Independent Project Evaluation Report

Conservation and Sustainable Management of Critically Endangered Biodiversity in Dashti Jum, Shamsuddin Shohin District of the Khatlon Region of Tajikistan

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1. Executive Summary

This evaluation confirms that the project *"Conservation and Sustainable Management of Critically Endangered Plant Biodiversity in Dashti Jum, Shamsiddin Shohin District of the Khatlon region of Tajikistan"*, implemented by the University of Central Asia (UCA) with support from the Swiss Agency for Development and Cooperation (SDC), has made meaningful progress in achieving its dual objectives of biodiversity conservation and livelihood strengthening in one of Tajikistan's most vulnerable mountain regions. By combining in-situ and ex-situ conservation with climate-resilient livelihoods, the project directly addresses the drivers of biodiversity loss while contributing to poverty alleviation. A five-day evaluation mission in August 2025, covering 20 sites across five villages, assessed the project using OECD-DAC criteria. Findings show that interventions such as beekeeping, solar water heaters, and fuel-efficient stoves are particularly relevant, effective, efficient, and sustainable. These interventions delivered measurable outcomes: households reported honey harvests of 80–100 kg per year generating significant income; electricity costs dropped from TJS 350–500 to TJS 40–50 monthly with solar heaters; and fuelwood use fell by half through efficient stoves, with notable improvements in health and women's wellbeing. Women's home nurseries and slope rehabilitation activities also demonstrated strong potential, with high survival rates of seedlings and woodlot plantations, tangible income prospects, and contributions to soil stabilisation and biodiversity recovery, although they remain vulnerable to pests, irrigation constraints, and climate stressors. By contrast, fruit and vegetable dryers were consistently reported as under-scaled and underutilised, limiting both their impact and their relevance to household or market needs. Importantly, the project has also achieved intangible but critical outcomes, including building pride, confidence, and social cohesion, positioning communities as active custodians of biodiversity and agents of sustainable development.

Overall, this evaluation finds that simple, market-connected interventions requiring minimal follow-up support generated the strongest results, while more complex or infrastructure-dependent activities require continued technical and financial inputs to achieve long-term sustainability. Limitations of this evaluation - particularly its small site coverage, reliance on self-reporting, and seasonal timing - should be acknowledged, and broader conclusions will require longitudinal monitoring across all 18 villages. Nevertheless, the project demonstrates the value of an integrated model that reinforces resilience at household, community, and

landscape levels. For SDC, the findings align closely with its strategic mandate under the International Cooperation Strategy 2025–2028 to promote sustainable livelihoods, climate-resilient development, and biodiversity conservation in fragile mountain regions. Continued SDC support is strongly recommended, with priority actions including scaling up proven interventions such as beekeeping and clean-energy technologies, adapting underperforming activities like dryers, investing in irrigation and pest management, and strengthening monitoring systems. By consolidating these gains, SDC can not only safeguard the project's long-term sustainability but also uphold its responsibility to address the inequities of global climate vulnerability, ensuring that rural communities in Tajikistan are supported rather than left to bear the costs of a crisis they did not create.

2. Project Aim and Objectives

Table 1: Project Details and Contact Information

Project Title:	Conservation and sustainable management of critically endangered plant biodiversity in Dashti Jum Shamsiddin Shohin District of the Khatlon region of Tajikistan
Organization:	University of Central Asia
Project Region:	Khatlon region, Tajikistan
Project Duration:	24 November 2023 to 30 October 2025
Project cost:	3,066,600.00 Tajiki Somoni
Key Donors	SDC Tajikistan: 73% UCA: 27%
Project Manager:	Aziz Ali Khan
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This project responds to the urgent need to conserve Tajikistan's threatened plant biodiversity due to climate change and unsustainable land use practices. In alignment with Tajikistan's Biodiversity Action Plan, this project aims to regenerate and protect 300 hectares of ecologically important mountain slopes through in-situ and ex-situ biodiversity conservation.

With poverty being a main driver of biodiversity loss across Tajikistan, this project is designed to uplift rural communities across 18 villages within the Dashti Jum Shamsiddin Shohin District of Khatlon, from poverty, by providing them with the relevant tools and knowledge to sustainably adopt climate resilient and biodiversity conserving livelihoods. By integrating biodiversity conservation with income generation, this project targets achieving long-term sustainable development within the focused area.

Strong collaboration between the University of Central Asia's Mountain Societies Research Institute (MSRI), the Swiss Agency for Development and Cooperation (SDC), Tajikistan's Government Forestry Agency, and community leaders ensures that activities are both

technically robust and locally owned. This partnership is central to building community resilience, securing government support, and ensuring the sustainability of project outcomes.

To achieve the aims of this project, the following activities have been implemented so far:

- A successful inception workshop with key government stakeholders
- Seven awareness workshops were conducted across 18 villages
- Establishment of seven village-level conservation committees
- Protection of 300 hectares of biodiversity hotspots
- Creation of endangered species nurseries in partnership with the Kulob Botanical Garden
- Provision of GIZ-designed fuelwood efficient stoves to 35 low-income families in the project area.
- Provision of GIZ-designed fruit and vegetable dehydrating equipment to low-income families identified by village heads.
- Provision of solar water heaters to 72 low-income households in 18 villages
- Provision of bee hives and beekeeping training, and equipment to 46 poor families
- Provision of 3 manual honey extractor machines to 3 groups of honeybee farmers in 6 villages.

3. Evaluation Report Aims

As part of the Terms of Reference of my internship with UCA's MSRI (**Annex 1)** I have been asked to carry out an independent evaluation of this project, alongside other tasks. In line with these terms, this report will thus evaluate the socio-economic and environmental impacts of the project's interventions, assess their strengths, challenges, and long-term sustainability, and identify areas for project improvement, including materials, community knowledge, and scientific research gaps. This evaluation, specifically written for the Swiss Agency for Development and Cooperation (SDC), will conclude by providing evidence-based recommendations that are prioritised and actionable, which I believe can help enhance the effectiveness and sustainability of this project.

Given the breadth of activities implemented under this project, to ensure a thorough and in-depth analysis is carried out, this evaluation will specifically concern the following activities:

- Provision of bee hives and beekeeping training, and equipment to 46 poor families
- Provision of 3 manual honey extractor machines to 3 groups of honeybee farmers in 6 villages.
- Provision of GIZ-designed fuelwood efficient stoves to 35 low-income families in the project area.
- Provision of GIZ-designed fruit and vegetable dehydrating equipment to low-income families identified by village heads.
- Provision of solar water heaters to 72 low-income households in 18 villages
- Rehabilitation through gully plugging and soil conservation of 300 hectares of biodiversity hotspots
- 6000 printed copies of brochures on 4 key endangered and threatened tree species of the project area and distributed among key stakeholders, including community and school children, for creating awareness and to support conservation efforts.

4. Methodology

4.1 Field Data

To evaluate this project, a field visit was made to the Dashti Jum Shamsiddin Shohin district of the Khatlon region in Tajikistan (**Figure 1**) between the 11-15th of August. Over this five-day period, 20 project sites (**Table 2**) were visited across 5 of the 18 villages (**Figures 1,2,3,4,5,6,7**). Activities of evaluation interest were observed and semi-structured interviews with project beneficiaries were carried out to contextualise and confirm interview findings. Prior to the field visit, interview question guides were created specifically for each activity evaluated (**Annex 2**). Considering the aims of this evaluation report, guides were designed to obtain insight into the socio-economic and environmental impacts of each relevant project interventions, assess the sustainability of each project after donor support ends, and identify any remaining challenges faced by project beneficiaries. A semi-structured interview approach was used moreover a questionnaire to allow for a more natural flow of conversation. This created a relaxed environment inviting trust and authentic expression of beneficiaries. Fieldwork was conducted jointly with project lead, Aziz Ali Khan, and fellow MSRI intern, Rezabegim Sholamova, who provided interview interpretation support.

