

SoluWaTree Project in Nechasalyan, Solukhumbu

Introduction

The SoluWaTree project is a groundbreaking initiative aimed at enhancing climate-smart forest and water management practices in the Nechasalyan Rural Municipality, situated in the Southern belt of Solukhumbu District within Province 1 of Nepal. Solukhumbu is a remarkable Himalayan district nestled in the Northwest region of Province 1, encompassing two distinct regions known as Solu and Khumbu. At the heart of this district lies Salleri, the bustling administrative headquarters. Spanning a wide range of elevations, Solukhumbu showcases the breathtaking beauty of landscapes that extend from 600 meters in Tuintar to the awe-inspiring height of 8,848 meters at the summit of Mount Everest. The district is bordered by China to the North, Province 3 to the West, Okhaldhunga District to the South, and Sankhuwasabha, Khotang, and Bhojpur Districts to the East. With a total of eight municipalities, including one urban municipality and seven rural municipalities, Solukhumbu District serves as the ideal setting for the implementation of the SoluWaTree project. This report highlights the significance and objectives of the project, emphasizing its role in promoting sustainable forest and water management practices to mitigate the impacts of climate change in the region.

Nechasalyan Rural Municipality, one of the seven rural municipalities in Solukhumbu District, has been selected as the project area for the SoluWaTree initiative due to its strategic location in the southern region of the district. Nechasalyan is geographically positioned between latitude 86032'13"N to 86040'56"N and longitude 27020'16"E to 27024'26"E. The municipality encompasses a wide range of elevations, with the lowest point situated at 600 meters in Tuintar and the highest point reaching an impressive 3,500 meters above sea level at Pattale Danda. Nechasalyan shares borders with Aiselukharka Rural Municipality of Khotang District and Thulung Dudhkoshi Rural Municipality of Solukhumbu District to the East, Siddhicharan Municipality of Okhaldhunga District to the West, Solududhakunda Municipality and Thulung Dudhkoshi Rural Municipality of Solukhumbu District to the North, and Chisangkhuagadi Rural Municipality of Okhaldhunga District to the South. This diverse geographical setting makes Nechasalyan an ideal location for implementing the SoluWaTree project, as it encompasses a wide range of ecosystems and natural resources that require sustainable management practices to mitigate the impacts of climate change.

Nechasalyan Rural Municipality is further divided into five wards, each contributing to the unique fabric of the municipality. The administrative hub of Necha Bihbare Bazar is situated in Ward No. 3, serving as the central point of governance and coordination. In line with the recommendations of the local government, the planned climate change project will be executed in ten selected settlements spanning across the five wards of Nechasalyan Rural Municipality. These settlements have been carefully chosen based on their specific needs and vulnerabilities in the face of climate change. The ten selected settlements are as follows: 1. Simkharka, 2. Kumal Gaun, 3. Bhandari Gaun, 4. Gurung Tol, 5. Bardada, 6. Phurke Village, 7. Gairi Village, 8.

Khaling Gaun, 9. Majh Gaun, and 10. Frewa. By targeting these settlements, the project aims to implement tailored climate-smart forest and water management practices that address the unique challenges and opportunities present in each location.

From an agricultural perspective, Nechasalyan Rural Municipality holds significant importance as one of the primary crop production regions within Solukhumbu District. Spanning an area of 67.53 square kilometers, the municipality comprises diverse land usage patterns. Forests cover approximately 36.48% of the total surface area, accounting for 24.64 square kilometers, while a substantial portion of the land, approximately 62.5%, equivalent to 42.21 square kilometers, is dedicated to crop cultivation (source: Village Profile, 2018, page 41 – see annex 13). Notably, the agricultural practices in this area currently exhibit limited use of chemical fertilizers and pesticides, presenting an opportune environment for the further development of agricultural production. The geographic belt of Nechasalyan Rural Municipality, ranging in altitude from 535 to 1,897 meters above sea level, offers favorable conditions for cultivating a wide range of fruits, including tropical, subtropical, and temperate varieties. With its untapped potential, this area holds promising prospects for establishing an organic fruit hub, given the current focus on subsistence fruit tree cultivation. Expanding agricultural activities in Nechasalyan can not only enhance local livelihoods but also contribute to sustainable economic growth and promote environmentally friendly practices in the region.

