

[HOME](#) / [ARCHIVES](#) / [VOL 12, NO 1 \(2018\)](#) / [Articles](#)

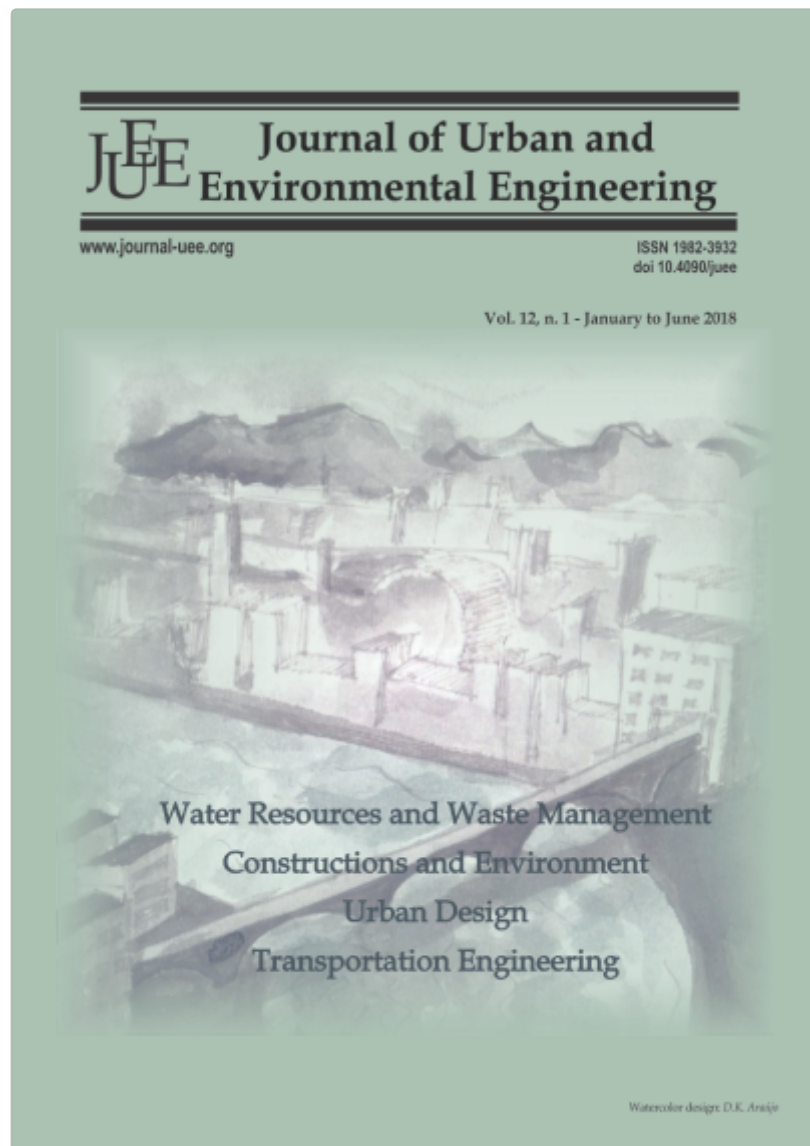
# EXPERIMENTAL STUDY OF THREE DIFFERENT AIRFOILS APPLIED TO DIFFUSER-AUGMENTED WIND TURBINES

**Jerson Rogério Pinheiro Vaz**

Universidade Federal do Pará

**Pedro Maia****Ronaldo Menezes****Marcelo Silva****Erb Lins****Keywords:** Wind turbine, Diffusers, Renewable Energy**ABSTRACT** Over the years the electricity generation based on alternative energy systems

applied to remote regions has been increased in Brazil, mainly due to the lack of conventional electric grid structure, specially in places as the Amazon. In this scenario, it is well-known that the wind power technology attracts great attention because the wind potential available in the country coast is really representative, leading this sort of technology to an important position into the local energy matrix. However, it is necessary to search new technology developments in order to get efficient turbines applied to isolated regions, where usually low wind speeds are found. The small wind systems using diffuser appear as a relevant alternative, which can be adapted to the characteristics of low wind speed conditions. Hence, in this work, an experimental study on diffusers using three different airfoils (SELIG 1223, EPPLER 423 and NACA 4412) was performed. The goal was to evaluate the influence of the diffuser velocity ratio on the classical theory (axial moment theory with diffuser), in order to show the increasing efficiency typically noticed in studies on Diffuser-Augmented Wind Turbines (DAWTs). In this regard, it was concluded that the wind speed increases under diffuser effect even whether the geometric model is composed by two straight parallel airfoils. Consequently, a DAWT might be adapted to low wind speeds usually found in northern Brazil.



 PDF

PUBLISHED

2018-07-27

ISSUE

Vol 12, No 1 (2018)

SECTION

Articles

## LICENSE

All Rights Reserved. All items (including but not limited to abstracts, artwork, poetry and articles) published by this journal are copyright of the original authors. To use articles beyond reasonable academic or journalistic norms, you must first gain permission from the individual authors. To reproduce any artwork, poetry, fiction or other artistic forms contained in this journal in any form you must first gain permission from the artist. All authors and artists are responsible for the content of their work, including proper citation, attribution and usage permissions.



ISSN 1982-3932  
DOI: 10.4090/juee

**Sponsor:**

