



Overview of constructed terraces in the watershed, Saighan district, Bamyan (Shabir Shahem (HELVETAS Swiss Intercooperation, Afghanistan))

Terracing in Watershed ()

Kordak dar Abriza

Reshaping unproductive land into a series of levelled, gently-sloping platforms creates conditions suitable for cultivation and prevents accelerated erosion.

The terracing in watershed fact-sheet is documented by Sustainable Land Management Project/HELVETAS Swiss Intercooperation which is funded by Swiss Agency for Development and Cooperation (SDC). Due to the enduring conflict and to the breakdown of common-pool resources management in upper catchments areas over the past decades, most pastures in Afghanistan are degraded. Uncontrolled grazing of animals tilling grazing land to grow cereal crops are the main contributors to the loss of vegetation coverage in the upper catchments. One of the negative consequences is repeated flash floods each year causing loss and damage of agriculture lands, gardens, road, canal, infrastructure, houses and even lives. To decrease the severity of flash floods and extend vegetation in upper catchment areas, HELVETAS Swiss Intercooperation in Saighan district has established watershed activities.

Purpose of the Technology: Terrace construction was identified as an effective measure in degraded watershed areas to:

- control runoff and decrease flash flood;
- increase water infiltration;
- create the opportunity for income from cultivation of valuable crops in the terraces.

Establishment / maintenance activities and inputs: Having selected the watersheds and established watershed committees, watershed master plans were prepared and various structural and agronomical measures identified and estimated for each unit of land. Community laborers, trained by HELVETAS technical staff, constructed the terraces under supervision of watershed committee members. 600 terraces, each measuring 10 m x 3.6 m were constructed on seven hectares of land. To ensure maintenance, HELVETAS Swiss Intercooperation facilitated the creation of community saving systems and invested 10% of the project budget for maintenance of each watershed. It improved the capacity of watershed members, so after ending project support the community watershed committee would be able to manage maintenance of watershed measures.

Natural / human environment: Bamyan province is a remote province of Afghanistan with a high poverty rate. It has a semi-arid climate with cold winters and hot and dry summers. During winter, temperatures can drop below -22 degrees. Summer temperatures can reach 34 degrees in the month of July. The average annual rainfall in the area is about 230mm and some years can be very dry. 90% of the population relies on subsistence agriculture for their livelihoods and off-farm activities are marginal. The soil texture is clay, sandy loam and clay loam with moderate type of soil fertility, naked area of upper catchments causes that most of Saighan villages face to water scarcity during May to September and can't grow valuable crops. The growing season in Saighan district is relatively short from April to October and farmers can produce only one crop per year. Farmers with access to irrigation water cultivate cash crops, for example potato and vegetables, in addition to staple crops (wheat) and fodder crops. Those without access to irrigation water cultivate wheat and fodder crops only. Water scarcity during May to September may result in a lack of high value crops. The average annual income from one hectare in the area of having enough irrigation water is 250000 AFN (3676 USD) and in the area which has no enough irrigation water is 67500 AFN (992 USD).

: Saighan, Bamyan,

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Close view of constructed terraces in the watershed (Shabir Shahem (HELVETAS Swiss Intercooperation, Afghanistan))

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Almost all the terraces constructed on the hill sides has 10 m length, 3.5 m width and 1.5 m depth.

Date: 19/04/2016

Technical knowledge required for land users: low

Terrace: forward sloping

Spacing between structures (m): 0.5

Depth of ditches/pits/dams (m): 0.3

Width of ditches/pits/dams (m): 3.6

Length of ditches/pits/dams (m): 10

Construction material (earth): Excuvation of soil and leveling

Slope (which determines the spacing indicated above): 15-30%

If the original slope has changed as a result of the Technology, the slope today is: 0%

Lateral gradient along the structure: 0%

Specification of dams/ pans/ ponds: Capacity 36m3

Catchment area: 36m²



- Labor cost is the determinate factors which was affecting the costs.
- (5 88) 1 USD =
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1. Labor cost for the construction of the terraces (/ : 1 month)

			()	()	%
Labor cost for the construction of the terraces	persons/day	1200,0	5,88	7056,0	10,0
				7'056.0	
				7'056.0	

