



Food and Agriculture
Organization of the
United Nations

Report of the 2020 WASAG Webinar Series



WASAG

The Global Framework on
Water Scarcity in Agriculture

Report of the 2020 WASAG Webinar Series

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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Executive summary

The Global Framework on Water Scarcity in Agriculture (WASAG) is a partnership established in 2017 and hosted by FAO that aims to support measurable, significant and sustainable progress on improving and adapting sustainable agricultural systems in conditions of increasing water scarcity and a changing climate, using the combined expertise and resources of the partners.

Under the current COVID-19 pandemic situation, WASAG has mostly pursued its work through new digital means, which have provided an opportunity to quickly adapt to this unexpected challenge that impacted the way of conducting business for all sectors.

The WASAG Webinar Series has therefore emerged as a means to engage partners in this context to further promote collaborative efforts towards innovative solutions to water scarcity in agriculture.

The series has addressed a variety of topics covering many facets of water scarcity in agriculture, such as water and gender, financing mechanisms, water and nutrition, drought preparedness, sustainable agriculture water use and saline agriculture, which also includes promoting quinoa as a drought and salt-tolerance crop.

The WASAG Webinar Series demonstrated the commitment of WASAG partners and stakeholders to explore new ways of working and address these pressing issues.

Between May and December 2020, WASAG organized ten webinars, proving the success of this initiative which benefited from the contribution of several partners and stakeholders, all experts in the topics discussed. Thirty-seven contributing institutions are listed in the acknowledgements below. The webinar also attracted 2 870 participants from international organizations, academic institutions and private sector, representing 135 countries or regions. All in all, they raised the visibility of WASAG and indirectly, of FAO's Land and Water Division as measured by an increased number of visits to our websites.

The next steps for the WASAG Webinar Series include turning these capacity development materials into more in-depth training opportunities and to further strengthen the collaboration through joint projects addressing water scarcity in agriculture, at local, national, regional, and global levels.

WASAG is looking forward to these next steps and to more webinars with the continued contribution of its partners and stakeholders.

Acknowledgements

The Global Framework on Water Scarcity in Agriculture (WASAG) Support Team would like to acknowledge the support of the Land and Water Division in hosting this series of seminars.

Special thanks to each of the WASAG Working Groups members, WASAG partners, stakeholders and eminent persons who worked within their respective organizations to not only prepare the information shared in each webinar, but to disseminate the information that led to the high participation and to rich discussions in each session. We would like to thank the following organizations (in alphabetical order) for their contributions to this WASAG Webinar Series:

- African Sustainable Agriculture Research Institute (ASARI), Mohammed VI Polytechnic University (UM6P)
- African Union
- Applied Biology and Soil Sciences (CEBAS) Irrigation Department. Spanish National Research Council - CSIC SPAIN
- Canale Emiliano Romagnolo (CER)
- Centre de coopération internationale en recherche agronomique pour le développement (CIRAD)
- Centro de Edafología y Biología Aplicada del Segura – Consejo Superior de Investigaciones Científicas (CEBAS-CSIC)
- Chinese Academy of Agricultural Sciences (CAAS)
- Climate-KIC
- Consultative Group on International Agricultural Research (CGIAR)
- Council for Research in Agriculture and the Analysis of the Agricultural Economy (CREA)
- Department of Land Resource Management and Agricultural Technology (LARMAT), University of Nairobi
- Food and Agriculture Organization of the United Nations (FAO)
- Global Soil Partnership for Food Security and Climate Change Adaptation and Mitigation (GSP)
- Government of Cabo Verde
- Institut National de Recherche et Développement Agricole INIDA/MAA – Cabo Verde
- Integrated Drought Management Programme (IDMP)
- International Centre for Biosaline Agriculture (ICBA)
- International Commission on Irrigation and Drainage (ICID)

- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
- International Food Policy Research Institute (IFPRI)
- International Fund for Agricultural Development (IFAD)
- International Institute for Applied Systems Analysis (IIASA)
- International Water Management Institute (IWMI)
- International Water Resources Association (IWRA)
- Lake Victoria Basin Commission (LVBC)
- Stockholm International Water Institute (SIWI)
- The Salt Doctors
- The Swiss Federal Office for Agriculture (FOAG)
- The UNCCD Drought Initiative
- UK Centre for Ecology & Hydrology
- United Nations Educational, Scientific and Cultural Organization (UNESCO)
- United Nations System Standing Committee on Nutrition (UNSCN)
- University of Nebraska Medical Center (UNMC) College of Public Health
- University of Pannonia and scientific advisor at the Agricultural Research Centre, Hungary
- Women for Water Partnership (WfWP)
- World Bank Group
- World Meteorological Organization

Abbreviations and acronyms

CAAS	The Chinese Academy of Agricultural Sciences
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement
FAO	Food and Agriculture Organization of the United Nations
ICBA	International Centre for Biosaline Agriculture
IWRA	International Water Resources Association
UNCCD	United Nations Convention to Combat Desertification
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNSCN	United Nations Standing Committee on Nutrition
WASAG	The Global Framework for Water Scarcity in Agriculture
WfWP	Women for Water Partnership
WWAP	World Water Assessment Programme



Introduction

In 2020, amidst the challenges posed by the COVID-19 epidemiological situation, the Global Framework on Water Scarcity in Agriculture (WASAG) has continued to work on addressing pressing issues related to water scarcity in agriculture in a changing climate.

WASAG organized a series of webinars to pursue its mandate under new digital means, as webinars were recognized as an opportunity to quickly adapt to the new current challenges.

Using the combine expertise and resources of its many partners, WASAG presented a variety of topics related to water scarcity and agriculture to WASAG partners, stakeholders and the interested public. These topics included water and gender, financing mechanisms, water and nutrition, drought preparedness, sustainable agriculture water use and saline agriculture which also include promoting quinoa as a drought and salt-tolerance crop.

With ten webinars organized between May and December 2020, this report highlights the key messages given by a wide variety of speakers that participated in making this new initiative a real success.

It is expected that this report will lead to more in-depth capacity development in the several topics discussed, to collaboration in developing and implementing projects addressing these topics and to offering a variety of innovative solutions to the communities, countries and regions that have to cope with water scarcity in agriculture.

WASAG webinars

The following section outlines relevant information regarding each webinar.

The description of each webinar includes the contributing organizations for each event, as well as notable speakers and topics for each webinar.

The overview section is meant to provide quick data on the number of participants and the countries they represented, as well as a link to the recording of the session being discussed.

The programme and speakers are included to provide relevant context to the session, as well as to facilitate further knowledge dissemination through the connections formed in this process.

The summary of the webinar provides key messages for each speaker and the way forward presents some recommendations that could be translated into actions or new projects.

WEBINAR REPORT 1: WATER SCARCITY, ABUNDANCE OF WOMEN

Description

In collaboration with the Women for Water Partnership (WfWP), a WASAG partner, this first WASAG webinar on mainstreaming gender in water scarcity in agriculture under the title: "Water scarcity, abundance of women?" shared with more than 200 participants how women can play a better role in managing water scarcity in agriculture, and how organizations like FAO can facilitate this process. The webinar tackled the vital topic of gender in water scarcity. Some key information on how water scarcity can provide opportunities for women were shared and the importance of disaggregated data for targeted gender-based efforts was conferred.



Overview

Recording: <https://www.youtube.com/watch?v=1EOkl53s6xI>

Number of registrations: 348

Number of participants: 219

Number of countries of represented: 71

Programme

Tuesday, 12 May 2020, 15.00-16.00 CEST (UTC +2)

Moderator: Ms Sasha Koo-Oshima, Deputy Director, FAO Land and Water Division

15.00-15.10	Opening remarks, Mr Eduardo Mansur, Director, FAO Land and Water Division
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15.10-15.55	Presentations:
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1. High-level address: Ms Gerda Verburg, Coordinator of the Scaling Up Nutrition Movement
2. Key presentation: Ms Annemiek Jenniskens, Women for Water Partnership
3. Invited panelist: Ms Michela Miletto, Acting Coordinator of the UNESCO World Water Assessment Programme

15.55-16.00	Closing remarks, Mr Eduardo Mansur, Director, FAO Land and Water Division
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Speakers

Ms Gerda Verburg - Coordinator of the Scaling Up Nutrition Movement

Ms Annemiek Jenniskens - Women for Water Partnership

Ms Michela Miletto - Acting Coordinator of the UNESCO World Water Assessment Programme

Webinar summary

Women play pivotal responsibility in the supply, management and safeguarding of water, so they must not be left behind. Women represent 50 percent of the workforce in the agricultural sector in developing countries, yet they still face significant constraint to raise production and productivity. This is mainly due to limited access to water resources, water services, employment, and markets as well as exclusion from decision-making at management levels. Therefore, it is important to increase women representation in local institutions, governance, and decision-making processes. Women should tell their stories, share their emotions, and continue to be champions for equality. The speakers provided key information on how water scarcity can provide opportunities for women globally. This webinar discussed methods to accelerate paths towards gender equality considering the new reality ahead of policymakers.



Speaker:
Gerda Verburg

Presentation title:
High-level address

Key message:
Water and nutrition are impacting at least 12 out of the 17 Sustainable Development Goals (SDGs), so they must be continuously considered to achieve sustainable development.

Summary:

Inequality and inequity are still present and even more showcased with the COVID-19 pandemic. Inequality has forcibly left a lot of people behind, who are now more vulnerable due to the pandemic and lack of access to social protection, social networks, and social security. This situation depicts that something must be done to address the complicating impacts of inequality.

Gender inequality is observable in many countries and structural changes are needed to improve women's access to water facilities, services and resources that could help improve nutrition.

It is important for all women that have already taken the forefront in ensuring gender equality to continue in their mission and motivate other women within their sphere of influence. Women should not ask for recognitions that they want to see but should be determined to get the recognitions. Women should set priorities such as making smart connections between rural and urban areas. Institutions should focus on women leadership programmes and trainings to prepare them for positions at management levels. Women need to be aware of their talents and capabilities, be competitive and be proud of themselves.



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Speaker:

Annemiek Jenniskins

Presentation title:**Water scarcity, abundance of women, golden opportunities****Key message:**

When women have the same access to productive resources as men, yields may increase by 20 to 30 percent, nutrition may improve, and hunger may reduce by up to 17 percent.

Summary:

Women for Water Partnership is an organization that brings together 28 member organizations representing 1.5 million women, advocating for the participation of women in water governance and management.

Men left water scarce areas, leading to an abundance of women in these areas. The women in these areas know how to cope with water scarcity, so their knowledge and expertise must be considered in the implementation of programmes and projects. Studies have shown that when this is done, the performance of projects usually double or even triple. Including women in policies, projects and programmes represents therefore an array of golden opportunities. The important work of this partnership is in the interlinkages of governance and leadership, vocational training, access to resources, inclusion of women in all phases of the programme cycle, and gender disaggregated data. Moreover, the partnership is also dedicated to the realization of WASAG's Praia Commitment number 17, including recognition of the essential role of women in smallholder farming; household water use; and reaching women, youth and farmers. The recent study done by the partnership within the WASAG working groups shows that at the local level, water projects designed and implemented with full participation of women are more sustainable and effective. Women's access to land, water, finance and extension services also facilitate success of water projects and programmes.



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Speaker:

Michela Miletto

Presentation title:

The importance of sex disaggregated water data

Key Messages:

Data equality is needed to achieve gender equality; lack of sex-disaggregated data creates a gap between gender-transformative policies and programmes with the reality in the field.

Summary:

The United Nations Educational, Scientific and Cultural Organization (UNESCO) World Water Assessment Programme (WWAP) monitors several priority topics, including water governance, water for agricultural uses and gender specific knowledge production. In each area, the use of sex-disaggregated data can provide greater windows into the reality on the field for all persons. Most times, sex-disaggregated data are not usually available in water resources management as many countries do not collect these data. In fact, only one-third of the world's countries regularly collect these data and make them available to the public. The unavailability of sex-disaggregated data has huge implications on women's participation in water governance and water management. It is also difficult to carry out gender analysis in the field because of unavailability of financial resources and absence of required human skills and resources. Another constraint is the analytical skills of the available human resources to effectively analyse and interpret the collected data. Cooperation is needed among sectors, institutions, and organizations to facilitate smooth and effective collection of these data.

