



第三届可持续发展大数据国际论坛

The 3rd International Forum on Big Data for Sustainable Development Goals

2023年9月6日-8日 中国 北京

Special session title: Big Data for Agrifood Systems Transformation: The Perspective of Sustainable Nature Resources Management

Session Organizer: Land and Water Division (NSL), FAO, International Research Center of Big Data for Sustainable Development Goals (CBAS)

Short Description

More than halfway to the deadline for the 2030 Agenda, the world is kept off track in achieving zero hunger by 2030, due to climate variability and extremes, conflict, economic shocks and growing inequalities. It is projected that 8% of the world's population will still face hunger in 2030, the same level as in 2015, when the 2030 Agenda for Sustainable Development was launched. In order to achieving Zero Hunger, global agricultural production, as the basis, would require to increase by 28 percent over the next decade, which is more than three times of increase over the past decade.

However, all evidence points to slowing growth in agricultural productivity, rapid exhaustion of productive capacity. Yield increases for some staple crops in major breadbaskets are entering into plateau. Meanwhile, high levels of pollution and greenhouse gas emissions are stretching the productive capacity to the limit and severely degrading land and environmental services. What's more, human use of land and water for agriculture has not yet peaked. Sustainable natural resource management is fundamental to the transformation of agrifood systems for better production, better nutrition, a better environment, and a better life.

Data is a key resource for monitoring the current situation and foreseeing the future. FAO, as the custodiam agency for over 60% of the indicators of SDG2: Zero Hunger, listed data as one of the four accelerators for the implementation of the 2030 Agenda for Sustainable Development and the achievement of the strategic framework 2022-31.

Objectives

From the perspective of sustainable use of natural resources, this session aims to explore the supporting and promoting role of big data in the transformation of agrifood systems. With special focus on the indicators referring to land, water, and soil, such as SDG 2.4.1, 6.4.1, 6.4.2, 13.2.1 and 15.3.1, we will discuss the achievements and gaps of big data in support of monitoring progress of the indicators, explore interactions between indicators, and potential routes for sustainable natural resources management to support the transformation of agrifood systems.

Expected results

Through this special session, we expect to achieve the following outcomes:

1. Providing the practices and sharing experiences of big data in supporting sustainable management of nature resources and food production.
2. Exploring future directions and efforts forward on agrifood systems transformation based on big data.



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Agenda

Time 15:15-18:30, September 7th, 2023 Room: 307

Moderator:



LI Lifeng

Director of Land and Water Division

Food Agriculture Organization of the United Nations (FAO)

Joined in FAO in August 2021, Dr. Li leads FAO's work on soil, land, water and geospatial, as well climate financing through partnership with the Adaptation Fund. He acts as FAO's Focal

Point to UNCCD Convention and Ramsar Convention and co-leads UN Decade of Ecosystem Restoration with other FAO and UNEP senior staff.

He has 15 years of experience on water policy, river basin and freshwater ecosystems management through his works in WWF China, WWF International (Switzerland) and Wetlands International (Netherlands), and three years of experience on climate financing, national climate planning & programming and country readiness to access climate financing through his works in the Green Climate Fund (GCF, South Korea).

He holds a PhD in physical geography from Chinese Academy of Sciences in China.

Opening Remark:



GUO Huadong

Director General

International Research Center of Big Data for Sustainable Development Goals

Prof. GUO is the Director General of the International Research Center of Big Data for Sustainable Development Goals (CBAS), an Academician of Chinese Academy of Sciences (CAS), a Foreign Member of the Russian Academy of Sciences, a Foreign Member of the Finnish Society of Sciences and Letters, and a Fellow of TWAS. He presently serves as Honorary President of the International Society for Digital Earth (ISDE), Director of the International Center on Space Technologies for Natural and Cultural Heritage under the Auspices of UNESCO, Chair of the Digital Belt and Road Program, and Editor-in-Chief of the International Journal of Digital Earth and the journal of Big Earth Data. He served as a member of the UN 10-Member Group to support the Technology Facilitation Mechanism for SDGs (2018-2021), Chairman of the International Committee of Remote Sensing of Environment (2017-2020), President of ISDE (2015-2019), and ICSU Committee on Data for Science and Technology (CODATA) (2010-2014). He specializes in remote sensing, radar for Earth observation, and Digital Earth science. He is the Principal Investigator of Moon-based Earth Observation Research Project of National Natural Science Foundation of China and the Chief Scientist of the Big Earth Data Science Engineering Project of CAS. He has published more than 500 papers and 24 books, and is the awardee of 18 domestic and international prizes.



