

# Certified to stay? Long-Run Experimental Evidence on Land Formalization and Widows' Tenure Security in Benin

This report explains how to replicate the results presented in the paper “Certified to stay? Long-Run Experimental Evidence on Land Formalization and Widows' Tenure Security in Benin”.

The study combines data collected at three points in time: 2011, 2015, and 2021. In 2011, we surveyed a sample of 3,507 households across 291 villages. In 2015, we attempted to re-interview these households; while most households that remained in their original village were successfully re-interviewed, some relocated (and were tracked), and others were lost. Our paper examines how the village's selection for a land registration program has affected the ability of some households to stay in their village. In 2021, we conducted group discussions in 71 of these villages, holding separate interviews with women and men. During these discussions, participants collectively reflected on various aspects of widowhood practices in their communities. The survey team then summarized the audio records into a database used to report key features of experiences regarding widowhood within villages.

## 1 Overview

The raw datasets used to identify relocated households and document household characteristics from 2015, along with the raw database created from audio recordings of the 2021 group discussions across 71 villages, are not publicly available.

Since some raw data is restricted, this package only includes processed and constructed versions of these databases, which have been merged and cleaned of sensitive identifying information to facilitate replication. These copies are placed in the `data\final` folder.

Users will only be able to replicate the analysis using the processed data by running the script: `code\00_main_dofile_with_final_data.do`.

## 2 Data Availability

- All data are publicly available
- Some data cannot be made publicly available.**
- No data can be made publicly available.

### 2.1 Data publicly available

- **Plans Fonciers Ruraux Impact Evaluation 2011, Baseline Survey - Benin, 2011**

**Path:** `data\raw\2011\`

- `PRESELECTION.dta`: Provides details about the villages participating in the land registration program.

- XCOMMUNAUTAIRE.dta: Reports data from the community survey and includes details on land administration at the village level for the village.
- XF.dta: Data from a part of the questionnaire administered to the female head of household or to the wife/partner of the male head of household.
- XH.dta: Data from the part of the questionnaire administered to the male head of household or to the spouse/partner of a female head of household
- XPPF.dta: Data from the part of the questionnaire administered to the head of the household on practices and perceptions related to land uses and administration
- XRM.dta: Data from the listing of household members
- XRMT.dta: Data from land survey form completed for each plot of land that is owned, used, and/or cultivated by the household over the past 12 months.
- **Source:** Microdata Library - World Bank.
- **URL:** <https://doi.org/10.48529/am76-g093>

- **Certified to Stay?, replication files - 2025**

**Path:** data\final\

- widowhood2021.dta: This dataset contains summaries from audio records of group discussions conducted in 2021 with men and women across 71 villages. These discussions were structured around community perceptions of Benin's Family Code and experiences of widowhood. This dataset is required to reproduce Table 1 and Table A.7 in the paper.
- maindata.dta: This dataset is an excerpt from the original survey conducted between March and April 2011. It includes information on household attrition between 2011 and the follow-up survey conducted between April and May 2015. This dataset is required to replicate all tables in the paper except for Table 1 and Table A.7.
- **Location:** Folder data/final of the replication package
- **Source:** World Bank Gender Innovation Lab

## 2.2 Data with restricted access

- **Plans Fonciers Ruraux Impact Evaluation 2011, Baseline Survey - Benin, 2011**

**Path:** data\raw\2011\

- XGPS.dta: Reports data from the GPS measurement for fields cultivated or managed by the household during the last major rainy season.
- XHS.dta: Data from the household identification page
- **Source:** World Bank Gender Innovation Lab

- **Plans Fonciers Ruraux Impact Evaluation 2015, Follow-up Survey - Benin, 2015**

**Path:** data\raw\2015\

- `F.dta`: Data from a part of the questionnaire administered to the female head of household or to the wife/partner of the male head of household
  - `H.dta`: Data from the part of the questionnaire administered to the male head of household or to the spouse/partner of a female head of household
  - `RM.dta`: Data from the listing of household members
  - `TRACHL.dta`: Data from household tracking form completed for every household that was previously interviewed during the 2011 survey.
  - **Source**: World Bank Gender Innovation Lab
- **Enquête de suivi pour l'étude de l'effet des plans fonciers ruraux (PFR) sur les femmes et les veuves au Bénin - 2021**

