ANCHOR SCHOOLS AS A MODEL FOR LANDSCAPE RESILIENCE IN CENTRAL ASIA: A PILOT STUDY IN RURAL TAJIKISTAN

December 2022
Anchor Schools as a Model for Landscape Resilience in Central Asia: A Pilot Study in Rural Tajikistan

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# Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ACC</td>
<td>Anthropogenic Climate Change</td>
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<tr>
<td>ASP</td>
<td>Anchor Schools Project</td>
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<tr>
<td>BUILD</td>
<td>Believe, Understand, Invent, Listen, and Deliver</td>
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<tr>
<td>CBO</td>
<td>Community-Based Organization</td>
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<tr>
<td>CCC</td>
<td>Climate Change Concern</td>
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<tr>
<td>COP26</td>
<td>26th Conference of the Parties</td>
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<tr>
<td>DSN</td>
<td>Descriptive Social Norms</td>
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<tr>
<td>EES</td>
<td>Earth and Environmental Sciences</td>
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<tr>
<td>EMI</td>
<td>Entrepreneurial Mindset Index</td>
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<tr>
<td>FIST</td>
<td>Foundation for Innovative and Sustainable Technology</td>
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<tr>
<td>GBAO</td>
<td>Gorno-Badakhshan Autonomous Oblast</td>
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<tr>
<td>GCCW</td>
<td>Global Climate Change Week</td>
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<tr>
<td>ISN</td>
<td>Injunctive Social Norms</td>
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<tr>
<td>MoES</td>
<td>Ministry of Education and Science</td>
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<tr>
<td>MSRI</td>
<td>Mountain Societies Research Institute</td>
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<tr>
<td>NGO</td>
<td>Nongovernmental Organization</td>
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<tr>
<td>NPS</td>
<td>Net Promoter Score</td>
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<td>NSED</td>
<td>National Strategy for Education Development</td>
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<tr>
<td>PACT</td>
<td>Program for Asia Connectivity and Trade</td>
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<tr>
<td>PICS</td>
<td>Passions, Interests, Causes, Skills</td>
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<td>SDGs</td>
<td>Sustainable Development Goals</td>
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<td>SI</td>
<td>Social Identification</td>
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<tr>
<td>ToT</td>
<td>Training-of-Trainers</td>
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<tr>
<td>UCA</td>
<td>University of Central Asia</td>
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<td>UN</td>
<td>United Nations</td>
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<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
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Executive Summary

Background

In the last few decades, Central Asian countries have made remarkable progress in alleviating poverty and achieving economic growth based on natural capital. Yet environmental pressures from intensive resource extraction and land use practices are threatening this progress. Climate change will likely make these pressures worse. In fact, climate-driven weather variability in Central Asia has already reduced agricultural production by up to one-third, creating food insecurity and constraining economic growth. This has a particularly severe impact on the rural poor who directly depend on the land for their survival and livelihood.

The World Bank supports Central Asian countries in bolstering resilience to climate change impacts, restoring landscapes, and protecting lives and livelihoods. Transitioning to green, clean, and resilient growth requires a paradigm shift. Social change occurs when awareness evolves to understanding and, ultimately, action through engagement with policy makers, civil society, media, youth, and affected communities to raise awareness and strengthen advocacy for climate resilience, green growth, and the achievement of related United Nations (UN) Sustainable Development Goals (SDGs).

This pilot study aimed to provide initial insights into the awareness of youth in Central Asia about environment, pollution, climate change, and landscape restoration practices. The study also intended to assess if rural schools in Central Asia could be mobilized as community assets for peer-to-peer learning to raise awareness about environment and climate change issues and activate entrepreneurship among youth for climate resilience and green transition. The study explored if and how regional assets, including universities and nongovernmental organizations (NGOs), can be

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1 World Bank 2021a.
3 The term ‘youth entrepreneurship’ refers primarily to the development of entrepreneurial mindset and skills in the spirit of human-centered, systems-oriented social impact while also including the more narrowly defined ‘entrepreneurship’ of for-profit business creation. For more on this distinction, social entrepreneurship, and the global rise of youth entrepreneurship, see United Nations (2020).
4 The original terms of reference for the study included both Tajikistan and Uzbekistan. Due to resource limitations, study implementation was restricted to Tajikistan.
leveraged to support rural schools to increase youth awareness of climate change and foster entrepreneurial engagement, contributing to sustainable landscape and community resilience.

The study identified the Anchor Schools model as a promising approach toward supporting affected rural communities in restoring landscapes, protecting lives and livelihoods, and increasing climate resilience. Anchor schools are community-centered spaces where people come together to address local priorities. They are hubs for learning, collaborative action, and social entrepreneurship that are connected to and supported by universities, NGOs, and other regional assets.

Tajikistan’s rural communities and the schools that anchor them form the ‘last mile’ to youth awareness building and engagement for resilient landscape restoration and climate action. As spaces where youth learn how to identify, test, and launch solutions to the environmental impacts of climate change through peer-to-peer learning approaches that are supported by universities and NGOs, schools can nurture and empower young people to become change makers in their communities. Extracurricular learning in underutilized rural schools can become an essential bridge for today’s youth as national curriculum reforms are put into place.

Study Context

The pilot study was conducted in the Gorno-Badakhshan Autonomous Oblast (GBAO) in the high Pamir mountains of eastern Tajikistan. The University of Central Asia (UCA), located in Khorog, the GBAO capital, served as the study’s base. A total of 298 youth from across the southern part of the GBAO region were recruited to participate in 12 workshops over July–August 2021. The youth workshops were held in Khorog and in municipalities and villages along the Ghunt and Panj rivers.

In a region disproportionately affected by climate change, Tajikistan’s rural communities and mountain landscapes are particularly vulnerable. Tajikistan, the poorest and most mountainous country in Central Asia, is hard hit with converging conditions that impede efforts to reduce poverty in rural communities, including arid landscapes and diminishing glacial runoff, agricultural practices, and deforestation, as well as extractive industries and infrastructure development.

The education infrastructure in Tajikistan is under-resourced and inadequate to meet the needs of the population. During the 2019/20 school year, there were 1.4 million secondary students and 3,884 general secondary schools, with 85 percent (3,299) of those schools located in rural areas serving 71 percent of enrolled students. For girls, however, enrollment is approximately 50 percent across all levels. The majority of schools in rural areas have aging facilities, scarce supplies, and a shortage of qualified teachers. Alongside economic migration, poverty, and family obligations, these conditions lead to low attendance, especially for girls.

The Ministry of Education and Science (MoES) of Tajikistan has identified introduction of climate science and environment-related curriculum among key reforms essential to decreasing the country’s vulnerability to climate change and related risks. Civil society and media (both conventional and social) are filling some of the education gaps by providing youth with information and connection to the global climate movement as the reform of the national curriculum and teacher training catch up with this critical need. Rapidly growing internet access and smart phone use overall in Tajikistan suggest that for young people social media may become an important portal for climate information and related global youth movements.

Youth entrepreneurship is a promising approach in Tajikistan, where youth unemployment is high and concentrated in rural areas. Around the world, youth unemployment is being addressed through social impact entrepreneurship—preparing young people to identify priority challenges and create enduring human-centered, systems-aligned solutions. Education and youth employment

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7 Government of the Republic of Tajikistan 2020, 4–5.
6 While data on rural youth’s internet access, social media use, and content preferences are not readily available for Tajikistan, with a median age of 22.4 and overall increases in internet users (39.2 percent) and social media use (51.5 percent) from 2020 to 2021, trends in this direction are strong (Kemp 2021).
innovations in Tajikistan are following suit: national curriculum revisions include entrepreneurship. Development agencies, universities, and NGOs are starting to offer programs for aspiring change makers. Quantitative data from our workshops in the GBAO showed limited growth (0.5 percent increase from 5.12 to 5.15) of both self-perceived entrepreneurial skills and willingness/interest in becoming an entrepreneur. However, qualitative data reveal that 72.5 percent have an interest in becoming an entrepreneur.

Scope and Methodology

The pilot study took an integrated approach to testing a social change framework and an experiential learning methodology in the context of rural Tajikistan by incorporating virtual training, on-site workshops, participatory field study, and quantitative and qualitative data collection. Research included secondary source investigation, primary source interviews, content generation by study participants (university students and youth), and pre- and post-activity surveys.

The study was led by AnchorEd, a global education and community development advisory firm based in the United States, and implemented by a global team of social impact designers and facilitators, science researchers, environmental activists, educators, and university students. A team from the UCA Khorog campus served as on-site implementation partners and technical consultants, while the Foundation for Innovative and Sustainable Technology (FIST), an environmental NGO based in Khorog, provided local expertise. Ten UCA undergraduate student interns were trained as integral team members.

A virtual training-of-trainers (ToT) workshop series with asynchronous on-site learning, planning, and coordination prepared 10 UCA undergraduate student interns to create content and facilitate workshops for youth. The Anchor Schools ToT curriculum is rooted in project-based learning and design thinking, a process for creative problem-solving that focuses on people and their needs. The UCA interns experienced and adapted the learning process as they designed climate change and entrepreneurial mindset lessons for youth, planned and coordinated their fieldwork, practiced facilitation, and reflected on their own learning.

The team of UCA interns, supported by two faculty and one NGO partner, delivered 12 in-person workshops for 298 youth between the ages of 11 and 18. The youth workshops included a climate change lesson, a climate action case study activity, a hands-on design challenge, a climate change impact problem identification process, and solutions brainstorming.

Quantitative and qualitative data collection assessed the effectiveness of peer-to-peer learning to increase awareness of and willingness to act on environmental issues and climate change and foster entrepreneurial mindset among youth participants.

Key Findings and Recommendations

- Shifts in education priorities at the national level—such as climate change awareness, environmental science, and entrepreneurship—open up possibilities for impact. These areas of study appear to be gaining some traction in Tajikistan as well as other Central Asian countries, with program investments by NGOs and higher education institutions.

- Rural schools in Tajikistan have the potential to become local hubs for building environment and climate awareness and resilience in communities. Through extracurricular learning experiences, even remote schools can be responsive to local needs and priorities, yet few resources and programs reach them. Tajikistan’s current education infrastructure—facilities, materials, curriculum, and teacher capacity—requires consistent, relevant, and innovative support and investment.

- By supporting rural schools, universities can contribute to enhancing local, national, and regional capacities to address environmental issues and climate change and building

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9 Government of the Republic of Tajikistan 2020, 40 and 43.
resilient communities. With this aim, they will need to prioritize sustainable development and have in place key assets: expertise, research and training capacity, local and global networks, and communication tools. They will also require funding and a seat at the policy table to effectively leverage their assets for climate resilience, education innovation, and a green economy.

- **Networks of organizations, or ‘ecosystems’, that leverage resources in support of rural schools are a key condition for building sustained climate-focused youth entrepreneurship.** Universities, government agencies, local NGOs, and individual schools form the core of youth-centric collaborations. Youth entrepreneurship ecosystems can also benefit from the financial, technical, human, and social capital resources of international development agencies, donors, research institutes, corporations, and other stakeholders currently operating in the climate and environment, education, and private sectors in Tajikistan and across Central Asia.

- **School-based peer-to-peer learning can increase knowledge and concern about environment and climate change among youth in Tajikistan** Qualitative data showed that 99.5 percent of participants reported learning new information about climate change. Even though the survey data indicate that youth participants had some initial awareness of environment and climate issues, there is room for improvement in building base awareness levels as well as specific content knowledge. The piloted workshops led by university student interns increased awareness of anthropogenic climate change (ACC) (9 percent increase, from 5.7 to 6.2) and the degree of climate change concern (CCC) (11 percent increase, from 5.6 to 6.2) in school-age youth in a sampling of villages in the GBAO. Moreover, the study suggested that youth respond positively to learning experiences facilitated by another young person with whom they identify.

- **Entrepreneurship education that fosters learning and builds critical work and life skills can be a catalyst for sustained climate resilience.** Social entrepreneurship is an emerging global approach to education innovation and youth employment. When coupled with the urgency of climate change impacts on vulnerable communities and linked to the work of community members and local stakeholders, it holds great promise as a catalyst for sustained change across Central Asia.

- **When given access to information, skills, and guidance, rural youth in Tajikistan have the potential to design solutions to the challenges their communities face.** Workshops conducted as part of the study demonstrated youth creativity, problem-solving, teamwork, and sense of collective responsibility to act. The solutions participants generated, including recycling, water conservation, planting trees, and local production, have real impact potential. Building on this initial momentum aligns with national education priorities to expand entrepreneurship education, an emerging global approach to innovation and youth employment.

**Key constraints.** School capacity and bureaucracy, youth responsibilities at home (especially in rural communities), lack of investment or prioritization of youth entrepreneurship by key sectors, and access to rural communities are not insurmountable. The report’s key findings address, at least in part, these constraints.

- **Teacher training in climate change and experiential learning supported by local universities have the potential to build capacity based on local priorities and support pedagogy innovation.** Teacher training is effective when the content is specific yet adaptable and broadly enhancing, the process is scaffolded and repeated, and the engagement is responsive to individual needs and supported with resources.

- **Measurement of impact using participatory evaluation and standard data collection tools provides insights for innovation and sustained impact.** Multisector initiatives with social impact goals require the use of participatory methodologies such as stakeholder and community asset mapping, surveys, interviews, and national data collection (for example, student assessments) to offer community members, practitioners, and policy makers actionable insights for community-driven change.
A Way Forward

Aligning climate and environment awareness, education, and communication objectives to create integrated initiatives centered on rural schools with engagement of universities may position regional investments for even greater impact. Connecting landscape and community resiliency initiatives with environment, climate change, and entrepreneurship education of youth has promising regional implications for long-term green economy transition impacts in Tajikistan and Central Asia.

Leveraging universities as regional anchors, the social and knowledge capital of NGOs, the reach and impact of the national education system, and the resources of other key stakeholders can activate a key capacity-building asset that even the most remote and vulnerable communities have and can rally around: rural schools. Building awareness of resilient landscape restoration and climate change through rural schools as local anchors and universities as regional anchors has the potential to enhance the projected long-term environmental and economic impacts across Central Asia.
1. Introduction

This report presents the key findings of a pilot study that considered the viability of a school-based model to support environment and climate change awareness and activate landscape resiliency entrepreneurship among youth in rural communities of Central Asia. The pilot study is an activity under the World Bank's support to strengthen the capacity of Central Asian countries to achieve sustainable and resilient economic growth, with a focus on transboundary landscape restoration. Its aim is to raise awareness and advocacy for climate resilience and green growth toward the achievement of Sustainable Development Goals (SDGs) through “engagement” with policy makers, civil society, media, youth, and affected communities.

