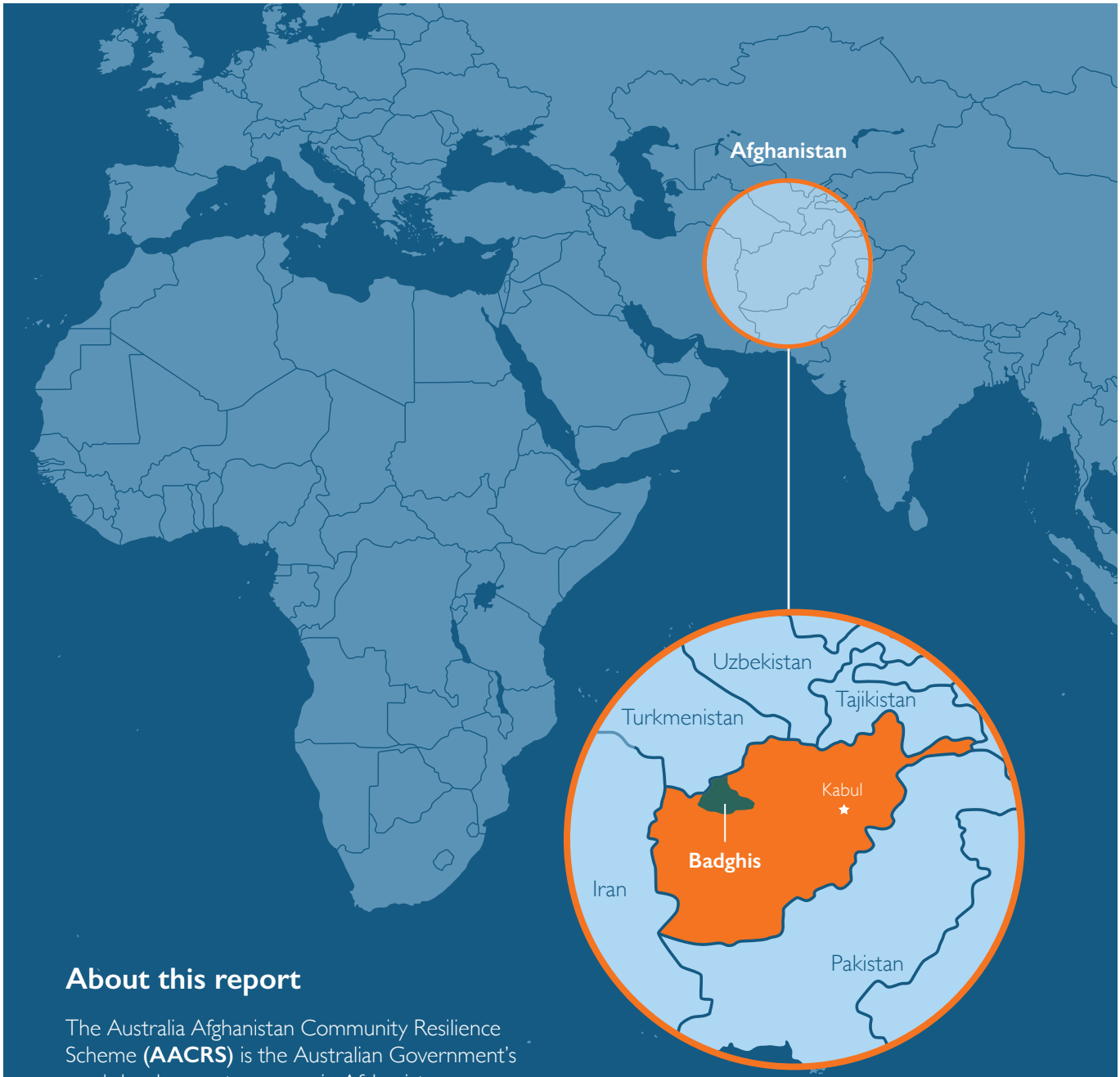
Australian Aid | World Vision

Landscape restoration, irrigation to benefit most vulnerable

Australia Afghanistan Community Resilience Scheme (AACRS)

Impact Brief – 2014-2021



About this report

The Australia Afghanistan Community Resilience Scheme **(AACRS)** is the Australian Government's rural development program in Afghanistan. The **AACRS** is a partnership between the Government of the Islamic Republic of Afghanistan (GIRoA) and the Government of Australia acting through the Department of Foreign Affairs and Trade (DFAT), and four non-governmental organizations (NGOs): ActionAid, Aga Khan Development Network, Oxfam and World Vision.

