Selection of the typical area to monitor and its photographing. (Archives of CAMP Alatoo (3, Uphimskiy pereulok, Bishkek))

Monitoring the condition of pastures (CACILM) (Kyrgyzstan)

Central Asian Countries Initiative for Land Management (CACILM).

DESCRIPTION

Monitoring the state condition of pastures.

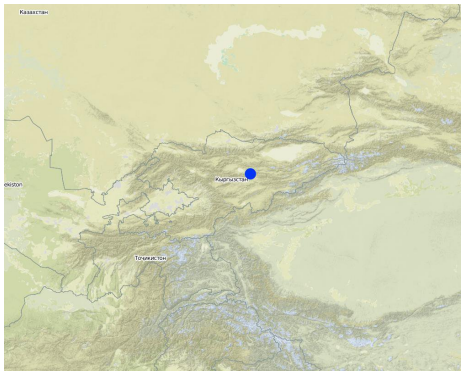
The monitoring of pastures is one of the powers of the Pasture Committee; It serves as a basis for developing a pasture use plan. This is a new task for the Pasture Committees, which requires specialized knowledge. Therefore, a simple method for evaluating pasture condition was developed:
1. Select an area on which the yield will be determined (place the prepared frame with an area of 1m2), specify the position coordinates (control points) of the selected area on the map using GPS.
2. Indicate the name of the area and information on the condition of the pasture area (erosion, salinization, etc.).
3. Photograph the area, which allows for a visual comparison of the vegetation development during the year.
4. Assess the vegetation cover inside the frame and measure the height of the vegetation with a ruler. Identify the types of plants in the square and divide them into palatable and non-palatable. Arrange the plants in the pouches, write notes about the place of withdrawal of the plant and indicate the date of withdrawal (use a pencil).
5. Determine the yield of the studied forage lands with the cut-sample method: the grass is mowed on 1 m2 (with a 5-fold repeatability). The cutting height should be 7-8 cm for hay, 4-6 cm for short grass pastures, and 6-7 cm for tall grass pastures. Move the frame consistently 5m diagonally from the corner of each control point.
6. Weigh the sample in raw condition and after drying and divide into palatable and non-palatable.
7. Calculate the yield for each type of pasture.
(in the frame of CACILM)

Purpose of the Technology: This approach enables a timely detection of changes in the condition and productivity of pastures under the influence of both anthropogenic and climatic factors. It also facilitates an assessment of such changes, in order to prevent and eliminate negative processes of pasture degradation.

Establishment / maintenance activities and inputs: Specialists from CAMP Alatoo together with Kyrgyz Designing Institute on Land Management "Kyrgyzgiprozem".developed a farmer's method to assess the productivity of pastures and conducted a training seminar on "Monitoring of pastures". Currently, each ayil okrug (A/O, aiyl okrug is an administrative and territorial unit consists of a group of villages, which has a local self-government) of the pilot area has a person responsible for the monitoring of pastures. The obtained data are updated, compared and linked to weather conditions (temperature, precipitation).

Natural / human environment: Naryn province is located at an altitude of 1800-4500 above sea level. Annual precipitation - 200-500 mm in summer (April-October) and 100-200 mm in winter (November-March). The population is traditionally involved in animal husbandry. The pasture vegetation is rich in diversity. Different altitudinal belts, the variety of climatic conditions and the exclusivity of the regional geographic areas determine the diversity of pasture vegetation and hay harvest. They differ from each other according to content and grass composition, as well as yield and forage quality.

LOCATION



Location: Naryn province, Kyrgyz Republic, Kyrgyzstan

No. of Technology sites analysed:

Geo-reference of selected sites
- 75.64186, 41.69328

Spread of the Technology: evenly spread over an area (approx. 10-100 km2)

In a permanently protected area?:

Date of implementation: less than 10 years ago (recently)

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

The process of mowing vegetation (Archives of CAMP Alatoo (3, Uphimskiy pereulok, Bishkek))

CLASSIFICATION OF THE TECHNOLOGY

Main purpose

- [ ] improve production
- [x] 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 economic impact
- [ ] create beneficial social impact

Land use

Land use mixed within the same land unit: Yes - Agro-pastoralism (incl. integrated crop-livestock)

CroplandNumber of growing seasons per year: 1

Grazing land

- Semi-nomadic pastoralism

Water supply

- [x] rainfed
- [ ] mixed rainfed-irrigated
- [ ] full irrigation

Purpose related to land degradation

- [x] prevent land degradation
- [x] reduce land degradation
- [ ] restore/ rehabilitate severely degraded land
- [ ] adapt to land degradation
- [ ] not applicable

Degradation addressed

biological degradation - Bc: reduction of vegetation cover, Bq: quantity/ biomass decline, Bs: quality and species composition/ diversity decline

SLM group

- pastoralism and grazing land management

SLM measures

management measures - M2: Change of management/ intensity level, M3: Layout according to natural and human environment

TECHNICAL DRAWING

Technical specifications

Example of calculation of pasture capacity.

