Outline of model files for:

**Synergies between climate change mitigation and national development through the Tanzanian dairy roadmap**

**Description**

Folder contents include:

* Excel sheets (.xlsx) used in income accounting module, and
* Python files (.py & .ipynb) forming the core components of the model used to conduct livestock production system simulations.

The herd populations at production system level for the four studied districts are calibrated within the python module and loaded into the sheet scenario\_parameters\_LSA.xlsx. From these herd populations, the income accounting procedure calculates imputed household income for the three household types and 4 districts. These results are then tallied to each household type, district and region in Income\_aggregation.xlsx. The .py files can be run in any python environment, and the .ipynb file can be run as a notebook in Jupyter.

**Contents**

**Excel**

* **District summary data (District\_data.xlsx)**

Basic household data sources derived from GLS (2019) used in income accounting module

* **Scenario Parameters (Scenario\_parameters.xlsx)**

Data sheet linking raw output data from python to sector level herd population parameters for each scenario

* **Income per household by district (Income\_accounting\_#Mufindi, Mvomero, Njombe, Rungwe. xlsx)**

Used to link district herd populations (from Scenario Parameters LSA) to household level following equation (1) of article

- Used to conduct dairy NPV calculations, household income, and population level income across scenarios

* **Aggregation of income across districts (Income\_aggregation.xlsx)**

Aggregates income results from district specific sheets

**Python**

* **Model\_define.py**

Defines a model ‘object’ which is the basis for conducting the production system simulations. The model draws data externally from excel sheets and conducts individual iterations representing each simulation unit, then creating a dataframe representing all output of the model.

* **Simulation\_engine.py**

Called as a method of ‘Model\_define’. Simualates *LivSim* and conducts land footprint and GHG accounting for each simulation unit.

* **Model\_run.ipynb**

Example of model instance and associated parameters used to run the simulations described in article.