World Vision
AFGHANISTAN

Technical Approach

Climate Change Adaptation and Mitigation

Improving local resilience to water shortages and droughts

Afghanistan is one of the most water-stressed countries in the world, ranking 31st out of 195 countries.[1] As a consequence of climate change, Afghanistan has seen a reduction of underground water, experienced severe drought throughout the country and suffered the effects of extreme heat. Weather extremes are set to worsen in the coming years if mitigation and adaptation measures are not put in place. The most recent severe droughts occurred in 2008-2010, 2013-2014 and 2018-2019.[2] Water scarcity is exacerbated by population growth, inefficient irrigation practices, and deforestation.

USGS (2009) estimates that at least 60 percent of shallow groundwater-supply wells in some parts of Afghanistan are under threat of drying up. Local communities in Badghis Province in the Western Region of Afghanistan have expressed concern about decreasing water availability. According to a 2014 Rapid Needs Assessment conducted by World Vision International (WVI) in Badghis, 91 percent of respondents had concerns about diminishing levels of water resources. If water resources continue to diminish, the impacts may be dire. The impact of the most recent drought in 2018 in Badghis Province was crop failure and the displacement of over 298,000 in search of food and water.[3]

Over the last five years, WVI has been developing a range of climate change adaptation and mitigation measures in order to enhance local resilience.

1 WRI, 2015.
2 Favre & Kamal, 2005.
3 World Bank, 2019.

Drip Irrigation

With the support of DFAT under the Australia Afghanistan Community Resilience Scheme (AACRS), WV has introduced drip irrigation in rural communities in Badghis Province. Drip irrigation is more water-efficient than traditional flood irrigation. It has numerous advantages:

- It can be tailored to deliver the precise amount of water required by individual plants;
- It reduces evaporative losses during conveyance and application;
- It uses less water as the water is delivered only to the plants that need it;
- It reduces nutrient runoff;
- It reduces waterlogging and soil salinisation.

According to a World Bank report (2006), drip irrigation uses 30-50 percent less water than flood irrigation and achieves up to 95 percent irrigation efficiency. Furthermore, a collection of research results from various Indian research institutes indicates yield increases of 20-50 percent for a variety of crops such as cotton, grapes, and tomatoes.[4] Drip irrigation has been introduced in green houses, working with women at the household level, as well as along terraces at the farm level.

Farmer Managed Natural Regeneration (FMNR)

With the support of DFAT under the AACRS Project, WV is introducing Farmer Managed Natural Regeneration (FMNR). FMNR is a low-cost land restoration technique involving the systematic regrowth and management of trees and shrubs from felled stumps.[5] The benefits of the approach include improved soil structure and fertility, reduced soil moisture evaporation, groundwater recharge, and increased biodiversity.[6] FMNR is now being considered as a promising climate-smart agricultural practice that represents an affordable means of enhancing rural livelihoods, and may contribute to climate change mitigation by sequestering substantial amounts of carbon in tree biomass and soil, in addition to conserving biodiversity.[7] The approach has resulted in the reforestation of 5-6 million hectares in Niger over the last 20 years and is being successfully implemented in over 24 countries.[8] In 2017, Tony Rinaudo, WV's Principal Advisor on FMNR, conducted a feasibility assessment in Badghis Province to determine the viability of the approach, with promising findings.[9] The AACRS project is currently introducing the approach in Badghis.

4 Indian National Committee, 1994; Sivanappan, 1994.
5 FMNR Hub, 2019.
6 FMNR Hub, 2018.
7 CIGAR, 2012.
8 FMNR Hub, 2014.
9 See FMNR Hub, 2018.

World Vision
AFGHANISTAN

Reforestation

Over the last 20-30 years, rangeland in Badghis Province has deteriorated due to overgrazing, drought and deforestation.[10] Badghis Province is renowned for its pistachio forests, however due to decades of deforestation, only 1.8 percent of the land cover is pistachio forest.[11] With the support of DFAT, under the AACRS Project, WV has been working with communities in Badghis to re-establish pistachio forests. Not only do the trees contribute to climate change mitigation, they also assist with adaptation through groundwater conservation. The pistachio trees reduce soil temperatures, therefore decreasing evaporation rates. Additionally, the trees enhance the water infiltration capacity of the soil by: (1) Channeling water into the ground through stemflow; (2) Increasing soil organic matter which improves soil structure for improved water retention.