Way forward

- Women must be included in all stages of a project's cycle.
- Sex-disaggregated data must be collected to design responses with gender factors in mind.
- Women's participation in decision-making and policy formulation processes must be increased.
- Governments and institutions at all levels should facilitate equality between men and women in sustainable agriculture production and sustainable development.
- Innovations in data collection such as the use of geospatial tools, remote sensing and phone technology should be embraced in collecting sex-disaggregated data.

WEBINAR REPORT 2: SALINE AGRICULTURE: SCALING UP OPPORTUNITIES AND CHALLENGES

Description

The Global Framework on Water Scarcity in Agriculture (WASAG) hosted by FAO's Land and Water Division held its second webinar on Saline Agriculture titled "*Saline agriculture: Scaling up opportunities and challenges*". The objective of the webinar was to share knowledge and experience on global projects related to saline farming, as well as smart digital approaches and solutions. Under the COVID-19 pandemic, unprecedented challenging conditions push focus on how the local food production could be enhanced by utilizing low-quality water and land resources, such as brackish groundwater and salt-affected soils. The three speakers shared their experiences in scaling up saline agriculture in various countries through different approaches.



Overview

Recording: <https://www.youtube.com/watch?v=HR67junAehY&feature=youtu.be>

Number of registrations: 777

Number of participants: 435

Number of countries of represented: 91

Programme

Tuesday, 26 May 2020, 15.00-16.00 CEST (UTC +2)

Moderator: Dr Ismahane Elouafi, Director General of International Centre for Biosaline Agriculture (ICBA)

15.00-15.10	Opening remarks, H.E Mohammad Hossein Emadi, Permanent Representation of the Islamic Republic of Iran to FAO
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15.10-15.40	Presentations:
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1. Projects on halophytes value chains in NENA: Dionysia-Angeliki Lyra, International Centre for Biosaline Agriculture (ICBA)
 2. Opportunities for cultivation of conventional vegetable crops under saline conditions: Arjen de Vos, The Salt Doctors
 3. Implementation of a Decision Support Tool (DST) under saline conditions - A showcase of the Mediterranean region: Andres Parra Gonzalez, CEBAS-CSIC
-

15.40 -15.55 Discussion/Questions and Answers

15.55-16.00 Closing remarks, Mr Eduardo Mansur, Director, FAO Land and Water Division

Speakers

Ms Dionysia-Angeliki Lyra - Halophyte Agronomist, ICBA

Mr Arjen de Vos - Director, The Salt Doctor

Mr Andres Parra Gonzalez - CEBAS-SIC

Webinar summary

The COVID-19 pandemic has shown the importance of local tools, technologies and farming techniques to support developing countries. There is a need to merge both new and traditional knowledge, technologies and research to scale up saline agriculture. More than 100 countries in the Near East and North Africa (NENA) region and Central Asia are affected by fragile conditions, especially those countries which 90 percent of food are dependent on importation. Therefore, this webinar presented an opportunity for member countries which are affected by saline conditions to communicate, learn, and share ideas together to scale up these challenges into opportunities.

One such opportunity is FAO's collaboration with ICBA in producing a global map of salt-affected lands, using modern techniques, remote sensing and reliable sampling. As more than a billion hectares of soils are affected by salinity worldwide, innovations in saline agriculture are not only important for fragile conditions but also very useful during the present global pandemic.



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Speaker:

Dionysia-Angeliki Lyra

Presentation title:

Projects on Halophytes value chains in NENA

Key message:

To feed 8 billion people, we need to shift our focus to the use of unconventional waters in agriculture. This includes brackish, saline and drainage water. There are many halophytic plants such as quinoa and sea asparagus (*Salicornia*) that can withstand and thrive in marginal conditions.

Summary:

Climate change is exacerbating the challenges of marginal conditions in many countries, especially the locust infection in East Africa. To achieve sustainability in marginal areas, it is necessary to focus on unconventional water resources by combining environmental boundaries with the concept of social boundaries as given by Kate Raworth's Doughnut Economic Theory.

Saline agriculture poses great benefits such as releasing pressure on good quality water and land resources, utilizing wasteland and poor-quality water resources, providing new sources of food, feeds, biofuels as well as serving as climate change mitigation and adaptation measure. Halophytes have been recognized as resources for improving saline soils and increasing salinity tolerance. Other resources for saline agriculture implementation are brackish ground water, drainage water and saline lands.

Halophytes could be used as food (quinoa, *Salicornia*, sea kale, pearl millet), forage and animal feeds, oil seeds, energy, phytoremediation and medicinal plants. ICBA has already facilitated some quinoa value chain projects in Morocco and Kyrgyzstan with interesting results. *Salicornia* is part of the crops incorporated into the inland integrated agri-aquaculture farms developed by ICBA. The crop has also been scaled up in many countries with environmental and social considerations and many halophytic dishes are being developed.



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Speaker:

Arjen de Vos

Presentation title:

Opportunities for cultivation of conventional vegetable crops under saline conditions

Key message:

Salinity exists on a large scale and affects millions of smallholder farmers. Thus, tailor-made solutions are required to overcome these challenges.

Summary:

Around 400 million hectares of soils, that can feed about up to 2 billion people, are saline. Two key examples are the Bangladesh delta and the East of Egypt delta, where majority of the soil has about < 8 dS/m. The field experiments and samples have shown that most of the soils are more saline than people thought. This large area of land cannot be left unproductive. Thus, the Salt Doctors have developed some salt-tolerated crop varieties that can withstand high-level of salinity and still produce abundant yields.

Furthermore, about 800 varieties of 50 different crops tests under controlled field conditions were carried out in the Netherlands. During these tests, moderately tolerant, high yielding

varieties were found for potato, carrot and beetroot, among others. However, saline agriculture is more than just cultivating salt tolerant crops. Socioeconomic, technical and social factors should be considered to come up with the right strategy and scalable projects. For example, in Pakistan, by switching to a salt tolerant variety of potato, a yield increase of about 28 percent was obtained compared to the local variety. Also, in Kenya, a yield increase of about 94 percent was obtained in salt tolerant carrot compared to the local variety. Therefore, it is evident that with this approach, the Salt Doctors are scaling up the challenges of saline soils into opportunities.



Speaker:

Parra Gonzalez

Presentation title:

Implementation of a Decision Support Tool (DST) under saline conditions – A showcase of the Mediterranean region

Key message:

If we focus agricultural practices on the use of non-conventional water, we will be able to relieve the pressure on our freshwater resources.

Summary:

The Decision Support Tool (DST) helps farmers in overcoming the challenges of irrigations at farm levels especially under saline conditions. It also helps farmers to contrast information provided by the DST with their personal knowledge and experiences. These include examination of multiple alternatives, identifying unpredicted situations, better use of data and resources and reduced costs.

The input requirement for the tool is relatively small. These include water and soil analysis, crop (variety, density, growth stage) and irrigation method. The farmers could obtain output in form of crop yield, water management, fertilizer recommendations which assists farmers in properly managing their farms. The tool is user-friendly and can assist farmers in taking timely decisions.

The following conclusions can be drawn:

- Saline agriculture is feasible in salt affected areas through multidisciplinary approaches.
- Tailormade and sustainable solutions are required.
- Developing the value chain of halophytic products is imperative.
- Raising public awareness initiatives on halophytes is desirable.

- Training and capacity building programmes are very much needed.
- Digital technologies can facilitate saline agriculture activities.
- Saline agroecosystems can preserve and enhance agrobiodiversity.

Way forward

- Develop a sustainable halophyte-based industry model in a desert environment that could be further replicated.
- Because salinity challenges are already here, innovation and implementation should be accelerated towards large-scale impacts.

Improved germplasm, effective management practices and pre-/post-harvest processes are imperative to a proper technical cultivation practices package.

WEBINAR REPORT 3: SOIL AND WATER MANAGEMENT IN SALT AFFECTED AREAS: PRACTICAL SOLUTIONS AND TOOLS

Description

The WASAG Working Group on “Saline Agriculture” organized the webinar titled “Soil and water management in salt affected areas: Practical solutions and tools” to share knowledge and experience in addressing the multiple challenges related to agriculture of these zones. The aim of the webinar was to understand major issues and the roles that tailored-soil management and irrigation techniques can play in ensuring food security in such areas. The webinar brought together irrigation practitioners

(researchers, government officials, service providers, etc.) from around the world to showcase solutions and tools provided by their experiences. Some of the key aspects of the dialogue focused on global projects related to the practice of irrigation with brackish or saline waters, as well as innovative approaches and solutions in managing saline soils. Under the COVID-19 pandemic, unprecedented challenging conditions push the attention on how local food production can be enhanced by utilizing low-quality water and land resources, such as in salt-affected soils.



Overview

Recording: <https://www.youtube.com/watch?v=WmiAJeeSEmw&feature=youtu.be>

Number of registrations: 712

Number of participants: 403

Number of countries of represented: 94

Programme

Tuesday, 02 June 2020, 15.00-16.30 CEST (UTC +2)

Moderator: Dr Torkil Jøneh Clausen, WASAG Chair

15.00-15.10	Opening remarks, Felix Britz Reinders, President, International Commission on Irrigation & Drainage (ICID)
15.10-16.10	<p>Presentations:</p> <ol style="list-style-type: none">1. Irrigation management under saline conditions: Marco Arcieri, Vice President, International Commission on Irrigation and Drainage (ICID)2. Biosaline agriculture techniques: Angela Moreno, President, Institut National de Recherche et Développement Agraire INIDA/MAA – Cabo Verde3. Water management in land reclamation areas of southern Spain: Francisco Pedrero, Researcher/Scientist, Applied Biology and Soil Sciences (CEBAS) Irrigation Department. Spanish National Research Council -CSIC SPAIN4. Saline water management in land reclamation areas of northern Italy: Tommaso Letterio, Consorzio Emiliano Romagnolo, CER5. International Network on Salt-Affected Soils (INSAS) and salinity mapping: Zineb Bazza, Global Soil Partnership, FAO6. Show cases for managing saline soil: Ahmed El-Naggar, ICBA7. Potentials of bio-based fertilizers in managing nutrients and soil properties in saline areas: Gergely Tóth
16.10 -16.20	Discussion/Questions and Answers
16.20-16.30	Closing remarks, Ms. Ana Laura Touza, Cabo Verde Representative to FAO

Speakers

Mr Marco Arcieri - Vice President, ICID

Ms Angela Moreno - President, Institut National de Recherche et Développement Agraire

INIDA/MAA – Cabo Verde

Mr Francisco Pedrero - Researcher/Scientist, Applied Biology and Soil Sciences (CEBAS)
Irrigation

Mr Tommaso Letterio - Technical Researcher, CER – Consorzio Emiliano Romagnolo

Ms Zineb Bazza - Global Soil Partnership, FAO

Dr Ahmed El-Naggar - Soil Management Scientist, ICBA

Mr Gergely Tóth - University of Pannonia and scientific advisor at the Agricultural Research Centre, Hungary

Webinar summary

“We do not inherit water and soil from our ancestors, we borrow it from our children”. This quote reminds us that it is a necessity for us to protect our water and soils for future generations. It is important to enable higher crop productivity with less water and energy through modernization of irrigation systems, improving operations and maintenance of irrigation systems, implementing water saving techniques and technologies, promoting institutional reforms, and supporting water productivity enhancement. The use of modern technologies raises a lot of questions from the social and economic points of view. Hence, both technology and humanity must be considered to succeed with saline agriculture. For developing countries to embrace these technologies, they must be sustainable, gender sensitive and reach small holder farmers.



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Speaker:
Marco Arcieri

Presentation title:
Irrigation management under saline conditions

Key message:
An integrated approach that considers several aspects is required in managing salinity, especially on irrigated lands.
A pilot desalination system installed in Cabo Verde to pump, desalinate and distribute fresh water shows that it is possible to create conditions for sustainable development of agriculture in rural areas affected by water scarcity.