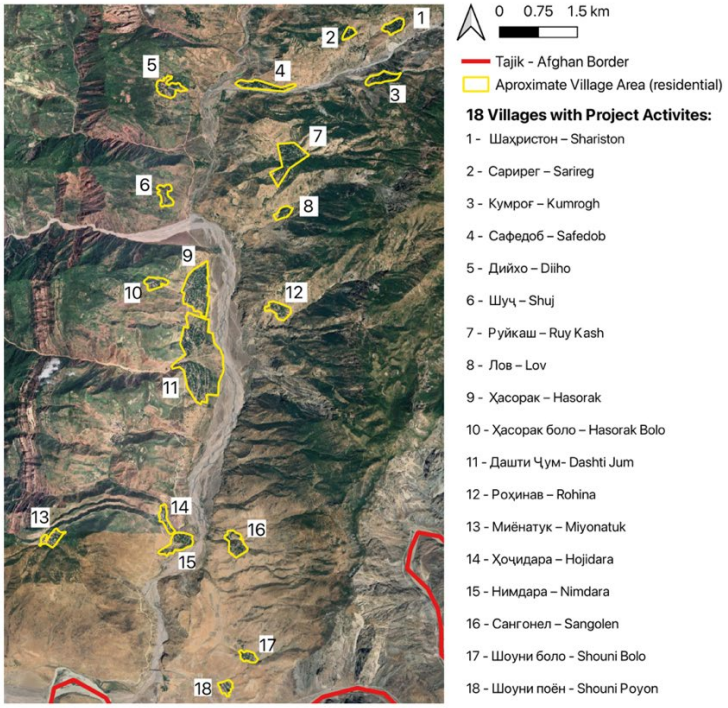

Figure 1: Map showing location of 18 project villages in Dashti Jum Shamsiddin Shohin district of Khatlon region, Tajikistan

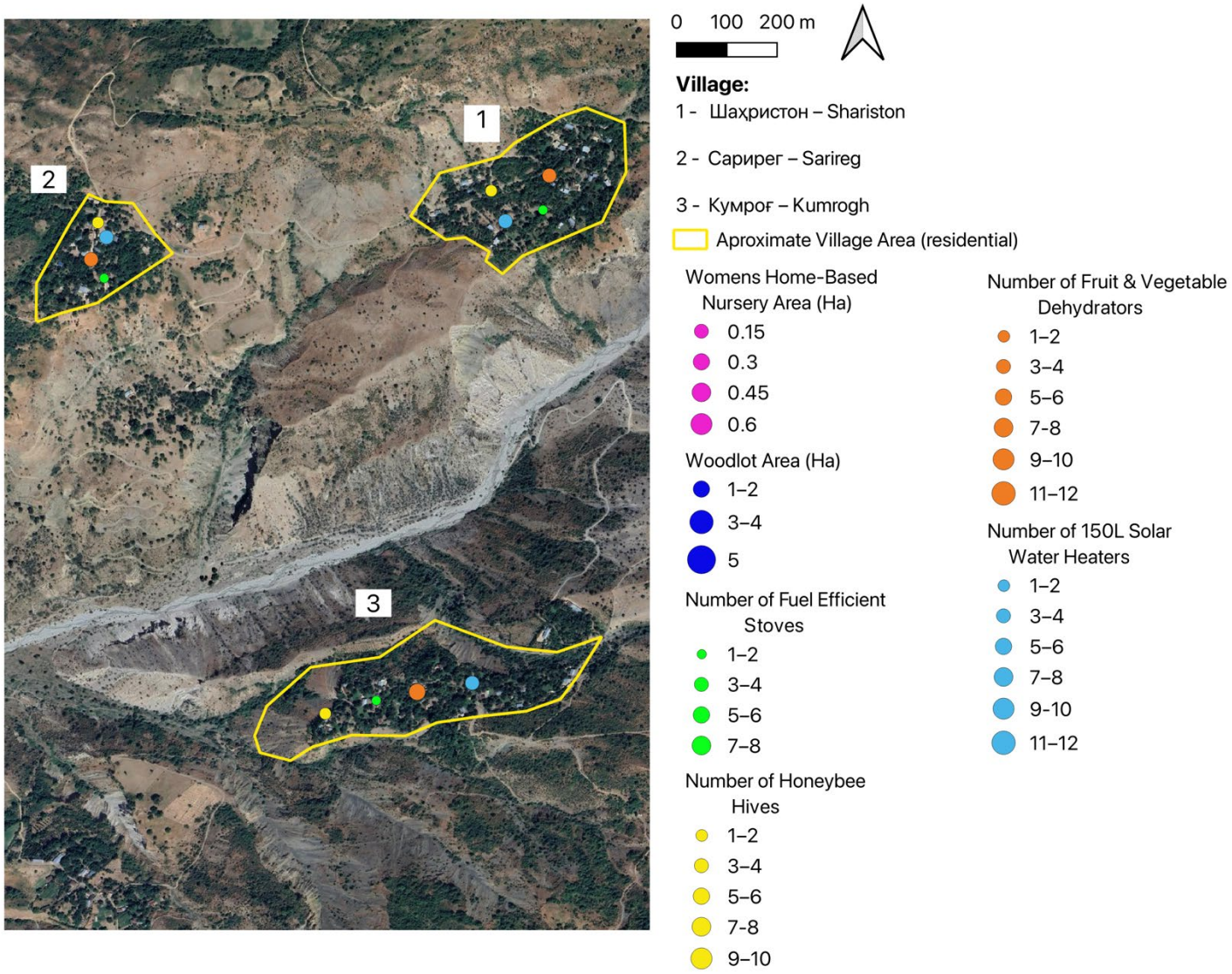

Figure 2: Map showing the number of different project interventions in villages Shariston, Sarireg, and Kumrogh

