Accessing and putting water to productive use in sub-Saharan Africa

Lead author: Timothy O. Williams (International Water Management Institute [IWMI])
*With contributions from: Bai-Mass Taal (African Ministers' Council on Water [AMCOW]), and Karen Villhoth, Robyn Johnston and Meredith Giordano (IWMI)**

Accessing water for productive agricultural use remains a challenge for millions of poor smallholder farmers, who constitute the majority of producers in sub-Saharan Africa (sSA). In 2006, 225 million hectares of land was cultivated in sSA. However, the total area equipped for irrigation was 7.2 million hectares, only 3.2% of the total cultivated area.

Hunger, malnutrition and poverty still persist, particularly in rural areas, despite recent growth in agricultural GDP. Improving access to water, while removing economic and institutional constraints, could enable millions of smallholder farmers to adopt irrigation and successfully grow their way out of poverty. At the same time, this action will reduce hunger and malnutrition.

Facilitating productivity gains by improving farmers' access to water will help governments and international agencies to achieve many of the proposed Sustainable Development Goals (SDGs). There are four interrelated measures that will be of particular use. These are: increasing investment in sustainable water infrastructure (from small scale to large scale) and technologies to augment water supply; guaranteeing water and land rights for poor smallholder farmers, including women and young people; including smallholder farmers in viable value chains and improving their access to adequate financial and extension services and markets; and increasing water use efficiency and agricultural productivity. These measures are essential if sSA governments are to attain the SDGs of ending poverty and hunger, and achieving food security and improved nutrition by 2030.

Increasing availability of water Public- and private-sector investments in infrastructure, technologies and tools to augment and stabilize water supply are the first steps towards improving and extending access to water for productive use in sSA. Investments are needed to: improve water harvesting; develop and sustainably manage groundwater resources; and develop a variety of built and natural water storage facilities at farm, community and basin levels.

Groundwater, in particular, remains a relatively abundant but underused resource; currently less than 5% of water used for irrigation comes from groundwater (Villholth, 2013). The major constraints to using groundwater include a paucity of information on hydrogeological conditions, lack of access to affordable energy sources to drill and lift water, and concerns over the capacity to sustainably manage the resource over the long-term. Increased and stable water supplies from all sources will help to expand sustainable irrigation at small-, medium- and large-scale levels.

The irrigation landscape in sSA is characterized by a pluralistic system. In many countries, small-scale, farmer-managed irrigation systems producing high-value horticulture crops for urban and peri-urban centres co-exist with large-scale public irrigation systems growing staple food and cash crops for domestic and regional export markets. In between these two extremes are medium-scale systems, often community-managed, growing staples, fruits and vegetables for domestic and regional markets. These irrigation systems differ in terms of: the organizational capacity needed to run and maintain them; their economic performance, including benefits and costs of operation and maintenance; and the implications they hold for livelihoods, food security and the environment.

Many smallholder farmers, including women and young people, engage in small-scale irrigation. They do so without government support, using their own resources to buy irrigation equipment, either individually or in small groups. They access water that is available as shallow groundwater, and from rivers, lakes and reservoirs.

This farmer-driven irrigation system has proven successful, cheap and adaptable and is expanding rapidly. It provides significant direct and indirect benefits to poor farmers. For example, in Burkina Faso, dry season small-scale irrigated vegetable and rice

* The views and opinions expressed are the authors' and do not represent those of the Secretariat of the United Nations. Online publication or dissemination does not imply endorsement by the United Nations. Authors' can be reached at j.vanderbliek@cgiar.org.

production increased incomes by USD 500-600 per farm household (Giordano et al., 2012). However, small-scale irrigation is growing in a spontaneous, unplanned and unregulated manner and faces several challenges.

Following a sharp decline in investments in the early 2000s, there is now a renewed interest in large-scale public irrigation schemes from governments, donors and development banks. This is partly driven by the volatility in food prices and the risk this poses to millions of vulnerable poor people. Commercial large-scale irrigation schemes are also being developed to accompany the wave of foreign investment in agricultural land in sSA (Williams, et al., 2012).