Project Objectives

The project aims to achieve the following objectives:

- A) Increase the forest and greenery cover on public and private land by planting local tree species, fodder trees, and Medicinal and Aromatic Plants (MAPs).
- B) Improve the water management capacity of local communities by:
 - Enhancing water retention in natural ponds.
 - Protecting a natural water source.
 - Promoting water collection techniques for farming purposes.
- C) Conduct garbage and waste management programs, which include:
 - Proper waste disposal and recycling initiatives.
 - Garbage and waste management programs.
- D) Enhance knowledge and capacity building of local communities and government representatives in environmental and climate change-related issues.
- E) Support the local government in setting up a Local Adaptation Plan of Action (LAPA) and its endorsement in climate-related policies.
- F) Set up two "Climate Smart Villages" according to the guidelines provided in the "Climate Smart Village procedure – 2073 B.S. (2016 A.D)" of the Government of Nepal.

The project aims to address environmental and climate change challenges by promoting afforestation, water management, waste management, capacity building, and the establishment of climate-resilient communities.

Project Activities conducted for SoluWatee so Far

1. *Training sessions on forest management and silviculture techniques.*

The training on forest management and silviculture techniques proved to be a significant milestone for the 24 participants from 11 Community Forest User Groups (CFUGs) in Nechasalyan Rural Municipality. Led by ARD forest officer Ms. Deepa Dahal, along with the assistant forest officer Mr. Ashok Jaisawal and forestry freelancer Mr. Ananta Paudel, the sessions were enlightening and informative. Participants gained a deeper understanding of the local forest context and the importance of biodiversity for rural livelihoods. They acquired theoretical knowledge encompassing forest management concepts and technical terms such as DBH, coppice system, thinning, pruning, and clearing. Moreover, the training emphasized the sustainable use of forests, showcasing their potential as a source of income and highlighting the significance of Non-Timber Forest Products (NTFPs). Participants were also introduced to various silvicultural tools and instruments, equipping them for practical application. Following the training, CFUG representatives engaged in productive discussions with government forest officers, addressing pertinent issues in their community forests. Overall, this training played a pivotal role in empowering participants to actively participate in forest management practices and contribute to the long-term sustainability of their forests.

2. *Training sessions on the cultivation and domestication techniques of medicinal and aromatic plants (MAPs).*

A group of 26 farmers, comprising 23 male and 3 female participants, took part in a training program focused on Medicinal and Aromatic Plants (MAPs) cultivation techniques. The training involved hiring an external expert to provide comprehensive knowledge and guidance in this field. As a result of the training, participants significantly enhanced their understanding of MAPs cultivation and domestication techniques. They gained insights into differentiating high-value and low-value MAPs based on altitudinal ranges, recognizing that higher altitude MAPs tend to command a higher market price compared to those found at lower altitudes. Participants had the valuable opportunity to exchange their experiences with the expert, enabling them to learn about marketing values specific to Nepal. Moreover, they discovered the potential for linkage between MAPs and Ayurveda, as well as other treatment methods. The training covered essential aspects such as seed collection, plantation techniques, post-plantation care, and harvesting methods for specific MAPs including Charaito (*Swertia chiraita*), Loth Sallo (*Taxus baccata*), and Satuwa (*Paris Polyphylla*). Participants also acquired knowledge of nursery techniques for Chiraito, Satuwa, Lothsallo, Dhasingare (*Iodex* plant), and thin-shell walnut, enabling them to produce seedlings in the field. To kickstart their own MAPs farming endeavors, each participant received Chiraito seeds and saplings of thin-shell walnut at the conclusion of the training. This practical hands-on approach ensures that the knowledge gained during the training can be directly applied by the participants in their MAPs cultivation ventures.