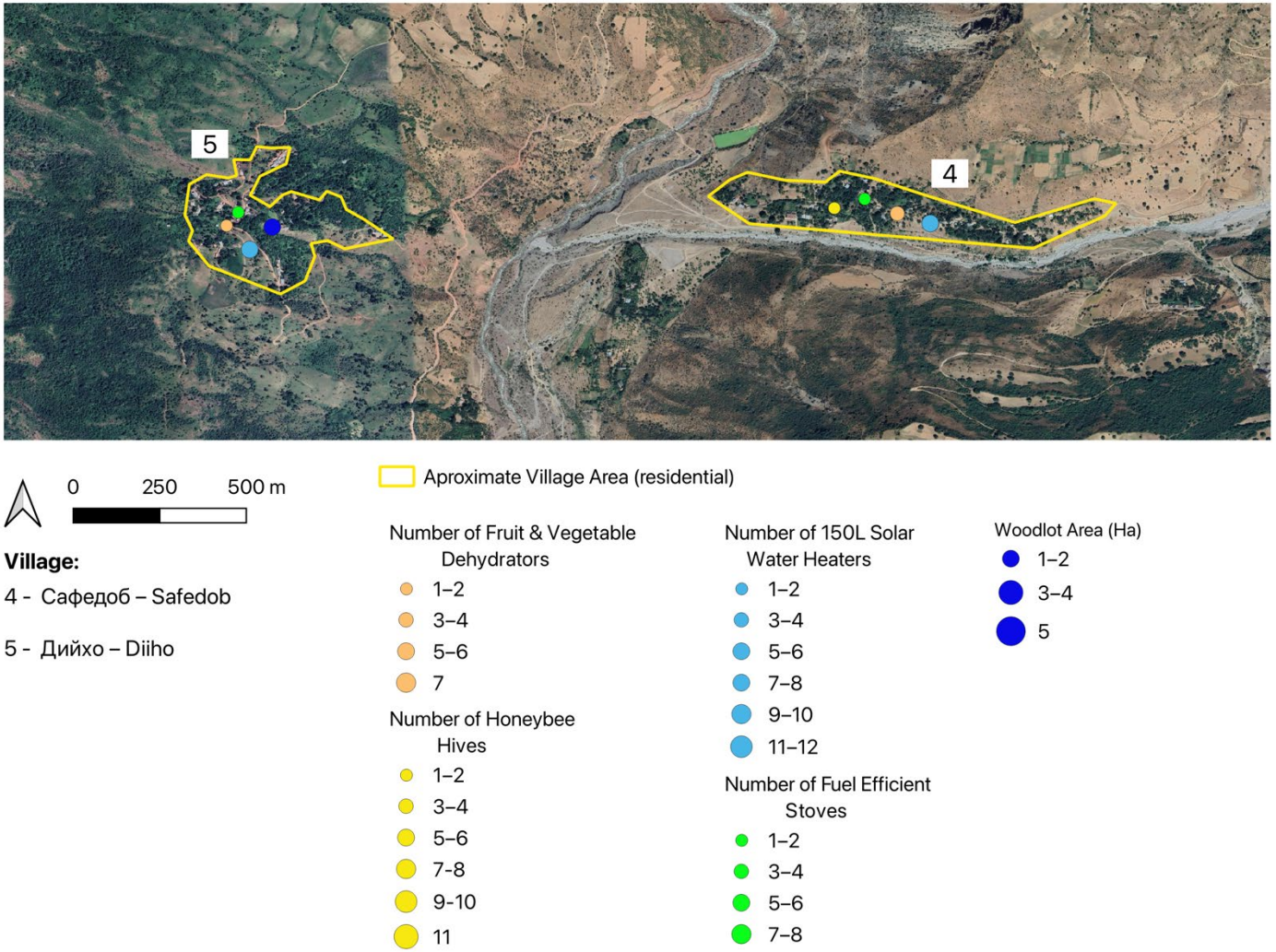

Figure 3: Map showing the number of different project interventions in villages Safedob and Diho

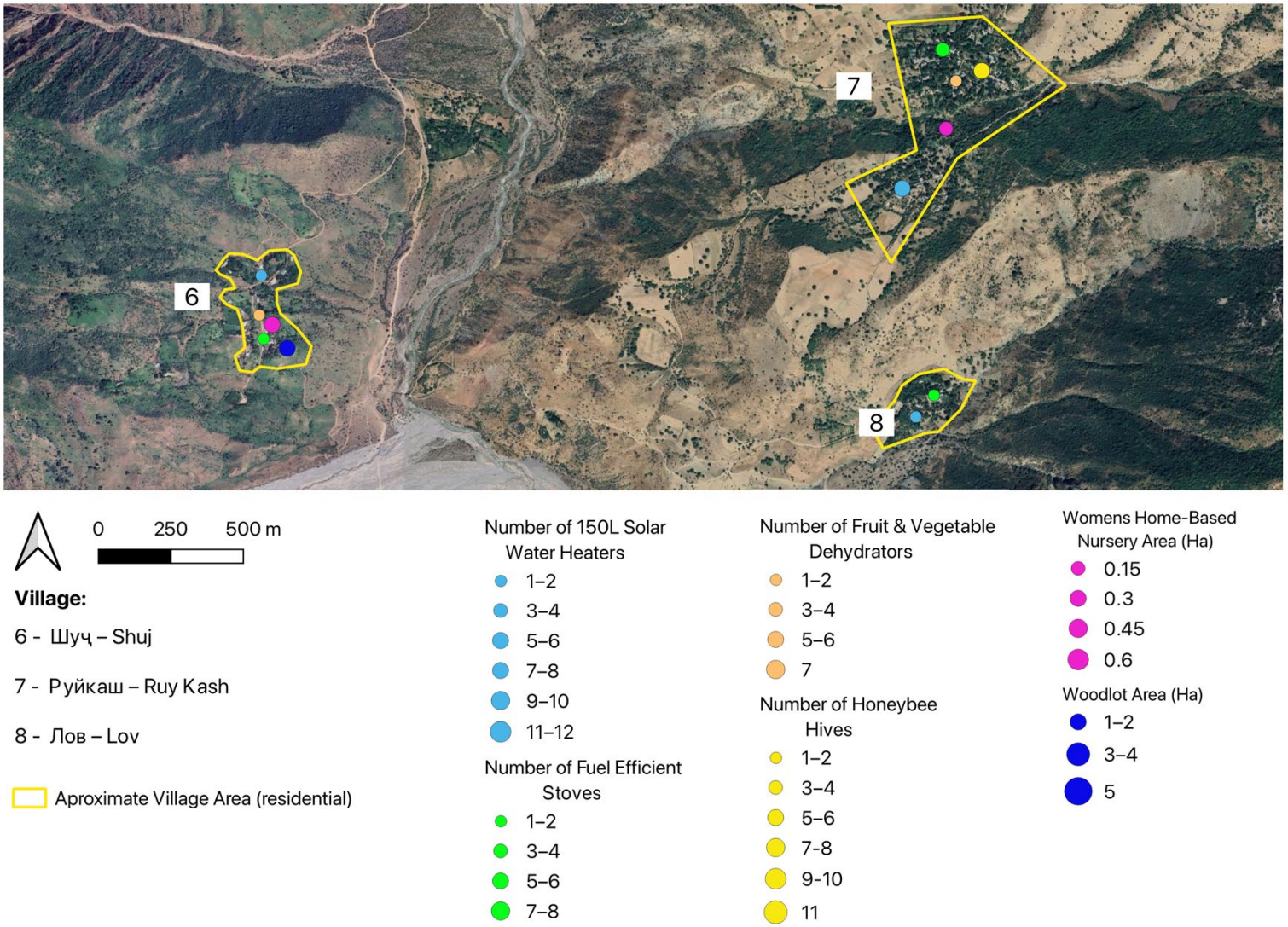

Figure 4: Map showing the number of different project interventions in villages Shuj, Ruy Kash, and Lov

