation along landscape transformation in central Ethiopia
146	A. Gdiri	Tunisia	Use of Cs-137 technique to study the vegetation effect on soil erosion in El Kbir watershead (Zaghouan,Tunisia)
161	R. Hernandez	Cuba	Quantification of soil erosion using the cesium-137 technique
163	K. Tiwari	Nepal	Soil erosion and sedimentation control in the Phewa Lake of Nepal through integrated watershed management practices
176	D. Xiong	China	Preliminary evaluation on soil erosion of alpine grassland fence project based on 137Cs and 210Pbex tracer technique in Northern Tibet, China
197	M.R. Khan	Bangladesh	Assessment of depth distributed fallout radionuclide (FRN) and soil redistribution on a hill slope in Bangladesh
200	M. Kassab	Egypt	Assessing soil erosion using the fallout radionuclides: Experimental investigations in two different agroecological zones in Egypt
202	E. Sta Maria	Philippines	Soil erosion and stable isotope signatures of runoff samples in a sub-watershed of Manila Bay, Philippines
212	C. Sproviero	Argentina	Evaluating ecological service crops use in an Agronomic rotation within the Humid Pampa
219	M. Tarafder	Bangladesh	Effectiveness of soil management practices to reduce soil erosion and improve soil health by fallout radionuclides
222	D. Dembele	Mali	Characterization of soils and agricultural practices at high scale in the cotton-growing zone of Mali

Paper No.	Name	Member State/ Organization	Title
225	M. Khododadi	USA	Evaluating the impact of installing check-dams on the sediment sources using geochemical fingerprints in Zarivar Lake watershed, Iran
226	A. Azbouche	Algeria	137Cs and 210Pbex redistribution in semi-arid land for soil erosion assessment
302	P. Houngnandan	Benin	Use of radioisotopes for soil and water conservation for agriculture in Benin: achievements and perspectives
310	M. Sanchez	Peru	Water erosion study in the Peruvian Andes
314	E. Yousif	Sudan	Assessment of erosion and effectiveness of soil conservation practices in Sudan using 137Cs technique
329	M. Almutari	Saudi Arabia	Assessment of land degradation in cultivated areas in Qasseem region, Saudi Arabia

SESSION 3: Agricultural Water Management

Paper No.	Name	Member State/ Organization	Title
4	M. Oke	Nigeria	The livelihood diversification strategies, landscaping of a typical fish farm in Gwagwalada Abuja Nigeria
9	Y. Amirhosseini	Iran	Investigation of water resources used in agriculture using isotopic data (Case study: Basin in Arak)
25	A. Sunday Fasina	Nigeria	Nuclear Techniques to the Rescue: Practicing Agriculture by Internal Displaced Farmers in Nigeria in the Face of Climatic and Political Hardship
26	A. Sunday Fasina	Nigeria	Influence of Drip Irrigation Frequency, N-Fertilization and Mulching on Yield, Nitrogen and Water Use Efficiencies of Cucumber in Nigeria
30	M. Sall	Senegal	Promotion of climate smart irrigation technologies in the small-scale farming systems of the Senegal river are
42	C. Daba	Mali	Transferring water/fertilizer technologies to small Sahelian producers in Mali
64	F. Muraga	Kenya	Assessment of the pollution impacts to the riparian small-scale irrigators along river Nairobi, Kenya

