

Irrigated crop production in a floodplain river oasis of the Mongolian Altay Mountains

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Conclusions

- The low irrigation water use efficiency calls for an irrigation management strategy adjusted to the crop growing stage and seasonal water availability. In addition to this better maintenance and reconstruction of irrigation canals could alleviate the pressure on scarce water resources.

Introduction & Objectives

- In the border area of Western Mongolia transformation of traditional transhumance systems to sedentary ones, reduction of the Mongolian dependence on Chinese vegetable imports and irrigated crop and hay production is gaining importance as part of herders' risk minimization strategy.
 - Notwithstanding the limited water availability, livelihoods in Bulgan *sum* center depend nowadays largely on water drawn from the Bulgan river and groundwater wells allowing small-scale cultivation of crops, hay and fruits.
- The study aimed to quantify water use and yields for irrigated crop and hay production in a river oasis of Western Mongolia.

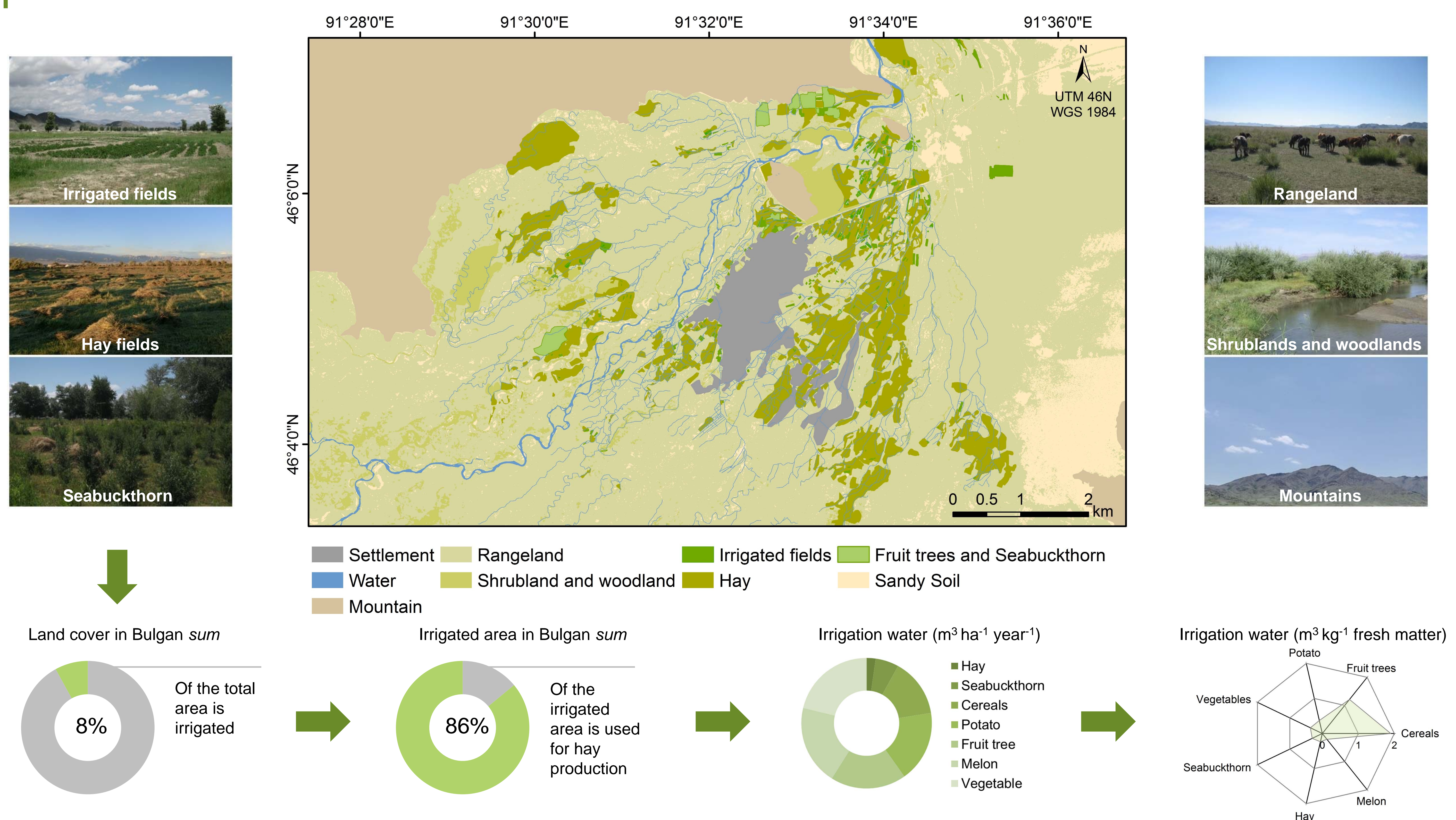


Figure 1. Land cover and land use map including the irrigation canal network (2013) of the river oasis Bulgan *sum* center, Western Mongolia.

Materials & Methods

- Study location: Bulgan *sum*, Western Mongolia (46° 05'N, 91° 32'E, 1182 m) with an average air temperature of 3°C and an average annual rainfall of 75 mm (CV 45%).
- A total of 98 semi-structured questionnaires was used to assess local water management practices.
- On the basis of Pleiades satellite images the extent of irrigated agricultural area was determined using ArcGIS10.3.
- Velocity measurements were conducted by FlowTracker® handheld to determine the irrigation canal discharge.

Results

- Overall, an area of 769 ha received irrigation water drawn from the Bulgan river whereby hay areas accounted for more than 86% (Figure 1).
- Small plot sizes (0.3 ha), little use of fertilizer and low percentage of harvest being sold (23%) indicated extensive subsistence oriented cropping systems.
- Most of the earthen irrigation canal (72%) required urgent maintenance
- A total withdrawal of 555,461 m³ irrigation water was estimated for the (summer) vegetation period.
- Irrigation water consumption varied between 1.6 (cereals) to 0.2 (melons) m³ kg⁻¹ fresh matter (Figure 1).