The Anchor Schools approach was piloted in a sample of rural communities in Tajikistan. The pilot enabled project leaders to test the hypothesis that when we invest in rural schools by leveraging regional assets, including universities and nongovernmental organizations (NGOs), we can increase youth awareness of climate change and foster entrepreneurial engagement, contributing to sustainable landscape and community resilience. Specifically, the goal of the study was to test the viability of the Anchor Schools Project (ASP) model as a means to build youth awareness and create entrepreneurial engagement in integrated community and landscape resilience initiatives in rural Central Asia. Study objectives were to

1. Prototype the ASP model tailored specifically for a rural village-centric regional approach in Uzbekistan and Tajikistan,
2. Provide initial insights into youth awareness levels of pollution/climate change and landscape restoration issues based on engagement of 90–100 youth in 9–10 rural communities in Uzbekistan and Tajikistan,
3. Provide initial insights into youth awareness levels of and orientation to entrepreneurship/social entrepreneurship based on engagement of 90–100 youth in 9–10 rural communities in Uzbekistan and Tajikistan,
4. Present an analysis of the youth-identified entrepreneurial opportunities for launching climate/resilient landscapes-oriented solutions as prototypes for expanded initiatives, and
5. Identify constraints and opportunities for integrating the ASP model at scale as a means to contribute to the objectives of environmental and climate awareness building.

Schools are critical public assets in rural areas around the world. In remote and marginalized areas, oftentimes schools are one of the few public or shared built resources, aside from roads and places of worship, that people have access to in their communities. Yet a sense of community engagement, ownership, and access to those schools is often lacking, resulting in these high potential resources not being effectively leveraged to support residents—children, youth, and adults—in their pursuit of livelihoods and sustainable futures.

When schools become intentional, active, community-led spaces where people of all ages and across social divides come together to address local priorities, entire communities are affected. Furthermore, when those schools become a part of regional collaborations, access to external resources is expanded and social capital is developed and enhanced. The World Bank and institutions such as the University of Central Asia (UCA), other university-level schools of forestry and environment, and social and economic development NGOs are catalysts that can leverage their influence and resources. Village-based schools, when networked, form critical links between regional and local assets which, in turn, support and enhance youth inclusion and build agency toward locally sourced solutions.

11 World Bank 2021a.
12 World Bank 2021b.
13 The Anchor Schools approach engages schools as community-centered spaces and hubs for learning, collaborative action, and social entrepreneurship that are connected to and supported by universities, NGOs, and other regional assets.
2. Context

2.1 Tajikistan and Regional Vulnerability

As the poorest and most mountainous country in the Central Asia region, Tajikistan’s rural communities and mountain landscapes are particularly vulnerable to climate change impacts. Naturally arid conditions, post-Soviet agricultural practices and industrial legacies, and current road and other infrastructure developments built by China, in addition to dramatic changes in climate patterns, have converged to make the drylands of Central Asia one of the world’s most vulnerable regional landscapes. Border areas of the countries in the region—Afghanistan, Kazakhstan, the Kyrgyz Republic, Tajikistan, and Uzbekistan—are most significantly affected by these natural and anthropogenic forces. The result is expanding drylands with extensive erosion from sustained deforestation that are now susceptible to destructive mudslides, further exacerbated by extreme risk of seismic activity. Rapidly receding high mountain glaciers also portend long-term water shortages. All of this impedes efforts to reduce poverty and support thriving rural communities. Global donors and the region’s national governments have made commitments to both internal and cross-border multisector initiatives to address those conditions and move toward a more resilient and green economy.

2.2 Schools in Rural Tajikistan

The education infrastructure in Tajikistan is currently inadequate to meet needs. During the 2019/20 school year, there were 1.4 million secondary students and 3,884 general secondary schools with 85 percent (3,299) of those schools located in rural areas serving 71 percent of enrolled students. General secondary education includes primary (grades 1–4), basic (grades 5–9), and general (grades 10–11) levels. Primary and basic levels are mandatory, while the general level is optional. General secondary school attendance is high overall, with enrollment declining after the primary level. For girls, however, enrollment is approximately 50 percent across all levels. Economic migration, poverty, and family obligations (childcare, farm work, other employment, and so on) affect student attendance, as do the conditions of many rural schools. Basic facilities are often insufficient, requiring double shifts at most schools. Additional challenges include lack of qualified teachers, insufficient and outdated learning materials, inadequate furniture (desks and chairs), lack of consistent heat and electricity, insufficient toilets and water supply, and lack of canteens and provision of meals during the school day. Few schools include science laboratories or supplies for music and arts, physical education, and languages. Teachers rarely have the time or capacity for learning enhancement or special interest clubs. In remote areas, school buildings are vulnerable to mudslides and earthquakes.

2.3 Climate Change Education in Tajikistan

Education dedicated to climate change awareness and its environmental and human impact is crucial to ensuring that investments in infrastructure, industry, agriculture, and landscape restoration are sustained and impactful over the long term. The National Strategy for Education Development (NSED) of the Republic of Tajikistan (2021–2030), which is aligned with the United Nations (UN) SDGs, identifies equal access and quality reforms to education and science as key to decreasing the country’s vulnerability to climate change and increasing its preparedness to related risks to children as well the economy, workforce, and health and well-being of the country overall. The NSED includes the expansion of climate and environment-related curriculum. Current Primary Education Subject Standards begin the study of ‘nature’ subjects in grade 1, including a range of topics related to ecology, animals and plants, life and safety, and the aesthetics of nature. However, climate

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14 Sidle 2020.
15 World Bank 2021a.
change is not introduced until grade 4. According to the UCA faculty, in the secondary curriculum, climate change is a topic taught under geography, which overall receives one to two hours per week of instruction time for grades 6–11. Competing with other subjects for compromised in-school time, especially in rural remote areas, climate literacy is not readily achievable.

Non-state entities are filling some of the education gaps to raise student climate change knowledge and awareness. Privately funded universities, international donors, and international and local NGOs offer learning opportunities as reform of the national curriculum and improvement of school facilities get under way. Examples include youth-centered initiatives such as summer camps that integrate climate awareness and environmental education with core subject learning and college/university and career readiness.

2.4 Rural Youth and Social Entrepreneurship

Rural youth engagement in social impact entrepreneurship remains limited and the support and investment ecosystem critical to the sector is underdeveloped and not yet reaching remote communities and schools. Youth (10–24-year-olds) make up 27.4 percent of the population in Tajikistan. With over 50 percent of the total population under 25, the population will continue to grow rapidly. With approximately 12.9 percent (2019) of youth unemployed and over 70 percent of all those unemployed (7.5 percent) residing in the countryside, rural youth are at a particular disadvantage. An emerging approach to youth unemployment around the world is social impact entrepreneurship—preparing young people to identify priority needs and create enduring, human-centered, systems-aligned solutions that can provide them with a livelihood and an opportunity to employ other youth. This youth entrepreneurship movement is starting to take shape in Tajikistan with recent initiatives launched by the World Bank Group, UCA, United Nations Children's Fund (UNICEF), Aga Khan Foundation, and others. In addition, the NSED includes entrepreneurship as a key area for general secondary curriculum revisions.

2.5 Youth Entrepreneurship Ecosystems

Entrepreneurship ‘ecosystems’ that create the conditions for school-based youth entrepreneurship initiatives related to climate resilience to take hold and become sustainable need to be developed. These ‘ecosystems’ are networks of organizations, schools, experts, investors, and other supporters that provide training and mentoring, funding, and amplification to youth trying to create enduring solutions to social and environmental problems. While there is little evidence of sustained intentional support for youth entrepreneurs at this time, the potential exists in the higher education and civil society sectors.

Tajikistan has attracted international NGO and donor investments and has a growing national civil society sector, with notable engagement in the environment, education, and entrepreneurship sectors. While much of the recent growth in local and national community-based organizations (CBOs) and NGOs has been in response to the COVID-19 pandemic, there also appears to be growth in the study’s three focus areas (climate, education, and entrepreneurship). International development aid and NGO engagement have been steadily growing since Tajikistan gained independence in 1991, with players investing across sectors. The climate action sector comprises NGOs, research institutes, international donors, bilateral and multilateral agencies,
education institutions, government entities, companies, and development organizations. Donor and multilateral agencies also operate regionally across Central Asia. Similarly, a number of entities—primarily international development agencies and funders as well as higher education institutions—are working to engage, train, and expand the impact of entrepreneurs in Tajikistan and in the region. As noted above, some of that investment is on youth, but initial research indicates that much of the current focus is on adults. The scan of the education sector also indicates strong support by local, regional, and international organizations and donors. Investments span school construction, teacher training, learning materials and supplies, food and school meals, and student programs, among others.
3. Methodology

3.1 Overview

This pilot study took an integrated approach to testing a framework and methodology in the context of Tajikistan and gathering initial information by incorporating virtual training, participatory field study, quantitative and qualitative data collection, and youth engagement. Research included secondary source investigation and analysis, key primary source interviews, and content generation by study participants (university students and youth), and pre- and post-activity surveys. The surveys were administered to both the student interns and the youth workshop participants, using some of the same quantitative measures for testing and comparison. Qualitative measures varied to capture relevant data for the different respondents. Individual interviews with school directors, both on-site and by phone, provided qualitative data.

The AnchorEd team, assisted by the UCA faculty team, delivered a series of virtual workshops using a training-of-trainers (ToT) model with a team of university student interns from the Gorno-Badakhshan Autonomous Oblast (GBAO) Province of Tajikistan. Grounded in design thinking, these training sessions guided the interns to design, practice, and plan youth-oriented workshops on climate change and early-stage social impact entrepreneurship. Climate change and environmental science content delivery coupled with facilitating awareness of local environmental and community impact led to needs identification and solution ideation by youth participants. Post-workshop sessions extended entrepreneurship skill building for the interns, drew on their sources of knowledge to model youth entrepreneurship support ‘ecosystems’ in Tajikistan, and allowed for final reflection and feedback.

3.2 Our Approach: Anchor Schools Model

The ASP model (Table 1) provided a framework for the pilot study. The model hypothesizes that a series of activities positioned under three core pillars (Curriculum Integration, Community Responsiveness, and Organization Alignment) lead to five outcomes (cultural and context competency, local empowerment and solutions, intentional local investment, regional collaborative action, and equitable social mobility). Key questions linked to the three pillars guided the study and grounded recommendations for next steps.

Curriculum Integration: Designing and delivering place-based, solutions-oriented, and human-centered learning experiences that capitalize on local and regional resources, curriculum, and programs are integrated with organization objectives and are connected to local/regional collaboration networks.

Guiding question: How might we transfer critical knowledge and support key skills acquisition across a regional ecosystem of stakeholders with rural youth at the epicenter of sustainable livelihoods, opportunity, and access?

Community Responsiveness: Actively engaging in building regional anchor resource networks that prioritize and sustain local stakeholders and build the capacity of local assets (natural, built and human/social), leveraging schools as loci for action.

Guiding question: How might we ensure sustained awareness of pollution/climate change and dynamic locally responsive action by leveraging rural school assets and regional social capital networks?

Organization Alignment: Identifying objectives-aligned opportunities for and creating the links among systems and structures—including human capital—across organizational departments and/or project pillars to build mutually reinforcing strategies for sustainable local impact.

Guiding question: How might we create dynamic cross-pillar strategies and activities that sustain locally relevant landscape restoration practices and promote transboundary collaboration?

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32 Design thinking or thinking like a designer can transform the way products, services, and processes are developed. [https://hbr.org/2008/06/design-thinking](https://hbr.org/2008/06/design-thinking); [https://designthinking.ideo.com](https://designthinking.ideo.com).
### Table 1. ASP Model Outcomes and Interventions Framework

<table>
<thead>
<tr>
<th>ASP Model Pillars and Project Activities</th>
<th>ASP Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Curriculum Integration:</strong></td>
<td></td>
</tr>
<tr>
<td>• Knowledge transfer and skills acquisition</td>
<td>Cultural and context competency</td>
</tr>
<tr>
<td>• Peer-to-peer learning model</td>
<td>Build awareness of climate change, environmental issues, and resilient landscape restoration practices.</td>
</tr>
<tr>
<td>• Design thinking workshops</td>
<td></td>
</tr>
<tr>
<td>• Challenge- and project-based learning</td>
<td>Local empowerment and solutions</td>
</tr>
<tr>
<td>• Social entrepreneurship education</td>
<td>Enable community-driven, locally relevant solutions to climate change and landscape degradation.</td>
</tr>
<tr>
<td>• Twenty-first century skill building</td>
<td></td>
</tr>
<tr>
<td><strong>Community Responsiveness:</strong></td>
<td>Organization mapping for identifying cross-pillar links</td>
</tr>
<tr>
<td>• Communication for awareness and action</td>
<td></td>
</tr>
<tr>
<td>• Community asset and stakeholder mapping</td>
<td></td>
</tr>
<tr>
<td>• Schools and other local assets capacity building</td>
<td></td>
</tr>
<tr>
<td>• Leveraging social media</td>
<td>Intentional local investment</td>
</tr>
<tr>
<td>• Local and regional collaborative networks</td>
<td>Actualize village-based assets to sustain local resilience.</td>
</tr>
<tr>
<td><strong>Organization Alignment:</strong></td>
<td>Regional collaborative action</td>
</tr>
<tr>
<td>• Alignment with development objectives</td>
<td>Connect and leverage resources that bolster assets and capacity of isolated communities to address challenges.</td>
</tr>
<tr>
<td>• Village school ecosystem scans and context research</td>
<td></td>
</tr>
<tr>
<td><strong>Cultural and context competency</strong></td>
<td>Equitable social mobility</td>
</tr>
<tr>
<td><strong>Local empowerment and solutions</strong></td>
<td>Activate entrepreneurial mindset and skills to build economic opportunity and employability among rural youth.</td>
</tr>
</tbody>
</table>

#### 3.3 Location

The pilot study was conducted in the GBAO, the geographically and historically isolated province in Tajikistan’s eastern territory in the high Pamir mountains. Khorog, the GBAO capital, with a population of approximately 31,000 and where UCA’s campus is located, served as the study’s base. The student intern training sessions and study implementation preparations were held at UCA. Of the 12 youth workshops conducted, 2 were held in Khorog town, 2 in jamoats (municipalities), and 8 in villages along the Ghunt river to the east and the Panj river to the north.