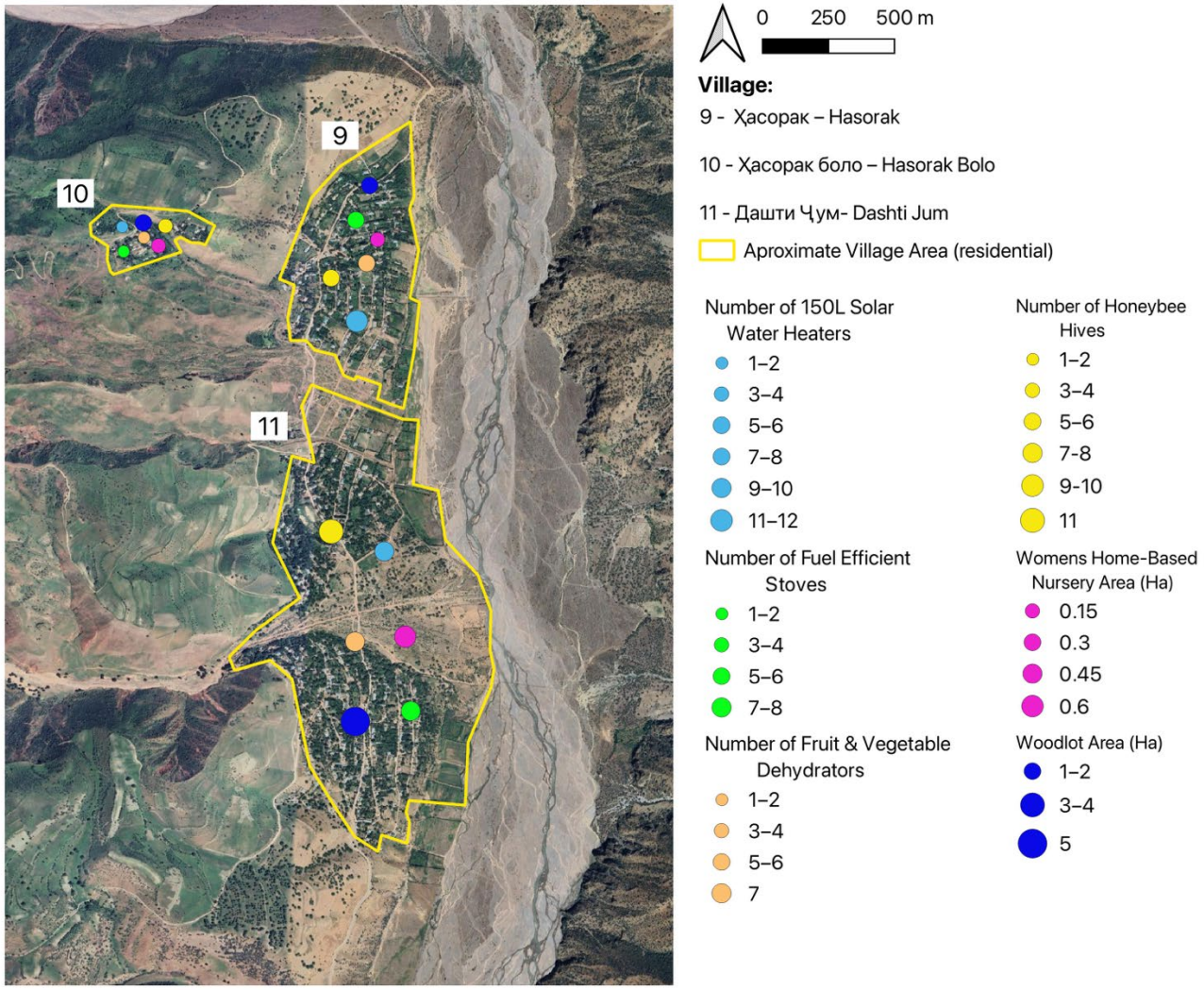

Figure 5: Map showing the number of different project interventions in villages Hasorak, Hasorak Bolo, and Dashti Jum

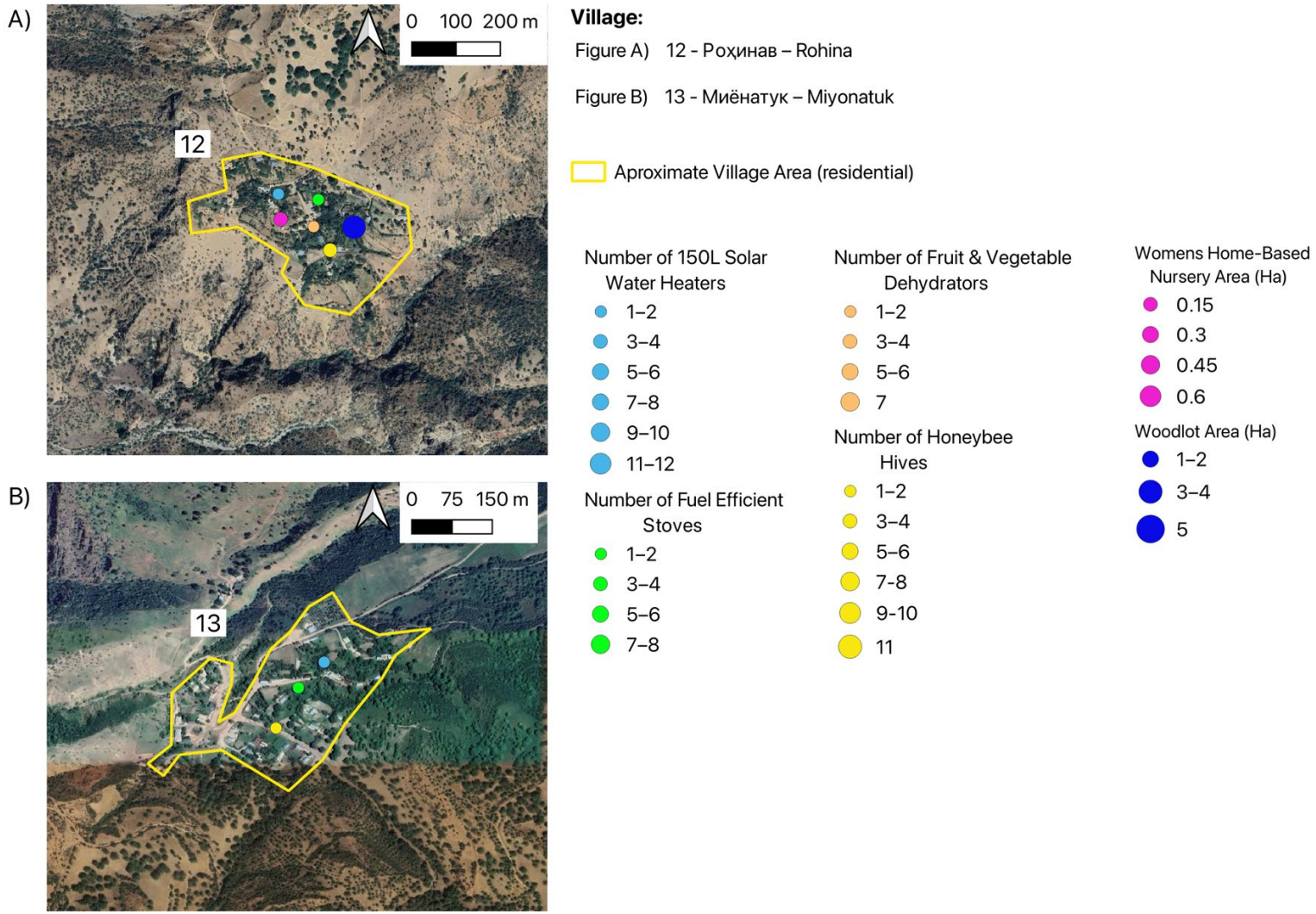

Figure 6: Map showing the number of different project interventions in villages Rohina and Miyonatuk

