

Approaches for improving water productivity towards global food security

Professor Mohan Reddy Junna
Irrigation Scientist and Head of Office IWMI-Central Asia, Tashkent, Uzbekistan
Dr. ShukhratMukhamedjanov
Irrigation Scientist, SIC-ICWC, Tashkent, Uzbekistan

Enough food is produced today to meet the current global population. However, the problem is with distribution. Some people receive too much food while a billion people receive too few calories. To raise the nutritional status of undernourished people, to meet the growing demand for more meat, fish, and milk, and to meet the food demands of increasing population, there is a need to increase grain production by an estimated 70 to 100 percent by 2050. Conversely, the global climate change is expected to decrease crop yields by 15 to 17 percent. Obviously, under 'business as usual' scenario more land and water resources are required to meet the growing demand for food. Agriculture has already expanded into marginal lands, and water resources are already limited. Development of new water resources is prohibitively expensive either economically or environmentally. Though irrigated agriculture occupies less than 20 % of the cultivated area globally, it contributes more than 40% of the total food production. Therefore, increasing area under irrigated agriculture is an option. However, with the projected increase in demand for water from other sectors, the amount of water available for agriculture is expected to decrease. Therefore, there is an urgent need to maximize water productivity both in irrigated as well as rain-fed agriculture.

During the 1960s through 1980s, there has been rapid increase in food production due to the combination of 'green revolution' and expansion of irrigated area. However, lack of proper management of irrigation systems, some of the irrigated area has become less productive or unproductive due to the combined effect of waterlogging and salinity. Therefore, the full potential of 'green revolution' has not been tapped. Today, research efforts are underway to improve crop production through genetic engineering, development of drought and salt tolerant crop varieties, fertilizer management, agronomic practices, IMP, etc. However, in the absence of appropriate irrigation water management or 'blue-green revolution', the full potential of these interventions cannot be realized. Improved irrigation water management is of paramount importance for increasing crop yields and water productivity.

Knowledge on improved irrigation water management practices is already available to irrigation scientists. However, these practices are not being implemented by majority of farmers. There are four main reasons for lack of implementation of improved irrigation water management practices at field level: unreliability in water delivery, lack of knowledge on improved irrigation practices due to lack of or inadequate information dissemination mechanisms (irrigation extension), lack of economic incentives, and lack of appropriate credit facilities. Under support from SDC, the WPI-PL project has designed and tested an effective information dissemination mechanism called an 'innovation cycle', and the IWRM-FV project to address the issue of reliability of water supply. Significant increases in water productivity, compared with the non-demo farm farmers, were achieved. These gains in water productivity can be further increased by providing proper economic incentives and credit facilities.