

Creation of saxaul pasture protective strips in the Northern desert for accumulation of a moisture and prevention of wind erosion

Creation of haloxylon pasture-protective strips at north desert (Kazakhstan)

Creation of sowed pastures

DESCRIPTION

Localization of erosion processes and moisture accumulation by creation haloxylon strips in pastures of north desert

- Pasture-protective haloxylon strips are created by sowing of seeds or planting of seedlings.
 Strips are three-row with 3 m spacing and 3 m distance between plants.
 Strips are destined to accumulate a precipitation, decrease wind velocity and localize

- Setting the additional feed for agricultural animals and fuel for people .
 Not more than 500 ha is introduced in South Pribalkhashye.
 The value of 1 ha of strips is 5500 tenge taking into account a preparation of soil, collection of seeds and sowing. The value of 1 ha of strips, made by planting of seedlings is 7200 tenge.
 This technology is recommended in north Kazakhstan desert.



Location: South Pribalkhashye, Almaty oblast, Kazakhstan

No. of Technology sites analysed:

Geo-reference of selected sites • 76.0011, 44.1904

Spread of the Technology: evenly spread over an area (approx. 0.1-1 km2)

Date of implementation: more than 50 years ago (traditional)

Type of introduction

- through land users' innovation
- as part of a traditional system (> 50 years) during experiments/ research
- through projects/ external interventions



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CLASSIFICATION OF THE TECHNOLOGY

Main purpose

- improve production
 reduce, prevent, restore land degradation

 conserve ecosystem
 protect a watershed/ downstream areas in combination with
 other Technologies
 preserve/ improve biodiversity
 reduce risk of disasters
 adapt to climate change/ extremes and its impacts
 mitigate climate change and its impacts
- create beneficial social impact

Land use



Grazing land - Extensive grazing land: Nomadism

Water supply

rainfed
 mixed rainfed-irrigated
 full irrigation

Number of growing seasons per year: 2 Land use before implementation of the Technology: n.a. Livestock density: n.a.

Degradation addressed

Purpose related to land degradation

prevent land degradation

reduce land degradation
 restore/ rehabilitate severely degraded land
 adapt to land degradation
 not applicable

SLM group

• windbreak/ shelterbelt

SLM measures



agronomic measures - A1: Vegetation/ soil cover, A3: Soil surface treatment, A4: Subsurface treatment

structural measures -

TECHNICAL DRAWING

Technical specifications



Technology of creation of saxaul pasture protective strips

Technical knowledge required for field staff / advisors: high

Technical knowledge required for land users: moderate

Main technical functions: increase / maintain water stored in soil

Secondary technical functions: reduction in wind speed

Early planting Material/ species: seeds Quantity/ density: 25-30kg/ha Remarks: at right angle to wind direction

Minimum tillage Remarks: at seeding

Deep tillage / double digging Remarks: at planting

Aligned: -against wind Number of plants per (ha): 35-40 thousand units Spacing between rows / strips / blocks (m): 3 Other species: haloxylon 35-40 thousand units

ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

Calculation of inputs and costs

- Costs are calculated:
- Currency used for cost calculation: US Dollars

• Exchange rate (to USD): 1 USD = n.a

• Average wage cost of hired labour per day: 4.00

Establishment activities

1. Soil preparation (Timing/ frequency: spring)

2. Planting (Timing/ frequency: spring)

3. Cultivating of spacing areas from second year of haloxylon (Timing/ frequency: 2 times in year - spring and autumn)

Establishment inputs and costs

Specify input	Unit	Quantity	Costs per Unit (US Dollars)	Total costs per input (US Dollars)	% of costs borne by land users	
Labour						
Soil preparation, planting and cultivating	ha	1.0	9.0	9.0		
Equipment						
Machine use	ha	1.0	13.0	13.0		
Plant material						
Seeds	ha	1.0	10.0	10.0		
Seedlings	ha	1.0	250.0	250.0		
Total costs for establishment of the Technology				282.0		

Maintenance activities

1. Soil surface treatment (Timing/ frequency: spring / 1 time.)

- 2. Sowing (Timing/ frequency: spring / 1 time.)
- 3. Soil packing (Timing/ frequency: spring / 1 time.)
- 4. Planting (Timing/ frequency: spring / 1 time.)
- 5. Cultivating of spacing areas (Timing/ frequency: spring and autumn /each year)

NATURAL ENVIRONMENT



Most important factors affecting the costs value of petrol.

