

Introduction and Objectives

The lowlands of the transborder water tower region of the Altay mountains are characterized by a low mean annual rainfall and an increasing competition among farmers for dwindling water resources. Therefore, an effective channel irrigation system is essential to meet water requirements for hay and crop production.

Objective: Survey and assessment of the irrigation system in the river oasis of Bulgan Sum, Mongolia



Figure 1. Irrigation channels in Bulgan, Mongolia, 2013

Materials and Methods

In Bulgan Sum (46°05'37N, 91°32'43E, 1,781 m a.s.l.), agriculture is primarily practiced in the floodplain of the Bulgan river that carries snow melt water from the Altay Mountains to the desert.

The study area comprises 77 km² and is characterized by alluvial soils of the floodplain with a high pH (7.77), and a low concentration of total nitrogen and organic matter (0.53%).

Farmers' irrigation practices were recorded by 33 questionnaires. Additionally, the channel system was mapped and assessed by 83 field surveys. Irrigation amounts and frequency of irrigation events were verified in 6 case-study farms.

Results

Irrigation channels within the study area have a total length of 400 km of which only 21% were reportedly established before 1990.

The general condition of the irrigation channels was poor (laterall water loss); maintenance was needed for 55%. On average, channels were used during five irrigation events per season lasting five month per year. Each channel was shared by an average of six families.

Channel characteristics:

- Average channel length: 0.26 km.
- Channel cross section: 0.05 - 1.08 m².
- Average flow rate: 0.09 m³ sec⁻¹.

Major constraints:

- Lack of machinery to maintain and construct channels.
- Inefficient water use due to poor condition of irrigation channel infrastructure and limited coordination of water distribution among farmers.

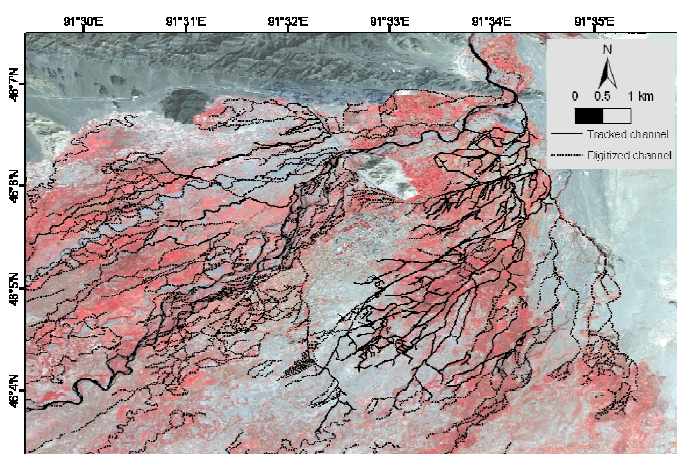


Figure 2. Irrigation map of Bulgan Sum, Mongolia, 2012

Conclusions

Besides permanent maintenance of the channels, water quantity, timing and methods of irrigation should be modified to better match water supply to crop demand.

