15

LIFE ON LAND

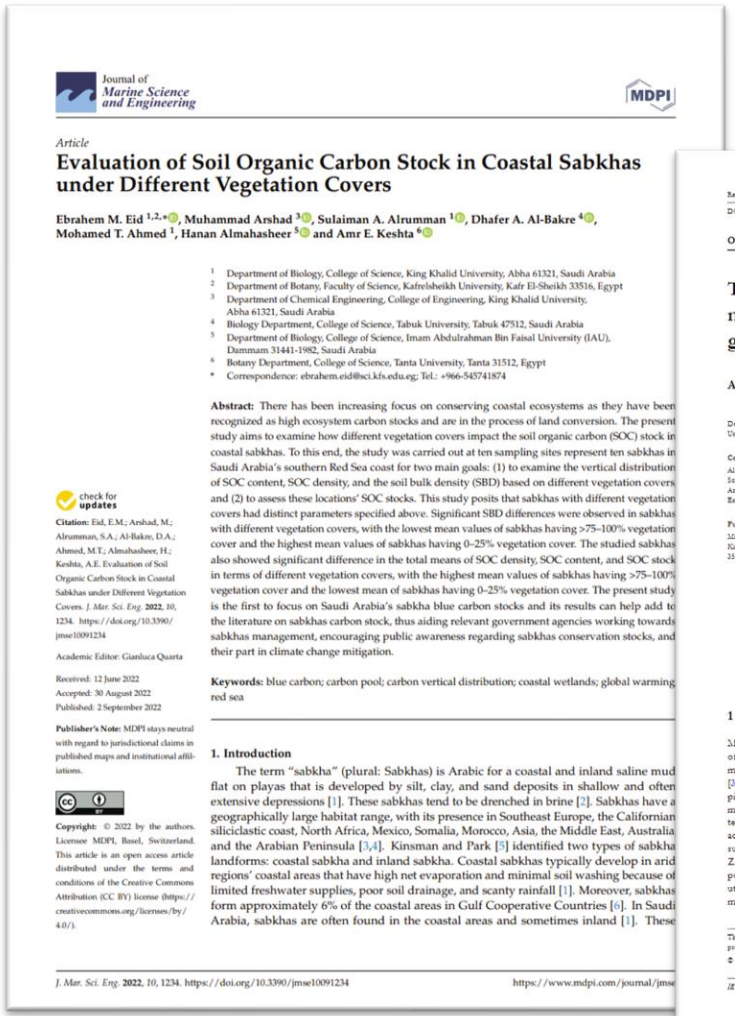
الحياة في البر

SDG 15: Life On Land

الهدف 15 : الحياة في البر

15.1 Research on land ecosystems

الأوراق العلمية في مجال النظم البيئية



Journal of Marine Science and Engineering

MDPI

Article

Evaluation of Soil Organic Carbon Stock in Coastal Sabkhas under Different Vegetation Covers

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Abstract: There has been increasing focus on conserving coastal ecosystems as they have been recognized as high ecosystem carbon stocks and are in the process of land conversion. The present study aims to examine how different vegetation covers impact the soil organic carbon (SOC) stock in coastal sabkhas. To this end, the study was carried out at ten sampling sites represent ten sabkhas in Saudi Arabia's southern Red Sea coast for two main goals: (1) to examine the vertical distribution of SOC content, SOC density, and the soil bulk density (SBD) based on different vegetation covers and (2) to assess these locations' SOC stocks. This study posits that sabkhas with different vegetation covers had distinct parameters specified above. Significant SBD differences were observed in sabkhas with different vegetation covers, with the lowest mean values of sabkhas having >75–100% vegetation cover and the highest mean values of sabkhas having 0–25% vegetation cover. The studied sabkhas also showed significant difference in the total means of SOC density, SOC content, and SOC stock in terms of different vegetation covers, with the highest mean values of sabkhas having >75–100% vegetation cover and the lowest mean of sabkhas having 0–25% vegetation cover. The present study is the first to focus on Saudi Arabia's sabkha blue carbon stocks and its results can help add to the literature on sabkhas carbon stock, thus aiding relevant government agencies working towards sabkhas management, encouraging public awareness regarding sabkhas conservation stocks, and their part in climate change mitigation.

Keywords: blue carbon; carbon pool; carbon vertical distribution; coastal wetlands; global warming; red sea

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Citation: Eid, E.M.; Arshad, M.; Alrumman, S.A.; Al-Bakre, D.A.; Ahmed, M.T.; Almahasheer, H.; Keshta, A.E. Evaluation of Soil Organic Carbon Stock in Coastal Sabkhas under Different Vegetation Covers. *J. Mar. Sci. Eng.* **2022**, *10*, 1234. https://doi.org/10.3390/jmse10091234

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1. Introduction

The term "sabkha" (plural: Sabkhas) is Arabic for a coastal and inland saline mud flat on playas that is developed by silt, clay, and sand deposits in shallow and often extensive depressions [1]. These sabkhas tend to be drenched in brine [2]. Sabkhas have a geographically large habitat range, with its presence in Southeast Europe, the Californian siliciclastic coast, North Africa, Mexico, Somalia, Morocco, Asia, the Middle East, Australia and the Arabian Peninsula [3,4]. Kinsman and Park [5] identified two types of sabkha landforms: coastal sabkha and inland sabkha. Coastal sabkhas typically develop in arid regions' coastal areas that have high net evaporation and minimal soil washing because of limited freshwater supplies, poor soil drainage, and scanty rainfall [1]. Moreover, sabkhas form approximately 6% of the coastal areas in Gulf Cooperative Countries [6]. In Saudi Arabia, sabkhas are often found in the coastal areas and sometimes inland [1]. These