**Path:** `data\raw\2021\`

- `quest_audio_pfr_2021.dta`: This file contains summaries of discussions with male and female participants from 71 villages in Benin regarding widowhood practices. Each discussion was synthesised around 20 key questions by at least two reviewers who listened to the audio recordings before responding. A final review was conducted to assert agreements and resolve discrepancies, producing a consensus set of responses for each discussion.
- **Source**: World Bank Gender Innovation Lab.

## 2.3 Statement about Rights

- I certify that the author(s) of the manuscript have legitimate access to and permission to use the data used in this manuscript.
- I certify that the author(s) of the manuscript have documented permission to redistribute/publish the data contained within this replication package. Appropriate permissions are documented in the `LICENSE.txt` file.

## 3 Instructions for Replicators

Below are the steps to reproduce the analysis based on your data access to only constructed final datasets.

1. Ensure that the final databases are stored in the `data\final` folder.
2. Identify the directory path for the `data` folder in the replication package (e.g., `C:\Reproducibility package\data`).
3. Open the script `code\00_main_dofile_with_final_data.do` and locate line 17, which reads:

```
cd "\1"
```

4. Replace line 17 with your directory path. For example:

```
cd "C:\Reproducibility package\data"
```

5. Confirm that all required software and dependencies (as listed in the Requirements section) are installed.
6. Execute the do-file `code\00_main_dofile_with_final_data.do` to run the analysis.

## 4 List of Exhibits

The provided code reproduces:

- All numbers provided in text in the paper
- All tables and figures in the paper
- Selected tables and figures in the paper, as explained and justified below

**Table 1:** List of Exhibits

Exhibit Name	Script	Output Filename
Table 1	<code>code\02_analysis.do</code> (lines 7 – 33)	Botea_2025.txt
Table 2	<code>code\02_analysis.do</code> (lines 89 – 147)	Botea_2025.txt
Table 3	<code>code\02_analysis.do</code> (lines 149 – 214)	Botea_2025.txt
Table 4	<code>code\02_analysis.do</code> (lines 216 – 271)	Botea_2025.txt
Table 5	<code>code\02_analysis.do</code> (lines 273 – 328)	Botea_2025.txt
Table 6	<code>code\02_analysis.do</code> (lines 330 – 377)	Botea_2025.txt
Table A.1	<code>code\02_analysis.do</code> (lines 379 – 450)	Botea_2025.txt
Table A.2	<code>code\02_analysis.do</code> (lines 452 – 507)	Botea_2025.txt
Table A.3	<code>code\02_analysis.do</code> (lines 509 – 564)	Botea_2025.txt
Table A.4	<code>code\02_analysis.do</code> (lines 566 – 623)	Botea_2025.txt
Table A.5	<code>code\02_analysis.do</code> (lines 625 – 679)	Botea_2025.txt
Table A.6	<code>code\02_analysis.do</code> (lines 681 – 723)	Botea_2025.txt
Table A.7	<code>code\02_analysis.do</code> (lines 35 – 80)	Botea_2025.txt

## 5 Requirements

### 5.1 Computational Requirements

All analyses were performed on a computer running Windows 10 Education, equipped with an Intel Core Ultra 7 165H (1.40 GHz) processor and 32 GB of RAM.

### 5.2 Software Requirements

The analyses were executed using Stata MP version 18. The script used to produce the results presented in the paper, `code\02_analysis.do`, relies on three user-written Stata commands:

- `mreg`: A custom command created using the file `code\00_mreg.do` file<sup>1</sup>. The `mreg` command runs the same linear regression on multiple outcomes simultaneously, reporting only the coefficient of the variable of interest.
- `estout`: A user-written command that exports estimation results into well-formatted tables. If not already installed, `code\02_analysis.do` will automatically install it; however an internet connection is required.
- `rwolf`: A user-written command that performs the Romano-Wolf multiple hypothesis correction and generates  $p$ -values adjusted for multiple hypothesis testing. If not already available, `code\02_analysis.do` will automatically install it, which also requires an internet connection.