33 An assessment of costs, travel constraints, time requirements, faculty/subcontractor supervision, and low numbers of UCA student nationals precluded extending the pilot study to Uzbekistan, as originally proposed.
Map 1. Pilot Study Location in GBAO


Map 2. Pilot Youth Workshop Sites

Source: Google Earth with village names added the authors.
3.4 Implementation Team

A global team of social impact designers and facilitators, science researchers, environmental activists, educators, and university students implemented the study. The AnchorEd team is based in the United States. AnchorEd led the study design, coordination, delivery, and reporting. A graduate student (MSc, Environmental Psychology) at the University of Groningen, the Netherlands, joined the team as a summer intern. The survey instrument was designed and data analysis conducted in conjunction with her master’s thesis work on the effectiveness of peer leadership and social identification mechanisms in youth climate change awareness and action.

UCA, Khorog campus, was AnchorEd's International Field Study Partner. A Mountain Societies Research Institute (MSRI) Senior Research Scientist and Associate Professor of the Earth and Environmental Sciences (EES) Department, School of Arts and Sciences, and a Post-Doctoral Fellow, EES Department provided on-site program coordination, content expertise, regional knowledge and relationships, and student intern oversight and mentoring. Additional UCA staff provided administrative assistance.

Ten undergraduate students from the UCA EES Department were recruited to take part in the project as interns through the university’s Cooperative Education Program. Students submitted applications for the internship, which was coordinated through the MSRI. Applications were reviewed by a UCA faculty (International Coordinator) and AnchorEd staff. Criteria for participation in the intern program included foundational knowledge of environmental and climate change science and family ties and/or experience in GBAO rural communities. Of the interns hired, 50 percent were males and 50 percent females and their ages were between 19 and 24. The student interns participated in the ToT workshops and led the youth workshops as peer educators.

The Foundation for Innovative and Sustainable Technology (FIST), an environmental NGO based in Khorog, was engaged by UCA to provide local expertise, enhance intern learning, assist with logistical support, and help establish key social capital networks. Specifically, it supported the student interns, supervised intern teams during youth workshop implementation, coordinated with school directors for the workshops, interviewed school directors, and provided content expertise.
The ‘Youth Entrepreneurial Spirit and Climate Awareness: Design Challenge’ ToT workshop series was delivered virtually by AnchorEd between June 24 and July 2, 2021, and on September 28, 2021, with asynchronous on-site learning, planning, and coordination led by UCA faculty. The workshop series design and planning were adapted to accommodate constraints and take advantage of opportunities presented by the study context, timing, and partnerships. Due to the global nature of the implementation team as well as COVID-19 travel restrictions, the training was conducted virtually using Zoom. Student interns gathered in one space at the university for the training sessions, using additional rooms for breakout spaces as needed. The ability of the interns and the field coordinators to meet in person for the virtual sessions facilitated team building and asynchronous group work between sessions. The training consisted of four three-hour sessions, with a fifth session held after all village workshops were completed.
Table 2. Intern ToT Design Challenge Workshop Overview

<table>
<thead>
<tr>
<th></th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Orientation and Kickoff</td>
<td>BUILD: Believe and Understand</td>
<td>BUILD: Invent and Listen</td>
<td>BUILD: Deliver</td>
<td>Wrap-Up, Debrief, and Celebrate</td>
</tr>
<tr>
<td><strong>Prework</strong></td>
<td>Internship paperwork</td>
<td>Personal strengths inventory</td>
<td>Stakeholder and asset maps</td>
<td>Final draft climate change lesson plan</td>
<td>Youth workshops implementation</td>
</tr>
<tr>
<td></td>
<td>Read/watch: Design thinking</td>
<td>Read/watch: Empathy, Needs versus wants</td>
<td>Final draft climate action case study</td>
<td>Workshop materials collection</td>
<td></td>
</tr>
<tr>
<td><strong>Core topics</strong></td>
<td>Pre-workshop survey</td>
<td>Team formation, Believe, PICS, Proactivity</td>
<td>Understand, Needs versus wants, Empathy mapping, Needs filtering (end user)</td>
<td>Water tower experiential Deliver, Climate lesson plan, Climate action case study</td>
<td>Pilot study review</td>
</tr>
<tr>
<td></td>
<td>Program overview</td>
<td>Understand, Beginner’s Mindset, Observer’s Eye, Persona, Stakeholder and Asset Maps</td>
<td>Invent, Ideate and brainstorm, Prototyping</td>
<td>Facilitator’s guide Q&amp;A Preparation planning</td>
<td>Retrospective: Village workshops (stop/start/continue)</td>
</tr>
<tr>
<td></td>
<td>Learning objectives</td>
<td></td>
<td></td>
<td></td>
<td>Preliminary endings</td>
</tr>
<tr>
<td></td>
<td>Design thinking and BUILD introduction</td>
<td></td>
<td></td>
<td></td>
<td>Learning and leadership Development goals Check-in</td>
</tr>
<tr>
<td><strong>Outputs</strong></td>
<td>Pre-workshop survey</td>
<td>Intern teams, Team strengths profile, Youth personas</td>
<td>Empathy maps, Solutions ideation, Lesson and case study prototypes</td>
<td>Climate Change Lesson, Climate action case study, Field action plan, Translated youth survey</td>
<td>Workshop reports</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Youth surveys</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Problems and solutions sheets</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Research and photo consent forms</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Photo files</td>
</tr>
</tbody>
</table>

Note: See Appendix C, for the workshop guide. BUILD (Believe, Understand, Invent, Listen, and Deliver).
The ASP ToT curriculum is based on the principles of experiential learning illustrated by the four stages of the Kolb Cycle iterative process: concrete experience, reflective observation, abstract conceptualization, and active experimentation. As a design challenge, design thinking fundamentals based on the BUILD framework were used and modeled to achieve two key outcomes: (a) intern-designed lessons tailored for rural youth on climate change, landscape resilience, and entrepreneurial mindset and (b) an intern team prepared to deliver climate change content and a human-centered design lab prototype with youth in village schools. The student interns experienced the process they were preparing to deliver themselves while also being given the opportunity to practice new approaches, such as project planning and facilitation, and examine their own learning.

Learning objectives:

1. Develop a working knowledge of design thinking model, BUILD, its components, and the intentional sequence of its stages.
2. Gain confidence through practical experience to empower youth to address climate resilience in their communities.
3. Become prepared to successfully execute this field study.

The student intern team conducted a rapid scan of stakeholders in the three arenas core to this pilot study: climate change awareness and action, entrepreneurship (not limited to youth focused), and rural education. Three levels of engagement were considered: local (village level), national (Tajikistan), and regional (Central Asia). The purpose of the scanning exercise was to introduce the interns to an analysis tool that would generate a snapshot of the broader landscape in which the pilot was operating. The resulting stakeholder map (Figure 2) gives us an initial view of the ecosystem within which school-based youth entrepreneurship focused on landscape and community resilience to climate change can emerge.

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34 McLeod 2017.
35 Centre for Entrepreneurial Leadership 2016.
The purpose of the mini-lesson on climate change crafted by the intern team of undergraduate EES students was to provide youth workshop participants with a foundational overview of the science of climate change and its impact globally and locally. That understanding would be the basis on which the youth would identify climate-change-related problems in their region for which they would then generate proposed solutions. Based on the national science curriculum as well as the interns’ high school experience, a working assumption was that youth in the villages where the workshops were to take place would be aware of climate change and would have a basic understanding of the key dynamics at play. However, the youth would likely require a basic explanation of the science behind those dynamics as well as connections between global climate forces, human actions, and local impacts on the landscape, including those the youth experience regularly. Group work was integrated into the lesson to reinforce learning. The lesson and its accompanying PowerPoint deck were presented in the Tajik language.

Table 3. Topics Covered in the ‘Climate Change: Fundamentals and Evidence’ Lesson

| • Understanding climate, climate change, and the difference between climate change and global warming |
| • Why climate change is happening, the greenhouse gas effect, the role of different types of pollution |
| • Evidence of climate change: rising temperatures, warming oceans, melting glaciers, extreme weather events, and so on |
| • Impact of livestock and agriculture (grazing, deforestation, methane gas), atmosphere and methane gas |
| • Effects on everyday life: examples from Tajikistan |

Interns also created a Youth Action Case Study: ‘Youth Training Against Climate Change’ that highlighted a young Tajikistani climate activist to inspire youth participants and illustrate the capacity of young people to effect change. The case study profiled a UCA alumna who founded a Green Society Club at the university to raise awareness of environmental issues and encourage participation in sustainable environmental practices on campus and in Khorog. The purpose of the case study was to demonstrate how youth participants can achieve something beyond their immediate
constraints by profiling an inspiring young person with whom they can identify. By introducing the concept of proactivity, the case study lesson develops a sense of agency in their ability to change their communities and the world around them.

Training outputs (see Appendix C) were as follows:

- Climate change lesson plan and presentation deck
- Youth action case study and presentation deck
- End user personas of rural youth
- Stakeholder map of climate change, entrepreneurship, and education sectors in Tajikistan.

### 3.6 Youth Workshops

The core of the study was 12 youth workshops delivered between July 26 and August 2, 2021, and attended by about 300 youth between the ages of 11 and 18. Three student intern teams were formed, each with a faculty/adult supervisor. Each team traveled to three different sites simultaneously on three different days (Monday, Wednesday, and Friday). All three teams reconvened for the 10th workshop on the following Monday, which was conducted in a village farther from the Khorog campus than the other villages. The alternate days were used to prepare workshop materials, purchase supplies, and coordinate meal preparation.

The initial plan involved student interns coordinating and facilitating workshops either individually or in teams of two in their home villages where they would have established relationships, with both residents and the school leadership, and extensive local context knowledge. The field study coordinators determined that not all the student interns were living in or had recently lived in village areas, with many residing in towns or cities. Furthermore, interns did not have the experience or the time to become sufficiently prepared to manage the travel and workshop logistics independently without adult support. In addition, traveling in teams would be more efficient, cost-effective, and safer (flooding was affecting access on some roads in the study area and the situation in Afghanistan was beginning to affect the border regions with soldier defections and refugee movement).

In response to such conditions, a new plan was devised, with the formation of the three teams of three or four student interns, each led by one adult. This team-based approach allowed for greater collaborative learning for student interns, increased numbers of youth participants per workshop, comprehensive faculty/adult supervision and guidance, improved travel logistics, and greater implementation efficiencies. A decision was also made for the entire intern and faculty group to travel to the farthest village, which required an overnight stay, to conduct the last workshop together. This became an opportunity for the interns to build on their planning and facilitation experience from the prior week. The presence of faculty/adult leaders at each workshop also allowed for school director interviews at 5 out of the 10 schools, generating valuable data that would otherwise not have been available (an additional five school directors were interviewed by phone after the workshops were completed).
A total of 298 youth\textsuperscript{36} from across the southern part of the GBAO region were recruited to participate in a total of 12 workshops. Seven workshops were conducted in village schools, two in town (Khorog) schools, one in a village private residence, and two in third-party youth summer camps. Of the recruited participants, 44.5 percent were males and 55.5 percent were females, and 8 percent were under 12 years, 61 percent between 13 and 16 years, and 27 percent above 16 years. While 43.5 percent of the participants reported that their families own a car, 56.5 percent do not (5 percent no response/incomplete), a rough proxy measure for socioeconomic status. The survey completion rate was 95.6 percent with 13 surveys (4.4 percent) incomplete. Student participants were provided a snack or meal as well as a reusable water bottle, along with a certificate of attendance.

\textsuperscript{36} The total number of youth who attended all or some of the workshops was 298. Of those, 266 participants completed both the pre- and post-activity surveys. The total number of youth in Table 4 (285) reflects participants recorded at the start of each workshop, with 19 completing only the pre-activity survey and 13 completing only the post-activity survey.
Table 4. Youth Workshops: Basic Data

<table>
<thead>
<tr>
<th>Date</th>
<th>Map Site No.</th>
<th>Village/City</th>
<th>District</th>
<th>School/Camp No.</th>
<th>Team</th>
<th>Supervisor</th>
<th>No. of Youth</th>
<th>Female</th>
<th>Male</th>
<th>Prefer Not to Say</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/26</td>
<td>1</td>
<td>Suchan</td>
<td>Pitob</td>
<td>19</td>
<td>Climate change fighters</td>
<td>Ben</td>
<td>22</td>
<td>10</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>7/26</td>
<td>2</td>
<td>Porshinev</td>
<td>Shughnan</td>
<td>11</td>
<td>Team leaders</td>
<td>Artur</td>
<td>19</td>
<td>16</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>7/26</td>
<td>3</td>
<td>Rosht-Qala</td>
<td>Roshtqala</td>
<td>26</td>
<td>Climate philosophers</td>
<td>Vasila</td>
<td>15</td>
<td>13</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7/28</td>
<td>4</td>
<td>Tang</td>
<td>Shughnan</td>
<td>25</td>
<td>Climate change fighters</td>
<td>Ben</td>
<td>23</td>
<td>14</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>7/28</td>
<td>5</td>
<td>Buni</td>
<td>Shughnan</td>
<td>8</td>
<td>Team leaders</td>
<td>Artur</td>
<td>14</td>
<td>5</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>7/28</td>
<td>6</td>
<td>Nishusp</td>
<td>Darmorakht</td>
<td>1</td>
<td>Climate philosophers</td>
<td>Vasila</td>
<td>32</td>
<td>15</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>7/30</td>
<td>7</td>
<td>Dasht</td>
<td>Ishkashim</td>
<td>Pamirian (private residence)</td>
<td>Climate philosophers</td>
<td>Arthur</td>
<td>18</td>
<td>7</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>7/30</td>
<td>8</td>
<td>Kalenin</td>
<td>Khorog City</td>
<td>2</td>
<td>Climate change fighters</td>
<td>Ben</td>
<td>18</td>
<td>14</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>7/30</td>
<td>9</td>
<td>Gagarin</td>
<td>Khorog City</td>
<td>7</td>
<td>Team leaders</td>
<td>Artur</td>
<td>18</td>
<td>16</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7/22a</td>
<td>10</td>
<td>Porshinev</td>
<td>Shughnan</td>
<td>Project Quandeel: Ignite Camp</td>
<td>Team leaders</td>
<td>Vasila</td>
<td>20</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>7/23a</td>
<td>11</td>
<td>Vamar</td>
<td>Rushan</td>
<td>Jurat (NGO) Camp</td>
<td>Climate philosophers</td>
<td>Artur</td>
<td>72</td>
<td>33</td>
<td>38</td>
<td>1</td>
</tr>
<tr>
<td>8/02</td>
<td>12</td>
<td>Jelondi</td>
<td>Shughnan</td>
<td>51</td>
<td>All</td>
<td>All</td>
<td>14</td>
<td>5</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>285</strong></td>
<td><strong>158</strong></td>
<td><strong>126</strong></td>
</tr>
</tbody>
</table>

Note: a. The workshop was held as part of the Project Quandeel: Ignite Camp between 7/22 and 7/24; youth participants were from GBAO, Sughd, and Khatlon regions.
b. The workshop was held as a part of the Jurat Camp on 7/23–24.