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Participants

15:25-17:10 Technical presentations (15 minutes/presentation)

Event 1 (15:25-15:40)

FAO open data for monitoring land and water productivity and achieving SDG



Livia Peiser

Land and Water officer

Land and Water division of FAO

Livia Peiser has been working in the Land and Water Division of FAO for the past 12 years, applying spatial analysis to water resources assessment. Since 2015, she focuses on remote sensing applications for water productivity monitoring through the implementation of the FAO WaPOR project.

WaPOR is the FAO portal to monitor Water Productivity through Open access of Remotely sensed derived data. WaPOR data can be accessed through the portal wapor.apps.fao.org, and through the FAO Hand in Hand Geospatial Platform, as well as GEE and other common data access standards (as APIs). The portal supports monitoring and reporting on agriculture water productivity over Africa and the Near East and provides open access to the water productivity database and its thousands of underlying map layers. It allows for direct data queries, time series analyses, area statistics and data download of key variables associated to water and land productivity assessments.

The database is the backbone of the WaPOR project that, now in its second phase, works with ten partner countries to build their capacity in the use of WaPOR data for its different applications, and to generate solutions to local challenges linked to water and land productivity as well as water management.

Website: <https://www.fao.org/in-action/remote-sensing-for-water-productivity>

Event 2 (15:40-15:55)

Soil mapping for a sustainable future: FAO's data-driven efforts in decision making



Yusuf Yigini

Land and Water officer

Land and Water division of FAO



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Yusuf Yigini is a soil scientist who holds a Ph.D., M.Sc., and BSc. degrees in Soil Science with a focus on soil information, data, and spatial data modelling. With over 20 years in the field, he has accumulated a wealth of research and policy experience. In 2017, he joined the FAO Land and Water Division and the Global Soil Partnership (GSP) Secretariat. In his role, Yusuf coordinates various soil information and data activities, including the Global Soil Information System (GloSIS), SoilSTAT, Country Driven Global Data Products, and capacity development programmes for member countries. Before joining the FAO and the GSP Secretariat, he served at the Joint Research Centre of the European Commission as a Technical and Scientific Project Officer for six years. Additionally, he spent more than 9 years as a researcher in Turkey.

Event 3 (15:55-16:10)

Big Earth Data in support of sustainable crop production



ZUO Lijun

Professor

International Research Center of Big Data for Sustainable Development Goals, Aerospace Information Research Institute, Chinese Academy of Sciences

Dr. ZUO Lijun is professor of Aerospace Information Research Institute, Chinese Academy of Sciences (CAS), and International Research Center of Big Data for SDGs, deputy director of the National Engineering Research Center for Remote Sensing Applications of China, SDG 2 coordinator of "Big Earth Data Supporting the Sustainable Development Goals". Her research focuses on remote sensing of land use change, and impact of land use change on food security and ecosystems. She hosted more than 10 major national science and technology projects, and has published more than 70 papers in journals including Nature Sustainability, Remote Sensing of Environment, etc.

Event 4 (16:10-16:25)

Global land degradation neutrality tracking and intervention platform



LI Xiaosong

Professor

International Research Center of Big Data for Sustainable Development Goals (CBAS)



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LI Xiaosong is a researcher of the International Research Center of Big Data for Sustainable Development Goals, deputy director of the Key Laboratory of Digital Earth, Aerospace Information Research Institute, Chinese Academy of Sciences, member of Expert Group on UNEP Sustainable Development Goals progress measuring report, SDG 15 coordinator of "Big Earth Data Supporting the Sustainable Development Goals", member of the Working Group of the International Earth Observation Organization-Land Degradation Neutrality Initiative, and member of the Expert Group on China's voluntary LDN targets setting. He has been mainly engaged in research work in the direction of big earth data to promote the realization of sustainable development goals, remote sensing big data analysis and land degradation monitoring, and hosted over more than 20 major national science and technology projects. As an associate editor, he has published 4 books, published more than 70 research articles, and won 3 National and Ministerial and Provincial-Level Science and Technology Award.

Event 5 (16:25-16:40)

Global cropping system mapping: past, present and future



YOU Liangzhi

Senior Research Fellow

International Food Policy Research Institute (IFPRI)

YOU Liangzhi is a Senior Research Fellow at the International Food Policy Research Institute (IFPRI) in Washington, DC, USA. His current research focuses on assessing the impacts of technology changes in agricultural production, with particular emphasis on developing better models to estimate the location and intensity of agricultural production, and to estimate the impact of climate change and changing climate variability on agriculture. Liangzhi earned a B.S. in hydraulic engineering from Tsinghua University, Beijing in 1990, and an M.S. in environmental economics and Ph.D. in civil and environmental engineering from Johns Hopkins University in 1999.