3. *Training on climate change sensitization, adaptation, and mitigation.*

A total of 38 participants, including 16 females and 22 males, took part in two training sessions on climate change. The trainings aimed to increase knowledge on climate change, adaptation, and mitigation. Participants from youth clubs, women cooperatives, and other groups attended the trainings held in four different settlements to ensure broader information dissemination. Topics covered included climate change terminologies, government policies, greenhouse gas emissions, global warming's impact on Himalayan glaciers, and climate change adaptation and mitigation measures. The trainings provided valuable insights into climate change issues and the importance of proactive action.

4. *Establishment of a forest tree nursery.*

A forest tree nursery has been established, and it has been operational until June of Year III. The nursery, located in Phurke village, has 23 seedling beds, each measuring 10 meters by 1 meter, with a capacity to produce 4,000 seedlings. Forest soil and sand have been collected at the nursery site to prepare the soil mixture for seedling production. Additionally, 265 liters of livestock urine have been collected for the production of bio-pesticides and bio-fertilizers. The nursery currently hosts 10 different types of seedlings. In preparation for the upcoming monsoon period, 62,700 seedlings of native tree and fodder tree species have been cultivated in the nursery. All necessary technical operations related to nursery techniques have been implemented. Seedling production will continue until April 2023, with ongoing care and maintenance of the nursery until the planting period.

5. *Promotion of cultivation and domestication of medicinal and aromatic plants (MAPs).*

A minimum of 26 farmers have embarked on commercial cultivation of Medicinal and Aromatic Plants (MAPs). As part of this initiative, 260 MAPs saplings of *Taxus baccata* and 3 kilograms of MAPs seedlings have been distributed to these farmers. Specifically, 120 grams (totaling 3 kilograms) of Chiraito seeds and 10 thin-shell walnut saplings have been provided to the 26 farmers who participated in the training, serving as the starting materials for their MAPs farming endeavors. The distributed seedlings and saplings are planned to be planted in the field during the upcoming pre-monsoon period. This support aims to encourage and enable farmers to engage in the cultivation of MAPs for commercial purposes.

6. *Restoration of natural ponds for water collection.*

As part of the project, two natural ponds, Bhedikhor water pond and Khune water pond, have been successfully restored. The Bhedikhor water pond, with dimensions of 50.86m x 15.25m x 1.52m, has a water holding capacity of 1200 m³ in the main pond and 33.8 m³ in the attached animal water feeding pond. Nearly 30 households in the village are benefiting from the renovated Bhedikhor water pond.

The Khune water pond, with dimensions of 30m x 21m x 1.2m, has been fully renovated and now has a water holding capacity of 692 m³. This pond had not been filled for the

past 10 years but has been restored to its original capacity. To ensure safety and control movement, gabion wire fencing has been constructed on the top of the boundary wall. Around 25 households in the local community directly benefit from the Khune water pond.

These restoration efforts have resulted in increased water availability for 55 households, improving their access to a sustainable water source. The renovation of the Bhedikhor and Khune water ponds provides vital support for the local community's water needs throughout the year.

7. *Construction of plastic ponds for water collection.*

As part of the project, three plastic ponds have been constructed to benefit three farmers. Additionally, nine farmers are now able to produce off-seasonal vegetables. These initiatives have significantly increased water availability by seven months, allowing for improved agricultural activities.

The project has distributed nine plastic ponds with dimensions of 6m x 4m x 1.5m, along with water collection HDPE pipes, to the farmers. Currently, three plastic ponds have been completed, while the remaining ponds are still under construction. Each completed pond has a water holding capacity of 35,000 liters, resulting in a total storage capacity of 103 m³ across the three ponds.

