

The Role of Yak Milk in Local Development of the Qilian Mountains, Tibetan Plateau, China

The Dilemma between Ecological Security and Local Development in Traditional Socio-Ecosystem

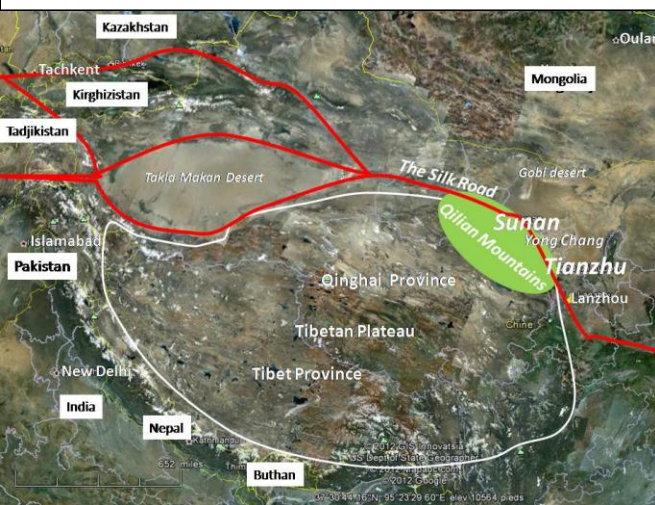
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The Qilian Mountains along the Silk Road, Gansu Province



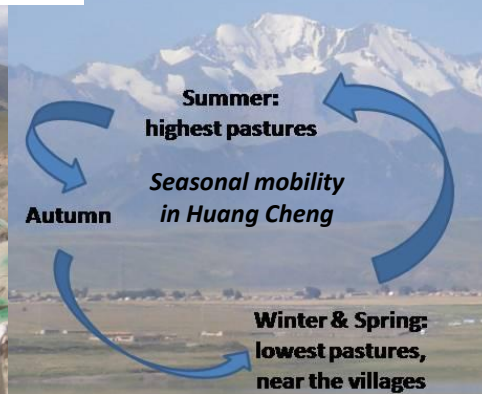
The Great Challenge of the Rangeland Management in China

Rangeland covers around 68% of China, especially in the West and North regions
 ⇒ Sustainable rangeland management is a key-factor of water supply, soil erosion and biodiversity conservation. It directly impacts the national development, both in urban and rural areas, and the future scenarios at local and global scale.
 ⇒ Relevancy of policy to avoid rangeland degradation at local and national level.



Rangeland in the Sunan County (Huang Cheng, left) and the Tianzhu County (right)

The yak milk production is based on small family farm, grazing and herd mobility



A typical small family farm # 2-3 persons, 40-80 yaks, 150-200 sheep + some goats

The yak milk production is low at farm level:
 # 1-2l/day/dairy yak from April-May to October
 But good food quality, especially fat and protein

Performance and yak milk composition in different seasons. Values without a common superscript are different at $P < 0.05$ (* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$)

| Item | July | Sept | Nov | March | SEM | P-value ¹ |
|-------------------------------|-------------------|--------------------|--------------------|--------------------|-------|----------------------|
| Number of yaks | 10 | 10 | 10 | 4 | | |
| Body weight ¹ , kg | 284 ^c | 324 ^a | 307 ^b | 243 ^d | 3.5 | *** |
| Milk yield, kg/day | 1.15 ^a | 0.74 ^b | 0.22 ^c | 0.15 ^c | 0.039 | *** |
| FCM ² kg/day | 1.18 ^a | 0.92 ^a | 0.32 ^b | 0.28 ^b | 0.082 | *** |
| Fat, g/100g | 4.15 ^b | 5.59 ^{ab} | 7.13 ^{ab} | 9.98 ^a | 0.994 | ** |
| Protein, g/100g | 5.93 ^b | 6.30 ^{ab} | 6.84 ^a | 6.52 ^{ab} | 0.253 | * |

¹ Estimated girth circumference/² milk corrected to 4g/100g; fat=0.4×actual milk yield (kg/d)+15×milk fat (kg/d)

Milk production is just one of the multi-functions of yak herd:
 home consumption of dairy products, income of sales (butter, yogurts, calves ...) savings, manure for heating, wool & hairs, land access ... in harsh cold conditions in winter and spring

Other relevant considerations about the yak milk development

Low attractive for youth High potential for ecotourism Social network strength



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Conclusion: Livestock farming systems in the Qilian Mountains are complex due to the multi-functions of the herd and the interactions between them. They also are efficient regarding the resources and conditions. The yak milk is already a key-factor of local development. Increase the contribution is not easy to imagine. It has to be planned linked to a sustainable rangeland management and viable livelihood of local society through an integrated and participative research & development program.

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