Summary:

About 7 percent of the earth's continental and 20 percent of the world's irrigated lands are salt affected. Globally, salt affected areas of the world cover about 10 Mha. Water resources management practices such as leaching requirement, drainage, irrigation, and multiple water resources could be integrated to effectively manage salinity in irrigated farms.

Drip irrigation provides the best conditions of soil water potential, avoiding leaf injury and salt accumulation at the wetting front. The irrigation frequency affects the soil moisture-salinity distribution, as well as the anti-clogging performance of drip irrigation systems, by changing fouling growth inside emitters. Furthermore, a new innovative way of accomplishing percolation is by sending a low-level electro-magnetic signal through the irrigation water before it is applied to crops.

Also, solar powered water pumping and desalination are sustainable and resilient solutions, giving access to clean and affordable water to farmers and communities in emerging countries such as Cabo Verde with the following advantages:

- desalinates any type of water (brackish and seawater);
- powered 100 percent by solar energy;
- up to 1000 m³/day capacity;
- operates autonomously without batteries and has a lifespan of about 30 years;
- low maintenance cost and can be remotely monitored and managed.



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Speaker:

Angela Moreno

Presentation title:

Biosaline agriculture techniques: soil and water salinity in Cabo Verde

Key message:

The Government of Cabo Verde has made remarkable investments in water management since 2016 through groundwater management, desalination, as well as soil and water conservation systems.

Summary:

The Government of Cabo Verde has heavily invested in water management, ranging from soil conservation, water mobilization, drip irrigation systems, improved seeds for fruits and

vegetables species and farmers' technical capacity building that have produced results, partially shifting the sector paradigm from subsistence to market supply oriented. In surface water management, new dynamic has been implemented with regards to the capture and storage of rainwater, through the construction of new, larger hydraulic infrastructure.

The soil and water conservation technologies have adapted well to the climatic, soil and socioeconomic conditions of the country. One of those technologies is rainwater harvesting. Rainwater harvesting technologies have greatly contributed to improving the livelihood of many rural farmers. It is an alternative for better water resource management and small-scale vegetable crop production in Cabo Verde. Treated wastewater has also been explored in Cabo Verde. The country has a potential of about 20 million m³/day of treated wastewater while only about 12 million m³/day is currently available.



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Speaker:

Francisco Pedrero

Presentation title:

Water management in land reclamation areas of southern Spain

Key message:

In Murcia, Spain, where agriculture is the main user of water, about 85 percent of 100 000 irrigated hectares are irrigated with a high level of salt.

Summary:

The south of Spain is the driest part of Europe and annual rainfall could be around 300 mm. Agriculture is a major sector in this region, as it contributes immensely to the development of the economy. In this region, an estimated irrigated 100 000 hectares of land are irrigated with water from aquifers. Out of this, about 80 percent have a very high levels of salts. For over 20 years, the organization has been working on different irrigation management strategies both at farms and district levels, working with different irrigation farmers. One of such strategies is the use of salty reclaimed water and regulated deficit irrigation (RDI) on mandarin and grapefruits.

In the last five years, the organization has also been using the technique of mixing irrigation water sources and soil organic amendment to reclaim degraded lands. Thereafter, the degraded lands are reclaimed. These lands are used in agriculture and producing substantial yields.



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Speaker:

Tommaso Letterio

Presentation title:

Saline water management in land reclamation areas of northern Italy

Key message:

Monitoring of seawater intrusion is important for land reclamations and irrigation systems, as demonstrated in northern Italy.

Summary:

Saltwater intrusion in areas of northern Italy can go about 15 km away from the coastal line during the summer period due to low discharge of rivers. Hence in the summer, there is maximum seawater intrusion in the coaster areas on surface water. Most of the intrusion occurs at rivers that are at the outlet of the pumping systems of land reclamation boards. In these channels, salinity is lower during the summer periods. Most farmers can use this water for irrigation and this water is suitable for diverting water to the channels to achieve artificial recharge of the groundwater system with leakage from channels. In this case, the activities of land reclamation board are focused on modelling and monitoring the interface or interaction among shallow groundwater systems, deep groundwater systems and surface water systems.



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Speaker:

Zineb Bazza

Presentation title:

International Network on Salt-Affected Soils (INSAS) and salinity mapping

Key message:

Salinization and sodification are among the greatest threats to global soils and thus affect global food security. Hence, the Global Soil Partnership (GSP) is currently building a country-driven Global Soil Information System (GloSIS) and a powerful integrated soil data management framework to bring national systems and data products into an integrated platform.

Summary:

Salt-affected soils occur in more than 100 countries and are a huge threat to food security in many regions, especially in the Near East, North Africa and Central Asia. Climate change is and will continue to have a significant impact on soil resources. Changes in water availability will lead to a significant increase in salt-affected soils. In coastal areas, intrusion of seawater and tidal flooding by saline water will tend to penetrate further inland than at present, extending the area affected by salinity.

The international Network of Salt-Affected Soils (INSAS) was established for the following roles:

- promote the sustainable management of salt-affected soils;
- develop a report on the global status, current trends and challenges of salt-affected soils;
- develop and provide a set of good practices for the sustainable management of salt-affected soils;
- provide a platform for countries with salt-affected soils to discuss common issues and management practices;
- foster collaboration among INSAS Member Nations towards promoting the sustainable use and management of salt-affected soils.

**Speaker:**

Ahmed El-Naggar

Presentation title:

Show cases for managing saline soil

Key message:

There is a huge disparity between how developing and developed countries respond to water salinity issues. Therefore, we must endeavour to work harder in developing countries to redress the balance.

Summary:

Soil salinity is a global threat to food security. Few studies investigated the economic value of soil degradation due to soil salinization on a global scale. The studies show that the impact of the soil salinity on food security in overpopulated developing countries is more pronounced. Furthermore, the results of the studies show that the approaches for soil salinity management are also different. Developing countries focus on unsustainable techniques, small scale projects, limited funding, lack of environmental regulations and policies, while developed countries have systematically focused on sustainable approaches, large scale projects, adequate investments and

developed environmental regulations and policies. Soil spatial variability assessment is also of great importance as, site specific management based on accurate assessments leads to efficient soil rehabilitation, water saving and is cost-effective compared to uniform soil management. Studies show that saline agriculture alters soil microbial communities and ecosystem services on the long term.

Other important points raised are:

- Farmers and stakeholders in developing countries require access to data and technical support for cost-effective salinity management.
- The selections of soil salinity management approaches should be based on accurate soil and water assessment.
- Biosaline agriculture requires time and sustainability to harvest its hanging fruits.



Speaker:
Gergely Tóth

Presentation title:
Potential of bio-based fertilizers in managing nutrients and soil properties in saline areas

Key message:
Bio-based fertilizers have been found to improve agricultural productivity especially in marginal areas, thus need more research and acceptance.

Summary:

Bio-based fertilizers are important for closing nutrient cycles, safe recovery from nutrient-rich side-streams, bioavailability and agronomic efficiency, best technologies for site specific management and soil improvement as well as threat mitigation.

In saline areas, the potential of bio-based fertilizers are:

- optimal nutrient release dynamics;
- improvement of soil structure and hydro-physical properties;
- exchange and sorption of salts;
- accessibility;
- economical efficiency;
- technological innovations in production and soil management.

Way forward

- Solar powered water pumping and desalination are sustainable and resilient solutions to water scarcity in marginal environments; thus, they should be scaled up in countries affected by salinity and water scarcity.
- Investment in non-conventional water resources and localized solutions is critical for development in emerging countries such as Cabo Verde.
- Degraded lands can be reclaimed for agricultural production using different innovative techniques.
- After the success of the GSOC map, the Global Soil Partnership (GSP) continues to conduct global assessments addressing global soil threats including salinity.
- Saline agriculture is a long-term approach that requires time and resources for efficient soil rehabilitation. More research is required to assess the impact of saline agriculture on the terrestrial agroecosystems.
- More research is also required to facilitate the benefits of bio-based fertilizers.

WEBINAR REPORT 4: BRIDGING FINANCING GAPS FOR NATIONALLY DETERMINED CONTRIBUTIONS (NDCS) IN AGRICULTURE UNDER CLIMATE CHANGE

Description

The Global Framework on Water Scarcity in Agriculture (WASAG) hosted by FAO's Land and Water Division organized its fourth webinar on "Bridging financing gaps for nationally determined contributions in agriculture under climate change".

WASAG's Finance Working Group organized this webinar to share the WASAG Framework on Financing Mechanisms. This Framework aims to identify and support new approaches to finance water for agriculture. These approaches will inform the work undertaken in the WASAG Working Groups to ensure an aligned approach across WASAG projects and activities. The webinar presented the Framework and a few case studies, illustrating how it can be utilized.



Overview

Recording: <https://www.youtube.com/watch?v=pJsQZAeJs7o&feature=youtu.be>

Number of registrations: 275

Number of participants: 156

Number of countries of represented: 64

Programme

Tuesday, 09 June 2020, 15.00-16.30 CEST (UTC+2)

Moderator: Francois Onimus, World Bank

15.00-15.10	Opening remarks, Pieter Waalewijn, World Bank
15.10-16.10	<p>Presentations:</p> <ol style="list-style-type: none">1. Unlocking finance to address water scarcity: proposed framework - Mr Daniel Zimmer, Climate- KIC2. Family farming in the context of climate change: A case study of Niger - Ms Audrey Nepveu De Villemarceau, IFAD3. Financing the micro-irrigation value chain: A case study of India - Ms Stuti Sharma, World Bank4. The adaptation of agricultural sector to climate change: The Italian experience - Ms Raffaella Zucaro, Italy Coordination Group
16.10 -16.20	Discussion/Questions and Answers
16.20-16.30	Closing remarks, Sasha Koo-Oshima, Deputy Director, FAO Land and Water Division

Speakers

Mr Daniel Zimmer - Director of the sustainable land use theme, Climate-KIC

Ms Audrey Nepveu de Villemarceau - Technical specialist, IFAD

Ms Stuti Sharma - Water resources specialist, World Bank

Ms Raffaella Zucaro - Senior researcher, CREA

Webinar summary

Water scarcity is more than just water productivity, it is about water services too. Consequently, it is important to think beyond public financing and towards developmental outcomes for farmers. Also, finance plays a pivotal role in agricultural project development and implementation, thus it is necessary to increase accessibility to finance by organizations and farmers. By doing this, Member Nations will bridge the financing gaps for nationally determined Contributions (NDCs) in agriculture under climate change. FAO is working with farmers through its evidence-based, country-led and country-owned, Hand-in-Hand initiative to help tackle their vulnerabilities in accessing finance.



Speaker:

Dr Daniel Zimmer

Presentation title:

Unlocking finance to address water scarcity: proposed framework

Key message:

If we want to address climate change, we must find ways to create value to finance the transformations required to achieve the nationally determined contributions (NDCs).

Summary:

The Finance Working Group aims to identify and promote new approaches to finance water for agriculture in the context of the NDCs. It is also tasked with guiding the other WASAG Working Groups in their approaches to get their projects and activities financed.

On-the-ground activities

Capturing part of the value created to generate assets and monetary flows is essential. Value can be created from:

- i. increased production (agriculture, biomass, energy);
- ii. provision of ecosystem services (protection, increased resilience, carbon sequestration);
- iii. reclamation of degraded land and provision of societal value (tourism, cultural goods).

Financial de-risking and risk sharing tools

Implement a holistic de-risking approach that needs to involve all stakeholders and can rely on:

- i. financial instruments (e.g. insurances or guarantee mechanisms)
- ii. contractual mechanisms
- iii. resilient practices

Financial support mechanisms

- i. developing trust: transparency, traceability, reporting instruments;
- ii. generating blended finance: i.e. mixing private and public sources of funding:
 - (i) grants and subsidies, (ii) debt e.g. concessional loans, green bonds, (iii) equity, (iv) private sector participation.

