

# Development of a numerical model of heat and mass transfer in biosourced materials

Authors: Anel P. Nelson <sup>1\*</sup>; Ted Soubdhan <sup>2</sup>

1,2 EA 4539, LARGE Laboratory, University of Antilles, Pointe-à-Pitre, Guadeloupe, France

<sup>1</sup> Département de Physique, Université d'État d'Haïti-Ecole Normale Supérieure, Laboratoire des Sciences pour l'Environnement et de l'Énergie (LS2E), Canapé-Vert, Port-au-Prince, Haïti

anel.nelson@etu.univ-antilles.fr 1; ted.soubdhan@univ-antilles.fr 2

Corresponding author: \* anel.nelson@etu.univ-antilles.fr

The Journal of Caribbean Environmental Sciences and Renewable Energy  
Vol. 4, Issue 1, 2022 [doi.org/10.33277/cesare/004.001/01](https://doi.org/10.33277/cesare/004.001/01)



THE  
UPCYCLE



Journal of Caribbean Environmental  
Sciences and Renewable Energy



## Development of a numerical model of heat and mass transfer in biosourced materials

Authors: Anel P. Nelson <sup>1 \*</sup>; Ted Soubdhan <sup>2</sup>.

1,2 EA 4539, LARGE Laboratory, University of Antilles, Pointe-à-Pitre, Guadeloupe, France

1 Département de Physique, Université d'État d'Haïti-Ecole Normale Supérieure, Laboratoire des Sciences pour l'Environnement et de l'Énergie (LS2E), Canapé-Vert, Port-au-Prince, Haïti

anel.nelson@etu.univ-antilles.fr 1; ted.soubdhan@univ-antilles.fr 2

Corresponding author: \* anel.nelson@etu.univ-antilles.fr

The Journal of Caribbean Environmental Sciences and Renewable Energy  
Vol. 3, Issue 3, 2021 [doi.org/10.33277/cesare/004.001/02](https://doi.org/10.33277/cesare/004.001/02)

Bio-sourced materials such as banana and coconut fibers can be modelled to show that they provide good thermal insulation especially in hot tropical climates. The numerical model found that these bio-sourced materials considerably slow down heat transmission but also increases internal humidity level. Treatments may have to be done to limit the development of mold within the buildings that use these bio-sourced materials.

The Journal of CESaRE has identified several areas of consideration stemming from the authors' work:

- Increased use of bio-sourced material for thermal insulation in hot tropical climates
- Importance of treating these materials so as to limit the generation of mold.