Location: 3, Uphimskiy pereulok, Bishkek

Date: 2010-04-20

Technical knowledge required for field staff / advisors: high (Must know how to conduct monitoring of pastures and pasture vegetation.)

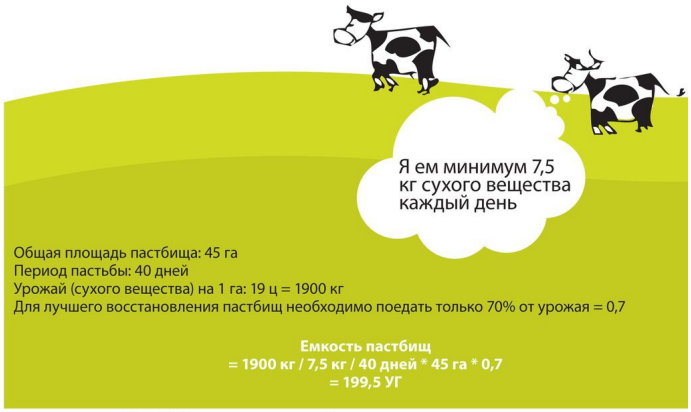
Technical knowledge required for land users: moderate (Should know palatable and non-palatable plants.)

Main technical functions: water harvesting / increase water supply, promotion of vegetation species and varieties (quality, eg palatable fodder)

Secondary technical functions: improvement of surface structure (crusting, sealing)

Change of land use practices / intensity level: Results of pasture monitoring provide an opportunity to assess their condition and take steps to reduce the load on pastures where there is overload.

Layout change according to natural and human environment: Redistribution of livestock in pasture areas, depending on the condition of pasture has partially changed the existing grazing scheme.



Author: CAMP Alatoo, 3, Uphimskiy pereulok, Bishkek

ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

Calculation of inputs and costs

- Costs are calculated:
- Currency used for cost calculation: **Som**
- Exchange rate (to USD): 1 USD = 47.0 Som
- Average wage cost of hired labour per day: 11.00

Most important factors affecting the costs

The costs are affected by the total pasture area of an aiyl okrug, by the selection of monitoring points, their distance from the village, by accessibility (mostly in the mountains), by the availability and condition of mountain roads and bridges, and by the variety of vegetation types.

Establishment activities

1. Acquisition of the necessary tools for pasture monitoring. (Timing/ frequency: Spring)

Establishment inputs and costs

Specify input	Unit	Quantity	Costs per Unit (Som)	Total costs per input (Som)	% of costs borne by land users
Equipment					
Camera	piece	1.0			
GPS	piece	1.0			
Horse	piece	1.0			
Compass	piece	1.0			

Maintenance activities

1. Pasture Committee assesses spring pastures (90688 ha) at 22 monitoring points (Timing/ frequency: spring)
2. Pasture Committee assesses summer pastures (85752 ha) at 31 monitoring points (Timing/ frequency: summer)
3. Pasture Committee assesses autumn pastures (90688) at 22 monitoring points (Timing/ frequency: autumm)
4. Calculation of yield and capacity of pastures using 305 weightings (Timing/ frequency: None)
5. Amendment of the pasture capacity maps (100 plots of pasture). (Timing/ frequency: None)

Maintenance inputs and costs

Specify input	Unit	Quantity	Costs per Unit (Som)	Total costs per input (Som)	% of costs borne by land users
Labour					
Assessment of spring pastures	person days	22.0			50.0
Assessment of summer pastures	person days	31.0			50.0
Assessment of autumn pastures	person days	22.0			50.0
Calculation of yield and capacity of pastures using 305 weightings	person days	10.0			20.0
Other					
Labour: Amendment of the pasture capacity maps (100 plots of pasture)	Person days	10.0			20.0

NATURAL ENVIRONMENT

Average annual rainfall

< 250 mm

Agro-climatic zone

humid

Specifications on climate

- [x] 251-500 mm
- [ ] 501-750 mm
- [ ] 751-1,000 mm
- [ ] 1,001-1,500 mm
- [ ] 1,501-2,000 mm
- [ ] 2,001-3,000 mm
- [ ] 3,001-4,000 mm
- [ ] > 4,000 mm

- [ ] sub-humid
- [x] semi-arid
- [ ] arid

The bulk of the precipitation falls in the spring and summer
Thermal climate class: temperate. Temperate with distinct four seasons.

