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Climate change land cover use and vegetation evolution in the upper Huai river basin

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Land use/land cover and vegetation in upper Huai river basin are considered to be highly susceptible to climate change. However, there is less indication of the change trends in both climate and land cover/land use in the study basin. Thus less understanding of the watershed sensitivity and adaptability to climate change. Here we identified the spatial and temporal patterns of changes in climate (from 1960 to 2016), land cover/land use and vegetation (from 2000 to 2014) in the upper Huai river basin using land using the Mann-Kendall test estimator, land use transfer matrix and NDVI for four-year time interval. During the past 56years, there was a slightly decreasing trend in precipitation while air temperature has increased by 1.2°C. During the past 15years, land cover has changed significantly. Herein residence construction land, artificial water and, artificial vegetation with a discrete distribution, increased and wetland and artificial water bodies showed a diminishing trend in the study period. On the other hand, natural vegetation coverage does not show obvious changes. Land use/cover change impact was gradually increased by human intervention on various land use types. Our findings have implications for predicting the safety of water resources and water eco-environment in the Huai river basin under global change.

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Climate change and workers: Overview of the psychosocial impacts of extreme weather events and determination of public health priority research topics for Quebec (Canada)

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Statement of the Problem: The impacts of climate change (CC) on workers are often discussed in terms of the physical health effects that some workers may experience when exposed to hazards such as heat waves, zoonoses and extreme weather events (EWE). To date, the scientific community has focused very little on the psychological impacts of CC on workers. The presentation will focus on a research conducted in the province of Quebec (Canada), which aimed at providing an overview of the negative psychosocial impacts on workers of four EWE that will increase in the context of CC in Quebec (heat waves, floods, storms and forest fires) and identifying public health priority research topics.

Methodology: A review of the literature published between 2007 and 2017 was conducted. The findings of this review were presented during two workshops involving various experts and stakeholders. During the workshops, the participants were invited to validate the information retrieved from the literature review and to share their needs for knowledge. Research topics were determined based on the workshop's discussions and priorities were established by means of consultation with public health experts.

Findings: The review identified that the studied EWE may cause psychological impacts on workers such as exhaustion, fatigue, stress and anxiety. These impacts can vary according to risk and protective factors and were mainly observed among front line workers (e.g. first responders, social workers) and farmers. Twenty-one research priorities were identified during the workshops and the consultation with the public health experts resulted in identifying the acquisition of knowledge related to the impacts of floods on front-line workers as a priority research topic for Quebec.

Conclusion: This research is among the first studies on this emerging topic and our approach may be useful to help prioritize research activities in other countries. Adam Poupart A, Labreche F, Smargiassi A, Duguay P, Busque M A, Gagne C, Rintamak H, Kjellstrom T, Zayed J. Climate change and occupational health and safety in a temperate climate: Potential impacts and research priorities in Quebec, Canada Industrial health.

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The fishing sector between climate change effects and the development of the Moroccan Southern regions

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During the last years, the climate change issue has been the subject of growing interest both at the national and international levels. Indeed, the situation is alarming and it is the developing countries that incur the economic, political, legal, social and environmental consequences, thus, climate change impacts affect negatively their development and their economy that mainly dependent on agriculture and fishing. In this context, Morocco is not safe from these impacts, while the fishing sector is one of the main pillars of the Moroccan economy, it remains face to negative impacts of climate change, hence the following problematic: To what extent does the fishing sector, one of the main catalysts of Morocco's southern regions economy, impacted by these effects? The study of this subject requires the adoption of a method based essentially on: The current economic situation, the climate context and its impact on the upwelling flow generator of fish resources and an exploratory study of this sector in the Southern zone. Thus, it is necessary to carry out a geographical analysis, in particular, a description of sector situation, identification of climatic changes effects and especially a gap analysis relative to this phenomenon. The objective is to identify the participation of fishing sector in the development of southern regions of Morocco and especially to present recommendations to ensure the sustainability of the sector's dynamism in an environment affected by climate changes.

