

SUBMISSION TEMPLATE

Research-2-Practice Forum on Renewable Energy, Water and Climate Security in Africa

16 - 18.04.2018, Tlemcen, Algeria

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Category: Research and Scientific Contributions

The main topics of the extended abstract should fit within the areas of water, energy, climate change, the nexus within water, energy and climate change. The abstract should also be in line with ongoing projects and priorities of the research agenda at PAUWES as a contribution to the Agenda 2063 of the African union.

General Guidelines:

Extended abstracts should be written according to structure given in the template below, including the following headings: abstract and keywords, introduction, method, results and discussion, conclusion and recommendations, references. There is flexibility as to the naming of the sections. Sub-headings can be used when necessary.

Extended abstract shall be written in Calibri font, single line spacing and 10 font size. Extended abstracts can contain figures, tables and/or images. Page format should be A4 page size with margins 2.5 cm wide from the right, left, top and bottom. **Extended abstracts should not exceed 4 pages (including references)** and pages should not be numbered.

Extended abstracts (in PDF format) shall be submitted via <https://easychair.org/conferences/?conf=res2prac>

For submission of abstracts, registration at easychair.org is required. The conference name on easychair.org is "Res2Prac 2018". **Guidelines for abstracts submissions at easychair.org are provided in the 'Call for Abstracts'**. For more information on the Research2practice Conference on Energy, Water and Climate Security in Africa, visit <http://www.pauwes.com/Res2Prac2018>

Author's details: please complete the table below before submitting the abstract.

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Extended Abstract Title (*Calibri, 14pt, centred, bold*)

**COMBATING CLIMATE CHANGE AND LAND DEGRADATION IN THE WEST
AFRICAN SAHEL: A MULTI-COUNTRY STUDY OF MALI, NIGER AND SENEGAL**

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Presenting Author's Name and Surname¹, Author's Name and Surname² (*Calibri, 10pt, centred*) **Samuel Igbatayo**

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Short Abstract

(max. 200 words; Calibri, 10pt, left alignment)

The West African Sahel is a vast ecological zone separating the Sahara desert to the north and Sudanian savannah to the south; traversing Senegal, Mali, Burkina Faso, Niger, northern Nigeria and Chad. With a population estimated at more than 60 million people, the region features a multiplicity of development challenges. It is home to some of the world's most impoverished people, whose livelihoods are reliant on rain-fed agriculture. The region faces severe and recurring bouts of droughts since the 1980s, jeopardizing environmental sustainability. During the past four decades, the West African Sahel has witnessed below-average annual precipitation, with two severe drought periods in 1972-1973 and 1983 – 1984, undermining agricultural productivity and triggering severe land degradation. Various studies have predicted even more severe climate variability and change in the region, with drier and more frequent dry periods expected. The major objective of this paper is to shed light on climate change and land degradation patterns in the West African Sahel. It employs empirical data to analyze the trends, with particular emphasis on Mali, Niger and Senegal. The study reveals considerable threats posed by the twin scourges of climate change and land degradation to food security, environmental sustainability and regional stability.

Keywords: (max. 5 keywords, separated by comma; Calibri, 10pt, left alignment)

Climate, land, Niger, Mali, Senegal

1. Introduction (Title: numbered, bold, Calibri, 10pt, left alignment)

The introduction section should (1) present the scope and objective of the paper and state the problem, (2) briefly review the pertinent literature, (3) list the applied methods, and (4) provide an overview of the main results of the work. (Text: Calibri, 10pt, left alignment)

The West African Sahel is a vast ecological zone separating the Sahara desert to the north and Sudanian savannah to the south; traversing Senegal, Mali, Burkina Faso, Niger, northern Nigeria and Chad. With a population estimated at more than 60 million people, the region features a multiplicity of development challenges. It is home to some of the world's most impoverished people, whose livelihoods are reliant on rain-fed agriculture. The region faces severe and recurring bouts of droughts since the 1980s, jeopardizing environmental sustainability.

2. Methods

The methodology must be clearly stated and described in sufficient detail or with sufficient references.



The study employs empirical data, embracing both quantitative and qualitative approaches to analyze the trends associated with the emergent global climate change in the Sahel and implications for land degradation, with particular emphasis on Mali, Niger and Senegal. A desk review of literature was also conducted on climate change and land degradation in the Sahel, while Data were sourced from various institutions, including the World Bank, United Nations Environment Programme, Food and Agriculture Organization of the United Nations and the Intergovernmental Panel on Global Climate Change, among others in support of the study.

3. Results and discussion

The results and discussion of the work should be explicitly described and illustrated. Supporting figures, tables and images of the results (no more than two figures and two tables) may be included in the extended abstract. Figures, images and tables must be numbered (see Figure 1 and table 2 as examples); figure headers should be placed under the figure or image; table header should be placed at the top. References (if any) of the tables, figures and images should be presented right under the tables, figures and images in the form of author surname and publication date.

Characterized by semi-arid vegetation, the West African Sahel is one of the most environmentally degraded ecosystems in the world. The region faces severe and recurring bouts of droughts since the 1980s, jeopardizing environmental sustainability. Land resources have been degraded, with arable soils turned into marginal lands, and rendered vulnerable to such anthropogenic activities as over-grazing, agricultural intensification and deforestation, which are common practices across the region. Table 1 illustrates the type and extent of land degradation in Senegal, 2001.

Table 1: Type and Extent of Land Degradation in Senegal, 2001.

