Ex ante impact of peste des petits ruminants control on micro and macro socioeconomic indicators in Senegal

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Introduction

Vaccination is espoused as the most reliable and effective control mechanism for the procedures outlined in the Global Control and Eradication Strategy for peste des petits ruminants (PPR). However, extant studies assert that vaccination can be expensive. Hence, the effectiveness of disease control may not necessarily translate to overall profit for farmers. Also, the consequences of PPR control on socioeconomic indicators like food and nutrition security at a macro-national level have been underexplored.

Aim

This study seeks to examine the ex-ante impact of PPR control (vaccination) strategies on farm-level profitability and the socioeconomic consequences concerning food and nutrition security at a national level in Senegal.

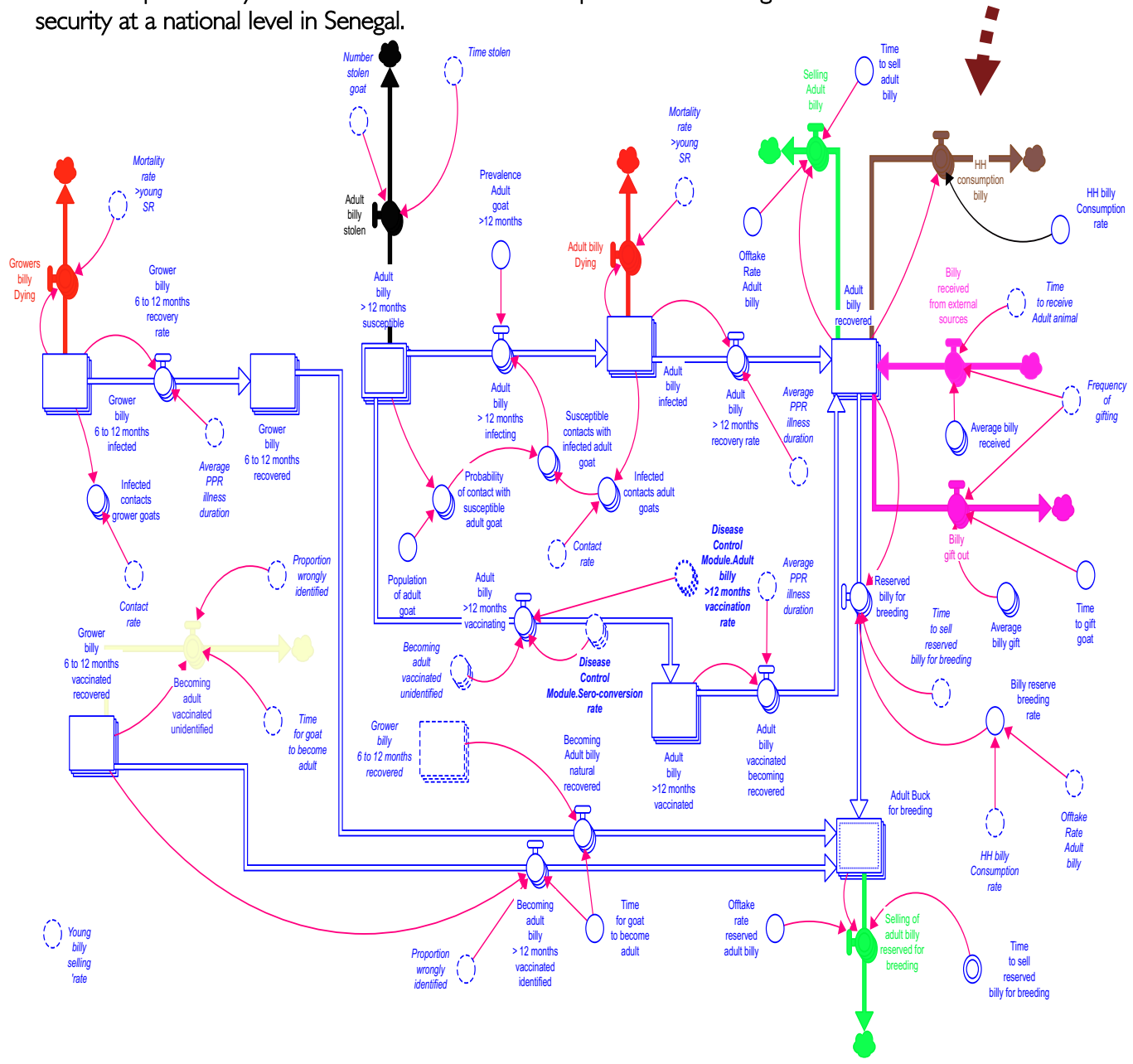

Figure 2 Extracted stocks and flow diagram in the production-epidemiological module