### 5.3 Memory, Runtime, and Storage Requirements

On the specified system, running `code\00_main_dofile_with_final_data.do` with Stata MP 18.0 takes approximately 15 minutes. Note that some results tables use the `rwolf` command, which employs resampling methods requiring additional computation time, and may take longer to load.

## 6 Code Description

Below is a detailed list of the do-files included in this replication package and their respective functions:

- `code\00_main_dofile_with_raw_data.do`: Sets file paths, installs the necessary packages, and executes `code\01_data_creation.do` and `code\02_analysis.do`.
- `code\00_mreg.do`: Creates the `mreg` command, which allows users to run the same linear regression on multiple dependent variables simultaneously while reporting only the coefficient of the variable of interest.
- `code\01_data_creation.do`: Loads raw data, executes all subordinate do-files (`code\01-##_*.do`) to generate the variables used in the analyses, and creates the temporary cleaned databases saved in the `data\build` folder. Most importantly, it produces the final databases `data\final\maindata.dta` and `data\final\widowhood2021.dta` that are used to generate the paper's results.
- `code\01-01_hhhead2011.do`: Extracts key characteristics of the household heads surveyed in 2011 and creates the file `data\build\hhhead2011.dta`.
- `code\01-02_hhhomestead2011.do`: Extracts key characteristics of the homesteads from the 2011 survey and creates the file `data\build\hhhomestead2011.dta`.

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<sup>1</sup>Note: `code\00_mreg.do` temporarily defines `mreg` as a new command, which may override any pre-existing command with the same name during the session.

- `code\01-03_terrains2011.do`: Generates variables detailing land use by households surveyed in 2011 and produces the file `data\build\terrains2011.dta`.
- `code\01-04_men2011.do`: Extracts data on the marital history of the male head of household or the spouse/partner of a female head of household from the 2011 survey and creates the file `data\build\men2011.dta`.
- `code\01-05_women2011.do`: Extracts data on the marital history of the female head of household or the spouse/partner of a male head of household from the 2011 survey and creates the file `data\build\women2011.dta`.
- `code\01-06_pfrperceptions2011.do`: Generates variables that capture practices and perceptions related to land use and administration as reported by the head of household in the 2011 survey and creates the file `data\build\pfrperceptions2011.dta`.
- `code\01-07_attrition2015.do`: Creates key variables that identify households surveyed in 2011 that remained in their villages by the time of the 2015 survey, and produces the file `data\build\attrition2015.dta`.
- `code\01-08_hhhead2015.do`: Extracts key characteristics of the household head as reported in the 2015 survey and creates the file `data\build\hhhead2015.dta`.
- `code\01-09_men2015.do`: Extracts data on the marital history of the male head of household or the spouse/partner of a female head of household from the 2015 survey and creates the file `data\build\men2015.dta`.
- `code\01-10_women2015.do`: Extracts data on the marital history of the female head of household or the spouse/partner of a male head of household from the 2015 survey and creates the file `data\build\women2015.dta`.
- `code\01-11_villages2011.do`: Generates variables related to village-level land administration, as reported by village representatives in the 2011 survey, and creates the file `data\build\villages2011.dta`.
- `code\01-12_treatmentstatus.do`: Identifies the treatment status of each village (including details of the lottery determining PFR selection) and creates the file `data\build\treatmentstatus.dta`.
- `code\01-13_villagesgd2021.do`: Generates variables describing practices and perceptions regarding widowhood, as reported by both men and women in 71 villages, and produces the file `data\build\villagesgd2021.dta`.
- `code\02_analysis.do`: Performs the statistical analyses and outputs a copy of the tables presented in the paper as they appear in the Stata results viewer.