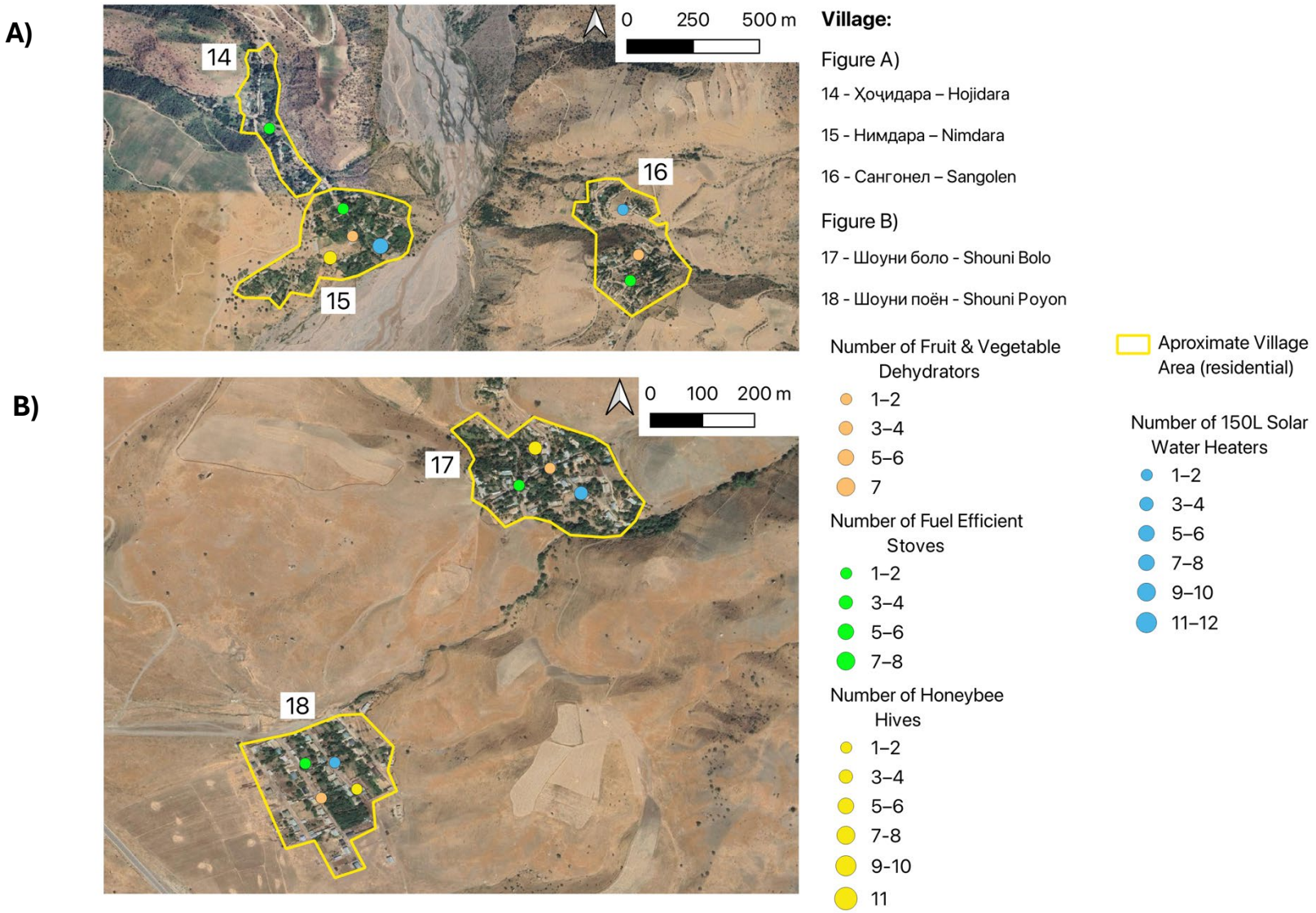

Figure 7: Map showing the number of different project interventions in villages Hojidara, Nimdara, Sangolen, Shouni Bolo, and Shouni Poyon

Table 2: Number of project sites visited per intervention over the five-day field visit.

Implemented Activity	**Total No. of Sites Visited**	**Visited Village** (village number)
Honeybee Hives	3	Hasorak Bolo (10) Dashti Jum (11)
Solar Water Heaters	3	Hasorak (9) Dashti Jum (11)
GIZ Designed Fuelwood Efficient Stoves	2	Dashti Jum (11)
GIZ Designed Fruit and Vegetable Dehydrators	1	Hasorak (9)
Women's Home-Based Nursery	6	Hasorak (9) Dashti Jum (11)
Gully Plugging and Multipurpose Fruit-tree Woodlots	5	Diho (5) Hojidara (14)

4.2 Evaluation

As most members of the OECD Development Assistance Committee (DAC), the SDC bases project evaluations on the six criteria designed by DAC (**Figure 8**). Given the SDC is the target audience of this report, this criterion will be used - where relevant and applicable - to evaluate the field findings of each relevant project activity.

Figure 8: The DAC Evaluation Criteria
(Source: Applying Evaluation Criteria Thoughtfully, OECD 2021)

5. Field Results

5.1 Honeybee Hives, Beekeeping Training, and Honey Extractors

The provision of honeybee hives and beekeeping training has delivered immediate economic and ecological co-benefits for project beneficiaries. Interviewees reported that training sessions organised by UCA equipped them with the knowledge and practical skills required to manage hives effectively and with confidence. While some families had prior generational experience in apiculture, the sessions were valued for consolidating best practices for hive management in both summer and winter conditions, and for providing a strong foundation for those without previous experience.

On average, beneficiaries reported harvesting 80–100 kilograms of honey per household annually, sold at approximately 120 somoni per kilogram. This provides a significant source of income in the project area. Several households highlighted that this success motivated them to expand independently, with two families reporting growth from a single hive to 10 and 20 hives respectively (**Figure 9 and 10)**. This expansion demonstrates strong ownership and confidence in apiculture as a good social enterprise and sustainable source of livelihood. Market demand remains high, with buyers travelling directly from urban centres to Dashti Jum, ensuring that there is no competition between producers. Beneficiaries also reported selling bee families and hives to other community members, both to generate further income and to encourage wider adoption of beekeeping, which they viewed as secure and manageable.

From an environmental perspective, beekeeping provides important ecological benefits. Bees play a crucial role in pollinating both cultivated and wild plants, thereby supporting agricultural productivity and biodiversity conservation. However, beneficiaries noted that increasingly frequent dust storms linked to climate change threaten hive productivity by covering flowers and restricting foraging.

A further challenge concerns the limited availability of honey extractors. Only three machines were provided across 18 villages. While these are shared, their heavy design makes transportation without vehicles difficult, creating inefficiencies during peak harvest periods (**Figure 9)**. When asked if communities could pool resources to purchase additional extractors, beneficiaries explained that the cost remains beyond their means. This highlights a need for

continued external support to ensure long-term efficiency and maximise the intervention's impact.

Figure 9: Beneficiates interviewed which have independently expanded from managing one honey beehive to 10

Figure 10: Honey extractor

5.2 Solar Water Heaters

The provision of solar water heaters has generated clear and immediate environmental, economic, and social impacts for beneficiary households. Environmentally, reliance on fuelwood for heating water has been significantly reduced, directly reducing pressure on local forests and contributing to biodiversity conservation.

This reduced dependence on fuel wood has brought social and wellbeing impacts, particularly pronounced for women. Before the introduction of solar water heaters, firewood was relied on for cooking and cleaning. This created smoke, ash, and dirt, leading to labour-intensive cleaning and frequent exposure to indoor air pollution causing more frequent respiratory illnesses and continued fatigue. The adoption of solar heaters has broken this vicious cycle:

women now experience reduced workloads, have more time for other activities, and reduced smoke exposure. At all visited sites, women praised the wellbeing and health improvements this intervention has brought them (**Figure 11**).

Economically, the benefits were equally notable. Families reported that monthly electricity bills previously ranged from 350–500 somoni, but after installation, costs fell to just 40–50 somoni. These savings have allowed households to reinvest in domestic infrastructure, such as showers and washing machines (**Figure 12**), which in turn improved hygiene and quality of life. Some households reported reselling surplus fuelwood stocks purchased before installation, creating additional income, and reflecting confidence in this provided infrastructure. Across all interviews, beneficiaries described the heaters as durable, low-maintenance, and easy to operate, and expressed confidence in managing them independently.