The youth workshop curriculum, outlined in the Facilitator’s Guide, mirrors the ToT program and incorporates the student interns’ collaborative lesson plan work. Consistent with training goals for interns to learn agile facilitation skills, intern teams adapted the program according to the specific conditions of each site. Due to time constraints related primarily to travel and the prioritization of climate change awareness building, the program outlined in the Facilitator’s Guide (Table 5) was shortened and modified by the teams. In addition to collection of consent forms, administration of surveys, introductions, and warm-up activities, the village and town (non-camp) workshops included the climate change minilesson, climate action case study activity, water tower design challenge, environmental impact problem identification, and climate change/resilient landscapes solution brainstorming. The camp workshop sessions were limited to the climate change lesson and water tower challenge experiential, and while those participants were reported to be enthusiastic and pro-environmental, solution ideation was not completed.
Table 5. Youth Workshops: Program Overview

<table>
<thead>
<tr>
<th>Duration (minutes)</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome</td>
<td>Introductions (facilitators and participants)</td>
</tr>
<tr>
<td>Registration, consent forms and pre-training survey completion</td>
<td></td>
</tr>
<tr>
<td>Introduction to workshop objectives and schedule</td>
<td></td>
</tr>
<tr>
<td>Experiential: Water tower challenge</td>
<td>● Team formation</td>
</tr>
<tr>
<td>● Challenge activity</td>
<td></td>
</tr>
<tr>
<td>Introduction to BUILD Believe</td>
<td>Proactivity: Inspiring self-belief as change agents using case studies, individual self-assessment, and reflection.</td>
</tr>
<tr>
<td>● Case study</td>
<td></td>
</tr>
<tr>
<td>● PICS worksheet</td>
<td></td>
</tr>
<tr>
<td>● “I Believe” activity</td>
<td></td>
</tr>
<tr>
<td>Break - Meal</td>
<td></td>
</tr>
<tr>
<td>Understand</td>
<td>Understanding climate change and the local impact context</td>
</tr>
<tr>
<td>● Climate change minilesson</td>
<td></td>
</tr>
<tr>
<td>● Identifying challenges and needs</td>
<td></td>
</tr>
<tr>
<td>● Empathy and needs identification</td>
<td></td>
</tr>
<tr>
<td>● Bug list</td>
<td></td>
</tr>
<tr>
<td>● Needs selection</td>
<td></td>
</tr>
<tr>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>Invent/Listen</td>
<td>Lesson on creative problem-solving</td>
</tr>
<tr>
<td>● Brainstorming lesson</td>
<td></td>
</tr>
<tr>
<td>● Solution filtering and prioritization</td>
<td></td>
</tr>
<tr>
<td>● Rapid prototyping and presentation</td>
<td></td>
</tr>
<tr>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>Deliver</td>
<td>Ideas/solution presentations and celebration</td>
</tr>
<tr>
<td>Closing</td>
<td>Post-training survey, group photo, and farewell</td>
</tr>
</tbody>
</table>

Source: Intern Facilitator’s Guide; Appendix C.

The key workshop outputs were climate-change-related problems and potential solutions to many of those identified problems. Problems identified included both global and local concerns and were captured on flip chart or other large-format paper using markers. The problems generated fall into seven major themes: pollution, extreme weather events and natural disasters, natural environment or landscape degradation, infrastructure, schools and education, social/economic conditions and behavior, and disease. The most frequently cited problems were water pollution/contamination and access to potable water, floods and rising water levels, garbage in public spaces and lack of trash receptacles and services, extreme weather events, deforestation and desertification, air pollution, lack of biodiversity, and lack of recreation spaces and entertainment options. Based on the small-group brainstorming data collection method, it is not possible to determine conclusively which of the problems identified were based on knowledge gained from the climate change lesson, prior school learning, television, internet and social media, or personal experience in local conditions. Notes from the small-group records (flip chart paper) and intern facilitators’ reports, such as knowledge of extreme weather events in other countries (for example, rising temperatures in Moscow), indicate that youth drew from a combination of sources. Specific problems and challenges raised that are consistent with the GBAO context demonstrate both the impact of examples provided in the lesson and participants’ personal experience.
The small-group brainstorming activity also included solution ideation. Solutions generated by youth participants fall into seven corresponding categories: garbage cleanup, water conservation, forests and trees, advocacy and action, behavior change, local goods production, and electricity generation. In several cases, youth identified key or preferred solutions they would be interested in pursuing as a specific project. The majority of workshops did not have sufficient time to go beyond the initial brainstorming phase of ideation to include solution prioritization, rapid prototyping, feedback, and presentations.
Table 6. Youth Workshops: Problem and Solutions Themes (in descending order of prevalence with most common items in bold)

<table>
<thead>
<tr>
<th>Problem Themes</th>
<th>Solutions Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pollution</strong></td>
<td><strong>Garbage cleanup</strong></td>
</tr>
<tr>
<td>● Water contamination and potable water access</td>
<td>● Trash and recycling bins</td>
</tr>
<tr>
<td>● Garbage/trash and lack of waste facilities</td>
<td>● Cleanup campaigns</td>
</tr>
<tr>
<td>● Air pollution from industry and vehicles</td>
<td>● Reduce waste burning (especially during school hours)</td>
</tr>
<tr>
<td>● Fossil fuel use/burning</td>
<td></td>
</tr>
<tr>
<td><strong>Extreme weather events and natural disasters</strong></td>
<td><strong>Water conservation</strong></td>
</tr>
<tr>
<td>● Flooding and rising water levels</td>
<td>● Clean up rivers</td>
</tr>
<tr>
<td>● Melting glaciers</td>
<td>● More/better water storage</td>
</tr>
<tr>
<td>● Rock and mudslides</td>
<td>● Decrease water use</td>
</tr>
<tr>
<td>● Drought</td>
<td>● Improve access and water channels</td>
</tr>
<tr>
<td><strong>Natural environment or landscape degradation</strong></td>
<td><strong>Forests and trees</strong></td>
</tr>
<tr>
<td>● Deforestation and desertification</td>
<td>● Plant trees</td>
</tr>
<tr>
<td>● Animal and plant extinction; decreased biodiversity</td>
<td>● Stop cutting down trees</td>
</tr>
<tr>
<td>● Forest fires</td>
<td>● Water trees</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td>● Protect trees from insects</td>
</tr>
<tr>
<td>● Lack of recreation and entertainment (parks, playgrounds, fields, cinemas, pools)</td>
<td><strong>Advocacy and action</strong></td>
</tr>
<tr>
<td>● Inadequate and unpredictable electricity, especially in the winter</td>
<td>● Pressure government</td>
</tr>
<tr>
<td>● Nonexistent or inadequate hospitals, health care, pharmacies, and medicines</td>
<td>● Educate young people</td>
</tr>
<tr>
<td>● Lack of public amenities (shopping centers/stores, gas stations, libraries, public toilets)</td>
<td>● People work together</td>
</tr>
<tr>
<td>● Bad and poorly maintained roads</td>
<td></td>
</tr>
<tr>
<td><strong>Schools and education</strong></td>
<td><strong>Behavior change (reduce):</strong></td>
</tr>
<tr>
<td>● Inadequate and poorly maintained school facilities</td>
<td>● Electricity use</td>
</tr>
<tr>
<td>● Broken equipment</td>
<td>● Burning wood and coal</td>
</tr>
<tr>
<td>● Trash around school</td>
<td>● Pesticides and fertilizers</td>
</tr>
<tr>
<td>● Lack of modern toilets</td>
<td>● Driving cars (ride bikes)</td>
</tr>
<tr>
<td>● No canteen</td>
<td></td>
</tr>
<tr>
<td>● Lack of heat</td>
<td></td>
</tr>
<tr>
<td>● Insufficient resources (clubs, laboratories, books, first aid)</td>
<td></td>
</tr>
<tr>
<td><strong>Social/economic conditions and behavior</strong></td>
<td><strong>Local goods production</strong></td>
</tr>
<tr>
<td>● Unhealthy behavior (smoking, drinking, inactivity)</td>
<td>● Increase local manufacturing</td>
</tr>
<tr>
<td>● Low incomes and expensive, low-quality goods</td>
<td>● Control imports</td>
</tr>
<tr>
<td>● Illegal behavior and drug dealing (proximity to Afghanistan)</td>
<td></td>
</tr>
<tr>
<td><strong>Disease</strong></td>
<td><strong>Electricity generation</strong></td>
</tr>
<tr>
<td>● COVID-19 and other viruses</td>
<td>● New power station</td>
</tr>
<tr>
<td>● Lack of adherence to pandemic protocols (masks, sanitizing, social distancing)</td>
<td>● Hydropower stations at lower altitude</td>
</tr>
<tr>
<td>● Increase in flies and insect bites</td>
<td>● Scheduled/predictable electricity service</td>
</tr>
</tbody>
</table>

Post-workshop intern sessions included workshop output collection, compilation, analysis, and reflection. Final virtual sessions allowed for articulation of lessons learned, identification of themes and gaps, reflection on the learning process, and documentation of recommendations and proposed next steps. Final report contributions were also completed. This feedback and debriefing work included a review of both the ToT sessions and the youth workshops. Results are presented in Section 4.
3.7 Communications Outreach

Communications outreach using social media and other digital platforms extended the study’s impact. Social media outreach related to the study was conducted primarily by AnchorEd through the LinkedIn platform. AnchorEd and its principals have over 2,000 followers combined. Seven original posts related to the study received 3,621 views with an average of 517 views per post. The UCA Public Affairs Office did not pursue posts related specifically to the study on its website or social media. However, posts were made on the university’s website as well as its Twitter and Instagram accounts sharing the student-led Global Climate Change Week (GCCW) that coincided with the 26th Conference of the Parties (COP26) global conference held in Glasgow, Ireland. This student-led activity was an initiative of the newly established EES Club, which was founded and led by members of the pilot study student intern team, all students in the EES Department, along with the faculty international site coordinator, following and in response to the study internship experience. UCA (@ucentralasia) has 5,288 followers on Twitter, has 21,400 followers on Instagram (ucentralasia), and had 55,600 total visits to its website in December 2021.

3.8 Research Instruments and Data Collection

Pilot data were collected using both quantitative and qualitative instruments to assess the effectiveness of peer-to-peer workshops. Confirmation was sought that the seminars and activities designed through the ToT sessions and held at rural schools positively affect youth by increasing their awareness of and willingness to act on climate change and foster entrepreneurial mindsets. It was hypothesized that the peer-to-peer model of the workshop would foster the formation of a pro-environmental social identity and, therefore, promote a change in the behavior of the participants, specifically because the workshop trainer is perceived as an identity leader.38

Permission was granted by the GBAO Department of Education for implementation of the pilot workshops in the region’s schools. Approval of the survey methodology, which included assurance of respondent anonymity and alignment with standards for use of minors in social research, was granted by UCA’s Ethics Research Committee. Workshop delivery proceeded using COVID-19 precautions. While it was not required in Tajikistan at the time, basic personal protective equipment (masks and hand sanitizer) was purchased and distributed to all facilitation teams and participants.

Research instruments included a set of questionnaires for anonymous surveying of university student interns and youth workshop participants. A qualitative data questionnaire for individual interviews with school directors was also tested. The instrument used to survey interns was administered electronically in English. The instrument used to survey youth participants was translated into Russian and Tajik and was used at all workshop sites. A subset of the school director interviews was conducted in four villages and Khorog City; additional interviews were conducted by phone with directors of schools located in Shughnan and Rushan Districts. Interviews were conducted in English, Russian, and/or Tajik, according to interviewee preferences and language capacity of the interviewer.

The 10 student interns completed pre- and post-training surveys and a final survey at the end of the internship period, which were all conducted digitally on Google Forms. The pre- and post-training surveys assessed demographics, climate change awareness, entrepreneurial orientation and skills, social identification with youth, and perceived efficacy of the training. The end-of-internship surveys assessed effectiveness and satisfaction with the virtual trainings, the implemented workshops, and the overall internship. Qualitative feedback was also solicited.

The interns administered the anonymous pre- and post-activity surveys to 298 youth participants at the 12 village- and town-based youth workshops. Participants completed hard-copy surveys. The pre/post-activity surveys assessed demographics, climate change awareness, entrepreneurial orientation and skills, social identification with youth, and identity leadership. Qualitative data were also collected on the same survey instruments to dive deeper into these constructs. School

37 Jans 2021.
38 Steffens et al. 2014.
directors were interviewed by the UCA faculty and the NGO subcontractor using a separate interview guide. Interviewers recorded school director responses in writing. Interviews were not recorded.

For both intern and youth quantitative surveys, most items were measured on a seven-point Likert Scale (1 = Strongly disagree; 2 = Disagree; 3 = Slightly disagree; 4 = Neutral; 5 = Slightly agree; 6 = Agree; 7 = Strongly agree). A Net Promoter Score (NPS) measurement for student interns used a 10-point Likert Scale. All youth survey questions were issued in English and Tajik, with translation by the student interns and UCA faculty (see Appendix A for the complete surveys and Appendix B for complete student intern data and youth participant data analysis).

3.9 Data Analysis

Student Interns (Quantitative Data)

Pre- and post-program student intern data were compared and the average change in 1–7 scale program impact data was quantified. Questions were aggregated into impact areas of (a) climate awareness and concern, (b) entrepreneurship interest and skills, and (c) social identification with youth. Aggregate data were tabulated as shown in Figure A.3, Figure A.4, and Figure A.5 (Appendix B). Statistical analyses were not conducted due to the small sample size.

To assess effectiveness and viability of the ToT workshop approach, an NPS was measured using a 1–10 scale calculated as the difference in proportion of responses to the question: “How likely is it that you would recommend an ASP internship to a friend or classmate?” (Figure 4).