Groundwater table on surface < 5 m 5-50 m > 50 m	Availability of surface water excess good medium poor/ none	Water quality (untreated) good drinking water poor drinking water (treatment required) for agricultural use only (irrigation) unusable	Is salinity a problem? Yes No Occurrence of flooding Yes No
Species diversity high medium low	Habitat diversity high medium low		
CHARACTERISTICS OF LA	ND USERS APPLYING THE	TECHNOLOGY	
Market orientation subsistence (self-supply) mixed (subsistence/ commercia commercial/ market	Off-farm income ✓ less than 10% of all income 10-50% of all income > 50% of all income	Relative level of wealth very poor poor average rich very rich	Level of mechanization manual work animal traction mechanized/ motorized
Sedentary or nomadic Sedentary Semi-nomadic Nomadic	Individuals or groups individual/ household groups/ community cooperative employee (company, government)	Gender women men	Age children youth middle-aged elderly
Area used per household < 0.5 ha 0.5-1 ha 1-2 ha 2-5 ha 5-15 ha 15-50 ha 50-100 ha 200-1,000 ha 1,000-10,000 ha > 10,000 ha	Scale small-scale medium-scale large-scale	Land ownership state company ✓ communal/village group individual, not titled individual, titled	Land use rights open access (unorganized) communal (organized) leased individual Water use rights open access (unorganized) communal (organized) leased individual

IMPACTS		
Socio-economic impacts fodder production		
e 11. 19	decreased increased	In spacing areas
fodder quality	decreased vincreased	In spacing areas
farm income	decreased vincreased	2004
		20%
Socio-cultural impacts community institutions		
	weakened strengthened	Convincing illustrative example
Ecological impacts		
wind velocity soil fertility	increased decreased	
1 · · · ·	decreased each and an 	40-50% more in strip zone
biodiversity	diminished	Introduction of haloxylon in vegetation community
Off-site impacts		
COST-BENIFEIT ANALVSIS		
Benefits compared with establish	ment costs	

Benefits compared with establishment costs Long-term returns very negative very positive

CLIMATE CHANGE

ADOPTION AND ADAPTATION

Percentage of land users in the area who have adopted the

Technology

	6,
	single cases/ experimental
	1-10%
	10-50%
1	more than 50%

Number of households and/ or area covered 440 households in an area of 5 km2 (50-100 persons/km) Of all those who have adopted the Technology, how many have done so without receiving material incentives?

Weaknesses/ disadvantages/ risks: land user's viewhow to

Weaknesses/ disadvantages/ risks: compiler's or other key

Reviewer

David Streiff

resource person's viewhow to overcome

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overcome

90-100%

Has the Technology been modified recently to adapt to changing conditions?

conunitio	I
Yes	
No	

To which changing conditions?

climatic change/ extremes changing markets labour availability (e.g. due to migration)

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

- increase of pasture capacity
- improvement of ecological conditions in places of abode
- increase of living standards

Strengths: compiler's or other key resource person's view

• shortening of possibilities of dust storms in degraded pastures

How can they be sustained / enhanced? all advantages can be sustained for 30 and more years

- possibility of fuel storage in woodless areas of desert
- increase of pasture capacity
- Influence on culture standard of people

REFERENCES

Compiler Unknown User

Date of documentation: June 5, 2011

Resource persons

Vladimir Yurchenko - SLM specialist Ilya Alimaev - SLM specialist

Full description in the WOCAT database

https://qcat.wocat.net/en/wocat/technologies/view/technologies_1090/

Linked SLM data n.a.

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• n.a.

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Editors