Conclusion

- There was no statistically significant difference in the gross margin earnings and the potential per capita consumption when vaccination is performed with or without government subsidies
- This study's findings offer an empirical justification for a sustainable approach to PPR eradication in Senegal. The information on the socioeconomic benefits of vaccination can be promoted via sensitization campaigns to stimulate farmers' uptake of the practice.
- Additionally, this study provides the precursory grounding for the development of web-based simulation interface that can serve as decision support tool for stakeholders (scan the QR code)

Acknowledgement

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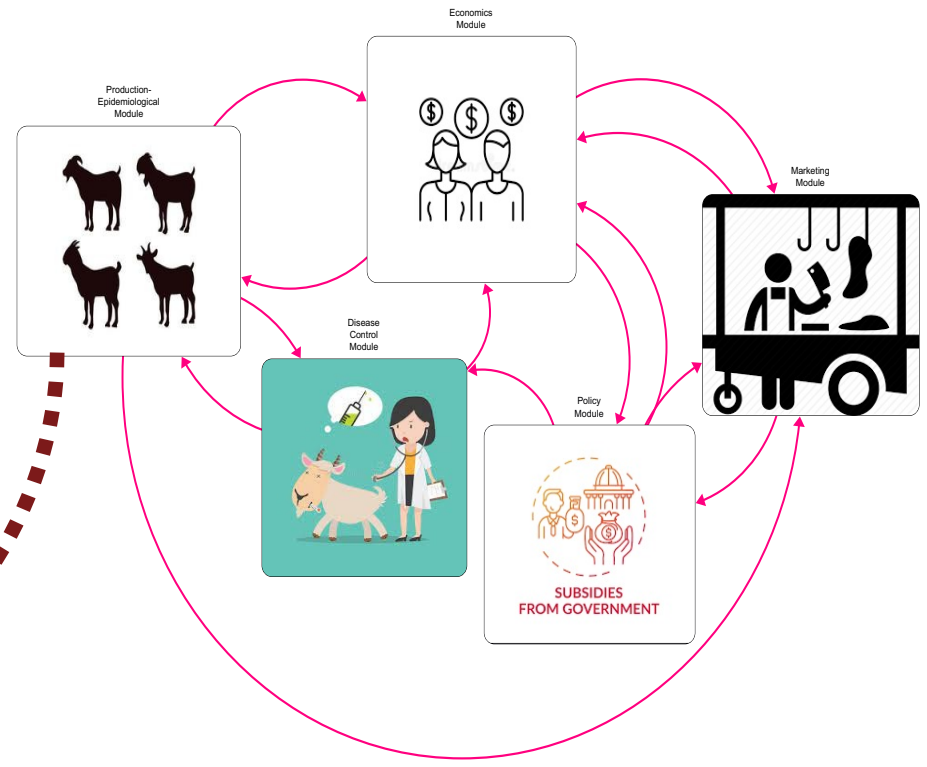


Figure 1 Modules in the model

Method

A bi-level system dynamics model, compartmentalised into five modules consisting of integrated production-epidemiological, economics, disease control, marketing, and policy modules, was developed.