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High energy fuel production by optimization of waste polymers pyrolysis

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Polymers are among the most popular materials used in modern societies. The applications of polymers go from high corrosion and temperature long-lasting components to one-time use applications containers; such as those used for food, beverages, liquids and a number of products consumed in our daily life. It is estimated that worldwide, more than 100millions of tons of plastic are wasted every year after one single use. Due to its high stability, most of these materials remain undegraded for decades, polluting the land, air and water with the consequent negative impact on humans and animal life. In recent years, an alternative that has called the attention is the use of pyrolytic process to transform wasted materials into fuels and other chemicals compounds, as an alternative to reduce the amount of material disposed of and at the same time, to generate products of economic interest. In this project, a pyrolytic process was implemented in order to thermally decompose High-Density Polyethylene (HDPE) into products with applications as fuel with high energy content. The HDPE was initially evaluated in a Thermogravimetric analyzer Q500, with this information the pyrolytic reactor was adjusted at 600°C, at a heating rate of 20°C/min and flow of 40mL/min of N_2. 25g of HDPE with a mean particle size of 5mm were treated during 25minutes. After that, the pyrolysis products were analyzed by Fourier-Transform Infrared Spectroscopy to determine its higher heating value (HHV) and the functional chemical groups present. Additionally, a second test was performed, reducing the HDPE mass to 15g and increasing the temperature to 700°C. The obtained results from the first test showed that the products obtained have an HHV of 47MJ/kg, which is an encouraging finding, considering the HHV of diesel and gasoline are 45 and 44MJ/kg respectively. With respect to the second evaluation, the results proved that an increase in the reaction temperature decreases the density of the products which facilitates its manipulation and application as high energy fuel.

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Water conservation practices on the reduction of greenhouse gas emissions on creeping bentgrass greens

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Statement of the Problem: Soil moisture and temperature are known predictors of greenhouse gas (GHG) losses from highly managed turfgrass. Irrigation management practices that conserve water use have the potential to reduce GHG losses but may adversely affect overall turfgrass quality.

Methodology and Theoretical Orientation: A field study was developed to evaluate the impact irrigation regimes (Business as Usual [sun and shade], Supplemental Rainfall, Syringing and Natural Rainfall), nitrogen (N) source (Urea and Milorganite) and rate (146kg N ha-1 yr-1 and 293kg N ha-1 yr-1) has on GHG (carbon dioxide [CO_2], methane [CH_4] and nitrous oxide [N_2O]) emissions from creeping bentgrass (Agrostis stolonifera) greens. Sampling occurred weekly throughout the 2015-2017 growing season. Gas samples were taken using a vented closed gas chamber for 40minutes. Soil temperature, soil moisture, canopy temperature, canopy greenness and turfgrass quality data were also collected.

Conclusion and Significance: Results indicate that nitrogen sources applied at the high N rate resulted in significantly higher emissions of both CO_2 and N_2O. Irrigation practices exposed to full sunlight (Supplemental Rainfall, Syringing, Business as Usual Sun), thus having a higher soil temperature, resulted in significantly higher emissions of both CO_2 and N_2O; the reverse was true for irrigation treatments experiencing shade from nearby trees. Both turfgrass quality and canopy greenness were significantly impacted by irrigation practices, N source and rate. Canopy greenness was improved with the higher rate of Milorganite and urea. Higher turfgrass quality was associated with the use of Milorganite at both the high and low N rates. Water conservation practices implemented on non-shaded greens resulted in higher soil and canopy temperatures (May-September) that contributed to GHG losses from creeping bentgrass putting greens.

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Cradle to grave life cycle assessment of Chardonnay white wine

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Life Cycle Assessment (LCA) is an international tool that evaluates the environmental impacts of a product, service, or process throughout its life cycle. The aims of the current cradle to grave LCA study are to (1) Assess the environmental impacts of the Chardonnay white wine produced by Château Ksara – Lebanon (33.8265°N, 35.8926°E) from grape production phase until the end of life phase (recycling, landfilling, or incineration scenarios) through winemaking, packaging, distribution and use phases (2) Compare the environmental footprint results of the Chardonnay white wine with those of the screening study carried out in Europe. The Life cycle inventory was modeled using the SimaPro 8.5.2.0 analyst multi-user software and the Ecoinvent database (version3.3) and the ILCD methodology was selected as the life cycle impact assessment method. Based on the normalized and weighted results and excluding the toxicity related impacts, the most relevant impact categories are mineral, fossil use & resource depletion, climate change, ionizing radiation human health, particulate matter, terrestrial eutrophication and acidification for a cumulative contribution of 85.10% of the total impact. The grape production, packaging & bottling and winemaking life cycle stages are the ones identified as "most relevant" for a cumulative contribution of 86.03% of the total impact for climate change impact category. The findings of this research are promising since they are comparable to those of the screening study carried out in Europe. Furthermore, sensitivity and uncertainty analyses are performed to check the robustness of the results.