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ORIGINAL RESEARCH

Toxicity of *Ulva lactuca* and green fabricated silver nanoparticles against mosquito vectors and their impact on the genomic DNA of the dengue vector *Aedes aegypti*

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Abstract

Marine seaweeds are known to have a potential role against microbial and pesticidal activities. *Ulva lactuca*, a green macroalgae extract analysed through gas chromatography mass spectrometry reveals 31 compounds. Resistance of mosquito vectors to synthetic insecticides remains a major problem. Discovering and applying natural agents to act against disease vectors is challenging. The activities of the extract and nano-fabricated green synthesised silver nanoparticles were checked for use against *Aedes aegypti* and *Culex pipiens*. The crude extract and synthesised silver nanoparticles exhibited a notable larvicidal effect, and very effective inhibition of pupal and adult emergence. Inhibition of adult emergence of *Ae.aegypti* was 97.7% and in *Cu.pipiens*, it was 93.3%. Our genotypic study of Deoxyribonucleic acid from treated larvae utilising random primers MA-09, MA-12 and MA-26 revealed damaged nucleotide sequences when compared with the controls. The antimicrobial activity of both the extract and green synthesised nanomaterials showed prominent activity against pathogenic drug resistant bacteria. Our results contribute to further development of eco-friendly insecticides with lower cost of preparation. This could further contribute to further research helping future generations to be free from these deadly disease-causing vectors and pathogenic microbes.

KEYWORDS
Aedes aegypti, antimicrobial, *Culex pipiens*, RAPD, vectors

1 | INTRODUCTION

Mosquitoes (Diptera: Culicidae) are the major vector for most of the deadly transmitted diseases in the world [1, 2] affecting more than 700,000,000 people per year throughout the world [3]. Mosquitoes have long slender body with long legs and piercing mouthparts. *Anopheles*, *Aedes*, and *Culex* are the three most common mosquito vector genera. They are biting Dipterans that suck blood from humans and other animals while acting as carriers of several diseases. Most of these diseases, such as malaria, filariasis, dengue, chikungunya, yellow fever, Zika virus, etc., are commonly spread throughout the human populations [4]. The resurgences of these diseases are attributed to multiple breeding sites in addition to resistance among mosquito populations due to repeated usage of chemical insecticides increasing resistance among mosquito population as well as causing serious environmental pollution [5]. Thus, an alternative approach is needed to fight against mosquito populations.

Seaweeds have wide range of biological applications from nutrition to therapeutic applications in pharmaceutical industries, etc. *Ulva lactuca* is a macroalgae and an edible seaweed found abundantly in the marine environment. This species is found practically everywhere in shallow waters, including estuaries, throughout the World Ocean [6, 7]. It has wide acceptance in society because it is biodegradable, eco-friendly and cost effective. Reports have also suggested that seaweeds have potential insecticidal activity [8, 9]. Study of the bioactive compounds present in seaweed can contribute to our knowledge of their mode of action in combating mosquito

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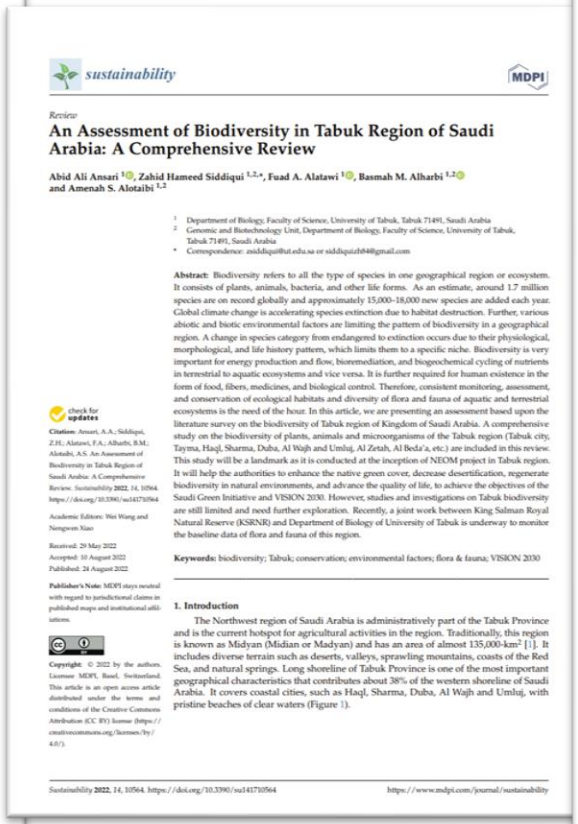

sustainability

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Review

An Assessment of Biodiversity in Tabuk Region of Saudi Arabia: A Comprehensive Review

Abid Ali Ansari [1], Zahid Hameed Siddiqui [1,2,*], Fuad A. Alatawi [1], Basmah M. Alharbi [1,2] and Amenah S. Alotaibi [1,2]