The only challenge identified was that some households lacked the technical knowledge to connect heaters secondary infrastructure such as showers or other water systems. Without this knowledge, families are unable to fully benefit from the intervention thus highlighting an area for further support. Nonetheless, overall findings indicate that solar water heaters represent a sustainable, low-cost technology delivering strong environmental, economic, and social returns, with clear potential for scaling across similar rural contexts.

Figure 11: Beneficiaries interviewed which received solar water heaters

Figure 12: Additional infrastructure installed connected to solar water heaters

5.3 Fuel Efficient Stoves

The provision of GIZ-designed fuel-efficient stoves (**Figure 13**) has delivered significant environmental, economic, and social benefits. Like the solar heaters, the stoves reduced household reliance on fuelwood, a major driver of forest degradation in the region. Beneficiaries reported that fuelwood consumption fell by approximately 50 percent following installation. The multipurpose design was widely praised for enabling faster, more efficient cooking, thereby reducing both resource use and expenditure. Families explained that dried branches and fuelwood collected near their homes are now sufficient to meet needs, eliminating the necessity of purchasing additional supplies. This shift reduced household costs while also easing pressure on local biodiversity.

Social and wellbeing impacts were also clear. Families reported improvements in indoor air quality, with women in particular noting fewer respiratory problems, such as coughing, that were previously linked to smoke exposure. Reduced cooking times further lessened domestic workloads, freeing women's time for other activities. Beneficiaries also noted the durability of the stoves: none had required repairs since installation, and in rare cases of malfunction, families were confident they could pay for local repair services, reflecting a degree of independence from project support.

Overall, fuel-efficient stoves represent a durable, low-cost technology with tangible environmental, economic, and social returns. Their high acceptance and continued use across beneficiary households indicate strong long-term sustainability, making them a scalable model for other rural communities in Tajikistan.

Figure 13: GIZ-designed fuel-efficient stoves

5.4 Women's Home-based Nurseries

Women's home-based nurseries emerged as one of the most promising interventions, combining strong environmental, economic, and social outcomes. Seedling survival rates of around 90 percent were recorded, reflecting effective management and suitability to local conditions. Apricot, mulberry, and walnut were the most cultivated species, selected both for their high market demand as saplings and fruit, and for their resilience and adaptation to local environmental conditions. The choice of species was determined collaboratively between the Forestry Agency and local communities, reinforcing a sense of ownership and confidence in their long-term success despite increasing climate pressures such as rising temperatures.

Economically, the nurseries demonstrate significant livelihood potential. Individual sites reported cultivating thousands of seedlings, with one managing 3,000 and another 5,000 (**Figure 14**). At a sale price of 7–10 somoni per seedling, projected revenues reached a minimum of 21,000 somoni per nursery cycle, representing a substantial income stream for rural households. Such earnings illustrate the profitability of nurseries as a means of diversifying income and reducing vulnerability.

Socially, nurseries have been particularly transformative for women. By positioning women as visible economic actors, the intervention enhanced their roles in household and community decision-making. Beneficiaries expressed strong satisfaction with the nurseries and confidence in the support provided by UCA and the Forestry Agency. However, they also highlighted challenges in managing insect pest infestation, with households relying on chemical treatments provided by the Forestry Agency. While effective in the short term, this reliance is

unsustainable, and beneficiaries expressed the need for more specialised technical guidance to develop environmentally sound and longer-lasting solutions.

Figure 14: Women home based walnut nursery visited

5.5 Slope rehabilitation: Gully Plugging and Multipurpose Fruit-tree Woodlots

The rehabilitation of degraded slopes through gully plugging, check damming, and the planting of fruit-tree woodlots has delivered visible environmental and livelihood benefits (**Figure 15**). Field visits confirmed that most rehabilitation work had been completed successfully, while the remaining activities were scheduled for September, following the harvesting season making local labour available. Survival rates of 75–80 percent for planted fruit trees were also observed despite prolonged dry conditions due to their climatic adaption. Beneficiaries and forestry staff reported these interventions to have improved soil stability, reduced erosion, and protected downstream villages, as well as the build-up of fallen leaves, and sediment collected behind check-dams to have improved soil fertility, supporting the recovery of degraded land.

Monitoring visits showed strong engagement by both community members and the Forestry Agency in maintaining sites. Regular inspections and technical guidance were described as essential in achieving observed survival rates. A particularly encouraging observation was the introduction of *Paulownia tomentosa*, a multipurpose forest tree species introduced by the Forest Agency from China which had exceeded one metre of growth in its first year (**Figure 16**), indicating high adaptability and potential for future use.

Despite these successes a key challenge with irrigation is still faced: households often transported water uphill by donkey due to limited pipelines. Despite planting drought-tolerant species, watering is required every two to three times a month in hot summer seasons to ensure survival. Insect pest infestations were also noted. Households reported using chemical treatments supplied by the Forestry Agency, which were effective but raise concerns about sustainability. Beneficiaries consistently stressed their need for more irrigation pipelines, as well as specialised technical guidance to better understand the unknown biological threats to their planted tree species (**Figure 17).**

Figure 15: Gully plugging and check damming sites visited

Figure 16: *Paulownia tomentosa* trial plot

Figure 17: Unknown disease spread amongst pomegranate fruit trees

5.6 GIZ - Fruit and Vegetable Dehydrators

The value of GIZ- designed dryer for hygienically dehydrating fruit and vegetable produce, and *qurut* (dried yoghurt/curd) was recognised, however beneficiaries consistently stressed on dryer being too small to productively meet household needs alone. Beneficiaries noted the potential for income generation through dried products, particularly given strong urban demand, but emphasised that the current scale of this intervention prevents this opportunity from being realised. Larger dryers were requested through further donor support as construction cost, estimated at around 4,000 somoni, was reported as out of reach.

The underutilisation of dryers was evident during the field visit. Although the units were in good physical condition, they lacked the same sense of pride and ownership visible in other interventions (**Figure 18**). This suggests that, while conceptually relevant, the current models have not generated strong community engagement due to their limited scale of impact. Without adaptation to larger, more efficient models, the dryers risk remaining a marginal rather than transformative intervention.

Figure 18: GIZ- designed dryer, shelves left reinstalled incorrectly

5.7 Awareness Brochures and Workshops

As part of environmental awareness-raising efforts, the project has actively promoted the conservation of endangered and threatened wild fruit tree species, including the Shaking pear, Tajik pear, Bitter almond, and Darwaz plum (**Figure 19**). Informational brochures in the Tajiki language were developed and distributed during the field visit to a wide audience of stakeholders, including schools, government institutions, and local community members. By targeting both younger generations and institutional actors, this activity aimed to strengthened knowledge of native biodiversity while fostering community-wide participation in conservation efforts. The use of accessible, locally tailored materials enhanced the relevance of this awareness campaign and its potential for long-term impact. All beneficiaries interviewed across the 20 sites visited showed clear in-depth understanding of the importance of combatting environmental degradation and biodiversity loss in the region, reflecting meaningful impact and learning from previously held awareness workshops.

Figure 19: Educational brochures handed out to community members, promoting the conservation of endangered and threatened wild fruit tree species, including the Shaking pear, Tajik pear, Bitter almond, and Darwaz plum.