Youth Participants (Quantitative Data)

Analysis of youth participant data considered six categories or scales of items. Anthropogenic climate change (ACC) measuring awareness that humans affect the environment through their activities; climate change concern (CCC) measuring concern for the health of the planet; entrepreneurship measuring perceived skills and desire to be an entrepreneur; social identification (SI) with youth measuring the strength of the identification with young people’s group; injunctive social norms (ISN) and descriptive social norms (DSN); identity leadership administered only to youth participants after attending the workshop measuring identity prototypicality, identity advancement, and identity entrepreneurship; and interns-perceived efficacy measuring impact of the ToT. Data analysis was conducted using the statistical software platform Statistics Statistical Package for the Social Sciences (SPSS).

Post hoc analysis revealed that the scale for climate change awareness initially composed of five items was not reliable and performed differently among samples as well as between pre- and post-measures. This unreliability of scales could be due to different factors such as participant comprehension problems due to translation or end-of-workshop fatigue among young students. For this reason, of the five initial items, only the two with more theoretical relevance were separately considered in the analysis: ACC and CCC. Future research requires a revised instrument to measure the construct more accurately and in depth. In addition, to better understand variables affecting workshop effectiveness, future research might include control studies to compare the effectiveness of a peer-to-peer workshop with a group that did not experience a comparable workshop and with a group that received an adult facilitated workshop.

Youth Participants (Qualitative Data)

Using the same instrument for youth participants, five qualitative questions were posed to dive deeper into the constructs outlined above. The level of engagement and usefulness of the program were assessed, and opinions were gathered on the perceived importance of having a peer leader

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39 Factor analysis determined that the original five-item scale of climate change awareness had low reliability between interns and youth post-measures. Therefore, the analyses were conducted on the two items with high reliability, ACC and climate change concern (CCC), as separate scales.
delivering the workshop and the desire to be an entrepreneur in the future. Feedback on improvements for future workshops was also solicited.

School Director Individual Interviews (Qualitative Data)

The purpose of the school director interviews was twofold: (a) to introduce the team and establish connections with school administrators for potential ongoing engagement and (b) to gather initial insights into the perspectives of administrators compared to the core objectives of the study. Our intention was to establish a positive, relaxed rapport through a conversational interview guided by the questionnaire. The instrument included a total of 14 questions grouped into five categories addressing basic respondent information, climate change and its environmental impact as a topic of study, the current role and potential of schools in climate change awareness and local youth action, connectivity of schools to related regionally based resources or networks, and overall identified community needs. The data set size was insufficient for conclusive quantitative analysis. Responses provided insights and indicated patterns for understanding the school context and potential for further study and action.
4. Key Findings

4.1 Overview

The key findings of the study align with the study’s five objectives: (1) prototyping the ASP model tailored to the rural context of Tajikistan, (2) gaining initial insights into youth awareness levels of pollution/climate change and landscape restoration issues, (3) providing initial insights into youth awareness levels of and orientation to entrepreneurship/social entrepreneurship, (4) analyzing youth solutions to climate change as potential prototypes for landscape resilience initiatives, and (5) identifying constraints and opportunities for integrating the ASP model at scale.

Overall, the study indicates the viability of an approach that leverages regional assets in support of rural schools to become loci for youth engagement in building resilient landscapes and communities. While quantitative data only partially supported our hypothesis, results from the qualitative data, school director interviews, and student intern and faculty observations show that the school-based, peer-to-peer workshops positively affect youth awareness of and willingness to act on climate change impacts. Similarly, the workshops effectively sparked in youth a sense of agency through development of entrepreneurial mindsets and skill-building. Our key findings reinforce the efficacy of the study’s core variables: rural schools, regional ecosystems, peer-to-peer learning, climate change awareness, and youth entrepreneurship.

Survey data generally support the efficacy of the model and provided a useful starting place for further study. As a pilot study with limited time and resources, the surveys administered were initial tests only. Environment and climate change knowledge and awareness, identity leadership, and entrepreneurship were measured using scales with multiple items. Social identification with youth was measured with one single item. Going forward, the survey instruments require revisions to better measure change in climate change knowledge and awareness as well as entrepreneurship knowledge, skills, and awareness. However, it will be critical to balance the need for data with the constraints imposed by the age of participants and the limited time available for those youth. Time spent in villages by student intern teams should be prioritized for workshop implementation and solution prototyping. In future iterations, therefore, it may be prudent to limit pre- and post-workshop data collection to a few key variables while measuring change in content knowledge and awareness in a separate data collection process, such as teacher-administered tests in collaboration with the Ministry of Education and Science (MoES). Specific to the ASP model, administering a quantitative survey with school directors would capture valuable basic school data and would complement qualitative interviews that allow for a more nuanced understanding of constraints and opportunities related to rural schools.

4.2 Objective 1: ASP Model Prototype

Objective 1: Prototype the ASP model tailored specifically for a rural village-centric regional approach in Tajikistan.

The ASP model prototype was tailored to the rural Tajikistan context, particularly the GBAO, while also designed to be replicable across Central Asia. The GBAO was an ideal location for the early-stage pilot because it had key variables in place: a university with sufficient capacity (for example, faculty, student intern cooperative program), resources (for example, internet, classroom space, vehicles), and strong regional relationships (for example, the Ministry of Education); undergraduate students from the area who are familiar with the local geography, culture, language, and schools; a viable nonprofit sector with which to partner; and accessible yet remote rural schools. Given the local context, challenges arose during the study that are likely to be experienced in other areas as well, including poor or impassable road conditions, long travel distances to school sites, cross-border tension or conflict, sparse school facilities, unavailable school directors, and hard-to-find workshop supplies. These assets and challenges required that priority was given to simplicity of design and feasibility of implementation, providing the implementation team opportunities to problem-solve, gain insights for improvements, and prepare for those eventualities elsewhere.
A higher education institution as a coordination, coaching, and co-training hub proved indispensable to the prototype. The importance and value of the UCA role in the study cannot be overstated, from hiring student interns, coordinating on-site logistics, providing key content expertise, and activating local and regional relationships to supporting intern learning. All aspects of this component worked smoothly due to the field coordinator’s commitment to pilot the model and dedication to intern learning, extensive experience conducting studies in remote areas of the GBAO, and key relationships within the university. The ability to adapt to changing circumstances and mobilize resources, such as the student cooperative program and university vehicles, was key to overall study success. Illustrating the value and potential of this type of work, UCA is establishing a new climate change research center that prioritizes student learning and engagement.

A university-based internship program offers an effective and sustainable structure for training students as peer leaders. Core to the prototype was a paid student internship embedded in a university cooperative learning program which lent the internship validity as well as essential structure, coordination, and policies. This allowed for the interns to be paid according to UCA’s policies, which in turn reinforced the professional expectations of the engagement. Positioning a senior faculty member as a field study coordinator to provide oversight, navigate university systems, and liaise with university leadership was critical to ensuring an impactful intern experience. Survey data indicate that the internship was received positively by the students with a high degree of overall satisfaction reported and a very high degree of interest in working on the project again if the opportunity were to arise. Enthusiasm for the internship is further reinforced with the NPS score of 83, indicating that respondents are highly likely to recommend the internship to a friend or classmate.

**Figure 3. Average Student Intern Final Survey Responses (0–7 Scale)**

- How would you rate your overall satisfaction with the internship?
- How effective were the online training workshops?
- How challenging was the internship overall?
- How well did the EES program prepare you for this internship?
- How would you rate the degree of impact/positive change the project had on the target audience?
- How interested are you in working on this project again, if the opportunity were to arise?

**Figure 4. Student Intern NPS Ratings**

How likely is it that you would recommend an ASPIRESILAND internship to a friend or classmate?

<table>
<thead>
<tr>
<th>Rating</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

6 responses
The success of the virtual ToT workshop series was key to prototype viability. Overall, the online intern training workshops were received positively and generated the desired result of having intern teams prepared to implement youth workshop pilots. The four-part virtual training prepared the 10 student interns to deliver a partial-day workshop to youth ages 13–17 using experiential learning pedagogies and design thinking in ways that activated school spaces (indoors and outdoors) and expanded on existing national climate change science curricula. As students in the EES Department, interns had a solid baseline knowledge of climate change science and felt well prepared, positioning them to create accurate and relevant content. Students felt strongly that they had a positive impact on the youth participants. Based on intern feedback and implementation team assessment, planned improvements to the ToT design include shortening sessions to two hours, increasing the total number of virtual workshop sessions, and extending the entrepreneurship curriculum (see Section 4.4).

“I learned new techniques and I believe this experience will help me to operate better for future projects.” - Student Intern

“Now I am [one] hundred percent sure that being in a field of research is something I really enjoy doing. It was the way this internship impacted me and my future choice” - Student Intern

“More detailed task for students. Continue with other region[s] in Tajikistan to see the difference.” - Student Intern

“The three-hour training seemed a bit long to me. It would be better if we had more days for the training but with maximum two hours/day sessions.” - Student Intern

“Continue doing for next time—everything.” - Student Intern

The overall success of the village-based youth workshop pilot series reinforces the effectiveness and replication potential of the model. Participants numbers were consistently higher than anticipated. The anticipated number of youth participants of 10 per workshop for a total of 100 was exceeded by 185 percent, with a participant total of 285. Excluding camp totals (20 and 72), the overall participant increase was 93 percent with a total of 193 participants in village/town workshops. Six of the 10 workshops had two times the anticipated numbers (between 18 and 23), three had a 50 percent increase (14 and 15), and one had over three times (32) the expected participant numbers. Post-workshop surveys indicate a high degree of satisfaction with the workshops, with qualitative data indicating that 99.3 percent enjoyed the workshop. Specific recommendations for improvements, albeit few (perhaps a reflection of the age and inexperience of participants), included increasing the length of the workshop, incorporating more games (experiential activities), videos, and supplies; and adding more practical work. Interest in more workshops like this one in their communities, ensuring other youth have similar experiences, and having workshops offered during the academic school year was expressed repeatedly.

Table 7. Summary of Student (Youth Participant) Qualitative Responses (%)

<table>
<thead>
<tr>
<th>Did you enjoy the workshop?</th>
<th>Was it useful to learn new information?</th>
<th>Would you like to be an entrepreneur in the future?</th>
<th>Was having a young facilitator positive or negative?</th>
<th>Do you have a recommendation to improve the workshop?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>99.3</td>
<td>72.5</td>
<td>84.6</td>
<td>—</td>
</tr>
<tr>
<td>Negative</td>
<td>0.7</td>
<td>23.7</td>
<td>2.7</td>
<td>—</td>
</tr>
<tr>
<td>Neutral</td>
<td>—</td>
<td>3.8</td>
<td>10.9</td>
<td>—</td>
</tr>
</tbody>
</table>

Based on participant data as well as student intern feedback and implementation team assessment, noted areas for improvement fall into three categories: logistics, communications, and curriculum. Logistics are often context specific. During the study, various adjustments were made in response to local conditions and implementation team capacity, most notably the creation of intern teams, which will serve as a model improvement. While overall internal or team communications were
consistent, open, and productive, establishing additional protocols and guides that are transferable will increase efficiency and quality of implementation as well as reporting—for instance, establishing clear protocols around collection and compilation of workshop survey data and outputs (for example, photographs of participant brainstorms, posters, and prototypes). Such consistency will also be key to ensuring coordination and comparisons across different pilot sites. To better measure overall youth participant experience, an updated survey will include an NPS measure. Improvements specific to climate change awareness and entrepreneurship curricular components are noted in Sections 4.3, 4.4, and 4.5.

“To improve this program in the future I advise having more workshops like this and these workshops should be conducted in all organizations.” - Youth Participant

“This was a fascinating workshop. I want to have this kind of workshop in my village more.” - Youth Participant

“I will also try to make the environment around me clean and similar to Anisa (from case study) think of new ideas about it.” - Youth Participant

Youth respond positively to a facilitator with whom they identify, showing the importance of a peer-to-peer learning approach. Both quantitative and qualitative data indicate that a student facilitator was a factor in workshop effectiveness. A significant correlation between perceived identity leadership and the strength of social identification with youth was found, meaning that the more people perceived the trainer as an identity leader, the more identification with the group itself grew in strength. Generally, identity leadership scores were extremely high, suggesting that identity leadership could indeed provide a valuable explanation for the effectiveness of peer-to-peer environmental education. Overall, the qualitative data showed 84.6 percent of participants agreed that having a young facilitator was positive.

“[Having a young facilitator] was positive because I felt myself more confident and free” - Youth Participant

“For me young students were really great because they explain things easily” - Youth Participant

“Yes, I liked the young students because they understand you more” - Youth Participant

“Yes, I also want to become a facilitator in the future and help people with awareness about climate change or other topics” - Youth Participant

Rural schools are viable spaces for extracurricular programs that promote climate change awareness and activate youth entrepreneurship, yet they require additional resources and innovative partnerships to sustain impactful learning. Initial insights into school availability and viability as locations for youth programs were drawn from the workshop experiences and school director interviews. During summer months, village-based schools are not typically in use, making them ideal locations for out-of-school-time learning. However, school staff are not always available to open the buildings and some schools do not have sufficient facilities to accommodate programs. School leaders interviewed expressed the importance of and need for extracurricular programs—and some have tree planting or other environmental projects under way but many do not have the time, teacher capacity, or funding to implement such initiatives. Some directors also noted that few external programs reach remote schools in their area and those that do tend to be one-time workshops for community residents focused on natural disaster preparedness. While the need for consistent, ongoing, and fully funded programs is evident, future studies are needed to more fully understand why some schools have environmental extracurricular or out-of-school time programs while others do not. For now, data suggest that rural schools will be in a better position to enhance student learning and respond to local needs
and priorities when they form ongoing relationships with universities that can leverage financial, technical, human, and social capital resources on their behalf.

“To my mind the role of the schools in addressing climate change and helping local communities is becoming more visible.” - School Director

“There are a few programs, but due to lack of funds they are not implemented.” - School Director

“There are time issues for teachers . . . paperwork is enormous. Due to this, the school’s assistance to the society is rarely seen.” - School Director

4.3 Objective 2: Youth Climate Change Awareness

**Objective 2:** Provide initial insights into youth awareness levels of pollution/climate change and landscape restoration issues based on engagement of 90–100 youth in 9–10 rural communities in Tajikistan.

