Improving livelihood of women farmers in Sudan through small-scale family drip system

THE CHALLENGE

Agriculture is the principal source of income and livelihood for 60 to 80% of the population of Sudan. About 21 million ha of land surface is used for agriculture. Irrigation is practiced in 2 million ha (11% of the arable land) which accounts for 25% of agricultural production. The rest of arable land is rainfed. Climate change and rainfall variability, water scarcity and the inaccessibility of ground water have contributed to crop failures in rainfed areas making livelihood difficult for small-scale family farmers, particularly in the Kassala region in the eastern part of Sudan. For the government, plans and strategies are important to reverse declining agricultural production and food insecurity, particularly for these family farmers.

THE PROJECT

Through the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture and the Technical Cooperation (TC) Department of IAEA, and the Horticultural Research Centre Farm of the Agricultural Research Corporation (ARC), in Wad Medani, Sudan, a regional TC project was implemented in Sudan to introduce small-scale drip irrigation systems to benefit women farmers in the Kassala region to overcome the water stress of growing vegetables (onion, Jew mallow, rocket and purslane) which are the main sources of vitamins, minerals and other micro-nutrients to subsistence farmers. This family drip system is suitable for small land areas up to 2,000 m² and is operated by gravity from a tank placed at 1 meter height. Irrigation was scheduled to be delivered to crops when and where is required by monitoring soil water.

Through the family drip system, the Irrigation was compared with local surface irrigation using onion as the test crop at the ARC research station using a soil moisture neutron probe. Onion yield increased from 20 t/ha for local surface irrigation to 27.4 t/ha for local drip irrigation (43%)5. The quantity of water applied decreased from 16,000 m³/ha for local surface irrigation to 9,600 m³/ha for family drip system (63% of water saving). The net profit increased from SDG 17,000 under surface irrigation to SDG 26,600 under the family drip system6.

THE TECHNOLOGY

Drip irrigation technology increases water use efficiency by applying water directly to the immediate vicinity of the plant roots through a network of pipes and water emitters. This leads to a reduction in soil water evaporation and excess water loss beyond the rooting zone, so that much less irrigation water is needed.
The soil moisture neutron probe (SMNP) is an instrument that measures soil water content for irrigation scheduling. During the measuring process, the probe emits neutrons that collide with hydrogen atoms of soil water. This collision slows down the speed of the neutrons. The change in neutron speed is detected by the probe and provides a reading that corresponds to soil moisture content. Measuring soil moisture is important to maximize crop water use. The SMNP is currently the most suitable instrument to accurately measure soil moisture under saline conditions.

THE IMPACT

The drip irrigation irrigation technology was transferred to small-scale farmers in Kassala. It was initially adopted by more than 50 farmers in five villages and by 62 women farmers in six villages in the north of the Kassala city. The project was expanded to three more villages around Kassala city and the technology was further adopted by another 75 families. These women farmers were trained to use the family drip irrigation systems. Due to the ease of installation and operation after short training sessions, the family drip system has proven to be a good choice for small-scale family farmers in which the production is constrained by frequent water stress. The Sundaneses Red Crescent (SRC) in collaboration with the United Nations High Commission for Refugees (UNHCR) has been involved to scale up the technology which is considered as a climate change adaptation approach for improving rural livelihoods and poverty alleviation in Sudan.

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For further information, please visit:

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