



Cattle on Lolldaiga Ranch (Michael Herger)

Lolldaiga Hills Ranch: Rotational Grazing and Boma-Based Land Reclamation (肯尼亚)

描述

Lolldaiga Hills ranch is a private ranch and conservancy with livestock production and tourism. Rotational grazing is used to manage livestock on semi-arid lands with limited water resources. Bare land is recovered by a "Boma" technology – strategic corralling of animals overnight on degraded land.

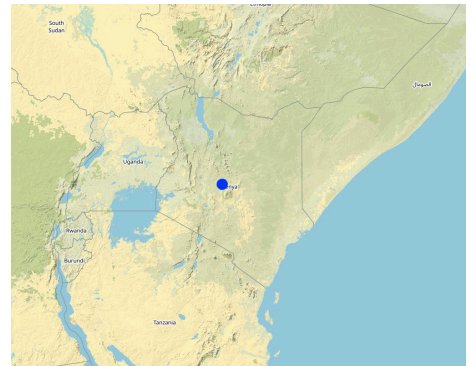
Livestock production on Lolldaiga Hills ranch is managed under an extensive grazing system for dairy, beef, sheep and camel production, with strategic fattening and selling, in harmony with conservation principles. The conservancy is dedicated to the sustainable conservation of critical habitat and wildlife. The ranch serves also as a training ground for the British Army. Grazing is managed without fixed blocks. Grazing areas vary considerably, depending on rainfall and location within the farm. Similarly, grazing duration in one area also varies significantly (from two weeks to eight months). Starting after the long rains (April to May), livestock are moved gradually from north to south: movement only occurs when areas are completely grazed. They stay for about four months in the north and eight months in the south – due to better grass in the southern part. Some of the dry season grazing is land set aside for later use. They use, for instance, highland forests in the west where zebra and other livestock are largely absent. During the rains, grazing takes place on a much smaller area than during the dry season, where water can be a major challenge. Livestock are kept together, though steers/heifers/breeding cows/resting bulls are separated into different herds of 90-150 units per herd. But these are not tightly "bunched" as in other ranches in the area which apply "Holistic Management" principles, since bunching is not appropriate due to strong wind erosion. The closer livestock are aggregated, the more damage – that is dust generated – in dry areas. As is typical of private ranches in Laikipia, Lolldaiga supports some of the highest densities of wildlife in Kenya. The wild herbivore biomass density on private ranches is estimated by Georgiadis (2007) at 14 ha /TLU.

Whilst the livestock is moving, large bomas (corrals in Kiswahili) are constructed for the herds. Here, animals are closely together kept in protective enclosures overnight. Bomas are strategically sited on bare areas to recover the land through dung accumulation and breaking soil crusts by hooves. Currently, there are 20 bomas covering an area of 0.02 km² (0.01% of their land). This can be taken to represent the area that can be restored each year. Boma sites are steadily but slightly shifted. On average, one boma is located on the same denuded patch for only one to two weeks during the dry season, and again for one week during the wet season.

In a single boma of 0.1 ha, 400 cows are corralled. Former bare patches with bomas have recovered well after just a few years. Results of a boma site comparison (see Herger 2018) have shown how bomas turn into ecological hotspots with a long-lasting effect. Amounts of soil organic carbon (SOC), as well as macro- and micronutrients in topsoil (especially) and subsoil of former boma sites were much higher than reference sites close-by. The chronology of former boma sites (1, 5, 9 years ago) also played a decisive role in soil parameters. Former boma sites from 5 and 9 years ago performed better than the most recent boma (1 year ago).

On the ranch, due to lack of rains, fodder supplements had to be purchased in 2016. However, it is usually water and not grazing that is the limiting factor on the rangeland. Whereas cattle are sold to the leading meat producer "Farmer's Choice" (80% for domestic distribution, 20% for export to neighbouring countries and the Middle East), sheep are sold to East African Seafood (Nairobi) and camels to Somalis in town and local butcheries. Lolldaiga also assists community grazing. The ranch helps neighbouring group ranches by allowing them access to their land for fattening purposes, but mostly as a grass bank during droughts (sometimes charging a small fee, sometimes none). During dry spells, they host on average 500-1000 heads from other communities. Along their fence informal (strictly "illegal") grazing of goats and sheep is tolerated.

地点



地点: Laikipia, 肯尼亚

分析的技术场所数量: 单一场所

选定地点的地理参考

• 37.12663, 0.2825

技术传播: 均匀地分布在一个区域 (200.0 km²)

在永久保护区? :

实施日期: 10-50年前

介绍类型

☒ 土地使用者创新
☐ 作为传统系统的一部分
☐ 在实地 / 研究期
☐ 额外目标



Former boma (corral) (Michael Herger)



Former camel boma (corral) (Michael Herger)

技术分类

主要目的

- ☒ 改_进 生产
- ☒ 减少、_进 _进 、恢复土地_进 化
- ☒ 保护生态系统
- ☐ 结合其他技术保护流域/下游区域
- ☒ 保持/提_进 生物多样性
- ☐ _进 低灾害_进 _进
- ☐ _进 应气候变化/极端天气及其影响
- ☐ 减缓气候变化及其影响
- ☐ 创_进 有益的经济影响
- ☐ 创_进 有益的社会影响

土地利用



牧场

- 经_进 牧场

动物类型: _进 _进 绵羊, cattle

产品和服务: 肉类, 奶类, 毛料

品种	计数
绵羊	1800
_进	140



定居点、基础设施 - 定居点、建筑物

注_进 : Few facilities for tourism. Few farm houses.