A peer-to-peer learning approach increased knowledge of and concern about climate change among the sample. Through the intern ToT design challenge, it was determined that the youth workshops required a minilesson on climate change to ensure a baseline of knowledge. The survey data indicate that youth participants were aware of and concerned about climate change before the workshop and that those indicators increased as a result of the intervention. They also suggest that there is room for improvement in building base awareness levels as well as specific content knowledge. The piloted workshops led by university students increased awareness of ACC (by 9 percent from 5.7 to 6.2) and the degree of CCC (by 11 percent from 5.6 to 6.2) in school-age youth in a sample of villages in the GBAO. Qualitative data showed that 99.5 percent of participants reported learning new information about climate change. The survey was designed to assess general understanding of human-driven or ACC. Data do not, therefore, provide clarity on what specific new information was learned or where significant knowledge gaps exist. Identifying other means of determining change and gaps in climate change knowledge, such as national assessments or studies conducted by international NGOs, would allow for useful comparisons across sites, including between different countries in the region. Those data paired against data from a targeted and age-appropriate survey specific to the needs of the initiative would provide useful insights into the efficacy of the model going forward.

“This workshop helped me to understand lots of new things about climate change.” - Youth Participant

“Yes, I also want to become a facilitator in the future and help people with awareness about climate change or other topics.” - Youth Participant

Table 8. Pre- and Post-measures of Youth Participant Climate Change Awareness and Concern

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean Pre</th>
<th>Mean Post</th>
<th>Index Growth (%)</th>
<th>P-value (sig. if &lt; .05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC students</td>
<td>5.68</td>
<td>6.18</td>
<td>9</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>CCC students</td>
<td>5.57</td>
<td>6.20</td>
<td>11</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

4.4 Objective 3: Youth Entrepreneurship

**Objective 3:** Provide initial insights into youth awareness levels of and orientation to entrepreneurship/social entrepreneurship based on engagement of 90–100 youth in 9–10 rural communities in Tajikistan.

The increase in awareness levels of and orientation to entrepreneurship among youth study participants was not significant yet promising. Quantitative data showed limited growth (0.5 percent increase from 5.12 to 5.15) of both self-perceived entrepreneurial skills and willingness/interest in
becoming an entrepreneur. However, qualitative data reveal that 72.5 percent have an interest in becoming an entrepreneur, with comments indicating a desire among many participants to take climate action in their communities. These data are reinforced by facilitation teams reporting consistently high and enthusiastic youth participant engagement in problem identification, solution ideation, and team-based design activities. An improved survey instrument might better elicit the extent to which youth participants’ entrepreneurial mindset is affected by the workshop measuring, for instance, opportunity recognition, creativity, problem-solving, and collaboration.⁴⁰

Table 9. Pre- and Post-measures of Youth Participant Entrepreneurship Self-perceptions

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean Pre</th>
<th>Mean Post</th>
<th>Index Growth (%)</th>
<th>P-value (sig. if &lt; .05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrepreneurship</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>students</td>
<td>5.12</td>
<td>5.15</td>
<td>0.5</td>
<td>0.755</td>
</tr>
</tbody>
</table>

A design thinking learning approach has potential to foster in youth a sense of responsibility and enthusiasm for addressing climate change problems and begin building skills to create solutions. As an initial study with time and resource constraints, the half-day workshop delivered in schools was an introduction to design thinking and entrepreneurial concepts. The limited change in skill development and orientation to entrepreneurship is likely a reflection of the limited scope of the workshop, including entrepreneurship-specific content. The workshop, however, demonstrated the potential for youth to become entrepreneurial thinkers and for a peer-to-peer approach to build a sense of agency and provide skills to act. Problem identification exercises demonstrated participants’ ability to draw connections between the climate and environmental science content delivered and the local implications they experience daily. Solutions brainstorming activities enabled youth participants to illustrate how they and others in their communities might address those problems. Results illustrate the need for a future workshop iteration to include more background on entrepreneurship and entrepreneurial mindset and how they can be applied in various contexts, in addition to a more comprehensive design process as described in Section 4.5.

“It was a very interesting experience and learning period. Thank you very much for the journey together this summer. Overall, it was great; however, if more information related to entrepreneurship was given to us during the trainings, we could deliver it to target audience in a better way.” - Student Intern

“Seeing all these problems, we came to the conclusion that it’s us, the youth who should deal with these problems. We have to protect our environment . . . because eventually it will affect us, directly or indirectly.” - Youth Participant

“I will also try to make the environment around me clean and similar to Anisa (from case study) think of new ideas about it.” - Youth Participant

4.5 Objective 4: Youth Solutions

Objective 4: Present an analysis of the youth-identified entrepreneurial opportunities for launching climate/resilient landscapes-oriented solutions as prototypes for expanded initiatives.

Study designers wanted to know if the solutions youth generate have the potential to be developed into ventures or initiatives that would have an impact on their communities and local landscape. As first-step brainstorming outcomes, the solutions generated during the workshops cannot be analyzed as prototypes. However, even though the time frame of the workshop did not allow for ideation to reach the prototype stage, it is possible to assess that many of the ideas are a starting point.

---

⁴⁰ The Entrepreneurial Mindset Index (EMI) is a tool used with students to measure attitudes, behaviors, and beliefs associated with being an entrepreneur. The EMI measurement domains are opportunity recognition, comfort with risk, creativity and innovation, future orientation, critical thinking and problem-solving, and communication and collaboration.
for workable prototypes for youth to pursue. The most consistently brainstormed solutions were garbage cleanup and recycling, clean rivers and water conservation, planting and caring for trees, and increased local production of goods. These ideas indicate how these youth experience their local environment, in terms of what they see around them (for example, garbage on the roads, no public receptacles for trash, and polluted waterways) and what they experience (for example, school or community tree planting initiatives). Additional peer-to-peer engagement could leverage that knowledge and experiences as well as youth’s social networks and creative thinking to evolve these ideas into prototypes which could, in turn, be piloted as ongoing initiatives.

“Planting trees is one of the ways that we can really help to fight climate change.” - Youth Participant

An important indicator of success of the study and potential for the model to have impact was activation of student interns’ entrepreneurial spirit. This was demonstrated by the group’s proactivity in establishing an EES club, for which they received start-up funding from the university and faculty support. This climate change awareness and advocacy club coordinated the first UCA GCCW to coincide with COP26, the 2021 UN climate change conference. The GCCW series of events included a science-based art competition, trivia night, student debate, movie night, campus cleanup, and outdoor games. A total of 70 students participated in the trivia night, 35 percent of all students enrolled at the university. In addition, individual student interns used their new skills to pursue interests inspired by the training, including a food waste management project. The next ToT iteration will build on these indicators of success with the full design thinking protocol requiring each trainee to present a solution venture and a plan for its launch.

“After this internship, I and some of my friends are working on a business plan for [a] food waste management project.” - Student Intern

The pilot study outcomes confirmed the need to expand the entrepreneurship content of both the ToT and youth workshops with a complete yet rapid design thinking process and better link it to climate change science and related environmental studies. Place- and problem-based learning pedagogies that incorporate the local context—such as farms, forests, streams, and roads—allow for making connections between those local realities and the science of climate change. This, in conjunction with ‘just in time’ learning, which supports learners as and when they need to understand content required to further their solution’s prototyping and, ultimately, piloting (for example, chemistry principles specific to soil enhancement for tree growth). Scheduling workshop sessions one or two weeks apart will provide participants time to test hypotheses, get feedback, and iterate their prototypes. Furthermore, a comprehensive design thinking process results in participants presenting solutions to identified local problems to an authentic audience, such as peers, educators, NGO representatives, and local businesspeople. These local or regional resources become potential collaborators, mentors, and funders, thereby forming the youth entrepreneurs’ ecosystem or network of engagement and support.

4.6 Objective 5: Constraints and Opportunities

Objective 5: Identify constraints and opportunities for integrating the ASP model.

Constraints and opportunities were identified to clarify how best to go beyond the initial pilot study and engage in an extended pilot that results in a replicable program. Implemented only in Tajikistan, the study’s findings offer provisional but compelling evidence that the ASP approach is feasible across Central Asia. Throughout the study, challenges and obstacles to delivering the model were identified. The study demonstrates that the key constraints considered—school capacity and bureaucracy, youth availability, lack of investment or prioritization of youth entrepreneurship by key sectors, and access to rural communities—are not insurmountable. Opportunities, many elucidated thus far in the key findings, address, at least in part, those constraints.
### Table 10. Constraints and Opportunities

<table>
<thead>
<tr>
<th>Constraints</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Rural schools’ capacity and resources are stretched; bureaucracy limits</td>
<td>• Virtual learning can be effective and efficient and enable access to global</td>
</tr>
<tr>
<td>innovation</td>
<td>resources.</td>
</tr>
<tr>
<td>• Rural youth have a lot of responsibilities at home and family resources</td>
<td>• Universities offer peer educators, interdisciplinary expertise, organizational</td>
</tr>
<tr>
<td>are limited, hampering participation outside of school</td>
<td>structure, and social capital/networks.</td>
</tr>
<tr>
<td>• Youth entrepreneurship is not yet a high priority for government, private,</td>
<td>• Local NGOs offer sector expertise, local knowledge, and regional relationships.</td>
</tr>
<tr>
<td>and civil society sectors</td>
<td>• Youth camps have broad reach, create youth networks, and existing structures.</td>
</tr>
<tr>
<td>• Travel to rural areas is time-consuming and costly and can be dangerous</td>
<td>• Entrepreneurship education and investment in youth ventures is gaining traction</td>
</tr>
<tr>
<td></td>
<td>among NGOs, universities, and the MoES.</td>
</tr>
<tr>
<td></td>
<td>• Climate change science and environmental studies are education priorities.</td>
</tr>
<tr>
<td></td>
<td>• Teacher professional development can expand reach and impact, connecting</td>
</tr>
<tr>
<td></td>
<td>curriculum with enhancements.</td>
</tr>
</tbody>
</table>

Universities, as regional anchor institutions, are critical to establishing sustainable structures for impactful responses to climate change. An institution such as UCA offers many elements that are fundamental to locally driven and responsive shifts toward resilient communities and landscapes: expertise, research capacity, training/education capacity, access to resources, local and global networks, students and alumni, perceived authority and influence, and communication tools. Activating these assets in support of a peer-to-peer approach that centers schools as loci for youth engagement in local resilience-building is a foundational opportunity for extended pilots.

The potential for local NGOs as key players in an emerging school-based youth engagement ecosystem in partnership with universities is a clear opportunity that can be expanded and improved upon. The involvement of FIST was not a part of the initial study plan but became a critical factor in its overall success from the standpoint of meeting study objectives as well as more fully activating the youth support ‘ecosystem’ component of the model. Study leaders are in a better position to make improvements grounded in an intentional university-NGO-school network approach, starting with identifying key NGO partners in advance and including them in program design plans based on their expertise, capacity, and networks. A revised study objective might be related to maximizing the role NGOs play in student intern training and the launch of regional ecosystems for youth.

Virtual training is an effective instructional and collaboration modality with high-impact potential. Opportunities inherent in a virtual training approach are multifaceted. As demonstrated by the study, virtual engagement brings global perspectives and innovations to a learning experience while allowing for participant funds of knowledge and local priorities to animate and inform the process and outcomes. Improvements to the approach include some basic adjustments such as the number and duration of sessions. More importantly, however, the study experience opened up opportunities such as integrating professionals in related fields from around the world as content experts and student mentors. Bringing youth voices and expertise from other regions of the world into the program would serve to expand student interns’ scope of possibilities, heighten individual and team agency, reinforce the importance of local knowledge and action, and create global youth social networks.

Careful yet flexible planning, dedicated resources, and local partnerships are key to addressing the challenges of reaching rural communities. Providing resources and developing out-of-schooltime learning interventions that align with rural school and national curriculum priorities create space for new approaches without adding to the burdens of school directors and teachers. Providing meaningful opportunities for youth in their own communities, engaging school officials, and communicating effectively with parents reduce some barriers to participation.
Youth summer camps, an opportunity presented to the study by a student intern, hold promise as a venue and vehicle for reaching greater numbers of youth, especially in providing young people with opportunities to meet and learn with peers from across their region, which builds their own social capital networks. Challenges inherent in youth camps as experienced during the study are that it is more difficult to have the time required to complete the curriculum and the particular camp’s priorities or themes may take precedence and thereby limit the impact of the workshop. Camps can be approached as an opportunity for introducing youth to the workshop model before an on-site village workshop, networking of youth who have already participated in an ASP workshop, or showcasing regional youth solutions for resilient landscapes.

Shifts in education priorities at the national level to include climate change awareness, environmental science, and entrepreneurship open up possibilities for impact. These areas of study appear to be gaining some traction in Tajikistan as well as other Central Asian countries, with program investments by NGOs and higher education institutions (see Figure 1) across the region. Importantly, as previously noted, the MoES 2030 NSED includes these and other subjects to achieve alignment with the UN SDGs. While not within the scope of this study, this shift in the education context suggests the need for teacher training in climate-change-related topics and skills in experiential learning pedagogies.

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41 Government of the Republic of Tajikistan 2020, 1.
5. Recommendations: Rural Schools as Catalysts for Local Landscape and Community Resilience through Youth Entrepreneurship

In a region disproportionately affected by climate change, Tajikistan is particularly vulnerable to environmental degradation and faces daunting challenges in transitioning to a green, resilient, and inclusive economy. Tajikistan’s rural communities and the schools that anchor them form the ‘last mile’ to implementing and sustaining that vision. It is through those schools that young people can be empowered to be the conduit for lasting change. To move from vision to impact, this study amplifies the following key conditionalities:

1. **Rural schools are key assets for sustainable and equitable development of local communities that require consistent, relevant, and innovative support and investment.** University-assisted community schools that are integrated into regional ecosystems are better positioned to further student learning and create conditions for improved community outcomes. Often under-resourced and isolated, rural schools in Tajikistan and other parts of Central Asia need external resources to become effective community hubs and build capacity for enhanced and improved learning outcomes. When approached as a critical node in an ecosystem set up for youth as agents of change, these schools have the potential to become community anchors and regional partners that can co-create and sustain locally driven initiatives that align with national priorities while not being overburdened by new policy requirements or unrealistic project expectations that come with insufficient resources and support.

2. **Universities activating their role as anchor institutions can contribute to enhancing local, national, and regional capacities to address climate change and build resilient communities.** Academic institutions such as UCA that are grounded in a mission of sustainable development, committed to their local areas, and networked across the region have in place the assets fundamental to locally driven and responsive shifts toward resilient communities and landscapes: expertise, research capacity, training/education capacity, access to resources, local and global networks, social and political capital, and communication tools. Perhaps the most important asset institutions of higher learning have are the current students and young alumni with critical acquired knowledge and skills, yet often with insufficient opportunities or access to resources that catalyze their potential as change makers. Local universities require funding, local partnerships, regional and global networks, and a seat at the policy table to effectively leverage their assets toward climate resilience, education innovation, and economic development.

