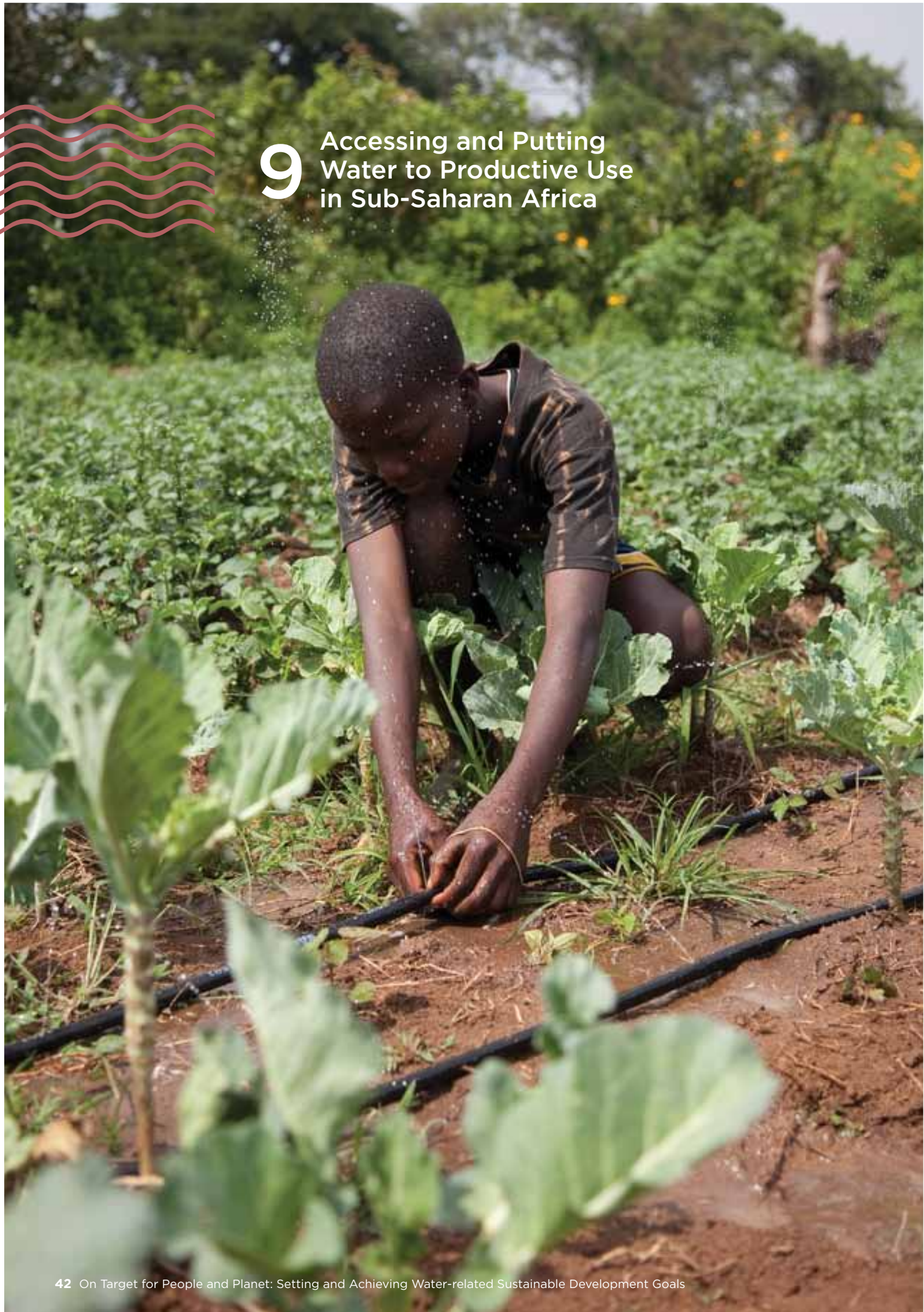


9 Accessing and Putting Water to Productive Use in Sub-Saharan Africa



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Access to 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. Improved access to water, coupled with the removal of economic and institutional constraints, can allow millions of smallholder farmers to adopt irrigation and successfully grow their way out of poverty and at the same time reduce hunger and malnutrition.

Attention to water access for productive use will help governments and international agencies achieve many of the proposed SDGs.

There is a need to implement four interrelated measures to improve water access for productive use:

- Increase investment in sustainable water infrastructure (from small scale to large scale) and technologies to augment water supply.
- Guarantee water and land rights for poor smallholder farmers, including women and youths.
- Include smallholder farmers in viable value chains and improve their access to adequate financial and extension services and markets.
- Increase 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.

Improving availability and supply of water will be meaningless if women and poor farmers are denied the right to make productive use of water and land.

INCREASED AVAILABILITY: A PREREQUISITE FOR INCREASED ACCESS TO WATER

Public and private sector investments in infrastructure, technologies and tools to augment and stabilize water supply is the first step 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
- develop a variety of built and natural water storage infrastructure at farm, community and basin levels.

Groundwater, in particular, remains a relatively abundant but underused resource, with less than 5% of the water used for irrigation coming from groundwater. The major constraints to using groundwater include 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 supply from all sources will help to expand sustainable irrigation at small, medium and large scales.