A recent evaluation of large-scale public irrigation schemes in Sahelian West Africa showed mixed results in terms of the contribution these schemes make to national food security and cost-benefit performance. While there is room for large-scale irrigation schemes in sSA, new investments must be guided by lessons learned from the failure of earlier schemes in Africa and Asia. For new schemes to succeed, sound technical, institutional and policy measures are needed, as is the use of new tools and techniques (e.g. remote sensing and satellite images) to improve water management and water-use efficiency, and reduce environmental problems.

Securing land and water rights

Millions of poor farmers, including women, hold tenuous and unsecured water and land rights in many parts of sSA. Existing customary and institutional factors, as well new drivers, such as large-scale foreign investment in agricultural land that displaces poor land users, have exacerbated this state of affairs. Any effort to improve availability and supply of water will be meaningless if women and poor farmers are denied the rights to make effective and productive use of water and land.

Research by the United Nations Food and Agriculture Organization (FAO) indicates that if women had the same access to resources as men, they could increase yields on their farms by 20 to 30 per cent, reducing, globally, the number of people who are hungry by 150 million.

Forward-looking governance systems are needed to strengthen and guarantee the water and land rights of poor rural farmers, including women, to promote equity and to enable them to make productive use of available water to enhance their livelihoods and food security.

Creating value from water

Putting water to productive use means using water to create value. However, entrepreneurial poor farmers face a multitude of challenges that prevent them from making effective use of water to create products for markets and consumers. For example, the lack of accurate and timely information and technical advisory services constrains their ability to assess the risks and benefits of irrigation and make informed investment decisions.

Upfront costs impede many farmers from investing in irrigation and water storage facilities. Both large and small producers face obstacles in gaining access to domestic, regional and international markets. Providing technical, advisory and financial services to farmers offers an incentive for them, and gives them the confidence, to invest in irrigation. Such services might include innovative credit and finance schemes or support for expanding markets. As smallholders diversify and intensify their enterprises, so livelihoods and household and national food security will improve.

Benefits of efficient water use When access to water is increased, it is important that the available water is used efficiently so as not to waste the valuable resource. Improving the efficiency of water use in agriculture can lead to more water being available for other productive uses, and may minimize impacts on ecosystems. Technical improvements, appropriate policies and economic incentives will help deliver such benefits.

New efficient irrigation technologies such as drip and sprinkler irrigation, plus better agronomic and soil management practices, can lead to improved water use efficiency in agriculture. If this is combined with the full suite of crop inputs – organic and inorganic fertilizers and pesticides – yields per hectare will increase as well as water productivity. Appropriate policies and economic incentives can help to improve water allocation and motivate water users to conserve and use water efficiently.

Water gains will help achieve SDGs There is a growing realization that water is the missing or ignored link in the drive for a green revolution in sSA. It is therefore crucial to understand, augment and stabilize the supply of water and to simultaneously improve access of poor smallholder farmers, including women, to land and water, financial and advisory services, and markets. This must be coupled with incentives to enable them to adopt and use new technologies (e.g. solar and wind-powered pumps), practices and information to expand the area under irrigation and improve water use efficiency.

By implementing these and other complementary measures, sSA countries will be well placed to attain the SDGs of ending poverty and hunger, and of achieving food security and improved nutrition, while laying solid foundations for sustainable agricultural growth.

References[1]

Giordano, M.; de Fraiture, C.; Weight, E.; van der Bliek, J. (Eds.). 2012. *Water for wealth and food security: Supporting farmer-driven investments in agricultural water management. Synthesis report of the AgWater Solutions Project*. Colombo, Sri Lanka. International Water Management Institute (IWMI). 48p.

Villholth, K.G. 2013. Groundwater irrigation for smallholders in sub-Saharan Africa – a synthesis of current knowledge to guide sustainable outcomes. *Water International* 38(4): 369-391.

Williams, T.O.; Gyampoh, B.; Kizito, F.; Namara, R. 2012. Water implications of large-scale land acquisitions in Ghana. *Water Alternatives* 5(2): 243-265.

[1] A version of this whole text was published in: van der Bliek, J.; McCornick, M.; Clarke, J. (Eds.). 2014. On target for people and planet: setting and achieving water-related sustainable development goals. Colombo, Sri Lanka: International Water Management Institute (IWMI). 52p. doi: 10.5337/2014.226