Event 6 (16:40-16:55)

Using big data to monitor cropland use and management



YU Qiangyi



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Research Fellow

Institute of Agricultural Resources and Regional Planning (IARRP), Chinese Academy of Agricultural Sciences (CAAS)

Dr. Qiangyi Yu is a Research Fellow at the CAAS-IARRP and the Director of the Smart Agriculture Research group. He obtained a PhD in Agricultural Resources and Environment in 2013 at the Graduate School of CAAS, and was a visiting researcher at the International Food Policy Research Institute (IFPRI) in 2015, and a postdoc researcher at the Institute for Environmental Studies (IVM) Vrije Universiteit Amsterdam between 2016 and 2018.

His research interests include: 1) advancing the manifestations of agricultural land system by considering crop allocation, farm management, and the all-inclusive human activities that have impacts on the state of cropland; 2) representing the highly dynamic and multi-faceted agricultural land systems by satellite, aerial, and ground-integrated (SAGI) remote sensing technology; and 3) evaluating the potentials and pathways of cropland use intensification and their implications on food security, environmental sustainability, and rural vitalization.

Event 7 (16:55-17:10)

Using big data to underpin the improvement of soil and crop system for coastal saline land



SUN Zhigang

Professor

Agroecosystem Research Center, Institute of Geographical Resources, Chinese Academy of Sciences (CAS)

SUN Zhigang is Deputy director/researcher of Agroecosystem Research Center, doctoral supervisor, university professor of Chinese Academy of Sciences. In 2015, he was selected into the "Introduction of Foreign Outstanding Talents" Class A talent program of Chinese Academy of Sciences. He also served as deputy director of Yucheng Station of Chinese Academy of Sciences, Deputy director of Yellow River Delta Modern Agricultural Engineering Laboratory of Chinese Academy of Sciences, director of Yellow River Delta Research Center of Institute of Geographic Resources of Chinese Academy of Sciences, and president of Shandong Dongying Geographical Research Institute of Chinese Academy of Sciences.

Event 8 (17:10-17:25)

SDGs' Sustainable Natural Resources Management and Big Data



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Therese El Gemayel (TBC)

Programme Management Officer

United Nations Environment Programme (UNEP)

Therese El Gemayel is an environmentalist, passionate about improving the understanding and techniques related to environmental assessment and monitoring to address climate change, achieve sustainable development and advocate for circular economy.

Through leveraging her experience within the international community on sustainable development goals and environment, capacity building and statistics, she worked on several environmental projects. More closely, Therese is currently managing a project on circular economy at UNEP with the aim to build countries' capacities in measuring sustainable consumption and production, and waste indicators within the SDG framework. She is responsible for UNEP's Measuring Progress report series.

Therese holds an MSc in environmental sciences and an international business management diploma from McGill university. She is fluent in Arabic, English and French.

17:25-18:20 Panel Discussion

Big data underpinning agrifood systems transformation: Current issues and future prospects

1. What efforts, as you have seen or done, ever made to promote the agrifood systems transformation targeting different stakeholders by using big data technology, especially from the aspect of nature resources management?
2. What kind of knowledges and technologies gained based on big data had helped facilitate the transformation of agrifood systems? Could you please provide some examples?
3. What are your perspectives on agrifood systems transformation help to achieve SDGs, could be promoted by big data?
4. What gaps do you think for obstructing agrifood systems transformation, from the perspective of sustainable nature resources management? Could these gaps be filled, or could be facilitated, by big data technology?

Panelists:



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LIU Wei

Sustainable Development Officer

United Nations Department of Economic and Social Affairs (UNDESA)

Dr. LIU Wei is the Coordinator of the UN Inter-agency Task Team on Science, Technology and Innovation for the SDGs, the Division for Sustainable Development Goals, UN DESA from 2016 to present. In his role, Dr. Liu provides both substantive and organizational support to the implementation of the science, technology and innovation (STI)-related decisions contained in the 2030 Agenda for Sustainable Development, and other related global processes. He has also developed effective partnerships with main partners in the STI field, such as the European Commission Joint Research Center, MoST China, JRC Japan, and the World Bank. Dr. Liu joined the United Nations in 2005 through the National Competitive Exam (NCE). He has mainly worked in the development policy sector and contributed to various United Nations publications, including the Global Sustainable Development Report, guidebooks, operational notes, and policy briefs of the Technology Facilitation Mechanisms. He also prepares briefing notes, talking points, speeches for UN senior staff, and makes presentations on international conferences.



Therese El Gemayel

Promamme Management Officer

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Therese El Gemayel is an environmentalist, passionate about improving the understanding and techniques related to environmental assessment and monitoring to address climate change, achieve sustainable development and advocate for circular economy.