Paper No.	Name	Member State/ Organization	Title
71	P. Mboyerwa	Tanzania	Irrigation water management regimes, nitrogen fertilization and their interactive effects on water use, water productivity and rice yield in eastern Tanzania
73	R. Chouari	Tunisia	Combining gamma irradiation and bioaugmentation enhances treated waste water's quality for its reuse in agricultural irrigation
83	A. Wahbi	Austria	Coping with COVID-19: Virtual training on installation, setup, calibration and validation and use of cosmic ray neutron sensor (CRNS) for soil moisture assessment
87	M. Itam	Japan	Improving water use efficiency in bread wheat under heat, drought, and combined heat and drought stresses
100	A. Haile Tefera	Ethiopia	AquaCrop model evaluation for irrigated potato (Solanum tuberosum l.) under various water levels at Debre Birhan, Amhara regional state, Ethiopia
101	A. Haile Tefera	Ethiopia	Applications of improved water management technologies in Tef production of Ethiopia
102	A. Haile Tefera	Ethiopia	On-farm validation and pre-extension demonstration of improved water management practices in Ethiopia.
105	C. Mukungurutse	Zimbabwe	Effect of water application rates on fertilizer nitrogen use efficiency, yield and water productivity of drip irrigated cabbages (Brassica oleracea)
108	T. Epule	Morocco	A new pan Moroccan platform for crop yields/precipitation gaps, and crop calendars for maize, barley, sorghum and beans
112	B. Nourice; R. Govinden	Seychelles	Managing saline-sodic irrigation to improve crop production, farmers' livelihoods in Seychelles
115	F. Eddine Belkhiri	Algeria	Calibration of FAO AquaCrop model for Durum wheat (Triticum durum) under Mediterranean conditions
120	B. Ait Hssaine	Morocco	The impact of sharpened land surface temperature on evapotranspiration estimated using three thermal-based energy balance models
124	R. Mirkhani	Iran	Maximizing the planting date of wheat with AquaCrop model and isotopic mass balance method for adaptation to climate change
127	S. Masic	Serbia	Radiation influence on the reduction of dissolved organic matter (DOM) present in water

Paper No.	Name	Member State/ Organization	Title
129	P. M. Dharmappa	India	Climate-smart water use efficient cultivars through a combined approach of stable isotopes, physiology, and molecular breeding
134	A. A. Phiri	Zambia	Optimizing Agricultural Water Management for Improved Water Use Efficiency (WUE)
135	L. Bouchaou	Morocco	Review of isotopic techniques contribution for sustainable water resources management: Insights from agricultural area of Souss-Massa (Morocco)
138	G. Skrzypek	Australia	Irrigation water quality assessed using hydrochemical and stable isotope analyses, Rio Cobre, Jamaica
154	I. Ghanma	Palestine	The effect of deficit irrigation on water and crop productivity of potato in Jenin Governorate - Palestine
158	V. Zupanc	Slovenia	Influence of irrigation on capsicum plants using the isotope 15N
160	R. Sibello Hernandez	Cuba	Parameterization of the AquaCrop model in the tomato crop (Solanum lycopersicum L), in the productive company Cultivos Varios Juraguá, Cienfuegos, Cuba
177	G. Hu	China	Divergent response of water use efficiency to growing season drought time on alpine meadow in Northern Tibet Plateau
181	N. Ismayilzade	Azerbaijan	Strengthening best agricultural practices related to soil, nutrients and water in cotton production (GAP)
184	M. Mwape	Zambia	Understanding the interaction between maize water use efficiency and nutrient uptake in irrigated cropping systems, a basis for predicting and improving Zambia's productivity in a changing climate
191	N. Ramachandra Bhat	Kuwait	Climate-smart nutrient and irrigation management for sustainable date palm production in arid environments
193	H.Said-Ahmed	Joint FAO/IAEA	Field scale soil moisture monitoring with Gamma Rays Sensor
194	M. Mbaye	Senegal	A near-real-time web GIS tool for climate smart water management by combining Cosmic-Ray Neutron Sensor data and remote sensing data (Sentinel 1 & 2 and MODIS)
195	G. Kornov	Bulgaria	Refining drip irrigation in a primocane-fruiting raspberry plantation
213	A. Nario	Chile	Determination of water use efficiency in maize (Zea mays) using isotopic techniques δ2H (Deuterium, D) and δ18O (Oxygen 18) under different irrigation levels