3. **Impact ecosystems are a key condition for building regional capacity for sustained climate-focused youth entrepreneurship.** Universities, regional ministries of education, and individual schools represented by school directors and teachers form the network core for sustained cooperation at the village level. Environmental, education, and youth development NGOs bring local context expertise, critical relationships with rural communities, and modeling and mentoring to youth. Small businesses and entrepreneur mentors also offer youth the modeling and skill-building inputs they need to take their solutions from the idea stage to implementation. These networks create a support system and resource pipeline for climate-focused youth entrepreneurship with the potential to be self-sustaining within a regenerative green economy.

4. **Entrepreneurship education that fosters learning and builds critical work and life skills can be a catalyst for sustained climate resilience.** Social entrepreneurship is an emerging global approach to education innovation and youth employment. When coupled with the urgency of climate change impacts on vulnerable communities and linked to the work of community members and local stakeholders, it holds great promise as a catalyst for sustained change across Central Asia. This experiential learning approach is relevant to students’ lives with immediate tangible outcomes that helps build meaning and a sense of purpose. Moreover,

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42 The concept of university-assisted community schools originated at the University of Pennsylvania (Harkavy et al. 2016, 303).
it is grounded in human-centered design thinking and project-based learning methodologies that foster growth mindset and skill building in critical thinking, creativity, and problem-solving. As an out-of-schooltime program or learning integrated into classroom curriculum, entrepreneurship and similar pedagogies reinforce core subjects and ground them in authentic, real-world learning.

5. **Teacher training in experiential learning within a university-assisted community school network reinforces education priorities, builds capacity based on local priorities, and supports pedagogy innovation.** Teacher training is effective when the content is specific yet adaptable and broadly enhancing, the process is scaffolded and repeated, and the engagement is responsive to individual needs and supported with resources. Entrepreneurship education, and experiential place-based learning more broadly, linked to local climate change and other SDGs, can be an effective introduction to student-centered pedagogies that can be incorporated across curricula at multiple learning levels. This adaptive approach thus sets the stage for other initiatives or reinforces existing education innovation initiatives. Teacher training in competency-based pedagogies and real-world content become particularly impactful when integrated into sustained community-centered initiatives that involve the NGO sector and are supported by a regional university through the engagement of faculty and students.

6. **Measurement of impact using agile tools provides insights for innovation and sustained effectiveness.** Multisector, integrated initiatives have the potential to offer practitioners, policy makers, and donors the data they require to understand, reinforce, and sustain change. Using agile and participatory methodologies such as stakeholder and asset mapping allows for broader community engagement in initiatives and complements the quantitative and qualitative data collection of surveys and interviews. To determine impact on student learning, measurement results of targeted inputs such as climate change-informed youth entrepreneurship in university-assisted community schools may also need to be analyzed against data from national student assessments.

7. **Aligning climate and environment, education, and communications objectives to create integrated initiatives may position regional investments for even greater impact.** Connecting the World Bank's climate change awareness and landscape resiliency initiatives with climate/environmental science education and youth entrepreneurship activation, using universities as regional anchors and schools as community hubs, has promising regional implications. Weaving the ASP model into regional approaches to build resilient landscapes and facilitate climate change awareness has an opportunity to enhance projected long-term environmental and economic impacts by leveraging the one asset that even the most remote and vulnerable rural communities have and can rally around: rural schools.
Appendix A. Survey Instruments

Student Interns Questionnaires (Pre/Post)

A. Pre/Post-Measurement Quantitative Questionnaires
(Note: These surveys administered electronically using Google Forms)

1. Pre-Measurement

Section 1

First, let’s create your unique code. Your code will be made up by 1) the number of the month you were born in (July = 07; December = 12); 2) the initial of your name and surname (John White = JW); 3) the number of the day you were born on (e.g., 03, 06, 13)

Which is your hometown? ________
Which village will you hold the workshop in? _________
How old are you? _________
What is your gender?
  - Male
  - Female
  - Other
  - Prefer not to say

Does your family have a car?
  - Yes
  - No

Section 2

For the next 10 questions, choose an option from 1 to 7 (1 = Strongly disagree; 2 = Disagree; 3 = Slightly disagree; 4 = Neutral; 5 = Slightly agree; 6 = Agree; 7 = Strongly agree)

Humans, through their activities, are damaging the environment
I am worried for the health of our planet
Eating meat has a high environmental impact
Many animals are suffering because of climate change
Littering pollutes our planet
In my future, I would like to be an entrepreneur
How much would you rate your entrepreneurial skills?
I identify with the group “young people”
Respecting the environment is important to young people
If I litter, other youths will approve me

2. Post-Measurement

Section 1

First, remind us of your personal code :) It is made up by 1) the number of the month you were born in (July = 07; December = 12); 2) the initial of your name and surname (John White = JW); 3) the number of the day you were born on (e.g., 03, 06, 13)
Section 2

For the next 10 questions, choose an option from 1 to 7 (1=Strongly disagree; 2= Disagree; 3=Slightly disagree; 4=Neutral; 5=Slightly agree; 6= Agree; 7=Strongly agree)

Humans, through their activities, are damaging the environment 1 2 3 4 5 6 7
I am worried for the health of our planet 1 2 3 4 5 6 7
Eating meat has a high environmental impact 1 2 3 4 5 6 7
Many animals are suffering because of climate change 1 2 3 4 5 6 7
Littering pollutes our planet 1 2 3 4 5 6 7
In my future, I would like to be an entrepreneur 1 2 3 4 5 6 7
How much would you rate your entrepreneurial skills? 1 2 3 4 5 6 7
I identify with the group "young people" 1 2 3 4 5 6 7
Respecting the environment is important to young people 1 2 3 4 5 6 7
In general, other young people behave in environmentally friendly way 1 2 3 4 5 6 7
I believe that I can make a difference in raising climate awareness and improving the state of our planet 1 2 3 4 5 6 7
I feel confident in delivering the workshop to the students 1 2 3 4 5 6 7

B. Post-Pilot Study Questionnaire
(to be administered following completion of Youth Workshops)

Section 2 - Qualitative

1. Did you enjoy being part of this program?
2. What is your opinion about climate change? Do you think the program helped you learn new information about it?
3. Would you like to be an entrepreneur in the future? Why or why not?
4. Do you think that being a young student like your audience had an influence on how much they listened and learned? If so, positive or negative? Did you encounter any struggles in the delivery?
5. How much would you recommend to take part in the project from 1 to 10?
6. Do you have any recommendations to improve the program in the future?
7. Would you recommend this internship to others? Why or why not?

Youth Participants Questionnaire (Pre/Post)

A. Pre/Post Quantitative Questionnaires
(Note: Where possible, these surveys will be administered electronically. Otherwise, they will be administered on paper)

1. Pre-Measurement

Section 1

First, let's create your personal code. Your code will be made up by 1) the number of the month you were born in (July= 07; December= 12); 2) the initial of your name and surname (John White= JW); 3) the number of the day you were born on (e.g., 03, 06, 13)

Which is your hometown? __________________

How old are you?
12 or younger
• Between 13 and 16
• 16 or older

What is your gender?
• Male
• Female
• Other
• Prefer not to say

Does your family have a car?
• Yes
• No

Section 2

For the next 10 questions, choose an option from 1 to 7 (1=Strongly disagree; 2= Disagree; 3=Slightly disagree; 4=Neutral; 5=Slightly agree; 6= Agree; 7=Strongly agree). You can circle or make a cross on the chosen number.

Humans, through their activities, are damaging the environment 1 2 3 4 5 6 7
I am worried for the health of our planet 1 2 3 4 5 6 7
Eating meat has a high environmental impact 1 2 3 4 5 6 7
Many animals are suffering because of climate change 1 2 3 4 5 6 7
Littering pollutes our planet 1 2 3 4 5 6 7
In my future, I would like to be an entrepreneur 1 2 3 4 5 6 7
I have high entrepreneurial skills 1 2 3 4 5 6 7
I identify with “young people” 1 2 3 4 5 6 7
Respecting the environment is important to young people 1 2 3 4 5 6 7
The majority of other young people’s behavior respects the environment 1 2 3 4 5 6 7

2. Post-Measurement

Section 1

Which was your personal code? :) 
Your code will be made up by 1) the number of the month you were born in (July= 07; December= 12); 2) the initial of your name and surname (John White= JW); 3) the number of the day you were born on (e.g., 03, 06, 13)

Section 2

For the next 10 questions, choose an option from 1 to 7 (1=Strongly disagree; 2= Disagree; 3=Slightly disagree; 4=Neutral; 5=Slightly agree; 6= Agree; 7=Strongly agree). You can circle or make a cross on the chosen number.

Humans, through their activities, are damaging the environment 1 2 3 4 5 6 7
I am worried for the health of our planet 1 2 3 4 5 6 7
Eating meat has a high environmental impact 1 2 3 4 5 6 7
Many animals are suffering because of climate change 1 2 3 4 5 6 7
Littering pollutes our planet 1 2 3 4 5 6 7
In my future, I would like to be an entrepreneur 1 2 3 4 5 6 7
I have high entrepreneurial skills

I identify with "young people"

Respecting the environment is important to young people

The majority of other young people's behavior respects the environment

Rate this scale from 1 to 7 referring to the person who held the lesson
(1 = Strongly disagree; 2 = Disagree; 3 = Slightly disagree; 4 = Neutral; 5 = Slightly agree; 6 = Agree; 7 = Strongly agree)

This leader was a good example of the kind of people that are members of the group of young people

This leader acts for promoting the interests of young people group

This leader creates a sense of cohesion within the young people group

Section 3 (Qualitative)

1. Did you enjoy the workshop program?

2. What is your opinion about climate change? Do you think the workshop helped you learn new information about it?

3. Would you like to be an entrepreneur in the future? Why or why not?

4. The facilitator of your workshop was a young student like you. Do you think this was something positive or negative? Would you prefer an adult teacher?

5. How much would you recommend to take part in the project from 1 to 10? Do you have any recommendations to improve the program to make it better for other young students like you?

School Directors Interview Schedule

Village School Leader—Interview Schedule
ASP/World Bank Pilot Study

[Interviewer: ]

Date:

Name:

Title/Position:

Village:

District:

1. How long have you been working at this school? How long have you been an educator/school administrator?

2. As you know. a major topic of our workshop with your students is climate change and the impact it has on the local environment.

   - To what extent do you view climate change as a concern and in what ways do you see it impacting this community?

   - How aware do you think these young people are regarding climate issues? How would you describe youth attitudes toward the environment in this community?
• Is climate change and environmental studies an important part of the school curriculum? Does your school offer classes or lessons related to climate change or environmental studies? If so, what topics are covered?

3. We’re also interested in figuring out how schools can best help build awareness of how the landscape is impacted by climate change and support young people to find solutions to local environment/landscape problems.

• How do you envision the role of youth in addressing environmental problems in this community?
• What do you see as the role of schools in addressing climate change and environmental degradation? Do you see ways that the school can support the community to become more resilient to climate change and environmental degradation?
• What does this community need the most from the school? Can you share a story about a time when the school helped the community or was a resource for the community beyond the way it supports families every day by teaching children?
• How might the school support students in identifying and pursuing solutions to local problems? What does the school need to achieve that?
• Can you share with me a time when a student started a club or other activity that was supported by the school? What happened? [examples do not have to be about climate/environment!]
• Was there a time when a teacher started a new initiative and was supported by the school or regional education system? What happened? [examples do not have to be about climate/environment!]

4. We’re also interested in how schools in the region are connected to other schools and different resources, such as NGOs, and how that might support efforts to increase climate/environment awareness and generate youth entrepreneurship.

• Have you ever worked with another school in another village? What are the opportunities and barriers to school-to-school connections or collaborations?
• Do you have any examples of organizations or groups visiting your school to provide programming? If so, what was good about the experience? How could it have been better?
• Are there programs or initiatives in this area (at schools or elsewhere) that are having a positive impact on the people of the local community? In what ways are young people/students impacted? What are the key elements that make it/them successful?

5. Finally, what do you think is needed most in this community?
Appendix B. Survey Data

Student Interns

Figure A.1. Student Intern Pre- and Post-Workshop Survey Data

### Pre-Workshop Survey

**Humans, through their activities, are damaging the environment**

<table>
<thead>
<tr>
<th>Score</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 (10%)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0 (0%)</td>
<td></td>
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<tr>
<td>4</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1 (10%)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>2 (20%)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>6 (60%)</td>
<td></td>
</tr>
</tbody>
</table>

**I am worried for the health of our planet**

<table>
<thead>
<tr>
<th>Score</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 (10%)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0 (0%)</td>
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<tr>
<td>3</td>
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<tr>
<td>4</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1 (10%)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>5 (50%)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>3 (30%)</td>
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</tbody>
</table>

### Post-Workshop Survey

**Humans, through their activities, are damaging the environment**

<table>
<thead>
<tr>
<th>Score</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>8 (80%)</td>
<td></td>
</tr>
</tbody>
</table>

**I am worried for the health of our planet**

<table>
<thead>
<tr>
<th>Score</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>2 (20%)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>8 (80%)</td>
<td></td>
</tr>
</tbody>
</table>
Pre-Workshop Survey

**Eating meat has a high environmental impact**

- 0 (0%)
- 1 (10%)
- 2 (30%)
- 3 (0%)
- 4 (0%)
- 5 (50%)
- 6 (20%)
- 7 (0%)

**Many animals are suffering because of climate change**

- 0 (0%)
- 1 (10%)
- 2 (10%)
- 3 (10%)
- 4 (0%)
- 5 (10%)
- 6 (10%)
- 7 (50%)

**Littering pollutes our planet**

- 0 (0%)
- 1 (10%)
- 2 (0%)
- 3 (0%)
- 4 (0%)
- 5 (30%)
- 6 (0%)
- 7 (50%)

Post-Workshop Survey

**Eating meat has a high environmental impact**

- 0 (0%)
- 1 (10%)
- 2 (10%)
- 3 (10%)
- 4 (10%)
- 5 (30%)
- 6 (20%)
- 7 (20%)

**Many animals are suffering because of climate change**

- 0 (0%)
- 1 (10%)
- 2 (10%)
- 3 (0%)
- 4 (0%)
- 5 (10%)
- 6 (0%)
- 7 (50%)

**Littering pollutes our planet**

- 0 (0%)
- 1 (10%)
- 2 (0%)
- 3 (0%)
- 4 (10%)
- 5 (0%)
- 6 (20%)
- 7 (70%)
Pre-Workshop Survey

Respecting the environment is important to young people
10 responses

If I litter, other youths will approve me
10 responses

Post-Workshop Survey

Respecting the environment is important to young people
16 responses

In general other young people behave in environmentally friendly way
16 responses

I feel confident in delivering the workshop to the students
10 responses
Figure A.2. Student Intern Final Survey (End of Internship) Data

Final Survey (End of Internship)

How would you rate your overall satisfaction with the internship?
6 responses

How would you rate the degree of impact/positive change this project had on the target audience?
6 responses

How effective were the online training workshops?
6 responses

How interested are you in working on this project again, if the opportunity were to arise?
6 responses
Figures A.3–A.5 show the mean change in survey responses following program participation for indicator categories related to climate awareness and concern, entrepreneurship interest and skills, and social identification with youth. Statistical analysis was not conducted.