Macro-Catchments

Over the past five years, with funding from the Australian Government and private donors, WVI has been constructing large water catchments, referred to as 'macro-catchments.' These macro-catchments capture and store rainfall, snow-melt and floodwaters to help recharge groundwater used for irrigation and drinking. Experience shows that they have the added benefit of protecting communities from flash flooding. Macro-catchments are widely accepted by communities and often requested. They consist of an inlet sited in a flood path to capture runoff, a large catchment pond with a diameter of approximately 60 metres and storage capacity of approximately 5652 cubic metres, and a permeable soil base to allow infiltration.

"We didn't realize that this catchment would help in improving our kariz systems and wells within our villages but it proved to be miracle in raising the water in our wells and kariz systems," said a local resident. According to another community member, "This catchment has also assisted the livestock of the nomadic Kuchi people."

World Vision
AFGHANISTAN

10 GRM, 2017.
11 Favre & Kamal, 2005.

Terracing

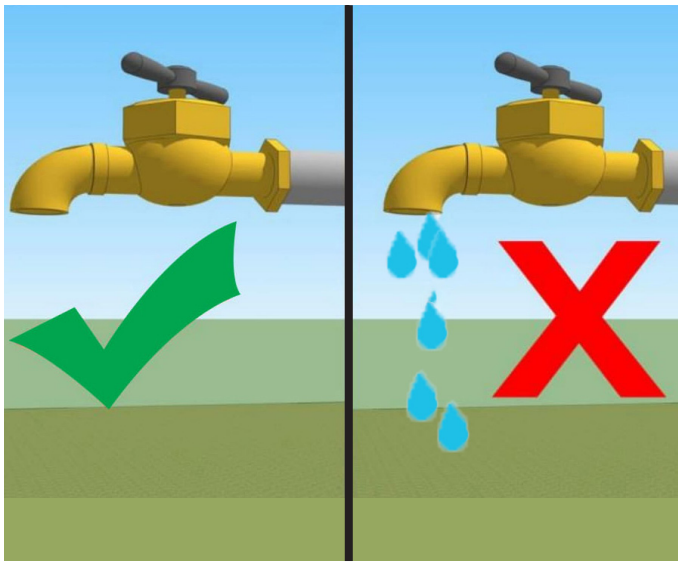
With the support of DFAT under the AACRS Project, WV has introduced terracing on the hill slopes in Badghis. Terracing is an effective water conservation measure in degraded watersheds. Terraces capture runoff from hills, increase water infiltration, and create opportunities for income from crop cultivation on the terraces. Using a benefit driven conservation approach the community has cultivated fruit trees on the terraces.

Check Dams

Over the last five years, WVI has constructed a series of check dams in Badghis Province. Check dams are small barriers built across the direction of water flow on shallow rivers and streams for the purpose of water harvesting. The function is to slow the spring flood water velocity and allow the water to percolate/infiltrate and recharge groundwater. Spring runoff can therefore be stored in aquifers, from which the water can be withdrawn during the dry season for irrigation, livestock watering, and drinking water supply. Check dam construction is both a disaster risk reduction activity (reducing flood velocity) and a water conservation activity.

Water Conservation Behavior Change

WVI has mainstreamed water conservation through hygiene promotion activities. WVI establishes community water, sanitation and hygiene (WASH) groups who share hygiene information in their respective communities. This hygiene information includes water conservation messaging such as fixing leaking taps, rainwater harvesting, and turning taps off after use. WVI's WASH in Islam curriculum, which is used with religious leaders, also contains messaging on water conservation from an Islamic perspective. Additionally, water conservation is incorporated into the children's Sesame Street (Baghch-e-Simsim) WASH Up! hygiene promotion program, recognising that children are powerful agents of change in their households.



CONTACT

Rosanna Keam
WASH Sector Lead - World Vision Afghanistan
rosanna_keam@wvi.org
YouTube: World Vision Afghanistan
Facebook: World Vision Middle East and Eastern Europe
Website: www.wvi.org/afghanistan

World Vision
AFGHANISTAN