Paper No.	Name	Member State/ Organization	Title
215	S. Hin	Cambodia	Effect of water irrigation regimes and nitrogen rates on rice yield and N fertilizer efficiency
218	R. Subedi	Nepal	Identification of recharge area of mountain springs using environmental isotopes and geospatial tool
220	J. Van Laere	Belgium	A dual stable isotope (C-13 and O-18) approach to assess drought tolerance of two contrasting varieties of cassava with different potassium availabilities
221	R. Singh Thapa	Nepal	Identifying potential recharge area of mountain springs through hydrogeological mapping and isotope analysis for effective springshed management against climate change impacts
235	A. Misi Manyanga; E. Chikwari	Zimbabwe	Effect of water application rates and plant population on white bulbous onion water and nitrogen use efficiency under drip irrigation on a clay soil
237	L. Mhaka; E. Chikwari	Zimbabwe	Evaluating different mulching materials for moisture retention, and nitrogen use efficiency and yield of drip irrigated white cabbage (Brassica oleracea)
257	T. Kelly	UK	AquaCrop-OSPy: Bridging the gap between research and practice in crop-water modeling
260	P. Doddaraju	India	Molecular and metabolomic dissection of drought tolerance governing loci in rice for sustainable crop improvement
281	S. N. Akai Nettey	Ghana	Growth, yield attributes and water use efficiency of drip-irrigated cucumber (Cucumis sativus L.) under greenhouse conditions
285	C. Chinchilla-Soto	Costa Rica	Improving water management for common beans (Phaseolus vulgaris L.) in Costa Rica using FAO model AquaCrop
305	S. Alharbi	Saudi Arabia	Variations of different wheat varieties to P stress: Could breeding be a part of the solution for improving P use efficiency?
306	A. Canet-Mari	Austria	Tracing the attenuation of δ18O and δ2H in the unsaturated zone for different soil textures and biogeographic regions
309	A. Guemouria	Morocco	Application of system dynamics approach for sustainable water management under global changes
317	A. Lasram	Tunisia	Production and water productivities gaps of durum wheat in Tunisian irrigated perimeters
323	F. Mohamed	Malaysia	The Cosmic Ray Neutron Sensor: Utilization for water intake measurement of pineapple plantation in Ulu Tiram, Johor, Malaysia

Paper No.	Name	Member State/ Organization	Title
327	F. Gbaguidi	Benin	Determination of rates of applied fertilizer (nitrogen) and irrigation water by drip irrigation using nuclear techniques (15N) for vegetable (tomato) production
332	V. A. Berriel	Uruguay	Benefits of using legumes as a summer cover crop for rotation with malting barley
333	Y. Cartagena	Ecuador	Evaluation of the efficient use of water in the cultivation of corn (Zea mays) variety INIAP 101, with different levels of fertilization
345	A. Hegazi	Egypt	Natural Radioactivity Levels in Some Vegetable Crops Under Greenhouse Cultivation
346	T. Thierry Lékadou	Cote d'Ivoire	Impact of Climate Variability on Water Resources: The Case of Marc DELORME-CNRA Station, Southeast of Cote d'Ivoire

SESSION 4: Tracing Agricultural and Industrial Pollutants

Paper No.	Name	Member State/ Organization	Title
3	M. Oke	Nigeria	Land use conflict between farmers and herdsmen – implication for agricultural and rural development in Nigeria
43	H. Hu	Australia	The global distribution and environmental drivers of the soil antibiotic resistome
88	I. Vujcic	Serbia	Microbiological decontamination of the coastal soil using of gamma irradiation
95	F. Tasneem Ahmed	Bangladesh	Agricultural water quality evaluation and environmental risk surveillance of trace pollutants in groundwater and soil in an industrialized region of Jessore, Bangladesh
99	M. Noor Hidayat	Malaysia	Source analysis of sulphate and carbon stable isotopes ratio in soil to determine source of pollution in Sungai Besar, west coast of Malaysia
113	A. Watzinger	Austria	Riparian strips as climate change mitigation strategy - 18O-PO4 technique to study the P cycling in streams subject to excess nutrient inputs
119	O. Meniailo	Joint FAO/IAEA	Microplastics in agricultural soils: a new field for stable isotopes application
126	J. Alexander Villalaz Perez	Panama	Soil properties, heavy metal content and dynamics of cadmium in Creole cocoa genotype grown organically in Bocas Del Toro Region of Panama

Paper No.	Name	Member State/ Organization	Title
136	G. Skrzypek	Australia	FRAME - a new tool for isotope mixing and fractionation Monte Carlo models for pollution studies
139	G. Skrzypek	Australia	Stable isotope multitracer approach to disentangling the pollution budget of Inle Lake, Myanmar
147	C. Nonterah	Ghana	Application of water quality index for irrigation and sustainable water resources management
157	E. Courage	Ghana	Sources and impacts of anthropogenic contaminants on surface water quality in the Volta Estuary: Any concerns?
164	A.G. Chandrapala	Sri Lanka	Are δ18OP ‰ values in water and other water quality parameters solute concentration dependent? A case study of seasonal variation of stream water quality parameters in central highlands of Sri Lanka
179	H.L. Nguyen	Vietnam	Assessment of nitrogen nutrient sources in aquatic environment of Tuyen Lam sub-catchment based on its stable isotopes ratio (δ15N-NO3) combined with geochemical parameters
198	E. Nzengue	Gabon	Assessment of environmental and health risks related to soils in the Moanda mining area (Gabon): study of the quality of cultivated peanuts (Arachis Hypogea L.)
210	V. Zupanc	Slovenia	Characterization of hydraulic properties in the upper vadose zone for alluvial aquifers with Hydrus
248	T.B. Anh Nguyen	Australia	Livestock manure and the antibiotic tylosin significantly altered soil protist functional groups
254	L. Bouchaou	Morocco	Groundwater management challenges in southern Morocco: Insights from stable isotopes
261	N. Zakaria	Ghana	The use of stable isotopes and an isotope mixing model to quantify nitrate sources in groundwater from the lower Anayari catchment, Ghana
265	F. Wang	China	Migration and potential ecological risks of microplastics in soil-water-plants system
269	A. Harbottle	United Nations	Reconstruction of heavy metals and hydrocarbons contamination history in lacustrine systems from Balta Mica a Brailei natural protected area, Romania