Irrigation in SSA – Many Different Scales and Dimensions

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 centers 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 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 youths, engage in small-scale irrigation without government support and use their own resources to buy irrigation equipment, either individually or in small groups. They access water that is available in shallow groundwater, 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 instance, in Burkina Faso, dry season small-scale irrigated vegetable and rice production increased incomes by USD 200–600 per farm household over one dry season. But 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 by 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.

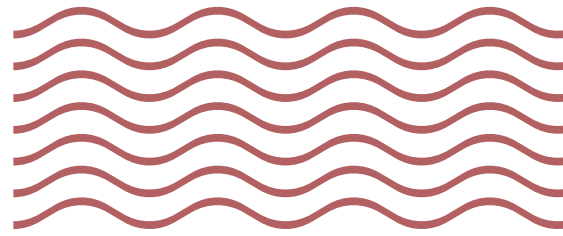
A recent evaluation of large-scale public irrigation schemes in Sahelian West Africa showed mixed results in terms of contribution of these schemes to national food security and cost–benefit performance. While there is room for large-scale irrigation schemes in SSA, new investments must be guided by 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.

GOVERNANCE SYSTEMS ARE NEEDED TO GUARANTEE WATER AND LAND RIGHTS FOR WOMEN AND OTHER POOR FARMERS.

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 situation. 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 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 20–30%; globally this would help to reduce 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 food security and their livelihoods.



Increased and stable water supply from all sources will help to expand sustainable irrigation.

EXPAND ACCESS TO SERVICES, VALUE CHAINS AND MARKETS

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. Lack of accurate and timely information and technical advisory services constrain their ability to:

- assess the risks and benefits of irrigation
- make informed investment decisions.

Also, upfront costs impede many smallholder farmers from investing in irrigation and water storage facilities. All producers—big or small—face obstacles in gaining access to domestic, regional and international markets.

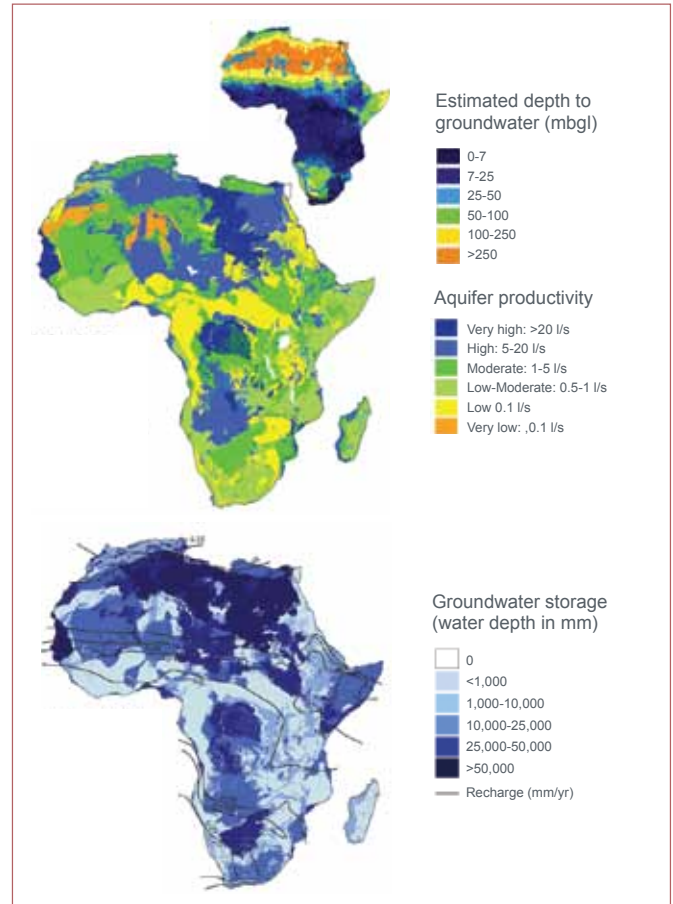
If they can access technical advisory and financial services, farmers will gain the incentive and confidence to invest in irrigation. Such services might include innovative credit and finance schemes or support for the expansion of markets. These services will help the farmers diversify and intensify their farming enterprises, leading to improved livelihoods and household and national food security.

MORE EFFICIENT WATER USE MEANS MORE WATER FOR BOTH PRODUCTIVE USE AND THE ECOSYSTEM

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 having more water available for other productive uses and may minimize the impacts on the ecosystem. Through a mix of technical improvements, appropriate policies and economic incentives, increased water use efficiency and agricultural productivity can also lead to tangible net water gains for other users as well as the sustenance of ecosystems.

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 and water productivity will both increase. Appropriate policies and economic incentives can help improve water allocation and motivate water users to conserve and use water efficiently.

FIGURE 11. Groundwater irrigation potential in Africa



Source: MacDonald, A.; Bonsor, H.C.; Dochartaigh, B.E.; Taylor, R.G. 2012. Quantitative maps of groundwater resources in Africa. *Environmental Letters*, 7(2).

WATER USE EFFICIENCIES WILL HELP ATTAIN SUSTAINABLE DEVELOPMENT GOALS

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) and 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 achieving food security and improved nutrition while laying the foundations for sustainable agricultural growth.

In the long run, the development and allocation of water resources to ensure balanced growth and environmentally sustainable use of water will depend on sound decision making. Governments will need to invest in data collection and in monitoring and evaluation to allow this to occur (see section 4).