**Figure A.3. Student Intern Survey Data: Average Change in Climate Awareness and Concern**

![Bar chart showing average change in climate awareness and concern](image)

**Figure A.4. Student Intern Survey Data: Average Change in Entrepreneurship Interest and Skills**

![Bar chart showing average change in entrepreneurship interest and skills](image)

**Figure A.5. Student Intern Survey Data: Average Change in Social Identification with Youth**

![Bar chart showing average change in social identification with youth](image)
1. Procedure

1.1 Quantitative Survey

All items, apart from identity leadership ones, were administered pre/post intervention and were measured on a 7-point Likert Scale (1=Strongly disagree; 7=Strongly agree). To design a questionnaire accessible to the young sample, the number of items was limited to a maximum of 15. All questions were provided in English and then translated into Tajik. For the complete surveys, see Appendix A.

Climate change awareness. Initially, five items were intended to assess climate change awareness. However, the scale was not reliable for post measures. Therefore, only the two most theoretically-relevant items, anthropogenic climate change and climate change concern, were considered in the analysis.

Entrepreneurship. Two items assessing Entrepreneurial skills and desire to be an entrepreneur were administered.

Social identification with youth. The single-item measure of social identification (Postmes et al. 2013) was administered.

Social norms. Injunctive and descriptive social norms were assessed with two separate items.

Identity leadership. The Identity Leadership Inventory—Short Form (Steffens et al., 2014) was administered as a post measure to youth participants. Three items assessing identity prototypicality, identity advancement and identity entrepreneurship were included (e.g., “This leader is a model member of the young people group”). The item addressing identity impresarioship was removed before the questionnaire administration because it was judged as too complicated for youth participants to comprehend in terms of phrasing.

1.2 Qualitative Survey

Five qualitative questions were asked to dive deeper into the constructs. Specifically, the grade of enjoyment and usefulness of the program was assessed, and opinions were gathered on the perceived importance of having a peer leader delivering the workshop, on the desire to be a future entrepreneur, and finally on feedback for future similar projects.

2. Results

Quantitative Data Analysis

Workshop Effectiveness on Climate Change Awareness, Entrepreneurial Spirit, Social Identification with Youth and Pro-environmental Social Norms

It was hypothesized that environmental workshops held by a peer leader would enhance awareness about environmental problems, entrepreneurial spirit, social identification with youth, and pro-environmental norms. To test the hypothesis, a paired sample t-test was run. Differences between the pre- and post-score of the measure for anthropogenic climate change, climate change concern, entrepreneurship, social identification with youth, injunctive social norms, and descriptive social norms were compared. Given the multiple analyses involved in the study, Bonferroni-corrected alpha levels of .01 were used to ensure an overall alpha of .05. As expected, youth participants scored significantly higher on anthropogenic climate change, climate change concern, injunctive and descriptive norms.

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43 Data analysis was performed by Matilde Barsanti, a University of Groningen graduate in environmental psychology. The following are excerpts from Barsanti’s master’s dissertation titled “Pro-Environmental Education in Tajikistan: Peer-to-Peer Approach as Key to Unlock the Change.”

44 Entrepreneurship items were included in the questionnaires, but since the focus of the master thesis project was more related to the study of how the peer-to-peer approach could impact social identification dynamics, correlational analysis was not conducted.
after the workshop, compared to before. Social identification with youth and entrepreneurship did not differ significantly. However, both pre- and post-measurements scores for social identification with youth were very high. This means that youth participants strongly identified with a group that was perceived as more pro-environmental after the workshop compared to before.

**Table of Pre/Post Mean Differences**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean Pre</th>
<th>Mean Post</th>
<th>Index growth</th>
<th>P-value (significant if &lt;.05)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC youth</td>
<td>5.68</td>
<td>6.18</td>
<td>9%</td>
<td>&lt;.001**</td>
<td>Yes</td>
</tr>
<tr>
<td>CCC youth</td>
<td>5.57</td>
<td>6.20</td>
<td>11%</td>
<td>&lt;.001<em>0.000</em></td>
<td>Yes</td>
</tr>
<tr>
<td>Entrepreneurship youth</td>
<td>5.12</td>
<td>5.15</td>
<td>0.5%</td>
<td>.755</td>
<td>No</td>
</tr>
<tr>
<td>SI youth</td>
<td>6.33</td>
<td>6.51</td>
<td>2.8%</td>
<td>.125</td>
<td>No</td>
</tr>
<tr>
<td>ISN youth</td>
<td>6.44</td>
<td>6.67</td>
<td>3.5%</td>
<td>.003*</td>
<td>Yes</td>
</tr>
<tr>
<td>DSN youth</td>
<td>5.47</td>
<td>5.82</td>
<td>6.4%</td>
<td>.003*</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Correlation Between Difference Scores and Identity Leadership**

Secondly, it was proposed that the more the leader is perceived as an identity leader, the more the workshop would be effective in enhancing environmental awareness, identification with youth, and pro-environmental social norms. To test this hypothesis, a correlational analysis was run between pre/post differences of anthropogenic climate change, climate change concern, social identification with youth, injunctive social norms, and descriptive social norms of youth participants with identity leadership mean scores. The only significant correlation found was the difference between scores in social identification and identity leadership mean scores. This finding suggests that the more youth participants perceive their trainer as an identity leader, the more identification with youth will grow after the workshop. No correlation with identity leadership mean score was found with the differences scores of any other studied construct, not further supporting the hypothesis. However, identity leadership scores were extremely high (M=6.50), suggesting that identity leadership could indeed provide one valuable explanation for the effectiveness of peer-to-peer environmental education.

**Table of Correlations**

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ΔACC youth</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. ΔCCC youth</td>
<td>.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. ΔSI youth</td>
<td>.09</td>
<td>-.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. ΔISN youth</td>
<td>.15*</td>
<td>-.01</td>
<td>.24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. ΔDSN youth</td>
<td>.03</td>
<td>.04</td>
<td>-.02</td>
<td>.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. M Identity Leadership</td>
<td>.12</td>
<td>.07</td>
<td>.18**</td>
<td>.05</td>
<td>.07</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: * Correlation is significant at .05 level (2-tailed).
** Correlation is significant at .01 level (2-tailed).

2.1 Qualitative Data

In order to have a better understanding of the findings, qualitative data was analyzed. Answers were narrowed down to “Yes,” “No,” “Maybe,” coded, and then analyzed through the recourse to percentages.

**Enjoyment of the Program**

Overall, youth participants perceived a very positive impact of the workshop. Almost all participants expressed their appreciation for the program (99.3%).

**Climate Change Awareness**

The workshop was rated as useful to learn new information about climate change by 99.5% of the participants, supporting findings coming from quantitative data analysis. Participants reported that the workshop helped them in learning new, interesting information and in realizing the importance and
urgency of climate change (e.g., “In the past, I had no idea about the climate change topic and today I have learned a lot of information about it”). Students referred to concrete examples of new information they learned, like the consequences of using high amounts of plastic, littering, and pollution in general. Answers showed that participants acquired a future-oriented perspective on climate change problems, being aware that its effects will be experienced in the long-term and will have different impacts across the globe. Lastly, workshops increased the sense of responsibility for climate change, its causes and consequences in high school pupils (e.g., “Starting today, we have to pay more attention to our environment”). They became aware of how human activities are destroying the planet and how we are therefore responsible for finding solutions (e.g., “I realized that we should not pollute the environment”, or “Climate change is closely linked to people’s attitudes”). Some people reported the desire to act immediately in their daily life and to share their knowledge with friends and family.

Entreprenuerial spirit

The answers to this question were more variegated. Nearly three-quarters (72.5%) of students reported the will to become an entrepreneur, 23.7% expressed that they would not want to become an entrepreneur, and 3.8% were in doubt.

Perceived Importance of the Peer Leader Element

The majority of youth participants rated having a peer leader as a positive experience (84.6%). Only 2.7% rated it as negative and would have preferred an older teacher, while 10.9% expressed indifference with regard to the age of the facilitator. Participants who rated the peer leader as positive reported more confidence and openness in expressing oneself because they felt more understood (e.g., “Young people would understand us better”). Moreover, it was reported that young facilitators were better able to explain things clearly and in a straightforward manner (e.g., “Explanations were clearer and I felt more comfortable. Adults have older views”).

<table>
<thead>
<tr>
<th>Did you enjoy the workshop?</th>
<th>Was it useful to learn new information?</th>
<th>Would you like to be an entrepreneur in the future?</th>
<th>Young facilitator, positive or negative?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>99.3%</td>
<td>99.5%</td>
<td>72.5%</td>
</tr>
<tr>
<td>Negative</td>
<td>0.7%</td>
<td>0.5%</td>
<td>23.7%</td>
</tr>
<tr>
<td>Neutral</td>
<td>—</td>
<td>—</td>
<td>3.8%</td>
</tr>
</tbody>
</table>

2.4 Demographics - Qualitative Data

<table>
<thead>
<tr>
<th>Age</th>
<th>Did you enjoy the workshop?</th>
<th>Was it useful to learn new information?</th>
<th>Would you like to be an entrepreneur in the future?</th>
<th>Young facilitator, positive or negative?</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;12</td>
<td>100% Yes</td>
<td>92.3% Yes</td>
<td>57.9% Yes</td>
<td>81.8% Pos</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.7% No</td>
<td>42.1% No</td>
<td>9.1% Neg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9.1% Neutral</td>
</tr>
<tr>
<td>13–16</td>
<td>99.4% Yes</td>
<td>100% Yes</td>
<td>73.2% Yes</td>
<td>86.7% Pos</td>
</tr>
<tr>
<td></td>
<td>0.6% No</td>
<td></td>
<td>22.6% No</td>
<td>1.8% Neg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.3% Don’t know</td>
<td>11.5% Neutral</td>
</tr>
<tr>
<td>&gt;16</td>
<td>100% Yes</td>
<td>100% Yes</td>
<td>73.5% Yes</td>
<td>90.7% Pos</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>22.1% No</td>
<td>0.3% Neutral</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>44% Don’t know</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Did you enjoy the workshop?</th>
<th>Was it useful to learn new information?</th>
<th>Would you like to be an entrepreneur in the future?</th>
<th>Young facilitator, positive or negative?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>100% Yes</td>
<td>98.9% Yes</td>
<td>69.5% Yes</td>
<td>88% Pos</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.1% No</td>
<td>29.5% No</td>
<td>2.7% Neg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1% Don’t know</td>
<td>9.3% Neutral</td>
</tr>
<tr>
<td>Females</td>
<td>99.3% Yes</td>
<td>100% Yes</td>
<td>74.5% Yes</td>
<td>87.3% Pos</td>
</tr>
<tr>
<td></td>
<td>0.7% No</td>
<td></td>
<td>19.3% No</td>
<td>1% Neg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6.2% Don’t know</td>
<td>11.8% Neutral</td>
</tr>
<tr>
<td>S/E Status</td>
<td>Did you enjoy the workshop?</td>
<td>Was it useful to learn new information?</td>
<td>Would you like to be an entrepreneur in the future?</td>
<td>Young facilitator, positive or negative?</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------</td>
<td>----------------------------------------</td>
<td>--------------------------------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Car owners</td>
<td>100% Yes</td>
<td>100% Yes</td>
<td>70.4% Yes</td>
<td>85.3% Pos</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>24.1% No</td>
<td>1.3% Neg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.6% Don’t know</td>
<td>13.3% Neutral</td>
</tr>
<tr>
<td>Not owners</td>
<td>100% Yes</td>
<td>99.2% Yes</td>
<td>73.2% Yes</td>
<td>89.2% Pos</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.8% No</td>
<td>23.9% No</td>
<td>2% Neg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.8% Don’t know</td>
<td>8.8% Neutral</td>
</tr>
</tbody>
</table>
Appendix C. ToT Sample Materials

Youth (End User) Personas

Persona Map -- Team 1: Imagine the typical youth in your village

NAME:

Demographics
1. Age
2. Gender
3. Grade
4. Location
5. Family
6. Economic
7. Religion

GOALS/ASPIRATIONS:

CHALLENGES

Stakeholder Map

Stakeholder Map -- Team 2

[Community]

[Family]

[Vasilia]

[Government]

[Business]

Customer or End User
(Youth Participant)
Team Logistics Plan and Budget Template

ASP/World Bank Action Planning Worksheet

Team Member Names: _______________________

Key questions to remember:
- How often will I need to visit the village?
- What transportation will I need? Where will I stay?
- What stakeholders and assets can I engage as resources?
- When will I need to collect money and make purchases?

<table>
<thead>
<tr>
<th>Milestones</th>
<th>Actions</th>
<th>Time</th>
<th>Estimate Costs ($170USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finalize Contextualized Curriculum</td>
<td>• Finalize Case Study&lt;br&gt;• Finalize Climate Change Mini-Lesson&lt;br&gt;• Material Packs (printouts, Survey Translations)</td>
<td>7/12 - 16</td>
<td>~ 10USD</td>
</tr>
<tr>
<td>Secure a Venue</td>
<td>• Speak to a school official</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recruit 10 Youth</td>
<td>• Collect parent consent forms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finalize Dates &amp; Program Schedule</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organize Meals for Participants</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Successfully Execute Workshop</td>
<td>• Observe and interview to finalize design&lt;br&gt; • Administer Pre/Post Surveys</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submission of Data to AnchorEd</td>
<td>• Upload Youth Workshop survey results</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Youth Change-Maker Case Study: Climate Change (Tajik)
References


