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## **ICID Young Professionals e-Forum (IYPeF)**

### **The Use of Groundwater for Sustainable Agriculture**

#### **Background Note for Discussion 15 January – 31 January 2018**

#### **Introduction**

Freshwater plays a fundamental role in support of the environment, society and the economy. Water is closely linked to a number of key global challenges. Its role in eradicating hunger, achieving food security and improving nutrition and promoting sustainable agriculture is critical (ICID, 2017). Among sectoral water uses, irrigation accounts for about 70% of the global freshwater withdrawals and 90% of consumptive water uses (Siebert et al., 2010).

Groundwater has gained, over the years, popularity as a sustainable source for irrigation water. It provides a highly reliable source to cope with drought and scarcity, especially under climate change. Groundwater currently supplies water to approximately 41% of the world's irrigated area and contributes to about 43.5% of irrigated food production worldwide (Villholth et al., 2015 & CGIAR, 2017).

The growing importance of groundwater for agriculture can largely be explained by the convenience of groundwater to act as a reliable source for irrigation, providing water on demand, while being largely unaffected by seasonal surface hydrological variation. In particular, groundwater irrigation enables the high-value agricultural production in the drought-prone regions (CGIAR, 2017).

The goal of sustainable agriculture is to meet society's food and fiber needs without compromising the ability of future generations to meet their own needs. Practitioners of sustainable agriculture seek to integrate three main objectives into their work: a healthy environment, economic profitability, and social and economic equity. This requires agriculture to avoid severe or irreversible damage to the endogenous or external ecosystem services upon which it depends (Velten et al., 2015).

Water is the principal resource that has helped agriculture and society to prosper. Limited surface water supplies have prompted the use of groundwater in irrigated agriculture. Although, use of groundwater has significant potential for boosting future agricultural yields, food production in some regions of the world is increasingly causing groundwater resource depletion, meaning that abstraction rates exceed replenishment levels. Globally, an estimated 14 to 17% of food produced with use of groundwater relies on unsustainable mining of groundwater resources (CGIAR, 2017). Hence, the challenge of groundwater protection for sustainable agriculture is one of the key priorities for water managers.

#### **Objectives**

This discussion on the topic of "The Role of Groundwater for Sustainable Agriculture" has the following objectives:

1. Get an insight into the growing importance and challenges of using groundwater in irrigated agriculture;
2. Discuss the need for putting in place policies, schemes and measures that would help in promoting sustainable agriculture and avoid over exploitation of groundwater; and
3. Highlight the views of young professionals with regard to groundwater, its sustainable use and potential solutions for avoiding irreversible damage to groundwater.



## **Expected outcomes**

It is intended that this IYPeF discussion may explore answers to the following questions:

1. How is groundwater, currently, contributing to agriculture on regional and global geographic scales?
2. How could groundwater be used for sustainable agriculture, and how can this contribute to food security?
3. What are the growing challenges surrounding agricultural groundwater use?
4. What are the possible solutions to avoid severe or irreversible damage to groundwater resources?
5. How could groundwater uses be managed in transboundary basins?
6. What are the impacts of climate change on agricultural groundwater use?
7. Supported with case studies and countries experience, what are the legal, institutional and policy impediments in using groundwater for sustainable agriculture?
8. Has conjunctive use of water been successfully practiced in agriculture?

## **Discussion mentors**

1. Prof. Dr. Ahmed R. Khater, Water Resources Management, Former Vice-President, National Water Research Center (NWRC), Egypt, as discussion mentor; and
2. Dr. (Mrs.) Eman R. Nofal, National Water Research Center (NWRC), Egypt, as discussion coordinator

## **References**

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