1. Repairing of few terraces after heavy rain falls (/ : 3 times a year)

			()	()	%
Repairing of few terraces	persons/day	6,0	5,833333	35,0	100,0
				35.0	
				35.0	

Thermal climate class: temperate

☐ < 250
☒ 251-500
☐ 501-750
☐ 751-1,000
☐ 1,001-1,500
☐ 1,501-2,000
☐ 2,001-3,000
☐ 3,001-4,000
☐ > 4,000

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☒
☐

☐ (0-2%)
☐ (3-5%)
☐ (6-10%)
☒ 15%
☒ (16-30%)
☐ (31-60%)
☐ (>60%)

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☐ 0-100
☐ 101-500
☐ 501-1,000
☐ 1,001-1,500
☐ 1,501-2,000
☒ 2,001-2,500
☒ 2,501-3,000
☐ 3,001-4,000
☐ > 4,000

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☐ (0-20%)
☐ (21-50%)
☐ (51-80%)
☒ (81-120%)
☒ (> 120%)

☐)
☒ / ()
☐ / ()

☐ (> 20%)
☐ / ()
☐ / ()

☐ (>3%)
☒ (1-3%)
☐ (<1%)

☐ < 5
☒ 5-50
☐ > 50

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SLM

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☐ 10%
☒ 10-50%
☐ 50%

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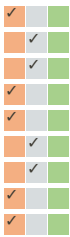
☐ < 0.5
☐ 0.5-1
☐ 1-2
☐ 2-5
☐ 5-15
☐ 15-50
☐ 50-100
☐ 100-500
☒ 500-1,000
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SLM: 60
SLM: 80
Technology reduce flood and lower lands doesnt effect by floods



SLM: 20
SLM: 25
Increasing under ground water by applying technology



SLM: 0
SLM: 50
Cultivation of cash crop in the terraces (farm income from uplands)

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SLM /

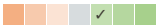


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livelihood and human well-being

reduced improved

The technology has effective role on reducing flash flood and as well through cultivation of valuable crops the community get more income from watershed area

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SLM: 0
SLM: 100
Leveled terraces infiltr the water

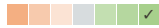
SLM: 0
SLM: 50
Technology let the water infiltration more

(
-springs)
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SLM: 0
SLM: 50
Control runoff





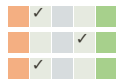
The establishment cost of this technology seems to be high but once they are built they need very less maintenance cost with lots of benefits in the other hand.



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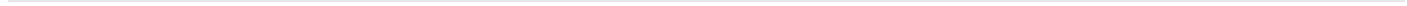
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- 1-10%
- 11-50%
- ✓ > 50%

- ✓ 0-10%
- 11-50%
- 51-90%
- 91-100%

444 households covering 100 percent of the stated area



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- Good measure that is easy to be applied by the people.
How can they be sustained / enhanced? Conducting training and workshops for capacity building of the community members.
- The application of this technology results to the control of runoff and reduction of the flash flood.
How can they be sustained / enhanced? More vegetative measures should be considered.
- A good technology for the better control of runoff and keeping the moisture.
How can they be sustained / enhanced? Cultivation and sustainable maintenance of the plants in the terraces.
- Preparing and providing a good and proper place for cultivation and plantation.
How can they be sustained / enhanced? Plantation of the local plants which has more resistance and are adaptable to the natural environment of Saighan district.
- Getting more income through cultivation of valuable crops.
How can they be sustained / enhanced? Protection of cultivated seed from grazing animals

- Requires high investment and financial cost. People should as well have contribution in the cost by providing the labor work.
- In case the technical measures are not considered and applied properly it may increase infiltration and subsequently increases the soil moisture which may trigger landslide on slopes during rainfalls High level of the technical staff and knowledge to be considered and as well the area should be studied and observed deeply.



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2016

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2019

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https://qcat.wocat.net/km/wocat/technologies/view/technologies_1732/

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Approaches: Resilient Watershed Management Plan https://qcat.wocat.net/km/wocat/approaches/view/approaches_3612/

- HELVETAS (Swiss Intercooperation)
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