Slope
- [ ] flat (0-2%)
- [ ] gentle (3-5%)
- [ ] moderate (6-10%)
- [ ] rolling (11-15%)
- [x] hilly (16-30%)
- [x] steep (31-60%)
- [ ] very steep (>60%)

Landforms
- [ ] plateau/plains
- [ ] ridges
- [x] mountain slopes
- [ ] hill slopes
- [x] footslopes
- [ ] valley floors

Altitude
- [ ] 0-100 m a.s.l.
- [ ] 101-500 m a.s.l.
- [ ] 501-1,000 m a.s.l.
- [ ] 1,001-1,500 m a.s.l.
- [ ] 1,501-2,000 m a.s.l.
- [x] 2,001-2,500 m a.s.l.
- [x] 2,501-3,000 m a.s.l.
- [ ] 3,001-4,000 m a.s.l.
- [ ] > 4,000 m a.s.l.

Technology is applied in
- [ ] convex situations
- [ ] concave situations
- [ ] not relevant

Soil depth
- [ ] very shallow (0-20 cm)
- [x] shallow (21-50 cm)
- [x] moderately deep (51-80 cm)
- [ ] deep (81-120 cm)
- [ ] very deep (> 120 cm)

Soil texture (topsoil)
- [ ] coarse/ light (sandy)
- [x] medium (loamy, silty)
- [ ] fine/ heavy (clay)

Soil texture (> 20 cm below surface)
- [ ] coarse/ light (sandy)
- [ ] medium (loamy, silty)
- [ ] fine/ heavy (clay)

Topsoil organic matter content
- [x] high (>3%)
- [ ] medium (1-3%)
- [ ] low (<1%)

Groundwater table
- [ ] on surface
- [ ] < 5 m
- [x] 5-50 m
- [ ] > 50 m

Availability of surface water
- [ ] excess
- [ ] good
- [x] medium
- [ ] poor/ none

Water quality (untreated)
- [x] good drinking water
- [ ] poor drinking water (treatment required)
- [ ] for agricultural use only (irrigation)
- [ ] unusable

Water quality refers to:

Is salinity a problem?
- [ ] Yes
- [ ] No

Occurrence of flooding
- [ ] Yes
- [ ] No

Species diversity
- [ ] high
- [x] medium
- [ ] low

Habitat diversity
- [ ] high
- [ ] medium
- [ ] low

CHARACTERISTICS OF LAND USERS APPLYING THE TECHNOLOGY

Market orientation
- [x] subsistence (self-supply)
- [ ] mixed (subsistence/ commercial)
- [ ] commercial/ market

Off-farm income
- [x] less than 10% of all income
- [ ] 10-50% of all income
- [ ] > 50% of all income

Relative level of wealth
- [ ] very poor
- [x] poor
- [x] 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
- [x] groups/ community
- [ ] cooperative
- [ ] employee (company, government)

Gender
- [x] women
- [x] 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
- [x] 15-50 ha
- [ ] 50-100 ha
- [ ] 100-500 ha
- [ ] 500-1,000 ha
- [ ] 1,000-10,000 ha
- [ ] > 10,000 ha

Scale
- [ ] small-scale
- [ ] medium-scale
- [ ] large-scale

Land ownership
- [x] state
- [ ] company
- [ ] communal/ village
- [ ] group
- [ ] individual, not titled
- [ ] individual, titled

Land use rights
- [ ] open access (unorganized)
- [x] communal (organized)
- [ ] leased
- [x] individual

Water use rights
- [ ] open access (unorganized)
- [ ] communal (organized)
- [x] leased
- [ ] individual

Access to services and infrastructure

health	poor	good
education	poor	good
technical assistance	poor	good
employment (e.g. off-farm)	poor	good
markets	poor	good
energy	poor	good
roads and transport	poor	good

drinking water and sanitation — poor ✓ good
financial services — poor ✓ good

IMPACTS

Socio-economic impacts

fodder production — decreased ✓ increased

Highly productive pasture land can be used as hay

fodder quality — decreased ✓ increased

Regulation of livestock grazing in accordance with the state of pastures will improve the quality of pasture fodder

animal production — decreased ✓ increased

Regulation of livestock grazing will improve the body condition of livestock

land management — hindered ✓ simplified

Farmers have to follow the grazing plan developed by Pasture Committee taking into account the state of pastures

farm income — decreased ✓ increased

Improvement of body condition of livestock will allow farmers to earn more income.