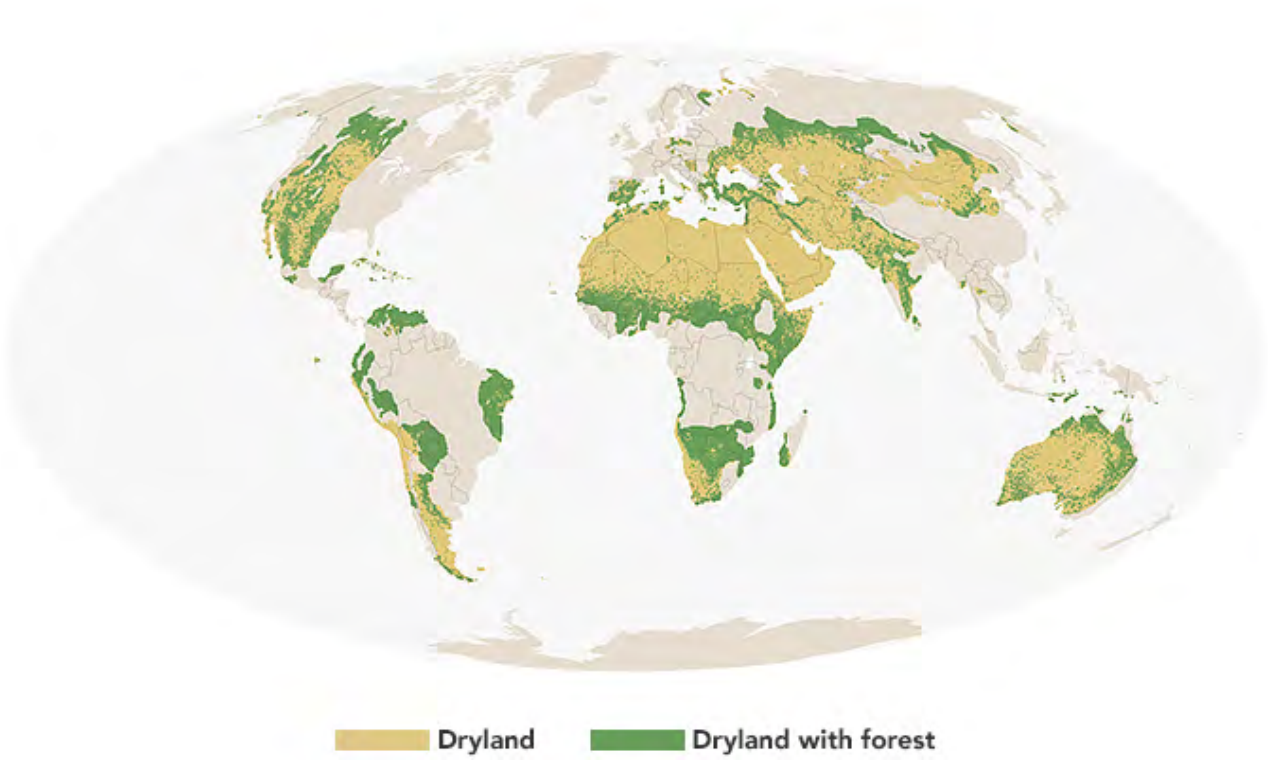
The following report presents the results of World Vision's AACRS contribution during AACRS (2014 – 2021), with the project 'Strengthening Communities to Build Resilience and Sustainable Livelihoods in Badghis.' The focus of this project has been to improve the economic and environmental resilience of farming communities and markets in Badghis Province, with technical support from World Vision Australia's Economic Empowerment and Climate Action & Resilience teams.

Global context

Drylands cover over 40% of the world's land surface, defined as places of water scarcity due to rainfall patterns. Rain may be limited, especially in arid desert zones, or abundant for short periods only. As a result, people living on drylands – more than two billion of them – must adapt to unpredictable seasons, climate uncertainty and rainfall variability. Drylands are extremely vulnerable to climatic variations, which are becoming more pronounced globally, worsened by damaging human activities such as deforestation, overgrazing, and unsustainable agricultural practices. Some 70% of the world's dryland areas, or 12 million square kilometres, have a degraded ecosystem, reducing land productivity by adversely affecting topsoil, vegetation cover and animal/crop production[1].