Some insights from this framework are:

- i. Identify who benefits from the created value and how to extract part of that value in monetary terms.
- ii. Create trustful ecosystems of stakeholders where information, risks and value are shared.
- iii. Overcome the risks associated with new solutions in a holistic way.



Speaker:

Audrey Nepveu de Villemarceau

Presentation title:

Family farming in the context of climate change: A case study of Niger

Key message:

In Niger, there are many different situational shocks due to climate change and limited access to markets, thus IFAD is working to improve access to markets for over 290 000 family farms.

Summary:

The Family Farming Development Programme (ProDAF) in Tahoua, Maradi and Zinder regions of Niger is expected to take effect from 2015 to 2023. The main goal of the Programme is to strengthen food and nutrition security, resilience and access to market for 290 000 family farms which comprises of about 2 million people, out of which 51 percent are women and 17 percent are

youths. This project is projected to cost about USD 205 million of blended finance. Also, a local territorial management approach, focusing on economic development clusters (EDC) has been developed based on past experiences. The economic development clusters are considered as the real entry points and compensating the overall value chain of other actors (collection centers). The key innovation about this approach is on what it takes for these collection centers and the small-scale markets to function effectively.

Some key points to work further on are:

- work on existing trading places and processes;
- better feeding satellite collection centres, which means that about 30 percent of family farms are more secured with reduced lean period;
- increase marketed volumes;
- scaling up in the Diffa and Dosso regions.



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Speaker:

Stuti Sharma

Presentation title:

Financing the micro-irrigation value chain: A case study of India

Key message:

The last 20 years in India have shown massive growth in micro-irrigation, yet most of the potential in this field is still largely untapped.

Summary:

The largely untapped potential in micro-irrigation in India could be attributed to two major reasons. Firstly, subsidies are only targeted at smallholder farmers who farm on only about 45 percent of the total arable land. Most times, these farmers do not have access to credits and loans.

Secondly, when large-scale farmers see small-scale farmers having access to modern technologies, there is usually limited incentives for them to invest in such technologies.

These four implementation channels have emerged:

- grants and subsidies – these includes Federal programmes and state subsidy schemes;
- OEM and integrators – these includes both local and international players as well as a large number of integrators and fewer manufacturers;

- cash and carry – pay as you go models and provision of services;
- down payment – this involves outright acquisition of asset, awareness, access and cash flow availability.

Farmers in India also have access to commercial loans, which come at high interest rates. In addition, there are high default rates. Most times, access is difficult, and farmers often cannot meet collateral requirements. Furthermore, there are some irrigation specific loans for farm ponds, minor tanks and micro-irrigations, which are provided by non-banking financing corporations (NBFCs) and microfinance Institutions. These loans are more financially sustainable, and the portfolio of products caters to different stakeholders across the agri-value chain.



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Speaker:

Raffaella Zucaro

Presentation title:

The adaptation of agricultural sector to climate change: The Italian experience

Key message:

The Italian Coordination Group's value chain project has enabled reaching 250 000 farms, using 1 300 km of irrigation networks in 14 regions of Italy. To reach better results, the beneficiaries were identified in the local association for water management (Consortia) that manages the collective irrigation in Italy.

Summary:

Framework implemented:

The Italian Ministry of Agriculture (MiPAAF) programmed public funds according to an integrated approach to generate and capture value and “to promote financial de-risking and risk-sharing”. The aim was to build trust in the socioeconomic system and creating and capturing value to induce a virtuous circle of development. Grants were identified as a financial mechanism. It was followed by an integrated approach because they were selected projects which were able to guarantee economic, environmental and social sustainability, and also satisfying specific territorial needs and following the criteria for the sustainable use of water.

The financing model adopted involved several actors: national institutions (Ministry of Agriculture, Ministry of Environment), European Commission, river basin management authorities, local association for water management and coordination by a steering committee. To reach better results, the beneficiaries were identified in the local association for water management (Consortia) that manages the collective irrigation in Italy.

Purpose:

All projects financed are value chain project, as they aim to increase efficiency in water use, increase resilience and protection to climate change, and promote non-conventional water supply source, mainly treated wastewater for irrigation.

National/EU funds for rural development present a combination of tools:

- i. funds for investments to foster the competitiveness of agriculture, ensuring the sustainable management of water;
- ii. funds for assurances as a de-risking tool for farmer;
- iii. regional funds to finance market reinforcement mechanisms.

Way forward

- Adopt the WASAG Framework on Financing Mechanisms in developing and financing projects in water for agriculture.
- Expand the Family Farming Development Programme in Tahoua, Maradi and Zinder regions with the national bank (BAGRI) to pilot green loans for low-carbon, climate friendly agriculture and green entrepreneurship.
- Public finances alone are not enough to cater for the needs of farmers. Hence, there is a need for different forms of finances, such as subsidy and credits. Commercial capitals need to be unlocked as this will assist the retailers.
- The Framework is recommended for implementation in other contexts regarding agriculture under climate change.



WEBINAR REPORT 5: COLLABORATION ON PROMOTING QUINOA (PART I)

Description

The Global Framework on Water Scarcity in Agriculture (WASAG) hosted by FAO's

Land and Water Division organized its fifth webinar under the title: "Collaboration on promoting quinoa (part 1)". With the threats of climate change, it is extremely important to cultivate salt and drought tolerant crops such as quinoa to enhance climate-smart agriculture. Hence, WASAG, in collaboration with ICBA and CIRAD, is coordinating international efforts towards extended quinoa production. Therefore, through this webinar, topics discussed included the biodiversity of quinoa, germplasm improvement suitable for marginal environments as well as the emerging opportunities in quinoa production.

Overview

Recording: <https://www.youtube.com/watch?v=DJt4UywgST4&feature=youtu.be>

Number of registrations: 444

Number of participants: 255

Number of countries of represented: 75

Programme

Monday, 15 June 2020, 15.00-16.00 CEST (UTC+2)

Moderator: Remi Nono Womdim, Deputy Director, Plant Production and Protection Division, FAO

15.05-15.10 Opening remarks, Dr Ismahane Elouafi, Director General, ICBA

15.10-15.40 Presentations:

1. Characterization and sharing of quinoa's biodiversity: Its global spreading beyond its origins, Didier Bazile, CIRAD
 2. Germplasm improvement for the saline and dry marginal environments, Rakesh Kumar Singh, ICBA
 3. Emerging opportunities in quinoa production, Ndeye Ndack Diop, FAO AGPM
-

16.10 -16.20 Discussion/Questions and Answers

16.20-16.30 Closing remarks, Tania Santivanez, FAO REU

Speakers

Dr Didier Bazile - Senior Biodiversity Advisor at the French Agricultural Research Centre for International Development (CIRAD)

Dr Rakesh Kumar Singh - Programme Leader - Crop Diversification and Genetics section and Principal Scientist (Plant Breeding), ICBA

Ms Ndeye Ndack Diop - Agricultural Officer, Plant Production and Protection Division, FAO

Webinar summary

Quinoa, which has high nutrient content and adaptability to various marginal conditions, has been identified by various organizations, such as FAO, the International Centre for Biosaline Agriculture (ICBA) and CIRAD, as a food that has a vital role to play in the realization of food and nutrition security globally. Subsequently, it is part of WASAG's mandate, through a robust network of partners, to provide the enabling environment, capacity building and resources in addressing food and nutrition insecurity, especially in countries facing challenges of water scarcity as well as soil and water salinity.



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Speaker:

Didier Bazile

Presentation title:

Characterization and sharing of quinoa's biodiversity: Its global spreading beyond its origins

Key Messages:

Access to quinoa germplasm and benefit sharing from its utilization should be addressed, recognizing the hard work of the Andean people in the selection and conservation of local quinoa landraces, maintaining and adding value to quinoa's biodiversity through

diversification for the benefit of global food security and poverty reduction.

Quinoa is more than only a crop: its biodiversity is at the heart of an innovative agrifood system that can be really inspiring for its spreading.

Summary:

Quinoa is an Andean crop which was first domesticated 7 000 years ago. It was rejected during the Spanish conquest and rediscovered during the twentieth century. Since then, quinoa was introduced to many countries outside the Andes. The geographical increase in distribution of quinoa has highlighted the difficulty of access to quality seeds (principally for genetic diversity), which is a key factor for testing the crop outside the Andes and adapting the species to new environments.

Quinoa's resilience is due to its high genetic diversity. It is a single domesticated species with five major ecotypes:

- quinoa from the highlands (Peru and Bolivia (Plurinational State of))
- quinoa from interandean valleys (Colombia, Ecuador and Peru)
- quinoa from the Yungas (Bolivia [Plurinational State of])
- quinoa from salares (salt flats) (Bolivia [Plurinational State of], Chile and Argentina)
- quinoa from sea level (Chile)

The spread of worldwide quinoa is made of strong relationship between institutions that share their genetic material. Nowadays, quinoa was tested in all the continents and cultivated in more than 125 countries.

The reasons why we consider quinoa as a model crop for sustainable agriculture development include:

- adaptive crop for marginal environments;
- agroecological practices that help improve resource efficiency production with low external inputs and few water consumption;
- nutrition-sensitive agriculture,
- incomes for small-scale farmers;
- farmers maintain agrobiodiversity for global changes adaptation.



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Speaker:

Rakesh Kumar Singh

Presentation title:

Germplasm improvement for the saline and dry marginal environment

Key Messages:

Quinoa is the best crop for highly saline and dry climate. Tailor-made varieties based on product profile lead to better acceptability. Saponin-free varieties are the game changers. Marker-assisted selection supplemented breeding efforts can speed-up the germplasm improvement.

Summary:

Quinoa has a wide range of variability for salinity tolerance and drought tolerance. With good experience working on quinoa introduction, breeding and agronomy, ICBA has developed five quinoa varieties.

ICBA is working on introgression of winning traits, which are game changers to develop improved quinoa varieties.

- Already identified the donors for the 'traits of interest' to be utilized in breeding programmes.
- Strengthening marker assisted selection to supplement breeding.
- Extensive phenotyping of the association mapping panel through MET at eight locations for reliable QTL identification.
- Develop high yielding, sweet and early maturing quinoa varieties in accordance to product profiles for different regions.



Speaker:

Ndeye Ndack Diop

Presentation title:

Emerging opportunities in quinoa production

Key Messages:

Promoting quinoa production faces some challenges, including access to quality seeds, suboptimal crop management techniques and the lack of technical proficiency. More quinoa collaboration is needed to increase agricultural productivity of farmers in marginal lands.

Summary:

The UN declared 2013 as the International Year of Quinoa, with the objective to increase awareness of quinoa as a strategic crop for food security and to promote production and consumption. FAO was designated as the technical secretariat and was to implement the global programme among at least 29 countries in Africa, the Near-East and Asia. During the projects, about ten varieties of quinoa were evaluated in different agroclimatic conditions per country. Season-long training, field days and demonstration trials as well as different capacity developing activities were carried out. The projects showed that in some countries, quinoa was better adapted to dry season planting under irrigation.

Promoting quinoa production faces some challenges, as following:

- access to quality seeds
- suboptimal crop management techniques
 - hand sowing
 - poor stand establishment
 - high weed infestation
- lack of technical proficiency
 - crop failed totally in some countries
 - yield instability over the years

Developing technical guide for farmers in local languages are also critical for quinoa cultivation.

Way forward

- Research ongoing for enhancing the access and adaptation of the genetic material.
- Larger number of accessions under evaluation.
- Quinoa is in the process of being included in the registered crop list (Burkina Faso, Niger, Togo).
- Varieties released in new country producers (Bhutan, Burkina Faso, Pakistan).
- Utilization and post-harvest technology.
- Promote quinoa for crop rotation, diversification.
- Creating and maintaining communication platforms (research, technician, growers' levels):
 - GCN-Quinoa (<https://gcn-quinoa.org/>), a CoP to fill the knowledge gap in quinoa production
 - in Morocco, WhatsApp group for growers
 - in Algeria, Facebook pages and small business <https://www.facebook.com/groups/Algquinoa/>
- In most cases, government ownership and willingness to adopt quinoa is high.
- FAO is initiating a new collaboration with CIRAD and ICBA in new programmes to increase agricultural productivity of farmers in marginal lands.