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Abstract: Biodiversity refers to all the type of species in one geographical region or ecosystem. It consists of plants, animals, bacteria, and other life forms. As an estimate, around 1.7 million species are on record globally and approximately 15,000–18,000 new species are added each year. Global climate change is accelerating species extinction due to habitat destruction. Further, various abiotic and biotic environmental factors are limiting the pattern of biodiversity in a geographical region. A change in species category from endangered to extinction occurs due to their physiological, morphological, and life history pattern, which limits them to a specific niche. Biodiversity is very important for energy production and flow, bioremediation, and biogeochemical cycling of nutrients in terrestrial to aquatic ecosystems and vice versa. It is further required for human existence in the form of food, fibers, medicines, and biological control. Therefore, consistent monitoring, assessment, and conservation of ecological habitats and diversity of flora and fauna of aquatic and terrestrial ecosystems is the need of the hour. In this article, we are presenting an assessment based upon the literature survey on the biodiversity of Tabuk region of Kingdom of Saudi Arabia. A comprehensive study on the biodiversity of plants, animals and microorganisms of the Tabuk region (Tabuk city, Tayma, Haql, Sharma, Duba, Al Wajh and Umluj, Al Zetah, Al Beda'a, etc.) are included in this review. This study will be a landmark as it is conducted at the inception of NEOM project in Tabuk region. It will help the authorities to enhance the native green cover, decrease desertification, regenerate biodiversity in natural environments, and advance the quality of life, to achieve the objectives of the Saudi Green Initiative and VISION 2030. However, studies and investigations on Tabuk biodiversity are still limited and need further exploration. Recently, a joint work between King Salman Royal Natural Reserve (KSRNR) and Department of Biology of University of Tabuk is underway to monitor the baseline data of flora and fauna of this region.

Keywords: biodiversity; Tabuk; conservation; environmental factors; flora & fauna; VISION 2030

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Citation: Ansari, A.A.; Siddiqui, Z.H.; Alatawi, F.A.; Alharbi, B.M.; Alotaibi, A.S. An Assessment of Biodiversity in Tabuk Region of Saudi Arabia: A Comprehensive Review. *Sustainability* **2022**, *14*, 10564. https://doi.org/10.3390/su141710564

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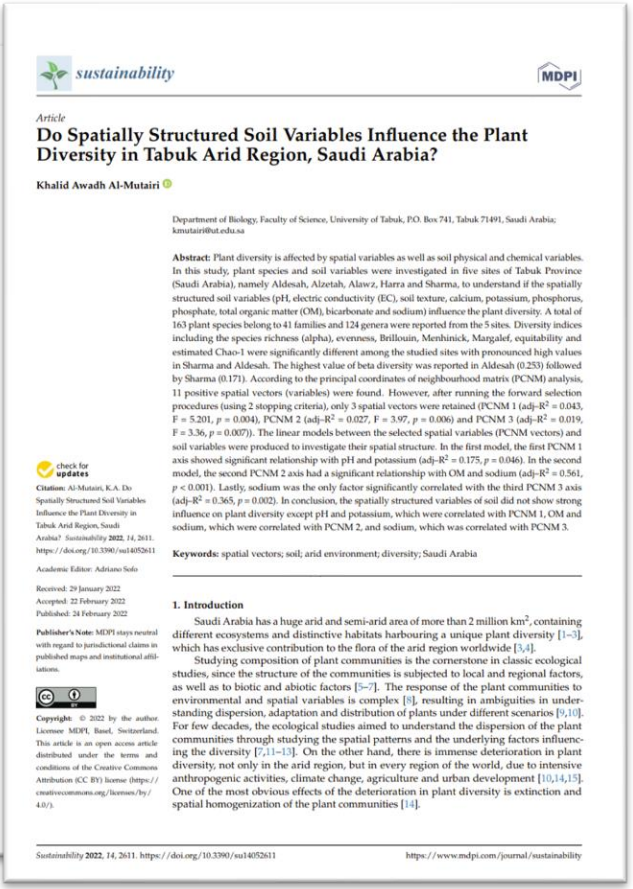
1. Introduction

The Northwest region of Saudi Arabia is administratively part of the Tabuk Province and is the current hotspot for agricultural activities in the region. Traditionally, this region is known as Midyan (Midian or Madyan) and has an area of almost 135,000-km^2 [1]. It includes diverse terrain such as deserts, valleys, sprawling mountains, coasts of the Red Sea, and natural springs. Long shoreline of Tabuk Province is one of the most important geographical characteristics that contributes about 38% of the western shoreline of Saudi Arabia. It covers coastal cities, such as Haql, Sharma, Duba, Al Wajh and Umluj, with pristine beaches of clear waters (Figure 1).



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Article

Do Spatially Structured Soil Variables Influence the Plant Diversity in Tabuk Arid Region, Saudi Arabia?