This is a complex and urgent problem to resolve for human survival and global development. A degraded environment undermines the resilience of those relying on the natural resources for livelihoods, exacerbating poverty, driving migration, and triggering social tensions and conflict. However, Figure 1 below shows it is possible for strong forested ecosystems to thrive in dryland areas. Reversing land degradation has significant potential to resolve economic, environmental and social issues for sustainable and resilient development outcomes.

Figure 1: Global view of dryland coverage, with and without forested ecosystems[2]



The data in this report is drawn from the AACRS endline Phase 2 evaluation and internal databases. This evaluation took a mixed methods approach combining document review with direct quantitative and qualitative discussions with participants. Two surveys took place, referring back to the 2018 Phase 1endline and Phase 2 baseline surveys so that results could be compared over time. The first consulted 635 households from 28 villages, and the second interviewed representatives from the Community Development Councils. For all data reported, the margin of error is 3.8%. In addition to the quantitative data, focus group discussions (FGDs) and key informant interviews (KIIs) with 236 people were compiled and analysed in a participatory process with the involvement of multiple stakeholders. Surveys were conducted by teams of one man, one woman, so that mixed and women-only conversations were possible.

1 Safriel U et al. 2005. Chapter 22: Dryland systems. In: Hassan, R., Scholes, R. and Ash, N. (eds.) Millennium Ecosystem Assessment. Vol. 1. Ecosystems and human well-being: Current state and trends. (World Resources Institute, Washington, DC.) pp623-662.

2 NASA Earth Observatory satellite image: Measuring the Earth's Dry Forests (nasa.gov)

Drylands in Afghanistan

The Hindu Kush, a mountainous area with little or no vegetation, covers two thirds of Afghanistan. Apart from the southern parts that benefit from the Indian monsoons, the remaining landscapes support limited, sparse bushland suited to this low rainfall area. For people living in this environment, rural livelihoods are based almost entirely on what the land can provide. Landscape degradation has been a growing crisis here. Since the 1979 war, uncontrolled exploitation of natural resources has led to largescale environmental degradation, affecting the lives of millions of smallholder farming families.[3]

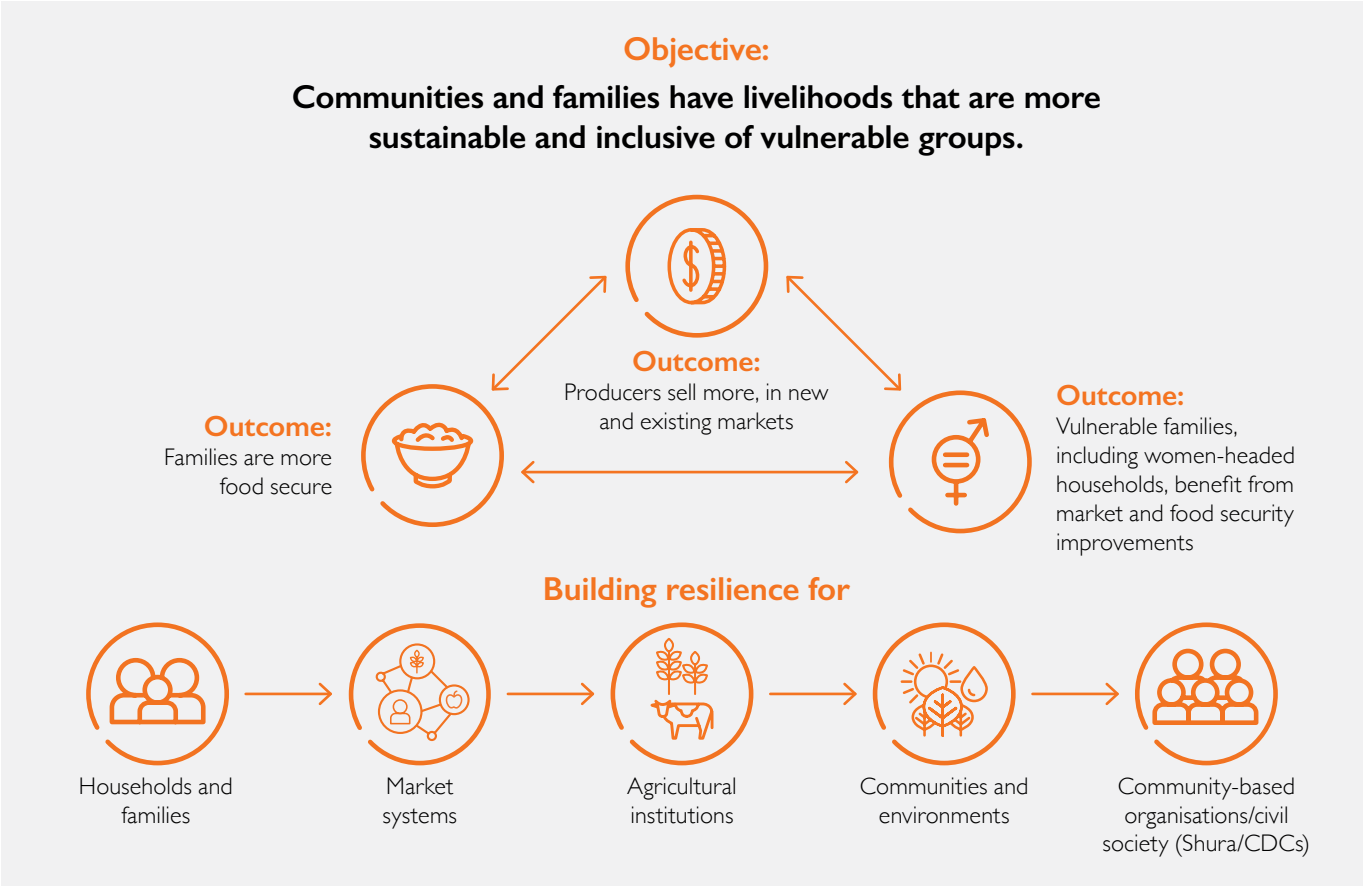
For instance, pistachio woodlands were once dense and productive in this ecosystem. According to USAID, in 1975 these woodlands covered 4,700 hectares with 40 to 100 trees per hectare. By 2005, the average tree density was between 20 and 40 per hectare, and more recent measures put woodland coverage at less than half (2,200 hectares). The loss of woodland is due primarily to cutting down trees, over-grazing and damage from uncontrolled harvesting of the pistachio nuts[4] as the crop dwindles: from 3,800 tonnes per annum in 1976 to 2,700 tonnes now[5].