Through leveraging her experience within the international community on sustainable development goals and environment, capacity building and statistics, she worked on several environmental projects. More closely, Therese is currently managing a project on circular economy at UNEP with the aim to build countries' capacities in measuring sustainable consumption and



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Gilles Amadou Ouedraogo

Programme Management Officer

UN Convention to Combat Desertification (UNCCD)

Gilles Amadou Ouedraogo assumed the role of Programme Management Officer for the Great Green Wall initiative at the UN Convention to Combat Desertification (UNCCD). He transitioned from a UN Volunteer assignment with the Sahel programme of the UN Development Programme (UNDP). His experience with UNDP prepared him well, enabling Gille to navigate challenges and embrace opportunities within the Great Green Wall initiative.

He is a multilingual International Development professional with over twelve years of experience in program management, implementation, systems strengthening, and digital planning, and monitoring & evaluation in over a dozen countries worldwide. He works on sustainable development projects that promote growth in and around sub-Saharan Africa and ensure improved livelihoods for future generations.



YOU Liangzhi

Professor

International Food Policy Research Institute (IFPRI)

YOU Liangzhi is a Senior Research Fellow at the International Food Policy Research Institute (IFPRI) in Washington, DC, USA. His current research focuses on assessing the impacts of technology changes in agricultural production, with particular emphasis on developing better models to estimate the location and intensity of agricultural production, and to estimate the impact of climate change and changing climate variability on agriculture. Liangzhi earned a B.S. in hydraulic engineering



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from Tsinghua University, Beijing in 1990, and an M.S. in environmental economics and Ph.D. in civil and environmental engineering from Johns Hopkins University in 1999.



Marcelin Sanou

Chief Manager, Forest engineer

Pan-African Agency of the Great Green Wall

Mr. SANOU is Program Manager, who responsible for "Database, S.I.G" at the National Direction of Water and Forests of Mali. Since 2015, he has been Head of the Planning, Monitoring, Evaluation and Information Management Department at the Pan-African Agency of the Great Wall, responsible in particular for these significant events:

- strategic and operational planning, monitoring and evaluation of programs and projects, in conjunction with the National Structures of member countries of the Great Green Wall.
- Implementing and operating the GIS/GGW Information System.

He has participated in the implementation of development and environmental programs in his country, the main elements include the following:

- Environmental development program / Ecological monitoring and observatory network,
- Forest Development Project,
- Management forest and wildlife resources project Projet d'Aménagement des Ressources Forestières et Fauniques,
- National Action Plan for Wetland Management.



WU Bingfang

Professor

International Research Center of Big Data for Sustainable Development Goals, Aerospace Information Research Institute, Chinese Academy of Sciences



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Dr. WU Bingfang is a professor at the Aerospace Information Institute of Chinese Academy of Sciences. He is the founder and leader of the global agricultural remote sensing monitoring team (CropWatch) of China, and the co-chair of the Global Earth Observation Global Agricultural Monitoring (GEOGLAM) Flagship. He has made outstanding achievements in agricultural remote sensing monitoring, river basin water resources management and other fields. He has published more than 400 scientific research papers and 10 books.



JIA Li

Professor

International Research Center of Big Data for Sustainable Development Goals, Aerospace Information Research Institute, Chinese Academy of Sciences

Dr. Prof. JIA Li is a leading scientist of Earth Observation for Terrestrial Water Cycle and Climate Change (EOWater) at the Aerospace Information Research Institute (AIR), Chinese Academy of Sciences (CAS). She is a distinguished scientist of the International Research Center of Big Data for Sustainable Development Goals (CBAS), focusing on SDG6. She has been recognized as High-Level Talent Program of CAS in 2009, and recently as distinguished scientist of CAS. She acts as a member of the WCRP-GEWEX Hydroclimatology Panel (GHP) (since 2019), co-chair of the Task Group on Drought Monitoring and Evaluation of the AOGEO (Asia-Oceania Group on Earth Observations) (since 2017), co-chair of the Working Group on Water of the Digital Belt and Road (DBAR) Science Program (since 2016). She has led and participated in many projects funded by various ministries and organizations both in China, the Netherlands and Europe. She has published more than 190 scientific papers/reports, of which more than 100 as peer-reviewed journal papers. Dr. Jia has been honored with several awards in recent year, including a second-class award in Natural Science from the Ministry of Education of China in 2017, the first-class award in Surveying and Mapping Science and Technology from Chinese Society of Geodesy Photogrammetry and Cartography in 2021.

18:20-18:30 Closing Remark: Mr LI Lifeng