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The effect of climate on Egyptian farm animal's performance and productivity

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The impact of climate change on human, animals, ecosystems and energy is enormous. Climate change could affect animal production and well-being, especially because of increases in air temperature. However, the knowledge of animal responses to heat stress during the hot months in several areas of the world, as well as during extreme heat events, may be used to evaluate the impacts of global change. Higher temperature and higher humidity are most favorable for growth and proliferation of disease-producing microbe as higher body temperature indicates all metabolic reactions to reduce the body's capacity to fight the disease. The breakdown of the body immune system further weakens the capacity of the animal to resist diseases. Multiple attacks of the FMD outbreak and others are corresponding to climate change. Temperature and humidity with water recording are most favorable for parasitic species and disease vectors. Helminths infestation connected with the climate in many tropical countries resulting in a reduction of the growth rate among sheep and goats. Exposure of farm animals to elevated temperatures results in the decrease of body weight, average daily gain, growth rate and body total solid, which is reflected by poor reproduction. The crossbreds and buffaloes are affected more than indigenous livestock. Since the crossbreds and buffaloes are more sensitive to temperature rise than indigenous cattle, a rise of 2-6°C due to global warming will negatively impact growth, puberty and maturity of crossbreds and buffaloes. Some current practices to reduce heat stress in farm and dairy animals, such as shades, sprinklers and ventilation will be suitable for modifying to future climates if the economics of heat stress management do not change radically. However, farmers are not quite aware of the impacts of global warming; therefore, good research work is needed to help them take strategic and planned decisions.

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Converging climate threats and enablers and barriers to resilience planning in the United States: The ecosystems solution

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The fourth United States climate assessment reports human-induced global climate change is outpacing national resilience capabilities thereby increasing the risk of multiple catastrophes. While some communities are incrementally enhancing their resilience to climate change; U.S. national resilience planning, overall, is not keeping pace with climate change. The paper explores the root causes of the growing national resilience gap and discusses how and why an "ecosystems framework" would enhance systemic resilience. In this paper discusses climate change threats to survivability and sustainability relative to the risks from other physical-environmental-social threats (pandemics, earthquakes, asteroids, etc.). Identifies resilience gaps, with a focus on the legacy paradigm underlying current resilience planning as well as the institutional context in which resilience planning and programming take place. Authors will report initial findings from interviews with key planning and policy officials that suggest a deep cognitive chasm between evolving and converging threats and the prerequisites of effective resilience planning. Presents an alternative to current/legacy resilience planning models that is titled "The ecosystems climate resilience planning model." Explores the types of innovative solutions (enablers that could result from replacing conventional resilience planning frameworks and/or paradigms with the ecosystem planning model. Hypotheses concerning climate change-induced risks and resilience planning are discussed. First, policymakers fail to understand the necessity for effective climate change resilience planning. The time requirements to make and implement resilience decisions are underestimated because of the way climate change is evolving. Second, policymakers lack an understanding of (eco) systems concepts that are key to an integrated, systemic approach to resilience. Third, an endemic lack of understanding is reinforced by institutional, organizational and cultural factors that reinforce fragmented and disjointed planning. Fourth, the ecosystems model (we present) provides a hopeful first step towards developing a robust national resilience system.

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Impact of climate change on food security in third world countries

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Background: This paper aims to examine the impact of climate change on food security in third world countries. For this purpose, the article adopted a desktop study approach. Previous studies, reports, surveys and policies on climate change and food (in)security. From this paper's analysis, climate change presents a high risk to food security in developing countries from crop production to food distribution and consumption. In light of this, it is found that climate change, particularly global warming, affects food security through food availability, accessibility, utilization, and affordability. To mitigate these risks, there is a need for an integrated policy approach to protecting the arable land against global warming. The argument advanced in this article is that the third world country's ability to adapt and protect its food items depends on the understanding of risks and the vulnerability of various food items to climate change. However, this poses a challenge in developing countries, because such countries have weak institutions and limited access to technology. Another concern is a wide gap between the cost of adapting and the necessary financial support from the government. There is also a need to invest in technologies that will resist risks on food systems.

Methods: A literature review was conducted from different sources using a Google scholar searching strategy that is written within 10 years period in the English language.

Result: Documents related to the impacts of climate change on food security were reviewed. Literature indicates climate components like temperature, precipitation, CO2 concentration, and extreme climate events have an effect on food security components. The third world is one of the most severely affected regions to climate change where most of the population is dependent on climate-sensitive economic activities. The most direct effect and a well-researched component of climate change on food security is food availability by reducing net crop production. It is also found that climate change has an impact on food accessibility and utilization but not well studied due to its complexity. Projections indicate that this problem will be more severe in the future than today unless climate change mitigation and adaptation strategies are done

Conclusion: This review concludes that climatic conditions are changing in developing countries and is affecting food availability, food accessibility and utilization. The problem will be severe in the future unless the current adaptation and mitigation efforts do not improve. Therefore to reduce the problem, the region should use its potential to adopt climate change.

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