



# Land Restoration & Resilience

HOW LAND RESTORATION LAYS THE FOUNDATION FOR RESILIENCE

## CRS' APPROACH TO LAND RESTORATION

Nearly one-third of the world's population are small-scale producers who depend on agriculture for their food and income. Their livelihoods and food security, and that of the next generation, are inextricably linked to the health of the land and water that surround them. Our community-centered approach to restoration of degraded land seeks not only to increase productivity, but also to make vulnerable farmers more resilient to ever present environmental stressors such as droughts, flooding, and erratic rainfall.

## CRS' 8 Land Restoration Principles:

- Maintain soil cover
- Minimize soil disturbance
- Ensure soil and crop nutrition based on soil analysis and crop needs
- Capture and infiltrate rainwater where it falls
- Ensure that water moves slowly off of slopes
- Diversify production system
- Incorporate trees and/or permanent crops into production system
- Manage natural regeneration

## MODELS



**Water Smart Agriculture (WSA):** manages soil to manage water and increase yields. Increases ground cover and incorporates organic matter into the soil to retain nutrients and build moisture-holding capacity.



**Watershed Restoration:** combines on-farm conservation agriculture with soil and water control structures to slow water flow, avoid erosion, and augment soil moisture. This combination of practices holds soil and nutrients in place, and work together to recharge ground water and replenish stream flow.



**Drylands Regreening:** combines Farmer Managed Natural Regeneration, which promotes the growth of existing tree root stocks in the farming system to improve soil fertility with rainwater capture through zai holes and demi-lunes to improve water-use efficiency, infiltration; cool soils and boost moisture and nutrient content.



**Multistory Agroforestry:** establishes layered systems of crops and trees to restore soil health, tree cover and biodiversity while simultaneously increasing market opportunities and income, and fulfilling household consumption needs.

## LAND RESTORATION APPROACH: SNAPSHOT OF SUCCESS

**1.34 million**  
hectares under restoration

**146%**  
Positive Return on Investment for WSA farmers

**79%**  
Reduction of Malawian communities' dependence on food assistance in a drought emergency.

**50%**  
Average yield increase for WSA farmer plots

# HEALTHY SOILS INCREASE WATER AVAILABILITY & PROVIDE A PATHWAY TO RESILIENCE

WSA approaches in Central America have built solid evidence that the restoration of soil and water resources to increase water and agricultural productivity is a viable short and long-term solution to [economic](#) and [environmental problems](#) associated with agriculture in the region. Rainfall variability and soil fertility are key constraints to crop production in Central America, and WSA practices have boosted yields by over 50% on farms where both factors are limiting. For smallholder farmers facing drought, these practices are essential for building resilience and preventing crisis.

In Ethiopia, CRS has been responded to water scarcity, soil erosion and declining yields by through watershed restoration, focusing on small-scale, practical interventions r farmers and communities can implement themselves. Initial findings from a post-project study shows a 36% increase in water availability and a 37% reduction in soil erosion resulting in significant improvement in the drought resilience of local communities. to provide ongoing support and guidance, ensuring sustainability and effectiveness in their operations.

## REDUCING DEPENDENCY ON AID

The old adage “an ounce of prevention is worth a pound of cure” also applies to land restoration’s ability to strengthen communities’ resilience during times of environmental stress, in turn reducing communities’ need for emergency food aid. Long-term land restoration initiatives build resilience and reduce reliance on costly emergency interventions.

<p><b>Watershed Restoration:</b> <i>Severe Drought &amp; 2 years post-ex</i></p>	<p><b>Malawi:</b> The CRS USAID-funded Wellness and Agriculture for Life Advancement (WALA) project, which ran from 2009 to 2014, introduced watershed restoration approaches to enhance food security. A <a href="#">USAID</a> evaluation done 2 years post project completion found that 19 out of 24 communities needed little to no additional food aid during a severe 2015/16 drought. In contrast, neighboring communities without restored watersheds required emergency food assistance for nine months. The success of WALA was attributed to increased water availability, improved soil fertility, and higher crop yields. The WALA watershed program demonstrated that watershed restoration is significantly more cost effective, and can reduce the need for costly emergency response:</p> <ul style="list-style-type: none"> <li>• WALA Program Total cost per household = \$375</li> <li>• Emergency Aid Total cost per household = \$3,510</li> </ul> <p>Moreover, the WALA program continues to bring benefits to communities in terms of water availability and drought resilience, pointing to a higher Return on Investment (ROI).</p>
<p><b>Watershed Restoration:</b> <i>In Times of Conflict</i></p>	<p><b>Ethiopia:</b> The Mesgi watershed, located in Tigray, watershed restoration efforts enabled communities to remain food secure even during the 2020-2022 conflict. While neighboring communities required food assistance throughout the conflict, communities in the Mesgi watershed required little to no food aid and continued supplying produce to Mekelle, the capital of Tigray. This demonstrates how well-planned watershed interventions can build long-term resilience, supporting communities to withstand a variety of shocks.</p>
<p><b>Water Smart Agriculture:</b> <i>Severe Drought</i></p>	<p>In <b>Central America</b>, for smallholder farmers facing drought, water-smart practices can make the difference between resilience and crisis. World Food Program estimated that the 2018 drought left 1.4 million people food insecure due to lost yields. Based on CRS’ 2018 data, at least 25% more farmers in the Dry Corridor could meet their basic maize production needs (based on a 2 t/ha maize food security threshold) in a drought year if they implement WSA management practices.</p>

### A WIN-WIN FOR THE ECONOMY AND THE ENVIRONMENT

**\$1<sup>00</sup>** INVESTED = **\$2<sup>46</sup>** MORE IN FARMER INCOME

THE ECONOMIC VALUE OF CARBON SEQUESTERED, RAINFALL STORED AND NUTRIENTS CAPTURED IN THE SOIL IS AT LEAST **\$7<sup>70</sup>** PER HECTARE PER YEAR

## ECONOMICS OF LAND RESTORATION – A SMART INVESTMENT

**Return on Investment (ROI) in Central America** with Water Smart Agriculture – An independent ROI study completed in 2022 analyzed the results of 3000 farmers in El Salvador, Honduras, Mexico, Nicaragua and Guatemala implementing WSA practices over a period of five years. The ROI results confirmed WSA’s impact on farmers’ livelihoods, finding that every US\$1 invested resulted in a US\$2.46 increase in farmer income. In addition to yield increasing practices, WSA also promotes reduced tillage and efficient fertilizer application, practices that can also reduce labor and input costs for farmers, significantly increasing their profit margins.