DEDICATION

To the Great prophet Mohammed

(Peace and prayers be Upon him),,

To my big family (father, mother, sisters and brother),,

To my small Family, my Husband and Children,,

To my friends in Range and Pasture General,, Directorate

To you,,

Fatima Siddig Alhadi Mohammed

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ACRONYMS AND ABBREVIATIONS

ANOVA	Analysis of Variance
ASM	Artisanal and Small-scale Mining
ASGM	Artisanal and Small Scale Gold Mining
CBNRM	Community Based Natural Resource Management
ECAW	Enhancing Adaptation to Climate Change in Agriculture and Water Resources
FAO	Food and Agriculture Organization
FNC	Forests National Corporation
GDP	Gross Domestic Product
HTS	Hunting Technical Services
IES	Institute of Environmental Studies
IFAD	International Fund for Agricultural Development
IIED	International Institute for Environment and Development.
MARF	Ministry of Animal Resources and Fisheries
MEA	Multilateral Environmental Agreements
NGOs	Non-Governmental Organizations
RPGD	Range and Pasture General Directorate.
SAS	Statistical Analysis System
SCBD	Secretariat of the Convention on Biological Diversity
SNAS	Sudanese National Academy of Sciences
SPSS	Statistical Package for Social Sciences
SRM	Society for Range Management.
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USDA	United States Department of Agriculture
WB	World Bank
WRI	World Resources Institute

ABSTRACT

This study was conducted in Al-Sobag area at Gedarif State-Sudan in October 2018. The study aimed to assess the impacts of gold mining on rangeland vegetation and socio-economic aspects of local communities. The study area was chosen as a range site representing these rangelands affected by gold mining. Two range sites were selected (Site A) that affected by gold mining activities and (Site B) did not affected in the same zone. Each site was divided into four plots were selected randomly. Four lines transects with a specific angles used compass at each range site, to estimate vegetation attributes and soil seed bank. The socio-economic data were collected through general survey, observations and questionnaire. Four villages namely (Al-Bougaa- Al-Rbdaa Abogola and Al-Tokoon) were selected randomly from the total villages surrounding the mined sites. A total of 60 Households randomly selected which constituted about 10% of the total number of households in these villages, which approximately about (600) families. Data were analyzed for vegetation attributes; organized, tabulated and analyzed using standard range measurements equations. All data tested by statistical analysis by using (SAS) program using (ANOVA) and Duncan procedure, to compare differences in vegetation attribute and seed bank in the two areas. The socio-economic data were analyzed using the Statistical Package for Social Sciences (SPSS) software (Ver. 20.0) by computing descriptive statistics. The main findings of this study according to the vegetation attributes showed that there were significant differences between percentages of ground cover in terms of bare soil, rocks, litter and plant cover in the location close to the mining activities, there are increased in the proportion of bare soil (56.37%) compared to the plant cover (2.25%).While there are no significant differences between the components of ground cover in the range site which is far from the mining area. Beside that the affected range site by gold mining activities was recorded the same percentage of live and dead seeds (50%), while the unaffected range site was recorded (31.6%) and (68.4%) for live and dead seeds respectively. The findings of socio-economic aspects results indicated that about of (58.3%) respondents within the active mining sites agreed that there are negative impacts of gold mining exploitations on soil of rangeland. Also the study revealed that about (95%) of respondents agreed that gold mining activities affected negatively on the animal correlated the problems facing livestock and (85%) they said that the mining exploitation had impacted negatively in human health. The study concludes that the increase of bare soil percentage, vegetation cover retrogression and decrease biomass productivity and range carrying capacity in the study range sites were main range condition

indicators of the impact of gold mining in these rangelands. The majority of respondents (61.7%) said the rangelands were deteriorated after gold mining appeared in Al-Sobag area. Therefore, the study recommends that: The implementation and integration of best practices for environmentally responsible extraction of gold from mining sites could also reduce the adverse effects of artesian gold mining on natural resources. Rehabilitation efforts are required to overcome the impacts of gold mining activities on sustainable range land management, and reseeding the range sites with the desirable plant species.