6. Evaluation

Relevance

All assessed interventions demonstrated strong relevance to both community priorities and broader national policy frameworks. Beekeeping was particularly well aligned, building on existing local knowledge and responding to clear market demand, while also contributing to environmental health through the critical role of bees in pollination and biodiversity. Solar water heaters and fuel-efficient stoves were equally relevant, as they directly addressed household needs for affordable and reliable energy while reducing reliance on fuelwood, thereby contributing to urgent biodiversity conservation objectives. These dual welfare and environmental benefits highlight the project's strong relevance at both the community and national levels, aligning closely with Tajikistan's climate and energy strategies.

Women's home-based nurseries and slope rehabilitation activities were also highly relevant, though their benefits require a longer time horizon to fully materialise. Nonetheless, the strong survival rates of seedlings and woodlot plantations confirm their potential to promote biodiversity restoration, strengthen environmental resilience, and generate household income. These interventions clearly complement national commitments on afforestation and climate adaptation while simultaneously creating pathways for livelihood diversification and long-term sustainability.

By contrast, the GIZ-designed fruit and vegetable dryers highlight the importance of aligning conceptual relevance with practical application. While food preservation is critical for winter security and there is clear market demand for dried produce, the limited capacity of the dryers significantly constrained both their impact and their relevance. However, the perception that the GIZ-designed dryers lacked sufficient scale to meet household or market needs must be interpreted with caution as the beneficiary interviewed owned an unusually large orchard of over 400 trees. Furthermore, his assessment that the dryers were impractical may have been shaped by the scale of his production, despite expressing his opinion being a shared one across the 18 villages. Nonetheless, while further interviews with a wider range of beneficiaries would be necessary to validate this perspective, the perception of inefficiency provides a valuable starting indication that the dryers lacked the practical relevance.

Coherence

A major strength of the project lies in its internal coherence. The interventions did not function in isolation but reinforced one another: stoves and heaters reduced biomass demand, indirectly supporting nurseries and woodlots; beekeeping enhanced pollination crops and orchards, and contributed to the overall health of plants, increasing crop yield and improved biodiversity; while slope rehabilitation stabilised soils essential for both agriculture and the success of woodlots. At the policy level, the interventions were coherent with Tajikistan's Biodiversity Action Plan, National Sustainable Development Goal commitments, and SDC's mandate to promote sustainable livelihoods and conservation in fragile contexts, adding credibility to the project's design.

By contrast, coherence was weaker in the case of the fruit and vegetable dryers. For larger farmers with significant harvests, the limited capacity of the dryers was insufficient to meet commercial-scale preservation or market needs. However, for households with smaller orchids, the dryers were seen as valuable, providing a practical means to hygienically preserve fruit and vegetables for winter consumption and small-scale local use. Furthermore, the technology has contributed directly to food security and the livelihoods of low-income families, even if its wider market integration and scalability remain limited. This divergence highlights the importance of tailoring technologies to both household-level and commercial realities when assessing long-term coherence and impact.

Effectiveness

Energy interventions proved highly effective, in some respects even more so than beekeeping, as their success depended largely on the proper use and basic maintenance of the technologies provided. Both solar heaters and fuel-efficient stoves have consistently delivered dramatic reductions in fuelwood use and electricity costs, alongside notable health and wellbeing improvements for women. Since their introduction in 2023, these technologies have been used daily, and the pride with which beneficiaries maintain them suggests that benefits will continue over the long term.

Beekeeping also emerged as highly effective, though its benefits remain more dependent on external conditions. Honey production is directly shaped by climate variability, particularly the frequency of dust storms and droughts, which are beyond the control of beneficiaries and reflect

broader global climate challenges. Nonetheless, in the absence of worsening climatic extremes, the strong sense of ownership and independent expansion of hives suggests that apiculture will continue to generate income and enhance biodiversity through pollination. Similarly, women's nurseries achieved impressive seedling survival rates and demonstrated clear income potential. However, their effectiveness was tempered by reliance on irrigation, vulnerability to pest outbreaks, and the need for technical guidance. Without specialist support, there is a risk that their initial success may plateau.

The fruit and vegetable dehydrators were more difficult to assess as only beneficiary who had received a dryer was visited. As this farmer owned extensive orchards and vegetable plots, the drying unit was unsurprisingly inadequate for the scale of his production and therefore assessed as ineffective. However, this case is not representative of many beneficiaries, as more than 35 low-income households with smaller orchards and subsistence vegetable plots also received dryers. For these families, the technology provides a practical way to hygienically preserve produce for winter consumption and local use, directly supporting household food security and reducing vulnerability. At the same time, the limited size of the dryers constrains their potential for scaling to marketable production. To enhance effectiveness, future support could consider upgrading unit capacity or diversifying models to serve both small-scale household users and farmers with larger harvests.

Efficiency

The evaluated interventions reflected broadly similar patterns in efficiency, with most demonstrating relatively high efficiency, with the exception of fruit and vegetable dehydrators. Honeybee hives, fuel-efficient stoves, and solar water heaters all delivered high returns relative to their initial investment once training and installation were completed. Beekeeping arguably represented the most efficient intervention: beneficiaries consistently leveraged the single hive initially provided to expand independently, producing additional hives, bee families, and honey for sale. This capacity to scale without further donor inputs highlights how resources were used to generate sustained and multiplying benefits. Solar heaters, though more capital intensive at the outset, also demonstrated efficiency over time through substantial household savings on electricity bills. All three of these interventions were reported to be in daily use, underscoring how efficiency is maximised when technologies are durable, appropriately scaled, and demand minimal follow-up support.

Resources provided for nurseries and plantations by the Forestry Agency were also used effectively, as indicated by high seedling and fruit tree survival rates. However, efficiency was constrained by external challenges. Beneficiaries regularly transported water uphill by donkey, applied chemical pesticides, and relied on Forestry Agency expertise for technical guidance. While these additional inputs reduced short-term efficiency, nurseries and woodlots nonetheless demonstrated promising success as longer-term interventions compared to beekeeping, stoves, and solar heaters. In this context, sustained donor and technical support could further enhance efficiency by alleviating irrigation burdens and introducing biological pest management, allowing already strong survival rates to be improved even further despite mounting climate pressures.

By contrast, the GIZ-designed dryers represented the weakest efficiency of all assessed interventions. Although physically functional, their limited processing capacity restricted both household food preservation and opportunities to access markets. As a result, the resources invested could not be fully leveraged to deliver anticipated benefits such as hygienic large-scale preservation or income generation through dried produce sales. This finding underscores that efficiency is not only about minimising input costs but also ensuring proportionality between resources invested and outcomes achieved. The evaluation suggests that efficiency is maximised where interventions reduce dependency, harness existing community capacities, and deliver benefits at a scale aligned with household and market needs.

Impact and Sustainability

The interventions collectively delivered measurable improvements in household income, wellbeing, and environmental outcomes, though impacts of each intervention varied in strength. Beekeeping was particularly impactful, diversifying and increasing household incomes, while enhancing biodiversity through pollination. Solar water heaters and fuel-efficient stoves reduced deforestation pressures, cut household energy costs, and improved indoor air quality, with notable health benefits for women. Women's nurseries generated income and strengthened gender empowerment, while slope rehabilitation and woodlots contributed to soil stabilisation and reduced erosion risks, advancing longer-term landscape resilience. Together, these results show that livelihood and quality-of-life improvements can be achieved alongside environmental restoration - a central aim of this project, even when external stressors such as dust storms, drought reduced plantation success, and pests and disease threats remain. By contrast, fruit and vegetable dryers had the weakest impact on

beneficiaries, as their limited processing capacity restricted their ability to improve food security or generate marketable surpluses for additional income.