WEBINAR REPORT 6: WATER AND NUTRITION: FROM RESEARCH TO ACTION

Description

The Global Framework on Water Scarcity in Agriculture (WASAG) hosted by FAO's Land and Water Division organized its sixth webinar on "Water and nutrition: From research to action".

This webinar, drawing on the work of the WASAG Working Group on Water and Nutrition, describes the important linkages between water and nutrition, and the importance of synergistic water-nutrition strategies for improved well-being and planetary health. A distinguished panel described the key linkages between water use and nutrition as well as the impacts from unsustainable



consumption for the world's water resources, presented examples of implementation of water-sensitive nutrition interventions and stressed the need for the development of policy actions in the water-nutrition space, which are now even more urgently needed as a result of the COVID-19 pandemic.

Overview

Recording: <https://www.youtube.com/watch?v=OzxLgRJf0wU&feature=youtu.be>

Number of registrations: 529

Number of participants: 291

Number of countries of represented: 83

Programme

Tuesday, 23 June 2020, 15.00-16.30 CEST (UTC+2)

Moderator: Ms Claudia Ringler, Deputy Director of Environment and Production Technology Division, IFPRI

15.00-15.05	Introduction to the WASAG Working Group on Water and Nutrition: Ruhiza Jean Boroto, WASAG Secretariat
15.05-16.35	Presentations: <ol style="list-style-type: none"> 1. Harmonizing actions on Water and Nutrition within the United Nations Decades on Water and Nutrition; Stineke Oenema, Coordinator, United Nations System Standing Committee on Nutrition (UNSCN) 2. The water-nutrition productivity gap; Jan Lundqvist, Stockholm International Water Institute and WASAG Working Group on Water and Nutrition coordinator 3. Combining water and nutrition interventions: Insights from the field; Mercy Chikoko, FAO Southern Africa
15.35 -16.15	Discussion/Questions and Answers
16.15-16.30	Summary thoughts: Sasha Koo-Oshima, FAO Land and Water

Speakers

Ms Stineke Oenema - Coordinator, United Nations System Standing Committee on Nutrition (UNSCN)

Prof Jan Lundqvist - Senior Scientific Advisor, Stockholm International Water Institute and WASAG W&N WG coordinator

Dr Mercy Chikoko - Nutrition Officer for the Sub-Regional Office for Southern Africa, FAO

Webinar summary

Water use in agriculture is fundamental for both food security and rural livelihoods, but also supports improved nutrition through many pathways; in tandem with water uses in other sectors, notably Water, Sanitation and Hygiene (WASH). There are many close linkages between nutrition and water. Each drop of water used for agriculture should also contribute to produce more nutritious food, providing a healthy and balanced diet. For the world to emerge more resilient after the COVID-19 pandemic, we must change how we think about food and recognize the close links between nutrition, health, water and human behaviour. Findings from case studies provide good experience to closing the water-nutrition gap.



Speaker:
Stineke Oenema

Presentation title:
Harmonizing the United Nations Action of Decades for Water and Nutrition

Key Messages:
Developing nutrition-sensitive water management, supporting sustainable healthy diets and addressing inequities are entry points to close the water-nutrition gap.

Summary:

Harmonizing the decades of nutrition and water:

(1) Ensure nutrition amid growing water stress (competition, demand and pollution) and climate change:

- household water availability indicator: significant association between household water and food insecurity;
- competition for water between households and ecosystems;
- climate change disturbs water-related ecosystems and food production (crops, fisheries, livestock);

- quality of water: wastewater is a valuable (sometimes the only) source of water, nutrients and organic matter for farmers, but is often untreated.

(2) Nutrition-sensitive agricultural water management, not just irrigation:

- consider diversification and better utilization of crops, and income;
- most agriculture is rainfed: need for better water management for nutrition via rainfed agriculture supported by supplemental irrigation;
- joint action at farm household, community and government level.

(3) Ensure the environmental sustainability of diets:

- limited knowledge on water use for food production, processing and preparation;
- dietary patterns change, with implications for water use;
- food availability increases, yet, 30 percent of food is lost or wasted;
- Mediterranean diet has \pm 29 percent lower water footprint (WF) than American diet (Blas *et al.*, 2016)

(4) Explicitly address social inequities in water-nutrition linkages:

- Right to adequate food, right to water, right to health are all interrelated.

Summarizing - entry points to close the water-nutrition gap:

- develop nutrition-sensitive water management;
- support sustainable healthy diets;
- address inequities.



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Speaker:

Jan Lundqvist

Presentation title:

The water-nutrition productivity gap, the case of Ethiopia:
Walking on two water legs for nutrition

Key Messages:

Walk on two water legs to reduce water-nutrition productivity gap: i) water for food with high nutrient density and ii) water in WASH (absorption of nutrients in the food eaten).

Summary:

Findings and messages:

- Improved nutrition: production, access, habits and absorption of nutrients in food eaten: from field to finger to stomach.
- Enhanced productivity, especially in smallholdings: better coordination of water, mineral and organic fertilizers, seeds.
- Coordination is more pragmatic than integration: community and basin level.
- For farmers to benefit from expanding market opportunities: logistics, (public) purchase of nutritious produce.

**Speaker:**

Mercy Chikoko

Presentation title:

Combining water and nutrition interventions: Insights from the field

Key Messages:

Developing diversified food production with less water is an important approach to combine water and nutrition.

Summary:

Poor WASH conditions lead to diarrhea, intestinal worms and inhibits the body's ability to absorb nutrients. Studies have demonstrated that prevalence of acute malnutrition is higher among children from households who walked more than 60 minutes to fetch water addition to sanitation. In the past two years, FAO Africa has developed food-based dietary guidelines (FBDGs) in eight countries and included issues of sustainability in the messages and visual illustrations.

Different production of nutrient dense food has been promoted. For example, Lesotho is well known for raised gardening where water usage is lesser.

In Angola, FAO supported the project of spirulina production in 2017 to 2018, which is a super food that uses less water and space. More than 0.8 ton of spirulina powder and granules were produced. Over 300 kg of spirulina were distributed to vulnerable children and elderly people, resulting in improved nutritional and health status.

Other water and nutrition sensitive programmes:

- next champion super food: moringa tree;

- use of grey water for food production;
- aquaponics;
- integrated fish and chicken farming;
- water harvesting for food production.

Way forward

- The findings from the webinar are of particular importance for the UN Food Systems Summit 2021 and will feed into various outreach materials in support of the Summit.
- The findings will also feed into the e-consultation of the Committee on World Food Security (CFS) on the High-Level Panel of Experts (HLPE) report on water for food security and nutrition.
- Finally, the findings will be reflected on key publications planned under the WASAG Working Group on Water and Nutrition, that is, the special issue and the factsheets.



WEBINAR REPORT 7: PANDEMICS/EPIDEMICS, DROUGHT AND AGRICULTURE: BUILDING BACK BETTER

Description

The Global Framework on Water Scarcity in Agriculture (WASAG) hosted by FAO's

Land and Water Division organized its seventh webinar on "Pandemics/Epidemics, Drought & Agriculture: Building back better". This webinar was organized by leading institutions on drought management, including the Integrated Drought Management Programme (IDMP), the UNCCD Drought Initiative and the WASAG working group on "Drought Preparedness."

The COVID-19 pandemic will have a disproportionate impact on vulnerable individuals and groups with precarious labour conditions, economies, those who are unemployed and those who are not able to work. Ongoing drought effects on the livelihoods and health of the poorest and most vulnerable people make them also the most vulnerable to the COVID-19 pandemic and its effects on human immune systems, supply chains and economies. The global initiatives to achieve a green recovery offer a defining moment that could either strengthen or weaken current efforts to achieve a drought resilient and sustainable society.

This webinar discussed the pathways through which drought vulnerable groups have been hit by the COVID-19 pandemic and left behind during the lockdown. The options and policy recommendations for an inclusive green recovery were also elaborated. Discussions involved identifying and mitigating the unintended economic and health consequences of the COVID-19 pandemic response and how to include drought vulnerable groups in COVID-19 pandemic decision-making and management.

Overview

Recording: <https://www.youtube.com/watch?v=z0Oz48skuxA&feature=youtu.be>

Number of registrations: 523

Number of participants: 217

Number of countries of represented: 82

Programme

Tuesday, 10 July 2020, 15.00-16.30 CEST (UTC+2)

Moderator: Mr Robert Stefanski - Chief, Agricultural Meteorology Division, World Meteorological Organization

15.00-15.10	Opening remarks, Mr Robert Stefanski - Chief, Agricultural Meteorology Division, World Meteorological Organization
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15.10-16.15	Presentations:
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1. Impacts of drought on human health in a global pandemic; Dr Jesse Bell, Department of Environmental, Agricultural, and Occupational Health, University of Nebraska Medical Center
2. Locking in livelihoods, locking out the COVID-19 pandemic? Impacts and insights for post-pandemic recovery in drought-vulnerable communities of Western Africa; Dr Festus Asaaga, Centre for Ecology & Hydrology, United Kingdom of Great Britain and Northern Ireland
3. Drought, infectious diseases and multiple stressors on vulnerable communities; Dr Beth Purse, Centre for Ecology & Hydrology, United Kingdom of Great Britain and Northern Ireland
4. Drought-COVID-19 pandemic interface: Insights for post-pandemic recovery in pastoral systems; Dr Oliver Wasonga, Department of Land Resource Management and Agricultural Technology (LARMAT), University of Nairobi

16.15-16.30	Questions and answers session
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Speakers

Dr Jesse Bell - Department of Environmental, Agricultural, and Occupational Health, University of Nebraska Medical Center, United States of America

Dr Festus Asaaga - Centre for Ecology & Hydrology, United Kingdom of Great Britain and Northern Ireland

Dr Beth Purse - Centre for Ecology & Hydrology, United Kingdom of Great Britain and Northern Ireland

Dr Oliver Wasonga - Department of Land Resource Management and Agricultural Technology (LARMAT), University of Nairobi, Kenya

Webinar summary

The COVID-19 pandemic is known to disproportionately impact specific populations, such as those of lower socioeconomic status, migrant workers and the elderly – populations already known to be at-risk during drought events. The linkages between infectious disease impacts and drought can be difficult to define, as such impacts accumulate over time and can be influenced by numerous environmental and societal conditions. However, drought stressors can induce intersecting human disease burdens through a variety of observed impacts, such as drought-induced population displacement or increased use of contaminated water. Engaging smallholders and pastoralist communities in the design of COVID-19 pandemic recovery planning can generate more broad-based and inclusive policies that are location specific. When implemented at different levels to address the interactions between infectious diseases, drought, and existing socioeconomic inequalities that contribute to long-term vulnerabilities, more resilient systems can be constructed. In Africa, where 40 percent of land is used in livestock production, responses that engage pastoral systems can help to ensure measures taken to reduce the impact of the COVID-19 pandemic do not disproportionately and negatively impact existing vulnerabilities.



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Speaker:

Jesse Bell

Presentation title:

Impacts of drought on human health in a global pandemic

Key message:

Drought is linked to human health and impacts at-risk populations highly similar to that of the COVID-19 pandemic, resulting in potential for cascading impacts on populations exposed to the COVID-19 pandemic. Drought programmes designed to assist socially disadvantaged people can also assist people impacted by the COVID-19 pandemic.

Summary:

No doubts, droughts threaten health, shape history and cause large economic impacts. Droughts have also been shown to be a driver of conflicts in different parts of the world. Studies have shown that in the last century, drought has likely caused more deaths than any other climate or weather related disaster globally. This is largely due to famine and malnutrition. For instance, in the United States of America drought is not regarded as a human threat but has caused significant impacts on the economy. Drought-related deaths were not reported between 2004 to 2013 in the United States of America, but economic losses associated to drought events were estimated at about eighty billion dollars. It is difficult to single out the relationship between droughts and human health because drought evolves slowly, their impacts are not immediate, and multiple steps are required in between drought and human health outcomes. Thus, health surveillance is not designed to connect drought and human health. Many pandemics and epidemics such as the Zika virus and Ebola have been associated with drought events. Therefore, drought programmes should be designed to assist socially disadvantaged groups. Interventions to reduce the human health outcomes associated with drought should be implemented.



