

[Valentin Russeil ^{a,b}, Danny Lo Seen ^b, François Broust ^c, Muriel Bonin ^b, Jean-Philippe Praene ^a]

[^a Laboratoire PIMENT, Université de La Réunion, Le Tampon, France, ^b CIRAD, UMR TETIS, F-97490 Sainte-Clotilde, Réunion, France TETIS, Univ Montpellier, AgroParisTech, CIRAD, CNRS, INRAE, Montpellier, France, ^c CIRAD, UPR BioWooEB, F-97743 Saint-Denis, Réunion, France], [France]

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[Food and electricity self-sufficiency trade-offs in Reunion Island: modelling land-use change scenarios with stakeholders]

At the scale of Reunion Island, a French overseas region located in the Indian Ocean, stakeholders have endorsed policies to increase both food and electricity self-sufficiency. Locally, farmlands provide food, feed and bioelectricity from sugar cane. Thus, improving self-sufficiency requires balancing different land-uses. To design and evaluate self-sufficiency scenarios at regional level, we first identified essential drivers of change through semi-directive interviews followed by a structural analysis. We modelled essential drivers as processes using Ocelet, a spatially explicit and dynamic modelling platform. We built a detailed land-use map for our initial state and calibrated the modelled processes through four plausible scenarios ranging from an extrapolation of trends to the implementation of existing land planning policies. These first simulations confirmed that current trends do not allow the territory to raise substantially and simultaneously its food and electricity self-sufficiency levels. However, simulated maps from our plausible scenarios were used as intermediary objects to mediate the debate with stakeholders around local self-sufficiency issues. Rupture hypothesis emerged from this second round of interviews such as the complete conversion of industrial sugar cane fields towards food crops or massive changes in consumer's behaviours. We are currently conducting a morphological analysis to assemble these hypotheses into contrasted rupture scenarios, which we aim to simulate in our spatial model. These second simulations are going to illustrate how Reunion Island (as other small insular territories relying heavily on bioelectricity) could maximize its food and electricity self-sufficiency, with radical but realistic trajectories according to local stakeholders.

Bibliographic references