Paper No.	Name	Member State/ Organization	Title
271	J. Regitano	Brazil	Land-use and microbial diversity depletion on enzyme activities and impacts on glyphosate mineralization in tropical soils
272	J. Regitano	Brazil	Land use and bacterial diversity effects on atrazine biodegradation
277	S. Jebri	Tunisia	Antibiotic resistance patterns of relevant antibiotic resistance genes in bacterial and viral fractions of reclaimed wastewater used in agriculture
319	J. Halder	Austria	Agriculture versus wastewater: tracing nitrate and water sources in the Danube River Basin with stable isotopes and compounds of emerging concern
344	E. Blagodatskaya	Germany	Microbial biodegradation of a bio-based and biodegradable plastic in field soil environments under ambient and future climatic conditions
349	K. Müller	Germany	Applicability of Stable Isotope Raman Microspectroscopy for the Analysis of Biodegradation of Microplastics

SESSION 5: Greenhouse Gas Emissions

Paper No.	Name	Member State/ Organization	Title
7	J. He	Australia	Relative contributions of ammonia oxidizers to soil nitrification
8	W. Wang	China	Integrated evaluation of greenhouse gas emissions and gained net ecosystem economic benefit to long-term conservation tillage under wheat-maize multiple field in the Loess Plateau, China
13	Y. Cheng	China	Soil pH is a good predictor of dominating N2O production pathways under aerobic conditions
63	A. Rebi	Pakistan	Effect of extreme precipitation on agriculture and possible solutions for the betterment of agriculture
66	A. Sanz Cobena	Spain	Reliable and cost-effective on-site ammonia emission measuring techniques based on inverse dispersion modeling
70	H. Gebremedhn	Ethiopia	Carbon stock and sequestration changes under traditional grazing management practices in semi-arid pastoral ecosystem of eastern Ethiopia

Paper No.	Name	Member State/ Organization	Title
72	P. Mboyerwa	Tanzania	Mitigation scenario for reducing greenhouse gas emission from irrigated paddy rice field in eastern Tanzania
77	A. Woldesesalassie	Ethiopia	Soil and water management practices as a strategy to cope with climate change effects in smallholder potato production in the eastern highlands of Ethiopia
96	A. Ranca	Romania	Effects of climate change on grape production in the Murfatlar vineyard
110	S. Wang	China	Biochar mitigates N2O emissions from sandy soil by improving soil pore structure and increasing nosZ gene abundance
114	T. Vellaisamy	India	Appraisal of soil carbon and nitrogen for development of integrated crop-livestock agroforestry system
117	C. Valli	India	Agrisilvipasture systems integrated with livestock– Solution for quality forage production and repository of carbon stock production in South India
153	M. Vezzone	Brazil	The use of Aquacrop for evaluating strategies to mitigate climate change effects on pasture systems
162	X. Qin	China	Multiple stable isotopic signatures corroborate the predominance of acetoclastic methanogenesis during CH4 formation in agricultural river networks
165	G. Dicen	Philippines	Vulnerability of soil organic matter to microbial decomposition as a consequence of burning
211	H. Lubega	Uganda	Strategies to mitigate municipal waste and greenhouse gas emissions in kira municipality in Wakiso District.
231	C. Gomez	Peru	Evaluation of greenhouse gases emissions from agricultural soils in Perú
236	B. Caceres	Ecuador	Little Ecuadorian Glacier in the way of disappearing
252	T. Ra	Myanmar	Effect of rice planting methods on methane (CH4) and nitrous oxide (N2O) emissions from paddy field under irrigation regimes
267	G. Dicen	Philippines	Soil organic carbon research in the Philippines: insights for agriculture and forest resources management and the climate
273	M. Deppe	Germany	Long-term climate feedback of elevated atmospheric CO2 concentrations on GHG emissions in a grassland ecosystem
287	P. Inofuentes	Germany	Beyond climate impact: Sustainability effects of beef meat production in Uruguay