Local farmers in Badghis, a region within the Afghan Hindu Kush, report that 50-70% of their pistachio woodlands have been lost during the last three decades. Declining forest cover has left smallholders unable to support their livelihoods or to build resilience in the face of climate change. In Badghis, World Vision Afghanistan has been using landscape development and natural regeneration to resolve land and water challenges, aiming longterm to create more sustainable, diversified livelihood opportunities for poor communities.

Though Badghis is dry and increasingly drought-prone, the mountain ranges provide a source of water by way of snowmelt. Improving access to irrigation is an important strategy to build resilience in this area, thereby supporting food production, providing livelihood diversity, and improving income through market linkage.

The work is part of the Australia Afghanistan Community Resilience Scheme (AACRS), funded by the Australian government through DFAT since 2014. AACRS aims to increase the resilience and livelihoods of rural Afghan communities. World Vision's objective was to ensure *"Communities and families in Badghis have livelihoods that are more sustainable and inclusive of vulnerable groups."*

Figure 2: AACRS Theory of Change towards Community Resilience



3 Saba DS 2001. Afghanistan: Environmental degradation in a fragile ecological setting. The International Journal of Sustainable Development & World Ecology, 8:279-289. DOI: 10.1080/13504500109470086
4 https://2012-2017.usaid.gov/results-data/success-stories/pistachio-woodlands-rehabilitated 5 FAOSTAT 2021.
5 FAOSTAT 2021.

Careful tending of every seedling has led to good survival rates in harsh conditions. As well as contributing to farmers' incomes, this will stabilise soil, reduce erosion and restore natural water reserves.

Impact: Restoring trees and forests

The experience in Badghis demonstrates that landscape restoration can be achieved in a way that addresses both environmental resilience and economic resilience for sustainability of results.

The project in Badghis applied an integrated catchment development approach to restore the land. Working together, farmers began to establish fruit trees on previously barren hills, supported by solar-powered drip irrigation and soil conservation measures (contours, terraces and micro-dams) to improve seedling establishment. These efforts restored 770 ha of 'unfarmable' sloping land, with over 309,240 fruit and nut trees planted. Facing drought in 2017-18, the supplementary irrigation and careful moisture retention kept seedling survival rates high; by the end of the fourth year 60% of pistachio, 68% of almond and 72% of apple trees remained alive.

