

Innovation and Research in Agricultural Water Management to Achieve Sustainable Development Goals

Introduction

Water management in agricultural areas is a key in achieving food security, but is also a driver towards achieving sustainable development goals set by the UN. With the increasing demand to achieve food security accompanied with the increasing population in most regions of the world, constrained by the amount of freshwater on the planet; the innovation and research in agricultural water management is extremely important when aiming for sustainable agriculture (e.g. IICA, 2015).

Climate change is creating continuous challenges for agriculture and food production globally (IPCC, 2022). The uneven global distribution of freshwater resources creates challenges, such as facing droughts and floods, in different parts of the world. Understanding the spatiotemporal impacts of hydroclimatic extremes (droughts and heatwaves) on hydrology and crop production is an important part of the research in agricultural water management. There is a strong need to identify the feedback between crop production and hydrology under climate extremes. There is a need for innovations related to sustainable agriculture, and water management including modern irrigation systems and water crisis management, in future climate conditions. One of the key challenges is to discover means for adaptation of agriculture to climate change especially in the Global South (e.g. Lal, 2019).

Greenhouse gas emissions (GHG) are one of the main drivers accelerating climate change and climate warming. Agriculture is one of the areas for GHG emissions. Recent studies (e.g. Rumpel et al., 2020; Tao et al., 2019) have shown that carbon sequestration and resulting carbon farming can be solutions to turn agriculture into a carbon sink rather than source, which will have effects on total GHG emissions. New innovations and research is urgently needed to understand the full capacity, possibilities and obstacles in agriculture with carbon sequestration.

New innovations and research results should be tested and the best practices set to motion. The main concern here is farmer interactions with the scientific community: what are the best practices to enhance getting the research into practice now and in the future?

Integrated water resources management (IWRM) approach is an international framework for efficient, equitable and sustainable development and management of water resources in the world and for coping with conflicting demands (UN-Water, 2008). The aim of IWRM is to promote co-ordinated development and management of water as water resources in the world are limited and interdependent. The main challenges could still be in the effective implementation of IWRM in the field (Rahaman and Varis, 2005), especially in the case of conflict management (Hileman et al., 2015)

This discussion aims to bring together young professionals with expertise in the field of irrigation and drainage to explore the innovation and research in agricultural water management to achieve the SDGs. Considering the knowledge and expertise of the international young

professionals forum about the challenges and research in this area, participants are invited to discuss the role of innovation and research to achieve sustainable agriculture and achieving food security.



Figure 1. Sustainable development goals (SDGs).

Objectives

This discussion on the topic “Innovation and Research in Agricultural Water Management to Achieve Sustainable Development Goals” has the following objectives:

1. Get an insight into the current state-of-art in research and innovation in agricultural water management at global, regional and local scales.
2. Discuss the possibilities to get new innovations into practice and how to monitor or measure functioning of new innovations in promoting the sustainable development goals.
3. Highlight the views of young professionals in regards to innovation and research in agricultural water management .

Expected outcomes

During the IYPeF e-Discussion, views of young professionals in the field of irrigation and drainage will be shared on the effects of agricultural water management on achieving or promoting SDGs. The following questions will be explored:

1. What is the role of agricultural water management (irrigation and drainage) in meeting the rising food demands of increasing population from local to global scale (SGD 2)?
2. How can the agricultural sector promote gender equality (SGD 5)?
3. What are the recent innovations in agricultural water management to mitigate climate change (SGDs 13, 15) and promote good water quality (SGDs 6, 14)?
4. What are the state-of-the-art technological advancements in the field of agricultural water management? What aspects need more innovation and research to ensure life on land and life below water?
5. What is the role of the global agricultural sector to ensure peace, justice and strong institutions (SGD 16) through responsible consumption and production (SGD 12)?
6. How could IWRM better be put to motion to achieve sustainable agriculture on a local, global and regional scales?

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