Khalid Awadh Al-Mutairi

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Abstract: Plant diversity is affected by spatial variables as well as soil physical and chemical variables. In this study, plant species and soil variables were investigated in five sites of Tabuk Province (Saudi Arabia), namely Aldesah, Alzetah, Alawz, Harra and Sharma, to understand if the spatially structured soil variables (pH, electric conductivity (EC), soil texture, calcium, potassium, phosphorus, phosphate, total organic matter (OM), bicarbonate and sodium) influence the plant diversity. A total of 163 plant species belong to 41 families and 124 genera were reported from the 5 sites. Diversity indices including the species richness (alpha), evenness, Brillouin, Menhinick, Margalef, equitability and estimated Chao-1 were significantly different among the studied sites with pronounced high values in Sharma and Aldesah. The highest value of beta diversity was reported in Aldesah (0.253) followed by Sharma (0.171). According to the principal coordinates of neighbourhood matrix (PCNM) analysis, 11 positive spatial vectors (variables) were found. However, after running the forward selection procedures (using 2 stopping criteria), only 3 spatial vectors were retained (PCNM 1 (adj-R^2 = 0.043, F = 5.201, p = 0.004), PCNM 2 (adj-R^2 = 0.027, F = 3.97, p = 0.006) and PCNM 3 (adj-R^2 = 0.019, F = 3.36, p = 0.007)). The linear models between the selected spatial variables (PCNM vectors) and soil variables were produced to investigate their spatial structure. In the first model, the first PCNM 1 axis showed significant relationship with pH and potassium (adj-R^2 = 0.175, p = 0.046). In the second model, the second PCNM 2 axis had a significant relationship with OM and sodium (adj-R^2 = 0.561, p < 0.001). Lastly, sodium was the only factor significantly correlated with the third PCNM 3 axis (adj-R^2 = 0.365, p = 0.002). In conclusion, the spatially structured variables of soil did not show strong influence on plant diversity except pH and potassium, which were correlated with PCNM 1, OM and sodium, which were correlated with PCNM 2, and sodium, which was correlated with PCNM 3.

Keywords: spatial vectors; soil; arid environment; diversity; Saudi Arabia

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Citation: Al-Mutairi, K.A. Do Spatially Structured Soil Variables Influence the Plant Diversity in Tabuk Arid Region, Saudi Arabia? *Sustainability* **2022**, *14*, 2611. https://doi.org/10.3390/su14052611

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1. Introduction

Saudi Arabia has a huge arid and semi-arid area of more than 2 million km^2, containing different ecosystems and distinctive habitats harbouring a unique plant diversity [1–3], which has exclusive contribution to the flora of the arid region worldwide [3,4].

Studying composition of plant communities is the cornerstone in classic ecological studies, since the structure of the communities is subjected to local and regional factors, as well as to biotic and abiotic factors [5–7]. The response of the plant communities to environmental and spatial variables is complex [8], resulting in ambiguities in understanding dispersion, adaptation and distribution of plants under different scenarios [9,10]. For few decades, the ecological studies aimed to understand the dispersion of the plant communities through studying the spatial patterns and the underlying factors influencing the diversity [7,11–13]. On the other hand, there is immense deterioration in plant diversity, not only in the arid region, but in every region of the world, due to intensive anthropogenic activities, climate change, agriculture and urban development [10,14,15]. One of the most obvious effects of the deterioration in plant diversity is extinction and spatial homogenization of the plant communities [14].

SDG 15: Life On Land

الهدف 15 : الحياة في البر

15.2 Supporting land ecosystems through education
15.2.1 Events about sustainable use of land

تنظم جامعة تبوك سنويا العديد من الفعاليات التي تهدف إلى تعزيز الإستدامة البيئية على الأرض ومن أمثلة ذلك ما يلي:	
المؤتمرات	- مؤتمر بيئة البحر الأحمر وتنوعها الاحيائي https://twitter.com/u_tabuk/status/1356541228712660992
المبادرات / الفعاليات	- معا لبيئة خضراء PowerPoint Presentation (ut.edu.sa) - صديق البيئة https://twitter.com/event_ut/status/1457416298141454346?cxt=HHwWlMCwydiZ5LkoAAAA - تحدي الكليات " نحو جامعة خضراء https://twitter.com/event_ut/status/1452555047288639491 - مبادرة إزهار البحر الأحمر https://twitter.com/dsa_ut/status/1467562241935429639 - مسابقة تحدي الابتكار الجامعي للتنمية المستدامة https://twitter.com/dsa_ut/status/1472566601794867208 - مسابقة تحدي تطبيقات البيئة المستدامة #اكسثون_تبوك #Xthon_Tabuk https://twitter.com/dsa_ut/status/1402179102514294784?lang=ar-x-fm - حملة بيئتنا مسؤوليتنا https://twitter.com/dsa_ut/status/1506720125914914822 - مارثون المشي وحملة الاصحاح البيئي https://twitter.com/U_Tabuk/status/1505789143653179393 - المعرض البيئي https://twitter.com/u_tabuk/status/1374637669947469828?s=21&t=ZObijQXPf0391-hZ_HnQ6g - المشاركة في المعرض والمنتدى الدولي لتقنيات التشجير https://twitter.com/U_Tabuk/status/1531205126249238528 - معرض العلوم لمستقبل مستدام https://twitter.com/U_Tabuk/status/1585663101252374528 - مشروع المسح الميداني لمحمية الملك سلمان الملكية https://twitter.com/U_Tabuk/status/1489557311148507140 - أسبوع البيئة 2022م https://twitter.com/U_Tabuk/status/1505272992406077440