These trees are expected to generate income for 1,008 families taking part in AACRS Phase 2, while pistachio gardens established in 2015 (AACRS Phase 1) are already producing at a rate that can support farmers sustainably; pistachios are delivering on average USD$2,597 per hectare, while apples and almonds give an average USD$311 per hectare.

As a result of this careful tending of land and water resources, soil erosion has stabilised, preventing further degradation. Vegetation is slowly recovering. Water infiltration is expected to improve, replenishing underground reserves and preserving water access. Environmental resilience has been bolstered – and future economic resilience has been made more secure.

Table 1: Results, Badghis drylands restoration

Intervention	Measure	Results by March 2021
Farmer Managed Natural Regeneration	Hectares under FMNR management	6
Land management	Hectares restored, managed sustainably	770
Tree planting	Pistachio trees	246,000
	Apple trees	61,040
	Almond trees	2,200
Improved, diversified livelihoods	Average income, pistachio (by hectare, by year)	$2,597
	Average income, apple/almond (by hectare, by year)	$311

These results could not have been achieved without large-scale irrigation solutions.

Impact: Increased access to irrigation and water

AACRS invested significantly in system-level irrigation in Badghis, as follows:

- 40 solar-powered irrigation systems to provide water for fruit tree gardens and vegetable cultivation
- Intake dams, super passages, karezes[6] and macro-catchments: a total of more than 209 schemes between 2014 and 2021
- Canal renovation: a range of activities such as canal clearing, mud-lining (to minimise leakage) and construction of canal protection walls (to minimise flood damage during rain events)
- Cement flood protection walls, to direct floodwater away from crop areas
- 1,400 m of water diversion canals or canal extensions developed.
- Micro-catchment areas in fruit tree gardens to improve water recharge
- Drip irrigation systems in 11 fruit tree gardens (approximately 101 ha)
- Establishment of 67 water management groups (WMGs) involving 423 men and 145 women, connected to Community Development Committees (CDCs) to address any maintenance requirements.
- 49 greenhouses with irrigation facilities, developed with women farmers in mind for new and diversified livelihood opportunities.

Table 2: Results, AACRS irrigation structures

Structure type	Number built /provided	Results by March 2021
Gabion flood protection schemes	16	Since 2014, **42,233 households** now benefit by having access to irrigation water for farming. An additional **4,089 ha** of land is irrigated, mainly for growing wheat and vegetables For communities taking part in Phase 2 only, the average amount of land irrigated per household more than doubled from **0.37 ha to 0.8 ha** per household.
Solar-powered irrigation system (3" pipes @21m³/h and 2" pipes @10m³/h)	40	
Check dam, RCC Canal lining and repairing of irrigation canal	2	
Construction of spring water catchments and irrigation pipe scheme	1	
Agriculture deep well	1	
Intake dam and irrigation pipe scheme	1	
Kariz cleaning and rehabilitation	24	
Intake dam and Repairing of irrigation canal	12	
Water Reservoir and RCC Kariz lining	1	
Flood protection structure and Water Reservoir, off takes	71	
Aqueduct, intake dam and repairing of irrigation canal, canal protection walls	33	
Flood protection wall	7	
Total	**209**	

6 A kariz is an underground slightly downward-sloping tunnel that collects and carries water released from the snowmelt-fed water table near to mountain slopes to downstream irrigation areas.

The impact of better irrigation has been felt across all community members, not only those engaged directly in program activities. For instance:

- **Increased yield potential:** with more water, farmers were able to cultivate higher-yielding varieties, and reported a 79% yield increase per hectare with new wheat varieties (2.31 tonnes per hectare, compared to 1.27 previously).
- **Crop and livelihood diversification:** irrigation gave farmers confidence to invest in crops other than wheat, such as vegetables, allowing for more than one cycle within a year. This gave an additional and complementary income-stream for farmers.
- **Families became more food secure.** The number of hungry months in a year dropped from an average of 7.5 to 1.7 months. The proportion of households experiencing moderate hunger, as classified by the Household Hunger Scale, dropped sharply from 97.3% to 8.2%.
- **Food consumption improved:** with increased income and crop yields contributing to higher levels of food security, households were eating more and better food. The proportion of families with "poor" food consumption score (FCS8) dropped substantially from 40% in 2015 to 15% in 2021.