供水

- ☒ _进 养
- ☐ 混合_进 水灌溉
- ☐ 充分灌溉

土地退化相关的目的

- ☐ _进 止土地_进 化
- ☒ 减少土地_进 化
- ☒ 修复/恢复严_进 _进 化的土地
- ☐ _进 应土地_进 化
- ☐ 不_进 用

解决的退化问题



土壤水蚀 - Wt_进 _进 土流失 侵_进, Wg_进 冲沟侵_进沟_进



土壤风蚀 - Et_进 _进 土流失



物理性土壤退化 - Pc_进 压实k_进 熟化和结壳i_进 _进 土



生物性退化 - Bc_进 植_进 _进 盖的减少 栖息地丧失Bq_进 数_进生物
_进 减少Bs_进 _进 _进 和物种群柱的下_进, BI_进 土壤寿命损失

SLM组

- 畜牧业和牧场管理
- 改_进 的地_进植_进 _进 盖

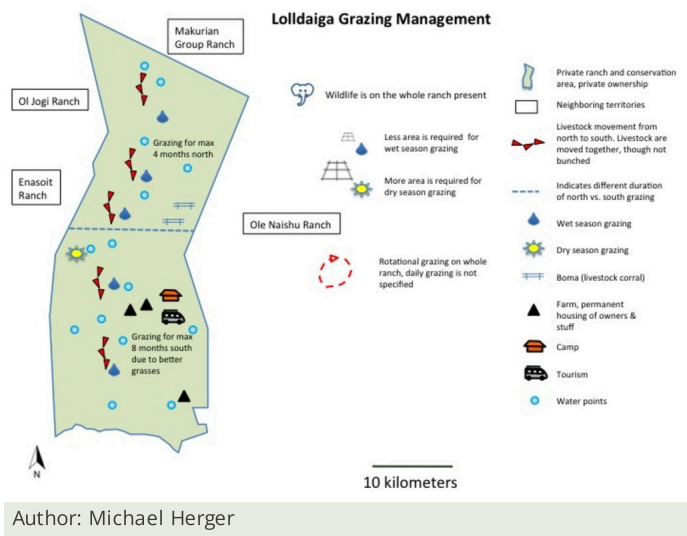
SLM措施



管理措施 - M2_进 改变管理强度级别, M4_进 活动时_进 安排的_进 大_进

技术图纸

技术规范



技术建立与维护活动、投入和成本

投入和成本的计算

- 计算的成本为每个技术单位 **Only livestock production related: Herders, animals treatment**
- 成本计算使用的美元
- 汇率 换算为美元 1 美元 = 不 用
- 用劳工的每日平均工 成本5

影响成本的最重要因素

Labor

技术建立活动
n.a.

- 技术维护活动
- Herders, supervisors, watchmen etc (时 / 率None)
 - Animal treatments (vaccination, spraying, injections) (时 / 率None)

技术维护的投入和成本 (per Only livestock production related: Herders, animals treatment)

对投入进行具体说明	单位	数量	单位成本 (美元)	每项投入的总成本 (美元)	土地使用者承担的成本%
劳动力					
Herders/employees	Person*days	36000.0	4.5	162000.0	
其它					
Animals treatments	Per TLU	3920.0	11.0	43120.0	
技术维护所需总成本				205'120.0	
技术维护总成本 美元				205'120.0	

自然环境

年平均降雨量

- < 250毫米
- ☒ 251-500毫米
- 501-750毫米
- 751-1,000毫米
- 1,001-1,500毫米
- 1,501-2,000毫米
- 2,001-3,000毫米
- 3,001-4,000毫米
- > 4,000毫米

农业气候带

- 潮湿的
- 半湿润
- ☒ 半干旱
- 干旱

关于气候的规范

以毫米为单位 算的年平均 376.0

Rainfall gauge Lolldaiga Northern gauge average from 2013-2016.

Strong local (and temporal) variation, changing rainfall regimes.

气站名称Rainfall gauge Lolldaiga Northern Gate

斜坡

- 水平 0-2%
- ☒ 缓 3-5%
- ☒ 平缓 6-10%
- 滚坡 11-15%
- 崎岖 16-30%
- 峭 31-60%
- 常 峭 0%

地形

- ☒ 平原
- 山
- 山坡
- ☒ 山地斜坡
- 坡
- 底

海拔

- 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.
- 2,001-2,500 m a.s.l.
- 2,501-3,000 m a.s.l.
- 3,001-4,000 m a.s.l.
- > 4,000 m a.s.l.