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Speaker:

Dr Festus Asaaga

Presentation title:

Locking in livelihoods, locking out the COVID-19 pandemic? Impacts and insights for post-pandemic recovery in drought-vulnerable communities of Western Africa

Key message:

Emerging infectious diseases (such as the COVID-19 pandemic) are re-shaping the contours of multilayered social vulnerability by exacerbating pre-existing inequalities that responders must be aware of in order to conduct meaningful actions.

Summary:

Agriculture is Africa's most important sector, contributing to about 23 percent of the region's GDP. In fact, in sub-Saharan Africa, agriculture provides jobs for about 60 percent of the economically active population, according to the World Bank. However, widespread environmental degradation that characterizes the region and the looming impacts of climate change are threatening agricultural production. So, there are interlinkages among livelihood, pandemics and agricultural production, especially in drought-vulnerable communities. Thus, the implications for post-COVID pandemic recovery planning are:

1. Impact of infectious diseases under drought conditions are critically dependent on context and underlying population vulnerability.
2. Meaningful engagement and participation of smallholder and pastoralist communities in the design of post-COVID-19 pandemic recovery planning and responsiveness.
3. Broad-based and inclusive policies that are location specific implemented at different levels (communities, subnational and national) are critical to adequately address the interacting impact of infectious diseases and other existing socioeconomic inequalities that contributes to vulnerability.

Therefore, it is important to create awareness about pandemics and public health safety measures, and safeguard security and equitable tenure rights to stimulate investments in sustainable land management practices as short-term and long-term measures, respectively.



Speaker:

Beth Purse

Presentation title:

Drought, infectious diseases and multiple stressors on vulnerable communities

Key message:

Drought can have wide ranging pathogen and community specific impacts on infectious disease burdens and induce multiple stressors impacting human, animal, and crop health; these factors necessitate intersectoral approaches such as One Health.

Summary:

Droughts can impact many types of infectious diseases, including vector-borne, water-borne, zoonotic as well as soil-borne diseases. There are challenges in attributing infectious diseases impacts to drought since:

- droughts are slow onset events and impacts accumulate over time;
- infectious diseases are sensitive to multiple environmental change drivers such as flooding, warming etc.;
- context and underlying population vulnerability are critical in determining disease impacts under drought.

Also, studies have shown that drought-flood sequences can precipitate midge-borne livestock diseases. For example, drought was the pathway to the first outbreaks of *E. coli* in Eswatini (Swaziland) and South Africa in the 1970s. Drought caused stress on livestock, so there was extensive use of human water sources by livestock, which later concentrated pathogens within water sources. When heavy rain arrived, the pathogens spread widely and facilitated exposure. However, care is required in attributing infectious disease impacts to drought and other climate anomalies. The diverse and interacting social, political, and ecological mechanisms responsible for increasing infectious disease impacts under drought must be better researched and accounted for in interventions.



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Speaker:

Oliver Wasonga

Presentation title:

Drought-COVID-19 interface: Insights for post-pandemic recovery in pastoral systems

Key message:

The COVID-19 pandemic has directly amplified drought risks by disrupting social safety networks, mobility, markets, and education in pastoral systems. Response must focus on the protection of productive assets in an integrated health approach supporting long-term planning.

Summary:

Pastoral systems are vast, comprising 40 percent of Africa's land and contributes about 10 to 44 percent GDP of African countries. Also, about 1.3 billion people in Africa benefit from livestock. Water scarcity directly affects pasture, which causes migration among pastoralists, congregation of livestock around water sources and could lead to food scarcity.

Since the beginning of the COVID-19 pandemic, pastoralists have experienced restricted mobility, severed social networks, restricted sociocultural events, closure of livestock markets, loss of casual employment, severed trade linkages and more importantly, restricted access to human and livestock health services. The priorities for post COVID-19 pandemic pastoral recovery should include improvement of livestock markets, management for equitable and reliable access to pasture and water, provision of health infrastructure and services to deal with future epidemics/pandemics, as well as embracing integrated health approaches (One-health/eco-health/planetary health). There is a need to support participatory learning and research, national and regional policies on drought and epidemics, learn from pastoralists' responses and strengthen contingency funds and early actions.

Way forward

- It is important to engage with health departments to understand drought impacts on health.
- We must strengthen and build capacity for intersectoral collaboration within a “One Health” paradigm to support the development of robust and contextually appropriate interventions towards reducing vulnerability to emerging zoonotic diseases.
- Longitudinal studies employing interdisciplinary approaches are essential for understanding:
 - the social, political, and ecological mechanisms that produce increases in infectious disease impacts in culturally fragmented landscapes;
 - the multiple interacting stresses affecting drought vulnerable communities under drought;
 - the potential and traditional resilience mechanisms of drought vulnerable communities and how these interact with local livelihood priorities as well as multilevel environmental and health policies.
- Key opportunities exist in integrating infectious disease impacts from climate anomalies (e.g. drought) into existing Early Warning Systems.
- Technology can accelerate learning among pastoral children (e.g. e-learning).



WEBINAR REPORT 8: WATER PRODUCTIVITY IMPROVEMENTS – A SILVER BULLET FOR THE CLIMATE CRISIS?

Description

The Global Framework on Water Scarcity in Agriculture (WASAG) hosted by FAO's

Land and Water Division organized its eighth webinar on "Water productivity improvements: A silver bullet for the climate crisis". This webinar was organized by leading institutions on sustainable agricultural water use, including the International Water Management Institute (IWMI), the CGIAR research programme on Water, Land and Ecosystems (WLE), the World Bank, the African Union, the Swiss Federal Office for Agriculture (FOAG), the International Food Policy Research Institute (IFPRI), and the WASAG working group on "Sustainable Agricultural Water Use".

A White Paper titled "Can water productivity improvements save us from global water scarcity?" has been drafted based on the discussions at the Working Group workshop (held on 25-27 February 2020, at CIHEAM in Bari, Italy) and further consultations and literature research. The White

Paper reviews the state of knowledge, presents relevant methodologies and approaches, and offers key policy recommendations to scale interventions and to ensure effective solutions across scales. Through this webinar, the main messages of the White Paper on water productivity were presented and feedback from key stakeholders were received. This webinar also discussed the potentials and limitations of water productivity interventions in helping water managers (from the farm to the basin level) to deal with growing scarcity due to climatic and other changes.

Overview

Recording: <https://www.youtube.com/watch?v=hp1N2rfvV38&feature=youtu.be>

Number of registrations: 1042

Number of participants: 555

Number of countries of represented: 80

Programme

Tuesday, 14 July 2020, 15.00-16.30 CEST (UTC+2)

Moderator: Mr Stefan Uhlenbrook - Strategic Programme Director - Water, Food and Ecosystems, IWMI

15.00-15.10	Opening remarks, H.E. Mohammad Hossein Emadi - Ambassador and Permanent Representative of the Islamic Republic of Iran to FAO
15.10-16.15	Panel discussion: <ol style="list-style-type: none"> 1. Mr Winston Yu - World Bank 2. Ms Laura Sommer - Federal Office for Agriculture (FOAG), Switzerland 3. Mr Agbonlahor Mure Uhumamure - African Union Commission 4. Mr Sudhanshu Kumar - Innovative farmer, State of Bihar, India 5. Ms Claudia Ringler - Deputy Director of Environment and Production Technology Division, IFPRI
16.15 - 16.25	Questions and Answers
16.25-16.30	Closing remarks, Ms Claudia Sadoff - Director General, IWMI

Speakers

Mr Winston Yu - World Bank

Ms Laura Sommer - Federal Office for Agriculture (FOAG), Switzerland

Mr Agbonlahor Mure Uhunamure - African Union Commission

Mr Sudhanshu Kumar - Innovative farmer, State of Bihar, India

Ms Claudia Ringler - Deputy Director of Environment and Production Technology Division, IFPRI

Webinar summary

Sustainable agricultural water management is essential for achieving food and nutrition security for all, supporting livelihood and economic growth, especially in arid and semi-arid areas that accommodates about 2 billion of the world's population. The threats of climate change, population growth and water scarcity show that urgent responses are required to include water management in the agricultural sector. It is imperative that the agricultural sector develop and implement action-oriented plans to enhance sustainable agricultural water management and promote water productivity. The three levels of decision-making, which are water governance, water management and technological aspect, need to be integrated to achieve sustainable agricultural water management.



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Speaker:

Winston Yu

Presentation title:

Water productivity improvements: A silver bullet for the climate crisis

Key message:

A White Paper was produced following a workshop discussion on water scarcity. The recommendations are as follows:

1. Monitor and assess – Develop water accounts and consider impacts of future changes and natural variability.
2. Set consumption limits – Identify sustainable boundaries for current and future water use at the basin scale and set appropriate allocations for agriculture.

3. Think systems – Design and implement agricultural water use interventions with the wider system context in mind.
4. Manage trade-offs – Use multiple policy instruments to achieve multiple objectives.
5. Maximize and share benefits from agriculture – Set targets for agricultural water use that maximize the benefits from the sector and ensure that farmers and vulnerable populations can thrive.
6. Evaluate, learn, and communicate – Put in place iterative processes of learning to build progress towards maximizing benefits from agricultural water use within sustainable limits.



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Speaker:

Laura Sommer

Key message:

Sustainable and resilient food systems and functioning ecosystems including water resources are strongly interdependent and the food and agriculture sectors are severely affected by climate change, including temperature anomalies, biodiversity loss and water scarcity or excess. Therefore, transformative change of food systems is vital for increasing the resilience of vulnerable ecosystems and populations. This calls for transitions towards win-win climate resilient agroecological solutions.

Summary:

Water productivity improvements should aim at impacting policymaking for more sustainable and resilient food systems. The policy reforms in the water and agriculture sectors are often catalysed by situations of acute water stress and driven by post-crisis measures to mitigate future similar water stress situations. In abnormal or so-called normal times, water users have been handling water extraction based on generation-old experience of availability, unpredictable weather patterns and well-established social water sharing systems. But the new normal is unpredictability. This is even true for Switzerland which has been considered “the unshakable water castle of Europe”, with almost unlimited water resource availability until a few years ago. Robust databases on water resources, equitable and reliable water governance mechanisms, avoidance of negative incentives for excessive water extraction and comprehensive policies on water quality and prevention of pollution should be integrated in water management.



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Speaker:

Agbonlahor Mure Uhunamure

Key message:

It is important to share knowledge and experience to navigate the issues of water scarcity and recognize feasible solutions from solutions that are failing.

Summary:

Setting allocations on consumptions is key and necessary to achieve water productivity. Increasing water productivity is also a vital means to achieve sustainable water use. Apart from that, setting consumption limits goes a long way in avoiding water wastage and minimizing water losses. Also, considering multiple water users, setting consumption limits will render the users more conscious of how they use water. There are efficient, affordable, and adoptable technologies that can be used in terms of crop water scheduling and irrigation scheduling, which can be scaled-up to other locations, thus ensuring optimal water use. The recently launched “African Union Irrigation Development and Agricultural Water Management Framework” of the African Union Commission provides different pathways that Member Nations can adopt in irrigation development, which facilitates sustainable agricultural water management.



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Speaker:

Sudhanshu Kumar

Key message:

Policies could have direct (positive or negative) implications on farmers and their activities, thus it is important that farmers be part of policy formulation processes.

Summary:

There are many policies formulated in the agriculture sector without considering the farmers who usually bear the brunt of bad policies. However, when good policies are formulated, farmers immensely benefit from them. A typical example is the newly introduced policy that provides a 90 percent subsidy on micro-irrigation systems for farmers in India. Before this policy, most farmers practiced traditional flood irrigation methods which inefficiently supplies water to crops, thereby resulting in low yields and low income for farmers. However, with the introduction of subsidies on micro-irrigation systems, water productivity has increased, yields have increased, and farmers' profit have increased tremendously. In fact, farmers can recover their investments in micro-irrigation within two years.