Impact: Progress towards equality

The project identified three most vulnerable types of households for economic and social participation: landless households, households headed by women, and households headed by people with a disability.

The project emphasised enrolment of vulnerable groups in literacy, numeracy and leadership training to enhance likelihood of participation in community activities and benefits. To foster inclusive attitudes and practices, Community Development Council (CDC) members took courses in disability inclusion and gender rights, and were then encouraged to use this training to hold inclusion initiatives for the community. Together, this was intended to build confidence and self-worth among marginalised participants, as well as to create more supportive community networks for these people to play a role in market and social influence.

Results for vulnerable people given gender and other social constraints in Badghis demonstrate the value of these combined approaches. Women's economic participation through agriculture has increased, with 14% of producer groups now led by women. Income from sales for Phase 1 women producers rose three-fold between 2015 and 2018. However, additional gains between 2018 and 2021 were not as forthcoming, possibly due to compound effects of the 2018 drought and 2020-21 COVID-related market closures. However, average sales income did not decline as much as expected (see Table 4).

The project trialled women only markets, a culturally safe place for women to find market opportunity for their home-based production.

Irrigated greenhouse cultivation provided opportunity for female farmers to engage in commercial level farming and cultivate vegetables more than one season per year.

Table 3: Results, for women's economic participation			
	2015	2018	2021
Phase 1 (2014-2021) villages			
% women producers who reported making sales	11.5%	25.6%	12.1%
Income from sales (per person)	11,998 Afs	37,017 Afs	38,244 Afs
Phase 2 (2018-2021) villages			
% women producers who reported making sales		0.2%	6.6%
Income from sales (per person)		13,000 Afs	13,232 Afs

Table 4: Results, for social status of women and other vulnerable groups			
Proportion of respondents reporting they felt valued[7]		2018	2021
Phase 1 (2014-20) villages			
Gender of household head	Male	90.7	96.1
	Female	91.8	68.4
Other vulnerabilities[8]	Most vulnerable	93.9	81.4
	Less vulnerable	90.5	92.5
Phase 2 (2018-20) villages			
Gender of household head	Male	8.6	93.8
	Female	5.6	62.5
Other vulnerabilities[8]	Most vulnerable	6.7	83.0
	Less vulnerable	9.2	94.2

Homebased income for women was an important step towards strengthened economic participation.

7 Combining "Somewhat valued" and "Very valued"

8 Vulnerable households are those that are landless, those with a household member with disability, and those that are female-headed.

How it worked: Learning from Badghis

The AACRS final evaluation considered which project-related and external factors were most important in contributing to the success of community development in Badghis, and concluded the following:

- **A shared vision behind partnerships:** This was a strength of the project. Once stakeholders had agreed on what needed to happen, by whom, and by when, this vision and management plan guided all parties forward collectively. The project worked closely with the Badghis Department of Agriculture, Irrigation and Livestock (DAIL) and local communities to select sites for landscape restoration and solar-powered irrigation systems. DAIL and World Vision also partnered on training to communities in watershed management practices.
- **Diversified income opportunities:** Fruit trees were suited to the climate, region and local markets, but they took time to bear fruit and provide income. The project encouraged farmers to intercrop with shorter term produce, for instance a perennial known as hing (Asafoetida sp.), which could be harvested earlier and provided excellent yield and income potential of around USD$45,000 per hectare.
- **Local nurseries:** Six nurseries were established in different locations, using only high-quality planting material and stock to ensure best possible chance of disease-free survival. Some master farmers became propagators, trained in how to graft high-yielding varieties to vigorous root stocks adapted to dry conditions. They sold these fee-based services to other farmers as an additional income stream.
- **Investment in water management:** Irrigation was essential to the survival of tree plantations and therefore to success of both environmental and economic resilience. The project invited local communities to contribute towards water solutions, and to participate in monitoring the restoration of their watershed over time. Solar-powered pumps in the more challenging settings sent water to tanks on top of slopes allowing drip irrigation of seedlings year round. New water-harvesting assets such as contours, terraces, micro-dams and half-moon water retention structures were installed through cash-for-work programs involving and supporting poorer communities and marginal farmers.
- **Reliable, relevant markets:** Badghis is famous for its production of top-quality pistachios and there is strong demand. The tree crop is well suited to local agro-ecology, and an ideal choice to contribute to landscape restoration while also winning people's interest and engagement. Even if farmers were growing another product, establishing a pistachio orchard could help diversify their income over time. To ensure a fair price, the project formed producer groups and linked them with potential buyers directly, removing the need for a 'middle man' to take a portion of profits.
- **Proven practices:** The project demonstrated World Vision's experience in landscape restoration, including good management practices (planting, pest and disease control, fertilising, grafting, pruning etc), and intercropping for enhanced soil stability and income. Where appropriate, the project also introduced World Vision's Farmer Managed Natural Regeneration (FMNR), now recognised as a UN SDG Good Practice[9] to restore land and vegetation. FMNR quickly restores vegetative cover by protecting and caring for regenerating roots and resprouting shoots. However, living roots and stumps were largely absent from the barren slopes targeted for restoration, and communities were only able to use FMNR in six of 770 hectares managed under the project.
- **Investing in social change:** As part of the inclusion strategy, the project worked directly with households, using World Vision's "Celebrating Families", a type of family counselling emphasising reflection on roles and rights within the household. Delivered through mullahs and shura leaders, the Celebrating Families campaign raised awareness on women's equality, children's rights and protecting children from early marriage. While increased income and food security materially supported children's education and other costs, the Celebrating Families component reportedly delivered positive effects on family relationships, especially between women and men.
- **Development and humanitarian projects complemented each other:** A cash-for-work project supported by Afghanistan Humanitarian Fund complemented canal clearing work required by AACRS infrastructure, leveraging local labour and community engagement. For more information, watch the video Building resilience of vulnerable communities against shocks.

