



Dry Spells, Urban Swells: Analyzing the Drought-Induced Expansion of Cities in Sub-Saharan Africa

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This review verifies the reproducibility of the exhibits included in the paper “*Dry Spells, Urban Swells: Analyzing the Drought-Induced Expansion of Cities in Sub-Saharan Africa*”.

Contents in this review:

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Main findings

- The code was successfully executed on a new computer after:
 1. Installing the environment for the python code.
 2. Running `renv::init()` to initialize the R programming environment
 3. Changing the file paths for the python script and R code.
- The output demonstrates consistent stability across multiple runs. Specifically, executing the code two times consecutively yielded identical results.
- The code takes approximately 3 hours to run.
- We conducted our reproducibility analysis based on the paper shared by the authors in the reproducibility package.
- Every exhibit has been reproduced accurately.
- **Reproducibility Summary:**
 - **Data:** All data sources are publicly available and included in the reproducibility package.
 - **Code:** All code files (from cleaning to analysis) are included in the reproducibility package.
 - **Outputs:** All outputs are generated by code included in the reproducibility package.
 - **Reproducibility verification:** Reviewers had access to the same materials in the public reproducibility package. The reviewers did not verify if publicly available data matches the data in the reproducibility package.
 - **Dependencies environment:** The reviewers reproduced an existing environment for dependencies using dependency files or an environment metadata file provided by the authors.

List of exhibits and reproducibility status

Results in the Main Section of the Paper

- **Figure 1** Reproduced.
- **Figure 2** Reproduced.
- **Figure 3** Reproduced.
- **Figure 4** Reproduced.
- **Figure 5** Reproduced.
- **Figure 6** Reproduced.
- **Figure 7** Reproduced.
- **Figure 8** Does not Apply. This figure does not show analysis result.
- **Figure 9** Reproduced.
- **Figure 10** Reproduced.
- **Figure 11** Reproduced.
- **Figure 12** Reproduced.

Results in the Annex

- **Table 1** Reproduced.
- **Figure 13** Reproduced.
- **Table 2** Reproduced.
- **Figure 14** Reproduced.
- **Table 3** Reproduced.
- **Table 4** Reproduced.

Reproduction Environment

- Paper exhibits were reproduced in a computer with the following specifications:
 - OS: Windows 11 Enterprise
 - Processor: Intel(R) Core(TM) i5-1145G7 CPU @ 2.60GHz
 - Memory available: 15.7 GB
 - Software version: Python 3.11, R 4.4.0