Dedication

Peace and Prayers to Great Grophet Mohammed

I dedicate this research

To my mother

To spirit of my father

To all my family and friends

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Researcher

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Abbreviations and Acronyms

Masl	Meter above Sea level.
DM	Dry Matter.
UNDP	United Nation of Development Program.
IIED	International Institute for Environment and Development.
IES	Institute of Environmental Studies.
CAPRI	Collective Action and Property Rights.
FAO	Food and Agriculture Program.
HCENR	Higher Council for Environment and Natural Resources.
CBRRP	Community Based Rangeland Rehabilitation Project for Carbon Sequestration and Biodiversity.
GEF	Global Environment Fund.
PCQ	Point-Centered Quarter.
GPS	Global Positional System.
GIS	Geographical Information System.
Ha	Hectare.
Kg	Kilo gram.

ABSTRACT

This work was conducted at Gireigikh Rural Council, Bara Province in North Kordofan State. The objectives of the study were to investigate the effect of protection, through enclosure, on productivity and quality of range. The parameters measured and used as indicators in the evaluation of range were biomass production, botanical composition, density of herbaceous and browse plants, cover, frequency and available browse production. The measurements were done at two sites Eyal Ali which has an enclosure and Mereikha which has no protected site and was open to grazing and other human activities.

A socioeconomic survey was also conducted with the objective to shed light on the prevailing production systems and ways of living which hopefully will provide an explanation for some of differences in the results that may be found between communities that had access to the project and thereby have enclosures and those that were not part of the project and have only open access land.. A questionnaire was developed and was implemented through group discussions with ten selected communities five with an enclosure and five without.

The results obtained from this study showed that biomass production of rangeland from the herbaceous layer in the enclosure was 635 kg DM /ha compared with 439kg DM /ha for the open access site. Plant cover was 75.6 and 29.4% in the protected and open access sites respectively. The available browse production was 1,538 and 209 kg/ha in each of the sites respectively. The density of herbaceous plants was 642 plant/ in the protected site and 216 plant / m^2 in the unprotected site. The densities of trees and shrubs in the two sites were in the range of 129 and 34 trees / ha respectively. The diversity of species composition was limited in the protected site compared with the unprotected site (Four vs. seven species respectively). This may be explained by the fact that while no reseeding was practiced in the enclosure, new seeds were always introduced in the open access area through animals and various human activities.

From the socioeconomic survey it was found that the project intervention was manifested mainly in the provision of services such as education, water, health and the enclosures that maintained their animals in dry season (summer). Lands of the communities under the common system (unprotected) were suffering from overgrazing, desertification, encroachment of sand dunes and shortage of forages and water during dry season.

The area of the enclosure of 18 ha was intended for piloting. It does not give a good demonstration for the communities as an alternative that provides sufficient feed for their livestock. Future attempts should consider areas large enough to provide feed that sustains a larger portion of the community's livestock.

It can be concluded that the enclosure system contributed positively to improving the rangeland resources while the open access resulted in severe deterioration of rangeland resources. Enclosures are a better tool for sustainable management of rangeland resources compared with open access systems.

ملخص الدراسة

اجريت هذه الدراسة بمنط قة جريجخ – محلية بارا – ولاية شمال كردفان . هدفت الدراسة الي معرفة تأثير الحماية) المحميات(علي انتاجية وجودة المرعي. والابعاد التي تم قياسها (انتاجية المراعي من المادة الجافة ،التركيب النوعي، كثافة الغطاء العشبي والشجري، نسبة التغطية النباتية، التردد والعلف الشجري المتاح) والتي استخدمت كمؤشرات لت قييم المرعي. هذه ال قياسات تم اجراءها بـ قرية عيال علي كمنط قة محمية و قرية مريخة كمنط قة رعي مفتوح.

المسح الاجتماعي الا قتصادي كان من ضمن اهداف الدراسة وذلك لتسليط الضوء علي نظام الانتاج المشاع ومستوي حياة هذه المجتمعات. وتم عمل استبيان عن طريق استخدام المنا قشة الجماعية وتم اختيار عشر مجتمعات (خمس بها محميات وخمس ليست بها محميات). و قد رصدت اختلافات في النتائج بين المجتمعات تحت نظام المحميات والمجتمعات تحت نظام الرعي المفتوح.

خلصت الدراسة الي ان انتاجية المراعي من المادة الجافة بلغت 635 كجم/ هكتار داخل المحمية مـ قارنة بخارجها حيث بلغت 439 كجم/ هكتار .كما بلغت نسبة التغطية النباتية حوالي 75.6 و 29.4 % داخل وخارج المحمية علي التوالي .كذلك بلغت انتاجية العلف الشجري المتاح 1538 و 209 كجم/ هكتار على التوالي في كل منط قة. كما وجد ان كثافة الغطاء العشبي بلغت 642 نبات/ م ^{2} في المنط قه المحمية و 216 نبات/ م ^{2} في

المنط قة غير المحمية . وبلغت كثافة الاشجار والشجيرات في المنط قتين 129 و 34 شجرة/ هكتار علي التوالي. كما وجد ان التباين في التركيب النوعي للنباتات محدود في المنط قة المحمية مـ قارنة بغير المحمية, وربما يعزي ذلك لعدم وجود اي نشاط كنثر البذور داخل المحمية بينما خارجها يعزي تنوع التركيبة النباتية الى ادخال بذور الى المنط قة عبر رعي الحيوانات المستمر ونشاطات الانسان.

من خلال المسح الاجتماعي وجد ان المحمية ادت الي تنمية تلك المجتمعات المحليةعن طريق تـ قديم الخدمات الاساسية (التعليم، المياه والصحة) كما وجد ان المحمية تعمل علي حفظ حيواناتهم اثناء الموسم الجاف (فترة الصيف) بينما نجد ان اراضي المجتمعات تحت نظام الرعي المفتوح تعاني من رعي جائر، تصحر، زحف كثبان رملية ونـ قص في الغذاء والماء اثناء الموسم الجاف.

وجد ان مساحة المحمية (18 هكتار) غير كافية لحفظ جميع حيوانات الـ قرية لذلك عند الحاجة الي انشاء مزرعة رعوية لابد من زيادة مساحة المحمية لكي تتناسب والحمولة الرعوية للمرعي.

خلصت الدراسة الي ان نظام المحميات يساهم في تحسين موارد المراعي بينما نظام الرعي المفتوح يؤدي الي تدهور الموارد الرعوية. ووجد ان نظام المحميات هو افضل اداة لاستدامة اداره الموارد الرعوية مـ قارنة بنظام الرعي المفتوح.