	Share of total land area (%)
Water erosion	50.30
Wind erosion	1.94
Chemical degradation (e.g. salinization)	5.80
Anthropogenic erosion	7.15
Non-degraded soils	34.59

Source: Sow et al., 2016

Compounding the multi-dimensional challenges associated with the fragile environment in the Sahel is the emergence of global climate change, which has fueled desertification, land degradation and drought (DLDD). The impact of the phenomenon has unleashed a wave of natural resource depletion, triggering a vicious circle of soil erosion, crop failure, famine, hunger and even deaths, particularly amongst infants and the elderly. Indications are that the region is becoming drier, with longer and more frequent dry periods expected. This development was affirmed by reports of the Intergovernmental Panel on Climate Change (IPCC), which reveal a decline in annual rainfall in the late 20th century across the region, with a reduction of 20 to 40% in the periods 1931-1960 and 1968-1990. The long-term decline in precipitation has triggered a southward shift of the Sahara desert in the latter period of the 20th century, with considerable loss of biodiversity. The trend was also accompanied by rising atmospheric temperatures, estimated between 0.2 and 0.8^o centigrade since the end of the 1970s, according to the IPCC report. Desertification, fueled by climate change, has altered the topography, vegetation and soils. The topsoil has faced increasing degradation, while tracts of land have been blown or washed away. Thus, the soil's texture, organic matter and nutrient contents are undermined across the region, as illustrated in figure 1.

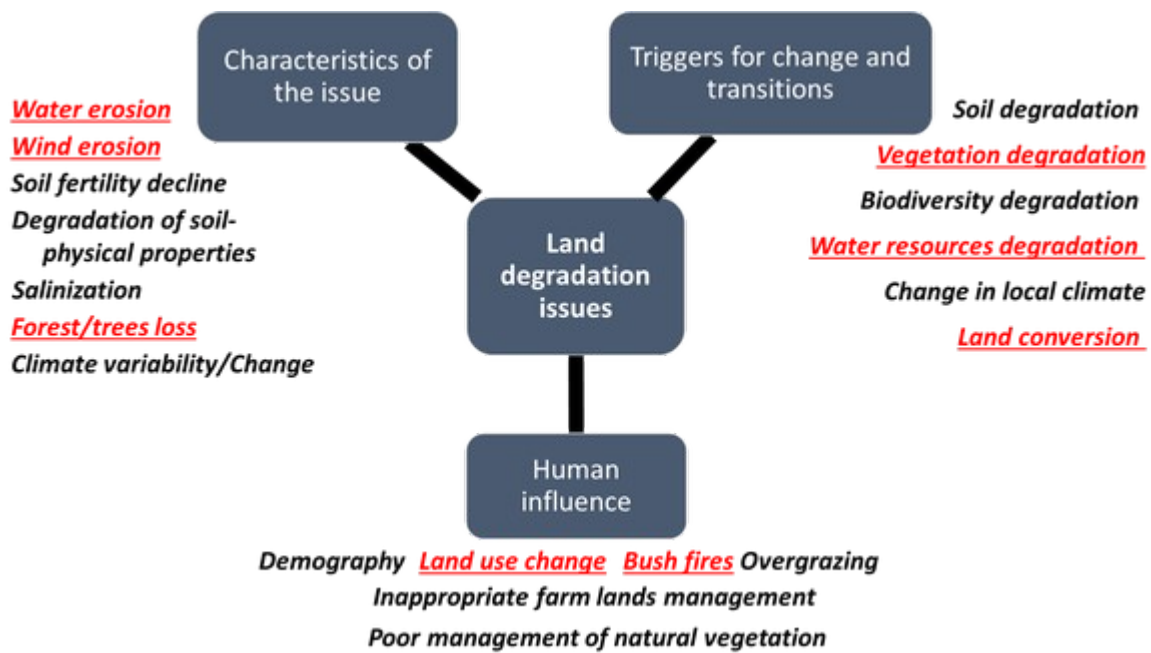


Figure 1: Factors triggering Land Degradation in the West African Sahel

Source: Mbow et al., (2015)

4. Conclusions

Conclusions should include (1) the principles and generalisations inferred from the results, (2) any exceptions to, or problems with these principles and generalisations, (3) theoretical and/or practical implications of the work, and (4) conclusions drawn and recommendations (5) comments on the relevance of the partnership among African and European institutions are welcome (see call for extended abstract for further reference)

The West African Sahel is one of the most environmentally degraded ecosystems in the world. The region faces severe and recurring bouts of droughts since the 1980s, jeopardizing environmental sustainability. Land resources have been degraded, with arable soils turned into marginal lands, and rendered vulnerable to such anthropogenic activities as over-grazing, agricultural intensification and deforestation, which are common practices across the region. Compounding the multi-dimensional challenges associated with the fragile environment in the Sahel is the emergence of global climate change, which has fueled desertification, land degradation and drought (DLDD). The impact of the phenomenon has unleashed a wave of natural resource depletion, triggering a vicious circle of soil erosion, crop failure, famine, hunger and starvation. The study has considerable potential to strengthen knowledge exchange and collaboration between African and European academic and research institutions, in furtherance of the 2063 agenda of the African Union.

5. References

References should be listed in alphabetical order and presented in a format according to the Chicago Manual of Style: http://www.chicagomanualofstyle.org/tools_citationguide.html. E.g.:
Pollan, Michael. The Omnivore's Dilemma: A Natural History of Four Meals. New York: Penguin, 2006

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