Paper No.	Name	Member State/ Organization	Title
288	V. Chukwu	Nigeria	Climate-smart forestry: Potentials, challenges and implications for Africa's ecosystem sustainability
295	Y. Wuuan	China	Mitigating Nitrous Oxide emission using Nitrification Inhibitors
296	A. Wawra	Austria	MaxRoot-C optimizing roots for sustainable crop production in Europe–pure cultures and cover crops
297	J. Chin-Pampillo	Costa Rica	Addition of biochar and other charred materials to the soil do not alter bromacil and diuron efficiency and improves soil habitat conditions for fauna in a tropical agroecosystem
307	H. Deroo	Belgium	Stable isotopes to understand paddy soil biogeochemical processes under water-saving irrigation
312	A. Larrandart	Argentina	Azospirillum spp. as a tool to reduce the nitrous oxide emissions from a corn crop
330	M. Kussainova	Kazakhstan	Evaluating the effectiveness of various land cover/use systems to mitigate climate change by reducing greenhouse gas emissions and increasing albedo

SESSION 6: Advances of Nuclear-Based Instrumental and Analytical Techniques

Paper No.	Name	Member State/ Organization	Title
23	A. Gdiri	Tunisia	Quantifying soil erosion using 137Cs on cultivated land in the Sbaihia watershed-Zagouane, Tunisia
67	M. Mihajlo	Bosnia and Herzegovina	Innovative agricultural water management in Bosnia and Herzegovina, SMARTWATER project
132	R. M. dos Anjos	Brazil	Nuclear, isotopic and related techniques available at the LARA of the Fluminense Federal University, Brazil
142	A. Zaouak	Tunisia	Gamma irradiation synthesis of Ag/PVA nanocomposites and their catalytic removal of toxic nitro-aromatic compounds
205	C. Grail	France	Transformation of pesticides in agricultural soil and groundwater: insights from pesticides and compound-specific isotope analysis (CSIA) in the Berambadi catchment (South India)

Paper No.	Name	Member State/ Organization	Title
206	N. Rhoujjati	Morocco	Assessing the snowmelt contribution to water resources in agricultural areas using stable isotope in the High and Middle Atlas Mountains of Morocco
249	T. Contreras	Honduras	Stable Isotopes 18O and 2H as a tool to understand El Cajon reservoir behavior
259	M. Hofmann	Netherlands	Real-time, online monitoring of ammonia and GHG emissions from soils with Cavity Ring-Down Spectroscopy
286	E. Ramirez	Bolivia	Use of Cosmic ray neutron sensors for the study of high-altitude wetlands in a context of climate change: Case of the Bolivian Andes (4500 m.a.s.l.)
289	Z. Chen	United States	Measuring heavy metals in agriculture soil and crops at a remediation site in Slovenia
292	T. Franz	United States	Feasibility assessment on use of proximal geophysical sensors to support precision management

SESSION 7: Digital Technology, GIS, Machine Learning and Modelling

Paper No.	Name	Member State/ Organization	Title
50	L. Conceição	Brazil	Assessment of the dependence and control of ET in temporal and spatial variability of soil moisture at a woodland savanna site in southern Brazil
84	S. Di Pippo	United Nations	Space applications for food systems and the contribution of the Office for Outer Space Affairs to the 2021 UN Food Systems Summit
85	Y. Tadesse	Ethiopia	Spacing theorems and procedure for manual level bench terraces
116	I. Ibrahim	Qatar	FarmTech: Regulating the use of big data in the commercial agricultural sector
173	H. Jegat	Venezuela	Integrated land and water management in the Yacambu-Quíbor Project, Venezuela
242	M. Djordjevic	Serbia	Use of nuclear techniques and GIS for soil erosion state interpretation in the forest areas of the Crveni potok catchment
276	R. Mbidde	Uganda	The effect of climate change adaptation on rural community livelihoods
278	B. Ssenyomo	Uganda	Tropical agricultural systems' vulnerability to weather variability