المستخلص

أجريت هذه الدراسة في منطقة الصباغ بولاية القضارف – السودان في أكتوبر 2018. هدفت هذه الدراسة إلى تقييم آثار تعدين الذهب على الغطاء النباتي للمراعي الطبيعية ودراسة الجوانب الاجتماعية والاقتصادية للمجتمعات المحلية. تم اختيار موقعين (أ) المتأثر بأنشطة تعدين الذهب و الموقع الآخر (ب) غير متأثر بالتعدين في نفس النطاق البيئي بمنطقة الصباغ بصورة عشوائية ومن ثم تم تحديد أربعة خط عينة (Transect) بزوايا محدده باستخدام البوصلة، كل خط عينة (زاوية) يتم تقسيمه الي خطين 100 متر كخط عينة أول ثم تترك مسافة 100 متر كفاصل دون قياسات ثم 100 كخط عينة ثاني ليصبح طول خط العينة 300 متر، لتقدير الغطاء النباتي ومخزون البذور في التربة. جمعت البيانات المتعلقة بالتعدين عن الذهب وتأثيرها على الجوانب الاجتماعية والاقتصادية للأسر من خلال المسح العام والملاحظات والاستبيان. اختير عدد أربعة قرى بصورة عشوائية وهي (البقعة – الربداء – التكون وأبوجوله) من مجموع القرى المحيطة بالمواقع المتأثرة والتي شملت عدد 60 أسرة والتي تمثل حوالي 10 ٪ من مجموع عدد الأسر في هذه القرى حيث بلغت 600 أسرة. تم تحليل البيانات الخاصة بالغطاء النباتي من خلال برنامج التحليل الإحصائي(SAS) باستخدام طريقة (ANOVA) و Duncan ، لمقارنة الاختلافات في الغطاء النباتي ومخزون البذور في الموقعين وتمت مقارنة الفروقات. كذلك تم تحليل البيانات الاجتماعية والاقتصادية باستخدام برنامج الحزمة الإحصائية للعلوم الاجتماعية (SPSS) (الإصدار 20) عن طريق حساب الإحصاءات الوصفية. تم عرض تحليل النتائج في شكل تكرارات ونسب مئوية بالإضافة للمخططات والرسوم البيانية والجداول. أظهرت النتائج الرئيسية لهذه الدراسة أن هنالك فروقات واضحة في نسبة التغطية من حيث التربة العارية والصخور وبقايا النباتات والغطاء النباتي في الموقع المتأثر بالتعدين، وهناك زيادة في نسبة تربة العارية (56.37٪) مقارنة بالغطاء النباتي (2.25٪)، بينما لا توجد فروقات معنوية في التغطية الارضية بالموقع البعيد عن منطقة التعدين. إلى جانب ذلك سجل الموقع المتأثر بتعدين الذهب نفس نسبة البذور الحية والميتة والتي بلغت (50 ٪)، بينما الموقع غير المتأثر بالتعدين سجل (31.6 ٪) و (68.4 ٪) للبذور الحية والميتة على التوالي. النتائج الرئيسي الجوانب الاجتماعية والاقتصادية تشير أن حوالي (58.3٪) من المستجوبين اكدو وجود تأثيرات سلبية للتعدين على تربة المراعي. كما أوضحت الدراسة أن حوالي (95 ٪) من المستجوبين أن تعدين الذهب أثر سلباً على الحيوانات بينما (85 ٪) منهم أوضحوا أن استغلال التعدين قد أثر سلبا على صحة الإنسان بالمنطقة. خلصت الدراسة إلى أن زيادة نسبة التعرية وتراجع الغطاء النباتي وانخفاض إنتاجية الكتلة الحيوية والحمولة الرعوية في الموقع الرعوي هي مؤشرات رئيسية

تأثير تعدين الذهب مراعي المنطقة. غالبية المستهدفين بنسبة (61.7٪) أكدوا أن المراعي تدهورت بعد ظهور تعدين الذهب في منطقة الصباغ. ولذلك، توصي الدراسة بتوحيد وتنفيذ أفضل التقنيات في عمليات إستخراج الذهب للمحافظة علي البيئة بمواقع التعدين والتي بدورها تنعكس علي الموارد الطبيعية بالمنطقة. كما يجب العمل علي إعادة تأهيل المواقع المتأثرة للتغلب علي الانشطة الخاصة بالتعدين للوصول الي إدارة سليمة ومستدامة من خلال إعادة الاستزراع بالنباتات الرعوية المرغوبة وذات القيمة العالية غذائيا وبيئيا.