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الهدف 15 : الحياة في البر

15.2 Supporting land ecosystems through education
15.2.1 Events about sustainable use of land

تنظم جامعة تبوك سنويا العديد من الفعاليات التي تهدف إلى تعزيز الإستدامة البيئية على الأرض ومن أمثلة ذلك ما يلي:

المبادرات / الفعاليات	- برنامج الندوة المقامة ضمن فعاليات أسبوع البيئة https://twitter.com/event_ut/status/1506501635245326336 & https://twitter.com/event_ut/status/1508185482819252229 - فعاليات أسبوع البيئة (الكلية الجامعية بحقل) https://twitter.com/event_ut/status/1506880246984978432 - ساعة الأرض https://twitter.com/U_Tabuk/status/1507770745971265554
اللقاءات العلمية	- التنوع الأحيائي: طريق نحو التنمية المستدامة https://twitter.com/event_ut/status/1437495582344552455 - تأثير المعادن الثقيلة والملوثات المُشعة على البيئة https://twitter.com/event_ut/status/1442587288266022915 - التقنيات التحليلة في علم السموم البيئية https://twitter.com/event_ut/status/1572260839293616129

SDG 15: Life On Land

الهدف 15 : الحياة في البر

15.2 Supporting land ecosystems through education
15.2.2 Sustainably farmed food on campus

استضافة جامعة تبوك ورشة عمل " الامن الغذائي التحديات والحلول"

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بالإضافة على الاتفاقيات المبرمة في هذا المجال

جدول الأعمال

كلية العلوم - جامعة تبوك
Faculty of Science – University of Tabuk

قاعة الاستقبال Visiting Room	10:00 – 10:30	الترحيب Welcome address
قاعة السيمنار Seminar Room	10:30 – 12:00	تقديم المقترحات العلمية Presenting scientific proposals

الباحث Researcher	الموضوع Topic	الوقت Time
د.سيد قاسم Dr. Syed Khasim	Sensors assisted automated logistics Greenhouse for Smart and Sustainable Agricultural Practices	10:30 – 10:45
د.أميمة العيسوي Dr. Omaymah Alaysuy	Green Metrics for current and future Projects	10:45 – 11:00
د.ناصر بادي Dr. Naser Badi	Development of a Fully Solar Powered Agricultural Greenhouses in Tabuk	11:00 – 11:15
د.زاهد صديقي Dr. Zahid Siddiqui	Innovative Ideas in Next Generation Farming to ensure Food Security of Future	11:15 – 11:30
د.راشد عياد Dr. Rachid Ayad	Neutron Spectrometer for Soil (NESSO): a neutron spectrometer for Soil moisture mapping	11:30 – 11:45

قاعة الاجتماعات Meeting Room	12:15 – 01:15	حلقة نقاش علمية Scientific panel discussion
	01:30	الغداء Lunch

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SDG 15: Life On Land

الهدف 15 : الحياة في البر

15.2 Supporting land ecosystems through education
15.2.3 Maintain and extend current ecosystems' biodiversity

المؤتمرات	-	مؤتمر بيئة البحر الأحمر وتنوعها الاحيائي https://twitter.com/u_tabuk/status/1356541228712660992
المبادرات / الفعاليات	-	معا لبيئة خضراء PowerPoint Presentation (ut.edu.sa)
	-	صديق البيئة https://twitter.com/event_ut/status/1457416298141454346?cxt=HHwWlMCwydiZ5LkoAAAA
	-	تحدي الكليات " نحو جامعة خضراء https://twitter.com/event_ut/status/1452555047288639491
	-	مبادرة إزهار البحر الأحمر https://twitter.com/dsa_ut/status/1467562241935429639
	-	مسابقة تحدي الابتكار الجامعي للتنمية المستدامة https://twitter.com/dsa_ut/status/1472566601794867208
	-	مسابقة تحدي تطبيقات البيئة المستدامة #اكسثون_تبوك #Xthon_Tabuk https://twitter.com/dsa_ut/status/1402179102514294784?lang=ar-x-fm
	-	حملة بيئتنا مسؤوليتنا https://twitter.com/dsa_ut/status/1506720125914914822
	-	مارثون المشي وحملة الاصحاح البيئي https://twitter.com/U_Tabuk/status/1505789143653179393
	-	المعرض البيئي https://twitter.com/u_tabuk/status/1374637669947469828?s=21&t=ZObijQXPf0391-hZ_HnQ6g
	-	المشاركة في المعرض والمنتدى الدولي لتقنيات التشجير https://twitter.com/U_Tabuk/status/1531205126249238528
	-	معرض العلوم لمستقبل مستدام https://twitter.com/U_Tabuk/status/1585663101252374528
	-	أسبوع البيئة 2022م https://twitter.com/U_Tabuk/status/1505272992406077440