.....应用的技术

- 凸形情况
- 凹情况
- 不相关

土壤深度

- 常浅 0-20厘米
- 浅 21-50厘米
- ☒ 中等深度 51-80厘米
- 深 81-120厘米

土壤质地 (表土)

- ☒ 粗粒 砂
- ☒ 中粒 壤土、粉土
- 细粒 粘土

土壤质地 (地表以下>20厘米)

- ☒ 粗粒 砂
- ☒ 中粒 壤土、粉土
- 细粒 粘土

表土有机质含量

- 3%
- ☒ 中 1-3%
- 低 <1%

地下水位

- ☐ 上
- ☐ < 5米
- ☐ 5-50米
- ☐ > 50米

地表水的可用性

- ☐ 好
- ☒ 中等
- ☐ 匮乏/没有

水质（未处理）

- ☐ 好用水
- ☒ 不好用水
- ☐ 仅供农业使用
- ☐ 不可用
- 处理
- 灌溉
- 水
- 参考

盐是个问题吗？

- ☐ 是
- ☒ 否

洪水发生

- ☐ 是
- ☒ 否

物种多样性

- ☒ 高
- ☐ 中等
- ☐ 低

栖息地多样性

- ☒ 高
- ☐ 中等
- ☐ 低

应用技术的土地使用者的特征

市场定位

- ☐ 生产/给
- ☐ 混合生产/商业
- ☒ 商业/市场

非农收入

- ☐ 低于全收入%
- ☒ 收入的10-50%
- ☐ > 收入的50%

相对财富水平

- ☐ 常穷
- ☐ 穷
- ☐ 平均水平
- ☐ 丰富
- ☒ 非常丰富

机械化水平

- ☒ 手工作业
- ☐ 畜力牵引
- ☐ 机械化/电动

定栖或游牧

- ☒ 定栖的
- ☐ 半游牧的
- ☐ 游牧的

个人或集体

- ☒ 个人/家庭
- ☐ 团体/社区
- ☐ 合作社
- ☐ 员工/公司、政府

性别

- ☐ 女人
- ☒ 男人

年龄

- ☐ 儿童
- ☐ 青年人
- ☒ 中年人
- ☐ 老年人

每户使用面积

- ☐ < 0.5 公
- ☐ 0.5-1 公
- ☐ 1-2 公
- ☐ 2-5公
- ☐ 5-15公
- ☐ 15-50公
- ☐ 50-100公
- ☐ 100-500公
- ☐ 500-1,000公
- ☐ 1,000-10,000公
- ☒ > 10,000公

规模

- ☐ 小模的
- ☐ 中等模的
- ☒ 大模的

土地所有权

- ☐ 州
- ☐ 公司
- ☐ 社区/村庄
- ☐ 团体
- ☐ 个人未命名
- ☒ 个人有命名

土地使用权

- ☐ 由无组织
- ☐ 社区有组织
- ☐ 租
- ☒ 个人

用水权

- ☐ 由无组织
- ☐ 社区有组织
- ☐ 租
- ☒ 个人

进入服务和基础设施的通道

- 健康
- 教
- 技术援助
- 就业例如农
- 市场
- 源
- 和交
- 用水和卫生施
- 服务
- 好
- 好
- 好
- 好
- 好
- 好
- 好
- 好
- 好
- 好

影响

社会经济影响

社会文化影响

生态影响

场外影响

成本效益分析

与技术建立成本相比的效益

与技术维护成本相比的效益

气候变化

应用

采用该技术的地区内土地使用者的百分比

- ☒ 单例/实例
- ☐ 1-10%
- ☐ 11-50%
- ☐ > 50%

在所有采用这种技术的人当中，有多少人在没有获得物质奖励的情况下采用了这种技术？

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

户数和/或覆盖面积

Similar practices, but different. Most ranches implement Holistic Management.

最近是否对该技术进行了修改以适应不断变化的条件？

- ☐ 是
- ☒ 否

什么样的变化条件？

- ☐ 气候变化/极端气候
- ☐ 不断变化的市场
- ☐ 劳动力可用性 ☐ 例如 ☐ 由于 ☐ 移 ☐

总结和吸取的教训

长处: 土地使用者的观点

- Ability to allow the land to recover.
- Drought resilience.

弱点/缺点/风险: 土地使用者的观点如何克服

弱点/缺点/风险: 编制者或其他关键资源人员的观点如何克服

长处: 编制者或其他关键资源人员的观点

- The listed advantages from Lance Tomlinson, the land user, are shared by the compiler's view. Lolldaiga has moderate stocking rates and good management, resulting in an overall fairly good condition of the rangeland. However, there are some bare patches, invasive species, and erosion features, also because of the influence of the neighbouring group ranch "Makurian".

参考文献

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资源人

Lance Tomlinson - 土地使用者

WOCAT数据库中的完整描述

https://qcat.wocat.net/zh/wocat/technologies/view/technologies_2982/

链接的SLM数据

☐ 不 ☐ 用

文件编制者

机构

- ☐ 不 ☐ 用
- ☐ 目

- Book project: Guidelines to Rangeland Management in Sub-Saharan Africa (Rangeland Management)

主要参考文献

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