The impacts of these interventions however were not only material. Beneficiaries reported pride, ownership, and confidence in managing activities, suggesting resilience and social cohesion has been developed. This indicates the project has gone beyond delivering tangible outputs to building lasting household and community capacity – an essential for sustainable development. Beekeeping, heaters, and stoves proved most sustainable, with evidence of independent expansion, daily use, and minimal reliance on donor support. Their integration into household economies suggests durable long-term adoption. Nurseries and plantations also hold strong potential however remain vulnerable to pests, limited irrigation, and climate variability, meaning their long-term viability depends on continued technical and donor support. Dryers again showed the weakest sustainability profile, with limited ownership and scale preventing meaningful continuation.

7. Future Project Recommendations

Switzerland's International Cooperation Strategy 2025–2028 commits to ending poverty, fostering sustainable economic growth, ensuring climate-resilient development, and promoting peace and human rights (FDFA, 2025; OECD, 2025). SDC also identifies climate, disaster risk reduction, and environment as cross-cutting priorities (SDC CDE, 2023), with development cooperation focused on locally owned, sustainable solutions. Continued SDC engagement in Dashti Jum would consolidate the project's demonstrated livelihood and environmental gains, close technical knowledge gaps, and build resilience in areas where humble households alone cannot. By investing in irrigation, targeted pest management, and up scaling market-relevant technologies, SDC can contribute further to safeguarding long-term sustainability and addressing the inequities of global climate vulnerability. Considering the sense of ownership and project engagement identified in benefices during this field visit, the recommendations outlined in the May 2025 narrative report are further encouraged, in addition to the following:

Scale up proven interventions

Beekeeping, solar water heaters, and fuel-efficient stoves have delivered the strongest social, economic, and environmental returns. Scaling up these interventions would maximise impact per unit of donor investment, as they are already widely accepted, low-maintenance, and delivering measurable results. Providing additional honey extractors, for example, would allow more households to expand production and income, while strengthening pollination services critical to biodiversity.

Adapt underperforming activities

Fruit and vegetable dryers hold potential but are currently too small to make a meaningful contribution. Replacing them with larger-capacity units, or training community members to construct cost-effective drying racks with locally available materials, would improve efficiency and ownership. Similarly, investing in irrigation pipelines for woodlots and low-cost protective measures against free grazing animals and wildlife damage would further enhance survival rates, contributing to biodiversity conservation and slope stabilisation.

Improve ecological coherence

The use of chemical pesticides in nurseries and plantations undermines the project's biodiversity conservation goals. To strengthen ecological coherence, UCA could engage Ms. Munira Karamkhudoeva, a senior entomologist at the Pamir Biological Institute (GBAO), to provide technical training and develop targeted pest management strategies. Her expertise in biological pest control, community engagement, and high-altitude agriculture can support nursery and woodlot managers in effectively combatting pest challenges.

Strengthen monitoring and evaluation

The present evaluation covered 20 sites across five days, creating risks of bias and under-representing variability. Expanding monitoring to include all sites, supported by longitudinal data collection, would provide a more accurate picture of seasonal, ecological, and socio-economic outcomes. Strengthened evaluation systems would not only help donors assess impact more confidently but also enable project managers to adapt interventions proactively, improving efficiency and accountability.

8. Conclusions

This evaluation confirms that this project located in Dashti Jum has made meaningful progress in advancing its dual objectives of biodiversity conservation and livelihood strengthening in one of Tajikistan's most vulnerable mountain regions. The interventions assessed demonstrate that economic development and environmental protection can be mutually reinforcing when approaches are locally relevant, market-connected, and supported by strong community ownership. Beekeeping, solar water heaters, and fuel-efficient stoves exemplify this success, having delivered measurable and sustainable benefits across income, health, and ecological outcome. Although this success was closely followed by nurseries and multi-purpose fruit tree woodlots, the evaluation highlights a need for more technical management, infrastructure, most notably for GIZ-designed fruit and vegetable dryers. There remains climate variability, pest pressures, and resource limitations, underscoring the need for targeted donor investment and technical expertise to secure long-term outcomes.

The project has also demonstrated achieving important intangible impacts, including increased pride, confidence, and social cohesion among beneficiaries. These are essential building blocks for resilience and sustainable development, ensuring that gains extend beyond individual households to the wider community.

While limitations of this evaluation must be acknowledged - particularly its small site coverage and reliance on self-reporting - the overall findings provide clear evidence that this integrated model of interventions is both effective locally and transferable to other mountain regions. By addressing remaining gaps in technical capacity, irrigation, and scale, the Swiss Agency for Development and Cooperation can consolidate the strong foundations it has established so far, advance climate justice, and ensure that vulnerable rural households are supported rather than left to bear the costs of a global crisis they did not create.

References

FDFA (2025) *Switzerland's International Cooperation Strategy 2025–2028*. Federal Department of Foreign Affairs. Available at: https://www.eda.admin.ch (Accessed: 24 September 2025).

OECD (2025) *Development Co-operation Profiles: Switzerland 2025*. Organisation for Economic Co-operation and Development. Available at: https://www.oecd.org (Accessed: 24 September 2025).

SDC CDE (2023) *About Us – Climate, Disaster Risk Reduction & Environment Network*. Swiss Agency for Development and Cooperation. Available at: https://www.sdc-cde.ch (Accessed: 24 September 2025).

Annexes

Annex 1: Contract Terms of reference

KEY RESPONSIBILITIES

- Develop a field visit plan in coordination with the MSRI Research Fellow upon joining the MSRI office in Khorog.
- Organize and conduct field visits to both projects, engaging with implementing partners and beneficiary farmers.
- Assess and evaluate the ecological and economic impacts of project activities through site visits, direct observation, and interviews with beneficiary farmers and households.
- Gather feedback from target farmers and stakeholders to understand their perspectives on the project's outcomes and identify areas for improvement.
- Identify knowledge gaps or areas requiring further research to enhance the effectiveness of project interventions.
- Prepare and submit an internship report focused on project monitoring and evaluation to the MSRI Research Fellow within two weeks of completing the internship.

Annex 2: Example of interview guide deigned per project intervention prior to field visits

Introduction of solar water heaters
70 low-income families provided with solar water heaters of 150L capacity (families recommended by village heads)

Topic	No.	Question
Background	1	What purposes do you use the solar water heater?
	2	What was your first reaction when you found out you would receive a solar water heater? Has your opinion on the heater changed?
Social Impacts		How has using the solar water heater changed any of your family routines (e.g. bathing, cooking, hygiene)?
		Have you noticed any changes in your health or comfort since using the heater instead of burning wood?
		Have the solar powered heaters helped reduce time, labour, or stress in collecting or preparing fuel?
Economic Impacts	1	Have you noticed savings in firewood, gas, or electricity costs since installation? Approximately how much?
	2	Have you been able to reallocate money or time to other priorities because of the heater?
	3	Would you be willing to purchase or co-invest in another heater in the future? Why or why not?
Environmental Impacts	1	How much less firewood or gas do you now use compared to before?
	2	Have you observed any noticeable changes in the environment (e.g., fewer trees cut, less smoke, cleaner surroundings)? What do you think of these changes (good/ bad?)
		Has the introduction of solar powered heaters to reduce pressure on wood resources made you and your community more aware of the environmental impact of or energy issues?
Perception of project Success / Challenges		What are the biggest benefits the solar heater has brought to your household?
Long term sustainability and ownership		Who is responsible for maintaining the heater? Do you know how to repair basic problems yourself?
		Do you feel ownership of the heater, or is it still part of a project donation?
		What are your thoughts about continuing to use the heater in the long-term? What would help you do so?