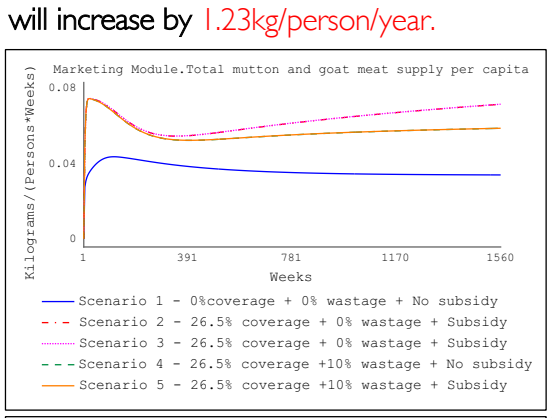
Simulation duration: 30 years at a weekly timestep.

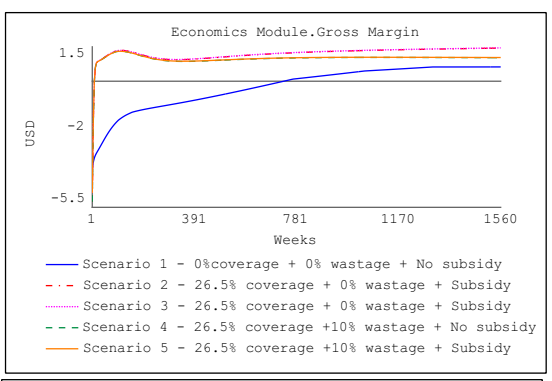
Data sources: Household surveys from pastoral areas in Northern Senegal and FAOSTAT, relevant official government data, and AfDB data.

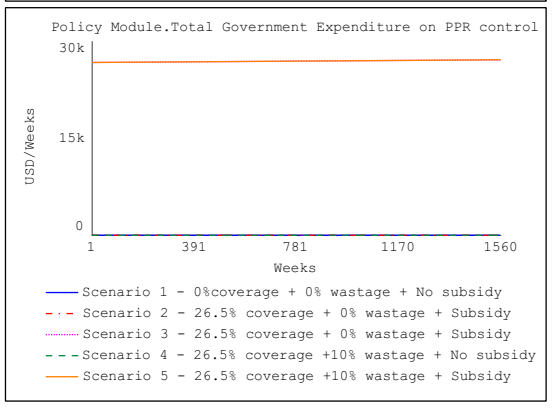
Scenarios: Nine (9) vaccination scenarios were examined from three vaccination dimensions (vaccination coverage, vaccine wastage [multiple vaccination], and the provision of government subsidies).

Findings

- Compared to a no-vaccination scenario, all the vaccination scenarios for both 26.5% (prevailing vaccination coverage) and 70% (expected vaccination coverage) resulted in statistically significant difference in the gross margin earnings and the potential per capita consumption for the supply of mutton and goat meat.
- At the prevailing vaccination coverage (with or without the provision of government subsidies), farm households will earn on average $69.43 annually more than the no-vaccination scenario, and the average per capita consumption for mutton and goat meat will increase by 1.13kg/person/year.
- When the vaccination coverage is increased to the prescribed threshold for PPR eradication (i.e., 70%), with or without the provision of government subsidies, the average gross margin earnings will be $72.23 annually and the per capita consumption will increase by 1.23kg/person/year.







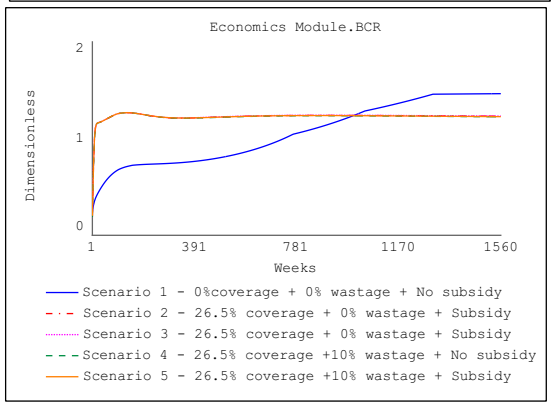


Figure 3 Ex-ante impact assessment @ prevailing vaccination coverage

SCAN the QR code to access the web-based simulation interface under construction

https://exchange.iseesystems.com/public/jaboah/i-ecoppr