Socio-cultural impacts

community institutions — weakened ✓ strengthened

Improved knowledge of new local institutions - Pasture Committees.

SLM/ land degradation knowledge — reduced ✓ improved

Independent assessment of pastures will allow the local community to better understand the problem of their degradation and will enhance their responsibility for their conservation

conflict mitigation — worsened ✓ improved

Grazing plan based on data concerning the state of pasture areas will reduce the number of conflicts

livelihood and human well-being — reduced ✓ improved

Mitigated the degradation of village pastures through reducing trampling by animals. Pasture Committee members were skilled in determining the capacity of pasture land

Ecological impacts

biomass/ above ground C — decreased ✓ increased

Adequate measures taken after an assessment of pastures will increase the biomass of pasture ecosystems

plant diversity — decreased ✓ increased

The use of rotational grazing as a measure to reduce the load on pastures on the basis of their assessment can improve biodiversity of pasture ecosystems

habitat diversity — decreased ✓ increased

Preservation of pasture plants

hazard towards adverse events — improved ✓ reduced

Annual assessment of pasture will make it possible to determine trends and take adequate measures in time.

Off-site impacts

COST-BENEFIT ANALYSIS

Benefits compared with establishment costs

Short-term returns — very negative ✓ very positive
Long-term returns — very negative ✓ very positive

Benefits compared with maintenance costs

Short-term returns — very negative ✓ very positive
Long-term returns — very negative ✓ very positive

The implemented measures on pasture rotation will bring profits in the long term. Balanced seasonal grazing will preserve pastures for future generations.

CLIMATE CHANGE

Gradual climate change

annual temperature increase — not well at all ✓ very well

Climate-related extremes (disasters)

local rainstorm — not well at all ✓ very well
local windstorm — not well at all ✓ very well
drought — not well at all ✓ very well
general (river) flood — not well at all ✓ very well

Other climate-related consequences

reduced growing period — not well at all ✓ very well

ADOPTION AND ADAPTATION

Percentage of land users in the area who have adopted the Technology

- single cases/ experimental
- 1-10%
- 11-50%
- > 50%

Of all those who have adopted the Technology, how many have done so without receiving material incentives?

- 0-10%
- 11-50%
- 51-90%
- 91-100%

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

- 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

- Nutritional condition of animals is enhanced by maintaining and increasing the productivity of pastures, as the pasture capacity will be taken into account for grazing.

  How can they be sustained / enhanced? As soon as all Pasture Committees will be able to develop grazing plans and pasture users will follow it.

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

- Annual monitoring of pastures will make it possible to follow the dynamics of pasture condition and productivity and will allow to plan their use.

  How can they be sustained / enhanced? Monitoring of pastures is a functional responsibility of Pasture Committees. They need to be trained in monitoring.

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

- Many Pasture Committees do not see the need for pasture monitoring. Raise awareness of the Pasture Committees about the need and advantages of such work.

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's viewhow to overcome

- It is necessary to have certain skills and knowledge for the monitoring of pastures Conduct training workshops on pasture monitoring for pasture committees
- The new decentralized system of pasture management is being implemented in the country since 2009. It was started in times of political instability and therefore pasture users are not aware of its details Raise awareness of pasture users and public officers.
- Characteristic of the local mentality is the attitude to pastures as a natural endless gift, in combination with a loss of traditional respect for the pastures which appeared since Kyrgyzstan's independence. Revival of traditional knowledge and skills.

REFERENCES

Compiler
Azamat Isakov

Editors

Reviewer
Fabian Ottiger
David Streiff
Alexandra Gavilano

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Resource persons
Azamat Isakov - SLM specialist
Salamat Dzhumabaeva - SLM specialist
Christoph Wiedemann - SLM specialist

Full description in the WOCAT database
https://qcat.wocat.net/en/wocat/technologies/view/technologies_1137/

Linked SLM data
Approaches: Stimulating the production of winter fodder through micro-crediting
https://qcat.wocat.net/en/wocat/approaches/view/approaches_2466/
Approaches: Mapping as a tool for the development of pasture use plans (in the frame of CACILM)
https://qcat.wocat.net/en/wocat/approaches/view/approaches_2583/

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Project
- n.a.

Key references
- Busler S. «Community Pasture Management in Kyrgyzstan», Bishkek, 2011: CAMP Alatoo PF
- Annual reports of CAMP Alatoo for 2009, 2010, 2011: CAMP Alatoo PF
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