Water Smart Agriculture

WaSA is an approach to efficiently harvest, store, access and utilize water throughout the year. Rather than hoping for rainfall to provide moisture for crop production, rural small scale farmers can harvest rain when it comes and use it when they need, year round. This can double incomes for farmers, who no longer have to rely solely on incomes from rainy season farming. Because seasonality is more and more uncertain, WaSA is a critical way to adapt.

66%

of water (globally) used in agriculture is from green water

80%

of food supply in SSA is provided by small scale farmers.

60-90%

of food production relies on green water

WaSA— water management for small scale agriculture development

By 2050, 70% of small-scale farmers will need to produce 70% more food without exceeding current levels of water withdrawals. This increased production needs to take place in the context of increasing pressure from recurrent dry spells and droughts, low water productivity and reduced capacity to use and manage green water. When compounded with the burden of producing food for a growing population, estimated to be 1.2 billion by 2030, a deliberate focus on increasing the sustainability, productivity, equity and resilience of small-scale agriculture is needed to enhance and safeguard livelihoods and increase food and nutrition security.

To ensure the sustainability of food systems, WaSA provides development practitioners with a package of water management tools that can be contextualized to adapt to the effects of climate change (floods vs. drought, highland vs. lowland farming). WaSA is not a new concept. It draws from decades of work in soil and water conservation and is a model that can contribute to climate smart agriculture (CSA). By delivering increased yields and incomes; increased resilience to climate change impacts and; contributing to increased mitigation potential by increasing infiltration rates and soil health, it represents a key approach in sustainable agriculture. Other agro-ecological approaches such as conservation agriculture (CA) and agroforestry focus on increasing the availability of water in soils. Yet the uptake of these interventions is inconsistent and does not always result in sustainable use of water resources. The added value of WaSA is in identifying where investments in access to water are needed and the type of investments to achieve impact, including in advocacy at local, regional and national levels to increase the allocation of funding to preserve, build, and sustain water resources.

WaSA in Practice

Within the Pathways to Women's Empowerment Program, CARE applies WaSA interventions in Ghana, Malawi and Mali to improve the productive capacity of small-scale farmers, mostly women, who are constrained by the crippling effects of climate

change and other environmental challenges, lack of access to land, water, productive assets, and extension services.

Through capacity building efforts the WaSA through Pathways CARE has reached more than 6 000 farmers, mostly women, in Malawi, Ghana and Mali, enhancing skills for enhancing soil water on fields.

Water Smart Agriculture can help small-scale farmers increase production by up to 100%, and increase their incomes through dry season farming.

In **Ghana** WaSA interventions have influenced farmers to engage in dry season farming using water from boreholes installed for domestic water supply, adding dietary diversity and income from sale of vegetables.

In Central **Mali** where women have access to only 10% of productive land, interventions to reclaim degraded soils have increased women's access to land. Coupled with irrigation WaSA interventions have led to increased productivity by women farmers.

In **Uganda**, the application of WaSA techniques such as rainwater harvesting to facilitate dry season crop production enabled farmers to double their incomes. Access to irrigation water from harvested rainfall enabled farmers to engage in dry season vegetable production, resulting in a dry season income stream that they normally did not have. Dry season crop production has proved more lucrative than rainfall season farming targeted for staple cereals production.

WaSA type interventions are apparent in other CARE programing aimed at improving food and nutrition security through access to boreholes and small reservoirs. For a continent where only 4% of productive land is irrigated, adding to existing irrigation increases food output and opportunities for farmers to engage in markets.

Delivering Results

WaSA is not about just accessing blue water, which is limited and difficult for small-scale farmers to harvest from new sources. Relying primarily on blue water therefore can limit small-scale farmers from increasing production or incomes during dry seasons. Limited access to water is a core constraint to building resilience capacity as any interventions focused on increasing the productive capacity of small scale farmers cannot be sustainable without a focused agenda on increasing access to water. WaSA focuses on 3 approaches:

Irrigation smart – invest in efficient small scale irrigation
Rainfall smart – reduce runoff, maximize infiltration, harvest rain water
Soil smart - initial investment for farmer, in soil management to enhance soil health and capacity to retain moisture.

By investing in WaSA, CARE can support farmers to:

- increase yields with less water
- increase investments in accessing water, and
- increase awareness/commitment to equity mechanisms and the role of farmers in managing water
- Increase the capacity to adapt to climate change

The Ideal WaSA Package

WaSA can be applied at multiple scales. As such, the WaSA package has multiple targets – farmers, private sector ad governments. WaSA is therefore a set of interventions targeted at multiple scales, and varies depending on environment and challenges. The ideal WaSA package is environment specific, and comprises tools and practices for farmers, approaches for private sector engagement (for example markets and access to markets), broader government engagement and budget allocation targeted at enabling small-scale farmers access to water, including enabling environment, and advocating for water access as an enabler for local development.

Farmers: package of environment specific interventions: soil moisture conservation/management, green water use, efficient irrigation use

Private Sector: Driving demand for new technologies and practices, information exchange comprising market opportunities locally and nationally

Local/National Governments: Identifying where to invest and targeting investments in water for agriculture for increased food production and sustainable livelihoods.

Regional/National Global: Advocacy for improved water use as a key ingredient for enhanced food production and livelihoods investments.

GREEN WATER refers to the water held in soil storage and available for direct plant uptake. It is a fraction of rainfall that is stored in the soil. About 60% food production is produced in rain fed agricultural systems and is dependent on green water. BLUE WATER on the other hand, is water abstracted from rivers, lakes, aquifers and reservoirs and is used for irrigation. Globally, irrigation is practiced on about 20 % of total production area; accounting for 40% of food production. In sub-Saharan Africa only 4% of agricultural production area is irrigated. More than 70% of food is produced in rain fed systems.

WaSA in Pathways

	Malawi	Ghana	Mali	Elsewhere in SSA
Constraints of Conventional Ag Practice	• Climate related droughts and floods • Food shortages • Mid-season dry spells • Soil degradation.	• Limited access to land and water for women who account for up to 80% of production. • Limited land productivity in dry season due to unavailability of water	• 70% of land in some areas is unproductive • Limited access to water • Inefficient irrigation	• Unavailability of water for production in dry season • Soil moisture unable to weather prolonged dry spells • Below potential productivity
Opportunities from WaSA Application	• Forest regeneration. • Zai pits to increase soil fertility and conserve soil moisture • Access to water; home gardens irrigation with income and nutrition benefits • Catchment conservation through WaSA practices	• Access to water for irrigation in dry season vegetable gardens using existing domestic water supply boreholes with income and nutrition benefits	• Increased productivity through yield, soil water retention, soil conditions, land restoration.	• Boreholes for garden irrigation water supply in Zambia • Small reservoirs for garden irrigation for food and nutritional security (Zimbabwe) • CA in Mozambique • Dry season vegetable production and increased incomes in Uganda

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