



Vegetable production enhanced through drip irrigation, Ghana
Photo: Adam Ojdahl/IWMI

NUTRITION

Feed the Future Innovation Lab for Small Scale Irrigation (ILSSI)

Key Messages

- » Households with access to irrigation often benefit from better nutrition than non-irrigating households
- » Four main pathways link small scale irrigation with improved nutrition and food security
- » Nutrition-sensitive irrigation policy and program design are improved by understanding the specific pathways between small scale irrigation and nutrition
- » A gender-sensitive approach is required for women farmers to benefit fully from irrigation
- » Small scale irrigation strengthens the resilience capacity of households and communities to effectively deal with shocks and stresses
- » Substantial biophysical and economic potential exists for the cultivation of nutrition-enhancing crops in the dry season through small scale irrigation

The number of people suffering from acute hunger and undernutrition is once again on the rise. Since 2015 the steady rate of decline in these numbers, spanning decades, has been reversed. Today around 135 million suffer from acute hunger, while 820 million people regularly go hungry. Many factors are contributing to this regression including conflicts, climate shocks and economic instability. Increasing both agricultural productivity and sustainable food production are key to meeting this challenge. To combat undernutrition the food produced must not only be sufficient in quantity to meet growing demand, but also be nutritious and nutritionally diverse.

Supporting smallholder farmers' ability to increase food production (both crops and livestock) in sub-Saharan Africa through small scale irrigation (SSI) could significantly help to reduce food insecurity and improve nutritional health. Research shows there are a range of promising pathways to achieve this.

The challenge is to fulfil these goals by expanding the use of irrigation in ways that are equitable, economically viable and environmentally sustainable.

[The Feed the Future Innovation Lab for Small-Scale Irrigation \(ILSSI\)](#) is a research-for-development project that aims to expand farmer-led, small scale irrigation in Ethiopia, Ghana, Mali, and Tanzania. Now in its second phase (2019-2023), ILSSI is working to identify the best ways to expand the use of small scale irrigation within environmentally sustainable limits. ILSSI is a part of the [U.S. Government's Feed the Future Initiative](#).

Through ILSSI research a number of important relationships between small scale irrigation, and nutrition and food security have come to light. These can serve to inform development focused investments, policy decisions, community engagement and future research.



Households with access to irrigation often benefit from better nutrition than non-irrigating households.

ILSSI research findings show that children under five in irrigating households have higher weight-for-height z-scores, meaning they are less wasted (a key predictor of child mortality) than children in non-irrigating households. Irrigation can lead to increased production, higher diversity of production and reduced food insecurity overall. Greater dietary diversity can also be achieved from irrigation through [the cultivation of vegetables and fruit, as well as through cash crops](#) when the income is spent on a wider range of foods including animal-source options. For example, [irrigators in northern Ghana](#) are more likely than non-irrigators to consume meats, poultry, milk and milk products, fruits and vegetables, sugar and honey, through both an income pathway and a production pathway.

Four main pathways link small scale irrigation with improved nutrition and food security.

[These pathways](#) are: increasing farmers' agricultural production, increasing their income, empowering women, and providing water for domestic and sanitation purposes. Research by ILSSI has found that [irrigation has a strong, positive effect on a household's economic access to food](#) and dietary diversity (but not always to improved nutrition resulting from increased diversity). Irrigation also helps to fill dietary gaps in dry seasons and droughts, and enables, but does not guarantee, consumption of more nutritious foods. [Irrigation can be a pathway for women's empowerment](#) if it increases their decision making over the technology or the irrigated produce, or alternatively if their time burden in agriculture or for collecting water is reduced. There are indications that this [empowerment may in turn lead to more of a household's resources being allocated to nutritious foods](#) and healthcare. Irrigation can also provide water for sanitation and hygiene, and improve health and nutrition through this pathway. However, this could also [risk undermining nutrition and health goals](#) by [causing water pollution](#) and contributing to water-related diseases. Irrigation must, therefore, be carefully designed to avoid these undesirable outcomes.

Nutrition-sensitive irrigation policy and program design are improved by understanding the specific pathways between SSI and nutrition.

The [potential for irrigation to influence diets appears to be highly context-specific](#). It is important therefore to understand which pathways and entry points for nutrition-sensitive irrigation are at work. The types of water sources, irrigation technologies, irrigated crops and water management approaches can positively (or negatively) affect nutritional outcomes, so [nutrient-smart irrigation approaches are needed](#).

A gender-sensitive approach is required for women farmers to benefit fully from irrigation.

A gender-sensitive approach to irrigation that enables women farmers to access irrigation technologies, benefit from and be empowered through, irrigation may have implications for the health and nutritional status of women and their children.

However, research findings indicate that the links between irrigation and nutritional outcomes for women farmers and their families are [complex](#). In some contexts irrigation interventions focused on women farmers have improved nutritional outcomes. Whereas others studies indicate that the varying extent to which irrigation affects women's labour can have a negative impact on household nutrition.

Small scale irrigation strengthens the resilience capacity of households and communities to effectively deal with shocks and stresses.

The resilience capacity of a household can be enhanced through small scale irrigation in three important ways; absorptive (for example enabling greater crop diversification options), adaptive (for example enhancing inclusive income pathways in irrigated value chains) and transformative (such as increasing access to insurance by reducing climatic risks). The high seasonal variation in the diets of women, children and the household overall, plus commonly a general lack of dietary diversity, [can be partly offset and improved by irrigation](#). In fact, ILSSI research results from Ethiopia and Tanzania show that the nutritional benefits from irrigation are stronger in drought-prone households.

Substantial biophysical and economic potential exists for the cultivation of nutrition-enhancing crops in the dry season through small scale irrigation.

ILSSI research identifies that around [1 million hectares in Ethiopia](#), 750,000 hectares in Tanzania, and [211,000 hectares in Ghana](#) are suitable for irrigation of nutrient-dense crops and irrigated fodder. This could benefit up to 9.5 million farmers. Extensive irrigation may pose water scarcity risks so an effective balance between reaping the benefits and mitigating the risks will need to be found during planning and implementation.

Hunger and undernutrition limit human development, resulting in less productive individuals, who are more prone to disease and so often unable to earn more and improve their livelihoods. Without effectively addressing hunger and undernutrition in Sub-Saharan Africa, other sustainable development goals such as education, health, gender equality and ending poverty will be impossible to achieve. Small scale irrigation has the potential to significantly improve nutritional outcomes and food security, which is why it's so important to understand how it can best do so, and to support the wider use of diverse, context specific irrigation technologies and approaches.



Vegetable and fruit market, Accra
Photo: Felix Antonio

[Links to these publications, and other resources, can be found here: https://ilssi.tamu.edu/knowledge/nutrition/](#)

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