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Speaker:

Claudia Ringler

Key message:

The recommendations of the White Paper are relevant because water sustainability is out of reach at this point and we are moving into a world where inequity in access to water uses is growing.

Summary:

Most Ministers of Agriculture around the world are already jointly committed to use water more sustainably and everyone is looking forward to guidelines to translate the goals into reality. There are three areas that needs further strengthening.

1. Stronger focus should be on farmers directly. Farmers are the key agent of change in agriculture water management; thus, they must be involved in decision-making processes. Farmers are more interested in investing in micro-irrigation due to the multiple benefits that derive from it.
2. Effective coordination is necessary in water governance. Setting a limit on water extraction might be effective if collective action mechanisms are not in place.
3. Water productivity can be improved more quickly and more sustainably through water-related interventions rather than through water-centred interventions such as crop breeding aimed at shorter duration or varieties that change the ratio of grain to total biomass. Changing diets could also lead to sustainable water management and higher water productivity.

Way forward

- Governments need to move from crisis management to preparatory and proactive mitigation of water scarcity and stress.
- Governments have key roles to play in providing enabling environments for collective water governance.
- Policy reforms on all levels should be driven by foresight (not hindsight) in water management.
- Addressing issues of water governance and regulations with regards to the transformation towards more sustainable and resilient food systems needs to be clear, concise and formulated in policy language fit for government implementation.
- Efficient, affordable and adoptable technologies that facilitates optimal water consumption are needed and should be embraced.
- Micro-irrigation is a typical example of sustainable agricultural water management in India; thus, it should be encouraged in similar settings.



WEBINAR REPORT 9: COLLABORATION ON PROMOTING QUINOA (PART II)

Description

The Global Framework on Water Scarcity in Agriculture (WASAG) hosted by FAO's

Land and Water Division organized its ninth webinar under the title: "Collaboration on promoting quinoa (part 2)".

As quinoa is an important salt and drought tolerant crop, WASAG is coordinating international efforts towards extending its production. The biodiversity of quinoa, germplasm improvement suitable for marginal environments as well as the emerging opportunities in quinoa production were initially discussed in the webinar titled: "Collaboration on promoting quinoa (part 1)". However, the discussion needs to continue. Through this webinar in collaboration with CAAS, ICBA and CIRAD, the success stories of production and strategies of adopting quinoa in some countries were presented. The nutritional benefits and value chain of quinoa were also discussed in this webinar.

Overview

Recording: <https://www.youtube.com/watch?v=lXEd4ghfLkk&feature=youtu.be>

Number of registrations: 348

Number of participants: 178

Number of countries of represented: 33

Programme

Tuesday, 28 July 2020, 15.00-16.30 CEST (UTC+2)

Moderator: Ms Dongxin Feng, Chief, FAO PSU

15.00-15.05	Opening remarks, Dongxin Feng, Chief, FAO PSU
15.05-15.35	Presentations, round 1: <ol style="list-style-type: none"> 1. Quinoa: A fast-developing multipurpose crop in China - Guixing Ren, CAAS 2. Success story of quinoa introduction and adoption through effective valorization in Morocco - Abdelaziz Hirich, African Sustainable Agriculture Research Institute (ASARI), Mohammed VI Polytechnic University (UM6P), Morocco 3. Boost to the internal consumption of quinoa in Bolivia (Plurinational State of) and its international reach - Ricardo Rodriguez, Bolivia (Plurinational State of)
15.35 -15.50	Questions and Answers
15.50 -16.10	Presentations, round 2: <ol style="list-style-type: none"> 4. A sustainable food value chain (SFVC) approach for quinoa development - Giang Duong and Aimée Kourgansky, FAO ESA 5. A nutrition-sensitive approach for quinoa development - Ana IslasRamos, FAO ESN
16.10 -16.25	Questions and Answers
16.25-16.30	Closing remarks, Didier Bazile, CIRAD

Speakers

Dr Guixing Ren - Professor, Institute of Crop Sciences (ICS), Chinese Academy of Agricultural Sciences (CAAS)

Dr Abdelaziz Hirich - Assistant professor of Biosaline agriculture, African Sustainable Agriculture Research Institute (ASARI), Mohammed VI Polytechnic University (UM6P), Morocco

Dr Ricardo Rodríguez Márquez - Independent Consultant, Bolivia (Plurinational State of)

Ms Aimée Kourgansky - Value Chain Development Consultant, ESA, FAO

Ms Giang Duong - Value Chain Development Consultant, ESA, FAO

Ms Ana Islas Ramos - Nutrition officer, ESN, FAO

Webinar summary

Non-conventional stress-tolerant crops – quinoa being among those attracting much interest in recent years – can play a central role in sustaining agricultural productivity and food security under climate change conditions, particularly in marginal areas where the natural resource base is already poor or has been degraded. Proposed by the government of Bolivia (Plurinational State of) and receiving strong support from many Central and South American countries, quinoa has now been singled out by FAO as a food with high nutritional value, impressive biodiversity and an important role to play in the achievement of food and nutrition security worldwide. China and Morocco have examples of success stories in introducing and promoting quinoa, which provide valuable experiences for other developing countries. Quinoa is a whole grain with an interesting nutrition profile. The nutrition-sensitive and value chain approach are essential for its promoting.



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Speaker:

Guixing Ren

Presentation title:

Quinoa: a fast-developing multipurpose crop in China

Key message:

China has become the third quinoa producer in the world, with 18 varieties that have been released through variety testing, registration and evaluation. The quinoa industry has good prospects in China, considering salt-tolerant and water-saving agriculture demands, huge market potential, nutrition and health potential.

Summary:

The spread and distribution of quinoa in China:

China has become the third quinoa producer in the world, ranking after Peru and Bolivia (Plurinational State of). Quinoa has been distributed in more than 20 provinces.

Current status of the quinoa industry in China:

- 18 varieties have been released through variety testing, registration and evaluation.
- Manual and mechanical methods are used in sowing and harvesting.
- There are more than 100 registered quinoa processing companies, and half of them are located in Western China. The products are noodle, bread, yellow wine, milk, biscuit, liquor and pre-cooked quinoa. The marketing channel includes e-commerce site and supermarket.

Poverty alleviation - A case in Northwest of China:

In the Tianzhu Tibetan Autonomous County of Gansu Province, quinoa planting income was USD 2 570 per ha (increased by USD 1 400 and 1680 per ha, compared to broad bean and barley).

The prospects of quinoa industry in China:

To meet the salt-tolerant and water-saving agriculture demands, quinoa has a huge market potential in China. The quinoa planting area and the total production are expected to be continuously increase by 2025.

Nutritional and health potential:

Quinoa polysaccharides, proteins and peptides showed a lot of health benefits, such as hypolipidemic and antihypertension effects.



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Speaker:

Hirich Abdelaziz

Presentation title:

Success story of quinoa introduction and adoption through effective valorization in Morocco

Key message:

Morocco has shown a success story in introducing and promoting quinoa through introductions trials, economic analysis, machines development, marketing studies, promotion activities and capacity building.

Summary:

The province of Rehamna is one of the poorest in Morocco. It is afflicted by irregular droughts and precipitations and needs to replace a cactus crop that was destroyed by a cochineal.

It also faced challenges in terms of quinoa introduction, such as:

- limited availability of genetic material for growing quinoa outside its native environment;
- limited knowledge of best practices on quinoa production and processing;
- lack of awareness around the nutritional benefits of quinoa and the complexity of integrating it into local diets;
- absence of marketing channels and appropriate marketing strategies.

Morocco introduced different varieties of quinoa for introduction trials, from which ICBA Q5 has the highest yield. Quinoa showed a higher net margin compared with wheat and barley, according to economic analysis. Some machines for post-harvesting were developed in the project. Seed-shelling effects on nutrient and saponin content were conducted. Marketing studies have shown that the optimal price for acceptability is between USD 4 to 5.2 per kg. Promotion activities are also important to introduce quinoa to the public, which raise awareness on the benefits of quinoa.



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Speaker:

Ricardo Rodríguez Márquez

Presentation title:

Boost to the internal consumption of quinoa in Bolivia (Plurinational State of) and its international reach

Key message:

The celebration of the International Day of Quinoa Consumption initiative is a very important space that was created and boosted for the consumption and production of quinoa, for the countries that are traditionally producers and those that adopted the cultivation.

Summary:

Quinoa has been domesticated and cultivated by ancient Andean cultures since 5000 BCE. Bolivia (Plurinational State of) produces approximately a total of 70 000 tons of quinoa in the Northern, Central and Southern Altiplano, among which only 15 000 tons go to internal and external marketing. The rest are from families that produce for self-consumption.

However, the value of per capita consumption of quinoa of 23 kg/year in 2019 is far from the real thing. Food subsidies do not reach the entire population and are not sufficient to solve nutrition problems. There are bad eating habits in the population and there is still malnutrition and anemia in children of Bolivia (Plurinational State of). There is no day in the year to remember and boost quinoa consumption in Bolivia (Plurinational State of) or internationally.

Therefore, in 2018, the celebration of 7 July was proposed in Bolivia (Plurinational State of) on a private initiative as the International Day of Quinoa Consumption and five countries participated in the activities, including events, fairs, tastings and presentations. In 2019, the number of countries that were involved in the celebration of the International Day of Quinoa Consumption was increased to seven. In 2020, in commemoration of this day, an international webinar was held, titled "Quinoa production and consumption, current situation and challenges in times of the COVID-19 pandemic", with the organization and active participation of 12 countries. The celebration of the International Day was generalized and consolidated. A very important space was created and boosted for the consumption and production of quinoa, for the countries that are traditionally producers and those that adopted the cultivation.



Speakers:

Giang Duong and Aimée Kourgansky

Presentation title:

A sustainable food value chain (SFVC) approach for quinoa development

Key message:

The potential of a sustainable food value chain (SFVC) approach for quinoa development was described, considering both the functional analysis of the actors of the value chain (VC) and the impacts of VC operations in terms of economic, social and environmental sustainability.



Summary:

The sustainable food value chain (SFVC) approach for quinoa development starts with a quinoa value chain analysis:

- functional analysis:
 - VC mapping
 - end-market analysis
 - analysing the elements
- core VC
- support services
- societal environment
- natural environment
 - governance analysis.
- sustainability assessment:
 - assessment of triple bottom line sustainability;
 - SDG-level impacts based on quantitative indicators;
 - sustainability hotspots flagged.
- vision and upgrading development:
 - SWOT analysis

- vision and upgrading strategy
- value chain development project design, action plan.

**Speaker:**

Ana Islas Ramos

Presentation title:

A nutrition-sensitive approach for quinoa development

Key message:

Quinoa is a whole grain with an interesting nutrition profile. A nutrition-sensitive approach is essential for considering all the actors of the food systems, from producers to consumers.

Summary:

Nutrition-sensitive agriculture involves maximizing agriculture's contribution to nutrition, food-based (variety, nutritional value, social-rural livelihoods) and multisectoral approaches including poverty, gender equity, and nutrition education. The difficulty of a nutrition-sensitive approach is including nutrition and agriculture dimensions for elaborating integrated alternatives that cover varieties, agricultural practices, transformation and markets, and acceptance by consumers.

Quinoa is a whole grain with an interesting nutrition profile (good source of bioavailable protein, polyunsaturated fats, vitamins and minerals). However, its potential to improve nutrition depends on many factors:

- Is it the best solution in the context where it is proposed?
 - Does it address the nutrition issues?
 - Alternative solutions could be simpler.
- Not only acceptance by consumers, but access (financial and physical), competition of other products/practices, addressing real needs, etc.
- Does no harm.

Way forward

- The collaboration between countries which have success stories on quinoa and countries which are interested in promoting quinoa should be established.
- FAO is initiating a new collaboration with China to share Chinese experience on promoting

quinoa to other developing countries.