Each plastic pond will irrigate approximately 9 ropani of land (equivalent to 0.45 hectares) for at least four months, from January to April. As more plastic ponds are completed, the volume of water collected and the area of irrigated land will increase further.

8. *Conduct training/workshops on organic fruit and vegetable farming.*

A training workshop on organic fruit and vegetable farming, as well as natural insect and pest management, was organized for the participants. A total of 23 farmers attended the training, including 5 farmers from the pocket area.

The training focused on vegetable and fruit cultivation, specifically covering crops such as tomatoes, cucurbits, chillies, cauliflower, cabbage, and fruits like citrus, mandarins, and lemons. The participants were provided with comprehensive guidance on non-chemical practices, including the use of bio-fertilizers, manures, bio-pesticides, traps, and lures.

The training sessions emphasized proper nursery management practices, intercultural operations, manure application, seasonal bed preparation, sowing techniques, irrigation management, and plant protection measures. Participants gained a clear understanding of the differences between on-season and off-season vegetable cultivation, effective utilization of land for extensive farming, and identifying markets for off-seasonal vegetable farming.

It's important to note that this training is part of an ongoing yearly training program, building upon the knowledge and skills acquired in previous years. This continuous training approach ensures that farmers receive regular updates and guidance on organic farming techniques and natural pest management practices.

9. *Establishment of Farmer Field School.*

A Farmer Field School (FFS) has been organized, and it is currently in its third year of operation. The FFS class is divided into two sub-groups based on geographical distance, following the suggestion and recommendation of the ward chairperson. A total of 43 local farmers, including 17 females and 26 males, are actively participating in the ongoing FFS program.

The FFS classes are conducted every Friday and Saturday, spanning a period of 16 weeks to cover the entire course. The selected crop species for the FFS is tomatoes, which is the most marketable vegetable in the area and has a relatively longer shelf life. This is the first time the tomato cultivation method is being introduced in Nechasalyan Rural Municipality.

The FFS curriculum covers various technical skills, including land preparation, seed bed preparation, optimal seed sowing and planting time, appropriate planting distances, care and management of newly planted saplings, and identification and control of diseases and insect infestations during planting. Farmers are also taught the preparation and proper use of bio-pesticides using local resources and are trained in weeding, cleaning, and Integrated Pest Management (IPM) techniques.

Through the FFS program, farmers gain knowledge and skills to identify and manage basic diseases and pests, such as praying mantises, predatory beetles, green lacewing insects, robber flies, aphids and thrips, field crickets, and cutworms. The objective is for the participating farmers to disseminate their newly acquired knowledge to their peers, promoting the spread of sustainable farming practices in the community.

Conclusion

The SoluWatee project has made significant progress in its mission to promote sustainable water management, agroforestry, and community development in the Nechasalyan Rural Municipality. Through the implementation of various activities, such as the restoration of natural ponds, construction of plastic ponds, the establishment of a forest tree nursery, and organization of training programs, the project has achieved positive outcomes.

The restoration of two natural ponds has resulted in increased water availability, benefiting 55 households in the community. Additionally, the construction of three plastic ponds has provided water storage capacity, benefiting three farmers and enabling the production of off-seasonal vegetables. The project has also facilitated the setting up of a forest tree nursery, producing a significant number of trees from different species, which will contribute to reforestation efforts and ecosystem conservation.

Furthermore, the project has successfully organized training programs and workshops, equipping farmers with valuable knowledge and skills in organic farming, natural pest management, and crop cultivation. Farmer Field Schools have played a crucial role in enhancing farmers' understanding of sustainable agricultural practices and encouraging knowledge sharing among peers.

While some activities are still ongoing and scheduled for completion by September 2023, the SoluWatee project has already made a positive impact on the participating communities. The increased water availability, adoption of sustainable farming practices, and capacity building of local farmers contribute to long-term environmental and socio-economic benefits.