Paper No.	Name	Member State/ Organization	Title
308	R. Jaña	Chile	Evaluating the water resource in the region of Magallanes, Chile, based on a combination of Cosmic Rays Neutron Sensor (CRNS) and climate and glaciological models

JOINT FAO/IAEA PUBLICATIONS RELATED TO THE SUBJECT OF THE EVENT

Wahbi, A., Heng, L., Dercon, G. (2018)	Cosmic Ray Neutron Sensing: Estimation of Agricultural Crop Biomass Water Equivalent, Springer Open, Cham. 33 pp.
Zaman, M., Shahid, S.A. Heng, L. (2018)	Guideline for Salinity Assessment, Mitigation and Adaptation Using Nuclear and Related Techniques, Springer Open. 131 pp.
Mabit, L., Blake, W. (Eds). (2019)	Assessing Recent Soil Erosion Rates through the Use of ^{7}Be, Springer Open, Cham. 69 pp.
Adu-Gyamfi, J., Heng, L., Eklund, G., De Souza, M. (2019)	Antimicrobial movement from agricultural areas to the environment: The missing link. A role for nuclear techniques. FAO Land and Water Discussion Paper 13 Rome. 33 pp. FAO
IAEA (2019)	Guidelines for Sediment Tracing Using the Compound Specific Carbon Stable Isotope Technique, IAEA-TECDOC-1881. 66 pp.
Lee Zhi Yi, A. and Dercon, G. (Eds). (2019)	Data management and visualisation in response to large-scale nuclear emergencies affecting food and agriculture, FAO Technical Guidelines. Vienna, FAO/IAEA. 39pp.
Zaman, M., Heng, L., Müller, C. (2021)	Measuring Emission of Agricultural Greenhouse Gases and Developing Mitigation Options using Nuclear and Related Techniques. Springer Open, Cham. 336 pp.
Adu-Gyamfi, J. , Pfahler, V. (2022)	Oxygen Isotopes of Inorganic Phosphate in Environmental Samples. Springer Open, Cham. 330 pp.
Dercon, G., Lee Zhi Yi, A., Fesenko, S., Heng, L. (2022)	Sampling of Agricultural Soils and Plants for Radioactivity Analysis, http://www.fao.org/3/cb9304en/cb9304en.pdf

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International Conference on Occupational Radiation Protection: Strengthening Radiation Protection of Workers - Twenty Years of Progress and the Way Forward, 5-9 September, Geneva, Switzerland

International Conference on Topical Issues in Nuclear Installation Safety: Strengthening Safety of Evolutionary and Innovative Reactor Designs, 18-21 October, Vienna, Austria

IAEA International Ministerial Conference on Nuclear Power in the 21st Century, 26-28 October, Washington DC, United States of America

Symposium on International Safeguards: Reflecting on the Past and Anticipating the Future, 31 October-4 November, Vienna, Austria

Fifth International Conference on Nuclear Power Plant Life Management (PLIM), 28 November – 2 December, Vienna, Austria

International Conference on Integrated Medical Imaging in Cardiovascular Diseases (IMIC-2022), 13-16 December, Vienna, Austria

2023

International Conference on Effective Nuclear and Radiation Regulatory Systems, 20-23 February, Abu Dhabi, United Arab Emirates

International Symposium on Trends in Radiopharmaceuticals (ISTR-2023), 17-21 April, Vienna, Austria

International Symposium on Uranium Raw Material for the Nuclear Fuel Cycle: Innovation for Sustaining Future Resources and Production (URAM-2023), 8-12 May, Vienna, Austria

International Conference on Nuclear Decommissioning: Addressing the Past and Ensuring the Future, 15-19 May, Vienna, Austria

International Conference on Computer Security in the Nuclear World: Security for Safety, 19-23 June, Vienna, Austria

International Symposium on Isotope Hydrology, 3 – 7 July 2023, Vienna, Austria

Second International Conference on Climate Change and the Role of Nuclear Power, 9-13 October, Vienna, Austria

29th IAEA Fusion Energy Conference, 16-21 October, London, United Kingdom

International Conference on Waste and Environmental Safety: Integrated Approach to Strengthening Sustainable Development, 6-10 November, Vienna, Austria

International Conference on Research Reactors: Achievements, Experience and the Way to a Sustainable Future, 27-30 November, Dead Sea, Jordan

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