SDG 15: Life On Land

الهدف 15 : الحياة في البر

15.2 Supporting land ecosystems through education
15.2.3 Maintain and extend current ecosystems' biodiversity

المبادرات / الفعاليات	- برنامج الندوة المقامة ضمن فعاليات أسبوع البيئة https://twitter.com/event_ut/status/1506501635245326336 & https://twitter.com/event_ut/status/1508185482819252229 - فعاليات أسبوع البيئة (الكلية الجامعية بحقل) https://twitter.com/event_ut/status/1506880246984978432 - ساعة الأرض https://twitter.com/U_Tabuk/status/1507770745971265554
اللقاءات العلمية	- التنوع الأحيائي: طريق نحو التنمية المستدامة https://twitter.com/event_ut/status/1437495582344552455 - تأثير المعادن الثقيلة والملوثات المُشعة على البيئة https://twitter.com/event_ut/status/1442587288266022915 - التقنيات التحليلة في علم السموم البيئية https://twitter.com/event_ut/status/1572260839293616129
الشراكات	- مذكرة تعاون مع محمية الملك سلمان في مجال الدراسات البيئية والمشاركة في تدريب الكوادر الوطنية لحماية البيئة وتنميتها https://twitter.com/U_Tabuk/status/1452604139700211720 - مذكرة تعاون مع وزارة البيئة https://www.ut.edu.sa/ar/Faculties/science/Pages/Agreements-partnerships.aspx - مذكرة تفاهم مع المركز الوطني لتنمية الغطاء النباتي ومكافحة التصحر https://twitter.com/U_Tabuk/status/1595848520086749185 - مذكرة تعاون مع المركز الوطني لتنمية الحياة الفطرية https://twitter.com/NCW_center/status/1635670582980231169 - مذكرة تعاون مع محمية الأمير محمد بن سلمان https://twitter.com/u_tabuk/status/1587110622071820293?lang=ar - مشروع المسح الميداني لمحمية الملك سلمان الملكية https://twitter.com/U_Tabuk/status/1489557311148507140 - مذكرة تفاهم مع شركة استرا https://twitter.com/U_Tabuk/status/1595743902128029697
بيوت الخبرة	https://www.ut.edu.sa/ar/Deanship/institute-for-research-and-consultancy/unit-of-expertise/Pages/default.aspx
الأبحاث المدعومة	البحوث الممولة للأبحاث في مجال الحفاظ على النظم البيئية
الأندية الطلابية المهتمه بالبيئة	- نادي بادرة البيئي https://www.ut.edu.sa/ar/Faculties/science/Pages/gesture-club.aspx

SDG 15: Life On Land

الهدف 15 : الحياة في البر

15.2 Supporting land ecosystems through education
15.2.4 Educational programmes on ecosystems

أولا البرامج المدفوعة:

- **برنامج الماجستير: التنوع الاحيائي** https://www.ut.edu.sa/ar/Faculties/science/Biology-section/Pages/Study-plan-M.aspx
- **برنامج الدبلوم العالي: في العلوم البيئية-مسار الاستدامة البيئية** https://twitter.com/ut_dgs/status/1431403597187764225
- **الدبلوم العالي في العلوم البيئية-مسار الغطاء النباتي** https://twitter.com/ut_dgs/status/1431403597187764225
- **الدبلوم العالي في إدارة المخلفات** https://twitter.com/ut_dgs/status/1431403597187764225

أولا البرامج الغير مدفوعة:

- **الكلية التطبيقية - الدبلوم في الدراسات البيئية** https://www.ut.edu.sa/ar/Faculties/Applied/Pages/default.aspx#v-pills-collegeDepartments
- **الكلية التطبيقية - الدبلوم في بيئة النبات** https://www.ut.edu.sa/ar/Faculties/Applied/Pages/default.aspx#v-pills-collegeDepartments
- **الكلية التطبيقية - الدبلوم في حماية البيئة والموارد الطبيعية** https://www.ut.edu.sa/ar/Faculties/Applied/Pages/default.aspx#v-pills-collegeDepartments

SDG 15: Life On Land

الهدف 15 : الحياة في البر

15.2 Supporting land ecosystems through education

15.2.5 Sustainable management of land for agriculture and tourism (educational outreach)

تقدم الجامعة العديد من البرامج التعليمية التوعوية للمجتمع المحلي والمتعلقة بالإدارة المستدامة للأراضي الزراعية والسياحية:

- معا لبيئة خضراء PowerPoint Presentation (ut.edu.sa)
- صديق البيئة https://twitter.com/event_ut/status/1457416298141454346?cxt=HHwWlMCwydiZ5LkoAAAA
- تحدي الكليات " نحو جامعة خضراء https://twitter.com/event_ut/status/1452555047288639491
- مبادرة إزهار البحر الأحمر https://twitter.com/dsa_ut/status/1467562241935429639
- مسابقة تحدي الابتكار الجامعي للتنمية المستدامة https://twitter.com/dsa_ut/status/1472566601794867208
- مسابقة تحدي تطبيقات البيئة المستدامة #اكسثون_تبوك #Xthon_Tabuk https://twitter.com/dsa_ut/status/1402179102514294784?lang=ar-x-fm
- حملة بيئتنا مسؤوليتنا https://twitter.com/dsa_ut/status/1506720125914914822
- مارثون المشي وحملة الاصحاح البيئي https://twitter.com/U_Tabuk/status/1505789143653179393
- المعرض البيئي https://twitter.com/u_tabuk/status/1374637669947469828?s=21&t=ZObijQXPf0391-hZ_HnQ6g
- المشاركة في المعرض والمنتدى الدولي لتقنيات التشجير https://twitter.com/U_Tabuk/status/1531205126249238528
- معرض العلوم لمستقبل مستدام https://twitter.com/U_Tabuk/status/1585663101252374528
- أسبوع البيئة 2022م https://twitter.com/U_Tabuk/status/1505272992406077440
- برنامج الندوة المقامة ضمن فعاليات أسبوع البيئة https://twitter.com/event_ut/status/1506501635245326336 & https://twitter.com/event_ut/status/1508185482819252229
- فعاليات أسبوع البيئة (الكلية الجامعية بحقل) https://twitter.com/event_ut/status/1506880246984978432
- ساعة الأرض https://twitter.com/U_Tabuk/status/1507770745971265554
- التنوع الأحيائي: طريق نحو التنمية المستدامة https://twitter.com/event_ut/status/1437495582344552455
- تأثير المعادن الثقيلة والملوثات المُشعة على البيئة https://twitter.com/event_ut/status/1442587288266022915
- التقنيات التحليلة في علم السموم البيئية https://twitter.com/event_ut/status/1572260839293616129