- Produce training material on integrated crop management (ICM).
 - Training activities to young farmers and students on ICM, using this knowledge.
 - Increase awareness and demand for quinoa and food legumes products and promote them through webinars.
- The sustainable food value chain (SFVC) approach and the nutrition-sensitive approach are Essential for promotion of quinoa development.

WEBINAR REPORT 10: SCALING RESILIENT WATER AND AGRICULTURE MANAGEMENT PRACTICES FOR SUSTAINABLE RICE INTENSIFICATION IN EAST AFRICA



Description

The Global Framework on Water Scarcity in Agriculture (WASAG) hosted by FAO's Land and Water Division organized its tenth webinar under the title: "Scaling resilient water and agriculture management practices for sustainable rice intensification in East Africa".

The webinar was organized in the framework of the research project

scaleWAYS (scaling out resilient water and agricultural systems), which is being implemented jointly by the International Institute for Applied System Analysis (IIASA), the Lake Victoria Basin Commission (LVBC) and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), with financial support from the Austrian Development Agency (ADA). Both the failures and successes of past and current pilot initiatives and practices on rice with respect to land and water management in the region were discussed.

Overview

Recording: <https://www.youtube.com/watch?v=2MLx2uhvD94&feature=youtu.be>

Number of registrations: 281

Number of participants: 161

Number of countries of represented: 81

Programme

Tuesday, 15 September 2020, 10.00-11.30 CEST (UTC+2)

Moderator: Dr Paul T. Yillia (Water Programme, IIASA), on behalf of scaleWAYS partners (IIASA, ICRISAT and LVBC)

10.00-10.10	Opening Remarks 1: Dr Paul T. Yillia
	Opening Remarks 2: Dr Henning Bjornlund, University of South Australia, on behalf of the International Water Resources Association (IWRA)
10.10-10.40	Panel discussion: <ul style="list-style-type: none"> • Prof Bancy Mati, Jomo Kenyatta University of Agriculture and Technology, Kenya: Sustainable Rice Intensification (SRI) in East Africa • Prof J. B. Okeyo-Owuor, Rongo University, Kenya: SRI in East Africa - Challenges for Water and Land Management • Ms Rachel Ajambo, Kilimo Trust, United Republic of Tanzania: Barriers and enablers towards the adoption of SRI practices • Mr Martinus van der Knapp, FAO Office for Eastern Africa: Integrated systems - Combining fisheries with rice farming • Mr Dennis Besigye, FAO Country Office, Uganda: Case study
10.40 -11.25	Contributions from the audience, including Q&A
11.25-11.30	Closing remarks: Martin Ager, FAO

Speakers

Prof Bancy Mati – Director, Water Research and Resource Center (WARREC) and Professor at Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya

Prof J. B. Okeyo-Owuor - Professor of Environmental Biology and Health at School of Agriculture, Natural Resources & Environmental Studies at Rongo University, Kenya

Ms Rachel Ajambo - Kilimo Trust, United Republic of Tanzania

Mr Martinus van der Knapp - Fisheries and Aquaculture Officer, FAO Sub-regional Office for Eastern Africa

Mr Dennis Besigye - Agricultural Water Management/Irrigation Consultant, FAO Country Office, Uganda

Webinar summary

Achieving food security remains a major challenge in East Africa. With increasing demand for food due to population growth and improvements in disposable income, the situation is expected to remain critical as the impact of climate change and unsustainable land and water management practices become more profound. The discourse on sustainable intensification practices to meet growing food demand has become increasingly relevant to balance increasing food production and sustainable agriculture, land, and water management practices.

Presentation title:

Scaling resilient water and agriculture management practices for sustainable rice intensification in East Africa

Key message:

In the framework of the research project scaleWAYS (scaling out resilient water and agricultural systems), experiences on sustainable rice intensification practices in Kenya, the United Republic of Tanzania, Uganda and other countries were shared as follows:

1. Prof Bancy Mati – Provided the historic context, including early field research undertakings on sustainable rice intensification (SRI) in Kenya and the East African region. The opportunity of SRI starts with the needs to increase yield.
2. Prof J. B. Okeyo-Owuor – There are many constraints on the growth of rice in East African countries. The five countries in the Lake Victoria basin have great disparity in land and water management issues. There are a lot of problems associated with soil fertility and land availability. Improved land and water management is required to make rice intensification a reality.
3. Ms Rachel Ajambo – SRI is a technique that farmers can apply to their fields to improve the yield. Farmers need to invest in SRI, including labour and increased inputs, to increase the yield and gain an improved market profit. A clear market signal is very important. Also, the availability, accessibility, and affordability of farm inputs (e.g., improved seeds, fertilizer, mechanisation etc.) are also important to farmers, which mean they must have access to finance, mechanization services and labour. Training activities and technical expertise are also needed.
4. Mr Martinus van der Knapp – Africa must produce more fish to meet the demand for food. Rice–fish agriculture provides a key opportunity to both produce fish and improve the quality of rice through natural fertilization. The advantages of rice–fish agriculture include reducing the use of fertilizers and pesticides, getting higher rice yield and additional fish yield. The disadvantages are rice and fish predation by birds and dependency on access to water.

5. Mr Dennis Besigye – Rice production in Uganda is estimated at 238 000 tons, yet the total consumption exceeds that amount at 346 309 tons. SRI could help redress the balance.



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Speaker:

Mr Dennis Besigye

Presentation title:

Assessment and improvement: On-farm water productivity and water use efficiency in Mubuku irrigation scheme

Summary:

Due to the gap of rice demand and gender issue as well as water scarcity, a project titled “Strengthening agricultural water efficiency and productivity on the African and global level” was developed from 2015 to 2018.

Characterization of demonstration and control farms activities were conducted to achieve outputs on improving water productivity and increasing water use efficiency.

The demonstration proved to save water. More research should be done to improve yields. The actual irrigation depth was not determined, therefore more research is needed to determine it.

Way forward

- There was a clarion call for a related webinar on gender dimensions and integrated fish farming to promote scaling and large-scale implementation of best practices for sustainable rice intensification in the region.
- There is a lack of data and analysis on gender inequalities, rice productivity and small scaled water irrigation systems. Therefore, gender analysis and gender transformative actions need to be embraced in future research and projects.
- Seeding rates should be studied to improve yields.
- Research on the plant–water–nutrient uptake relationship is needed.
- Water and land remain a limiting factor for sustainable rice intensification in the region as we hope to produce more rice for income generation and livelihood.
- A critical component of achieving the SDGs is an agricultural innovation platform to help in overcoming barriers and increase yield and productivity.

- Close attention needs to be paid to productivity, yield and profit for farmers – the need for innovation and smart water use is clear.
- If farmers do not see immediate benefit in the change in practices, they will not be adopted.
- It is important to have a lens on return on investment for all farm inputs – how do we come up with solutions that give outputs that are profitable, whether it is water management or improved livelihoods?



Conclusion: Outcomes and way forward

Without a doubt, the WASAG Webinar Series achieved the difficult task of bringing partners, stakeholders and interested people together under the COVID-19 pandemic extenuating circumstances. It demonstrated the continued will and commitment to work together on addressing issues related to water scarcity in agriculture in a changing climate. In this regard, the pandemic helped the partnership to become a more agile and efficient network, able to deliver much needed knowledge in a collaborative fashion, and bringing together contributors and participants from a rich geographical and sectoral diversity. The advent of online technology proved useful in this respect.

With ten successful webinars organized, the WASAG partnership has proved an excellent instance for opening and furthering important discussions in the fields of agriculture and water management. They have shown that the partnership has matured and is ready to play an even greater role in finding innovative solutions to water scarcity in agriculture.

One key outcome that the webinars have delivered to the participants as well as to those who read their proceedings are key messages, such as the importance of including women in all stages of a project's cycle, of investing in non-conventional water resources and localized solutions, of using new approaches for enhancing resilience such as saline agriculture and promoting quinoa, and of rethinking financing in water and agriculture projects.

Among the key messages from the Webinar Series, recurring themes also included a call for more research in many aspects of water and agriculture, the importance of communication platforms and most importantly of governmental support.

The other key outcome from this WASAG Webinar Series is that they provided a wealth of capacity development materials that will be used for more in-depth training in several topics and for the development of viable collaborative projects through which together, as WASAG partners and stakeholders, we can tackle the challenges of water scarcity in agriculture at the field, local, national, regional and global levels. They also provided a rich source of information and resource people for implementing the new WASAG Strategy for 2021 to 2024.

Already, as a result of the momentum generated by the WASAG webinars, several activities have emerged such as:

- Interactions with the Ministry of Agriculture of the Netherlands in finding solutions to saline agriculture in several countries and interaction with a wider network of experts. This has facilitated access to experts from Morocco to assist Technical Cooperation Projects (TCP) such as in Cabo Verde and Djibouti.
- Collaboration with partners to develop a proposal for quinoa and resilient agriculture that targets countries in four regions (Africa, Asia, Central Europe and Near East).
- Collaboration with partners from China for a South-South cooperation project proposal.
- A greater visibility of WASAG as well as FAO's Land and Water Division through an increased number of website visits.
- Publications on several topics discussed during the webinars.

In conclusion, the webinar series are a testimony to the fact that WASAG is a living and agile platform through which partners are set to further collaborate as advocated by the Sustainable Development Goal (SDG) 17 on partnerships, towards the achievement of other SDGs (among them SDG1, SDG2, SDG3, SDG5, SDG6, SDG13 and SDG15). WASAG partners are set to further tackle all facets of water scarcity in agriculture, despite a global pandemic, a changing climate and any other challenges to contribute significantly to a better production, a better life, a better nutrition and a better environment.

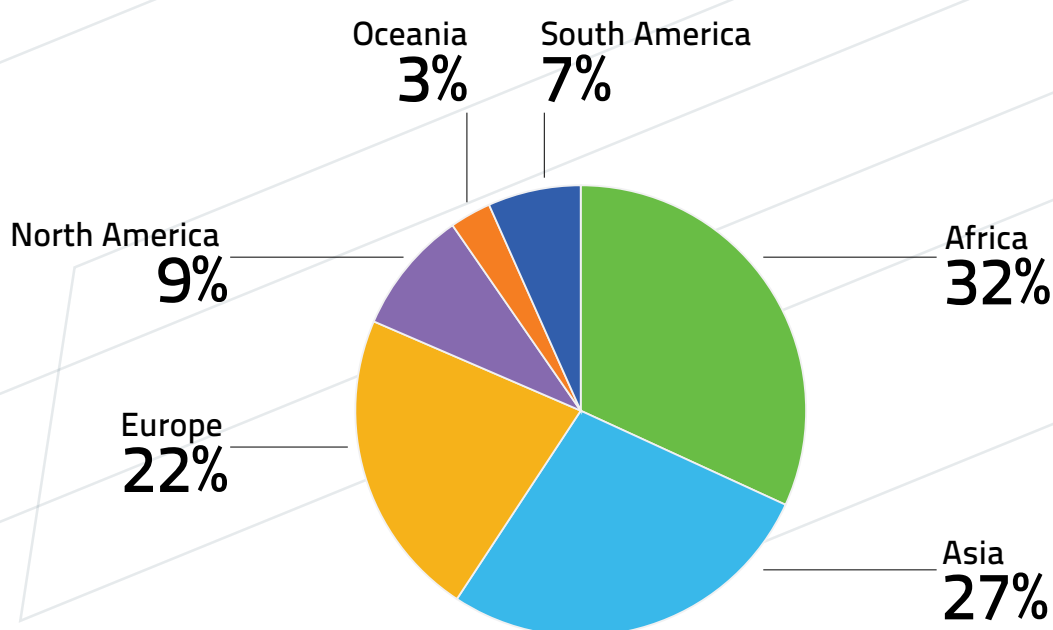
Annex 1 – Participants report

1. NUMBER OF REGISTRATIONS AND ATTENDEES

Table 1. Number of registrations and attendees

Webinar	No of registrations	Attendees
1	348	219
2	777	435
3	712	403
4	275	156
5	444	255
6	529	291
7	523	217
8	1042	555
9	348	178
10	281	161
Total	5279	2870

2. REPRESENTATION OF ATTENDEES FROM EACH CONTINENT





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