9 UN DESA 2020. SDG Good Practices. (https://sdgs.un.org/publications/sdg-good-practices-2020)

What should happen next?

The results of this project confirm that connecting landscape regeneration and access to irrigation water with sustainable livelihoods for smallholder farmers can work in the dryland regions of Afghanistan. However, dependencies on external investments and partnerships, especially with government, remain strong. The AACRS project repurposed an existing cash-for-work scheme to invest in irrigation and water catchment essential to the survival of trees and other crops. Though the approach itself has been proven across the two phases of AACRS, it is unlikely to scale up to other surrounding watersheds without further similar investment. As well, the fragile and food-insecure context across Afghanistan challenges local areas to rebuild environmental assets without clear purpose and shared vision. While this work is also central to government goals, and technical support was received from DAIL for AACRS, conflict prevents regular access to other areas where such an approach could deliver similar results.

Recommendations for scaling up:

- **Be sure of buy-in from all stakeholders in landscape management:** community groups and leaders, local government and other partners. Landscape restoration is large-scale by its nature and everyone needs to be in agreement as to its value.
- **Keep investing in construction** of physical structures for rainwater capture to improve water infiltration and restore watersheds. Install structures that best suit context and site.
- **Link restoration with clarity to generating profits** for the local community, with products and value chains suited to local conditions and market demand. Often, more than one value chain can be built with intercropping or agroforestry.
- **Supply farmers with the "full package" of inputs.** For instance, in pistachio: (1) access to high-quality planting material, both scion and rootstock; (2) access to supplementary water to support tree survival (without associated high labour cost); (3) in-depth training to lead farmers and smallholders alike.
- **Use inclusive market system approaches** to connect farmers more effectively with improved markets. The project found forming producer groups around pistachio production provided a more direct link to markets and helped farmers retain a greater share of profits to sustain the intervention.
- **Foster awareness and action on environmental sustainability for income:** for instance, installing physical structures to sustain groundwater so that crops and forests return on their potential for profits.
- **Identify more activities to integrate landless households:** Landless households remained precariously vulnerable to seasonal and climate shocks. In addition to greenhouses, other solutions are needed to support production through access to land or equipment (for instance, in honey production).
- **Prioritise women's engagement and social status:** As well as continuation of women's economic empowerment strategies, household-level Celebrating Families (see page 9) has helped to shift values and roles around gender, but significantly more is needed in this challenging gender context.

Through AACRS, smallholder farmers have driven the restoration of a thriving pistachio market in Badghis. These children show part of their family's annual crop.

When you commit to humanity amazing things can happen!

Through AACRS in Badghis, Afghanistan, World Vision has shown that landscape restoration and irrigation access can build resilience of smallholders in dryland areas of Afghanistan. AACRS has also demonstrated progress towards inclusion and equality for the most vulnerable, though recognising the long-term nature of such work in this challenging social context.

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