SDG 15: Life On Land

الهدف 15 : الحياة في البر

15.3 Supporting land ecosystems through education

15.3.1 Sustainable use، conservation and restoration of land (policy)

تلتزم جامعة تبوك بالاستخدام المستدام للأراضي والحفاظ عليها واستعادتها وذلك من خلال:

- مذكرة تعاون مع محمية الملك سلمان في مجال الدراسات البيئية والمشاركة في تدريب الكوادر الوطنية لحماية البيئة وتنميتها https://twitter.com/U_Tabuk/status/1452604139700211720
- مذكرة تعاون مع وزارة البيئة https://www.ut.edu.sa/ar/Faculties/science/Pages/Agreements-partnerships.aspx
- مذكرة تفاهم مع المركز الوطني لتنمية الغطاء النباتي ومكافحة التصحر https://twitter.com/U_Tabuk/status/1595848520086749185
- مذكرة تعاون مع المركز الوطني لتنمية الحياة الفطرية https://twitter.com/NCW_center/status/1635670582980231169
- مذكرة تعاون مع محمية الأمير محمد بن سلمان https://twitter.com/u_tabuk/status/1587110622071820293?lang=ar
- مشروع المسح الميداني لمحمية الملك سلمان الملكية https://twitter.com/U_Tabuk/status/1489557311148507140
- مذكرة تفاهم مع شركة استرا https://twitter.com/U_Tabuk/status/1595743902128029697

SDG 15: Life On Land

الهدف 15 : الحياة في البر

15.3 Supporting land ecosystems through education
15.3.2 Monitoring IUCN and other conservation species (policies)

تفاهم بين شركة البحر الاحمر وجامعة تبوك لحماية البيئة

تلتزم جامعة تبوك باللوائح الخاصة بحماية الكائنات الواردة في IUCN أو في القوائم الوطنية وذلك من خلال الشراكات القائمة مع الجهات المختلفة

- هيئة تطوير محمية الملك سلمان بن عبد العزيز الملكية
- أمانة منطقة تبوك
- شركة البحر الأحمر
- وزارة البيئة والمياه والزراعة

SDG 15: Life On Land

الهدف 15 : الحياة في البر

15.3 Supporting land ecosystems through education
15.3.3 Local biodiversity included in planning and development

تدعم جامعة تبوك إدماج قيم النظم الإيكولوجية والتنوع البيولوجي في عمليات التخطيط والتطوير وذلك من خلال الشراكات القائمة مع الجهات المختلفة:

- **هيئة تطوير محمية الملك سلمان بن عبد العزيز الملكية**
- **أمانة منطقة تبوك**
- **شركة البحر الأحمر**
- **وزارة البيئة والمياه والزراعة**

معالي رئيس #جامعة_تبوك أ.د.عبد الله بن مفرح الذيابي يلتقي سعادة أمين أمانة منطقة #تبوك المهندس حسام بن موفق اليوسف، حيث جرى خلال اللقاء استعراض أبرز سبل التعاون بين الجامعة والأمانة.

@U_Tabuk
@tabukm

Translate Tweet

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الهدف 15 : الحياة في البر

15.3 Supporting land ecosystems through education
15.3.4 Alien species impact reduction (policies)

تلتزم جامعة تبوك باللوائح المتعلقة بالتخلص بالآفات الغازية وذلك من خلال:

- اللجنة الدائمة لمكافحة الآفات
- معمل أبحاث الحشرات والسموم
https://www.ut.edu.sa/ar/Faculties/science/Pages/Insect-Toxicology-Research-Laboratory.aspx
- بيوت الخبرة: الرواد للحلول البيئية والمكافحة الحشرية
https://www.ut.edu.sa/ar/Faculties/science/Pages/Experience-houses.aspx
- الاتفاقيات في مجال البيئة مع هيئة تطوير محمية الملك سلمان بن عبد العزيز الملكية
https://twitter.com/U_Tabuk/status/1452604139700211720

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الهدف 15 : الحياة في البر

15.3 Supporting land ecosystems through education
15.3.5 Collaboration for shared land ecosystems

ابرمت جامعة تبوك العديد من الاتفاقيات تهدف إلى الحفاظ على النظم البيئية:

- مذكرة تعاون مع محمية الملك سلمان في مجال الدراسات البيئية والمشاركة في تدريب الكوادر الوطنية لحماية البيئة وتنميتها https://twitter.com/U_Tabuk/status/1452604139700211720
- مذكرة تعاون مع وزارة البيئة https://www.ut.edu.sa/ar/Faculties/science/Pages/Agreements-partnerships.aspx
- مذكرة تفاهم مع المركز الوطني لتنمية الغطاء النباتي ومكافحة التصحر https://twitter.com/U_Tabuk/status/1595848520086749185
- مذكرة تعاون مع المركز الوطني لتنمية الحياة الفطرية https://twitter.com/NCW_center/status/1635670582980231169
- مذكرة تعاون مع محمية الأمير محمد بن سلمان https://twitter.com/u_tabuk/status/1587110622071820293?lang=ar
- مشروع المسح الميداني لمحمية الملك سلمان الملكية https://twitter.com/U_Tabuk/status/1489557311148507140
- مذكرة تفاهم مع شركة استرا https://twitter.com/U_Tabuk/status/1595743902128029697

SDG 15: Life On Land

الهدف 15 : الحياة في البر

15.4 Land sensitive waste disposal
15.4.1 Water discharge guidelines and standards

تلتزم جامعة تبوك بالاستخدام الفعال لجميع الموارد الطبيعية بما في ذلك المياه. كما تعزز الجامعة الاستخدام الواعي للمياه في الحرم الجامعي. كذلك يوجد في الجامعة محطة لمعالجة مياه الصرف الصحي والتي تعتمد على تكنولوجيا أغشية المفاعل الحيوي (Membrane Bio Reactor)

SDG 15: Life On Land

الهدف 15 : الحياة في البر

15.4 Land sensitive waste disposal
15.4.2 Policy on plastic waste reduction

تلتزم جامعة تبوك بضمان الحفاظ على بيئة الحرم الجامعي من خلال تنفيذ اللوائح المتعلقة بالحد من النفايات البلاستيكية. إذ أطلقت الجامعة حملة معا لبيئة خضراء والتي سلطت الضوء على مخاطر النفايات البلاستيكية على البيئة، وخطر المخلفات البلاستيكية
https://www.ut.edu.sa/ar/Faculties/science/Documents/مبادرة معا لبيئة خضراء.pdf

وحدة الدراسات البيئية بشطر الطالبات تنفذ رابع فعاليات أسبوع البيئة تحت شعار بيئتنا مسؤوليتنا

SDG 15: Life On Land

الهدف 15 : الحياة في البر

15.4 Land sensitive waste disposal

15.4.3 Policy on hazardous waste disposal

تلتزم جامعة تبوك بضمان الحفاظ على بيئة الحرم الجامعي من خلال تنفيذ اللوائح المتعلقة بالتخلص من النفايات الخطرة

University of Tabuk

Faculty of Pharmacy

Standard Operation Procedures for Laboratory waste disposal

Preparation of waste by respective department, packed and sealed

⇩

Filling of Standard application form, signed by:

1. Lab. Senior Staff
2. Head department
3. FPUT Security & Safety Coordinator
4. FPUT Senior administrator
5. FPUT Dean

⇩

FPUT Security and Safety unit

⇩

FPUT Senior administrator

⇩

UT - Support services directorate for collection and disposal

University of Tabuk
Faculty of Pharmacy

REQUEST FOR HAZARDOUS WASTE DISPOSAL

For Security and Safety unit use ONLY
_____ Date Received
_____ Date Picked Up

Please print neatly. Fill out all information requested. Incomplete forms will be returned.

DEPARTMENT:	PRINCIPAL INVESTIGATOR/SUPERVISOR:			PI/SUPERVISOR LOCATION:	
DATE OF REQUEST:	PERSON PREPARING FORM:			PHONE #:	FAX:
LOCATION OF WASTE:					
IDENTIFICATION/DESCRIPTION OF WASTE CHEMICALS DO NOT USE "CHEMICAL STRUCTURES" (Please Print)	WASTE TYPE (Solid, Liquid or Gas)	PH (if liquid)	NUMBER of CONTAINERS	SIZE AND TYPE OF CONTAINER (E.g. 4 liter, 250 ml, 5 gal, box, etc.)	VOLUME or WEIGHT in CONTAINER (E.g. 100 ml, 850 gm, etc.)

SPECIAL NOTES OR HANDLING INSTRUCTIONS:

CERTIFICATION: I hereby declare that the identification/description of waste chemicals is accurate and complete to the best of my knowledge and that I have made every effort to minimize our waste streams.
SIGNATURE:_____ DATE:_____

The Request for Hazardous Waste Disposal form must be filled out completely and legibly or FPUT - S&S UNIT will not pick up your hazardous waste.

Kingdom of Saudi Arabia
Ministry of Education
University of Tabuk
University Rector
(052)

المملكة العربية السعودية
وزارة التعليم
جامعة تبوك
رئيس الجامعة
(٠٥٢)

2020 - 2026

الموضوع: بخصوص تجديد تشكيل اللجنة الدائمة للتخلص من المواد الكيميائية والمخلفات الطبية بالجامعة