THE DRIVERS OF LIVESTOCK PRODUCTIVITY IN THE NIGERIA

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Introduction

- The livestock system is an open, inter-related, feedback dominated, non-linear featuring time delays as in gestation periods, processing and response of price to change in demand.
- The livestock system is characterized by incomplete information, uncertainty and distributed decision-making (FMARD, 2016).
- The livestock subsector has been reported to be highly dynamics (Thornton, 2014) as increasing demand, climate constraints, environment, health and social cultural issues are factors affecting the subsector globally.

Research Questions

- What are the key drivers of livestock productivity in Nigeria?
- How do these drivers relate with each other and affect livestock productivity?
- What are the future productivity levels based on current trend?
- How will the subsector’s productivity perform in the long run based on controlled changes in land use and livestock feed?

Objectives of the Study

The general objective of this study is to use system dynamics approach to model drivers of the Nigerian livestock subsector's productivity.

The specific objectives of the study are to;

- Identify key drivers of productivity in the livestock subsector
- Examine the trend of key drivers of livestock productivity
- Predict future productivity levels based on existing trend in the subsector
- Forecast productivity levels based on scenario changes in land use and livestock feed in the livestock subsector

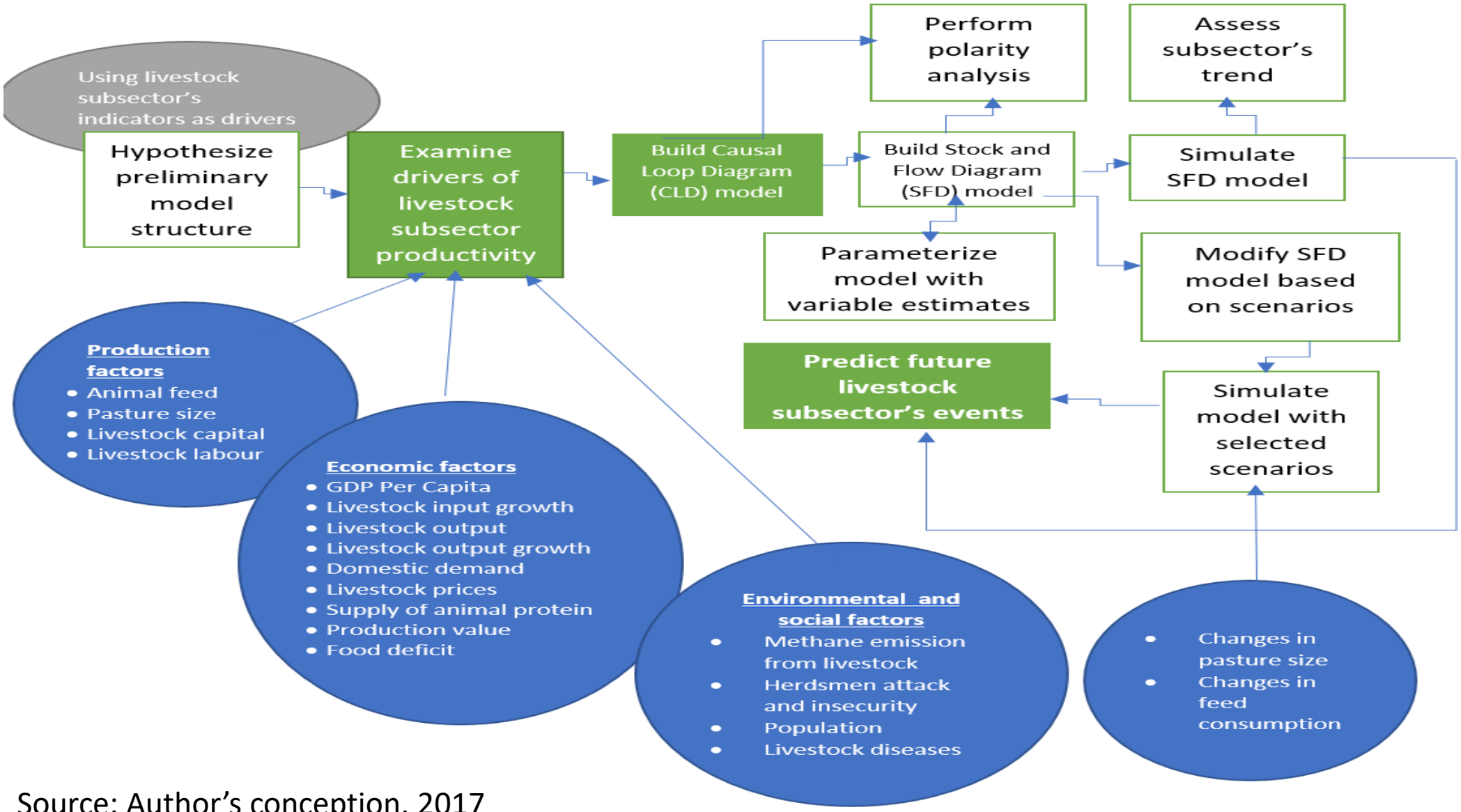
Literature Review

Theoretical Framework: Theories of production, productivity, systems and dynamic systems.

Methodological Review: Agricultural productivity measures, productivity assessment and herd growth models; system dynamic models.

Empirical Review: Livestock production and its trends; livestock drivers and livestock models; non-dynamic models of livestock productivity.

Conceptual Framework

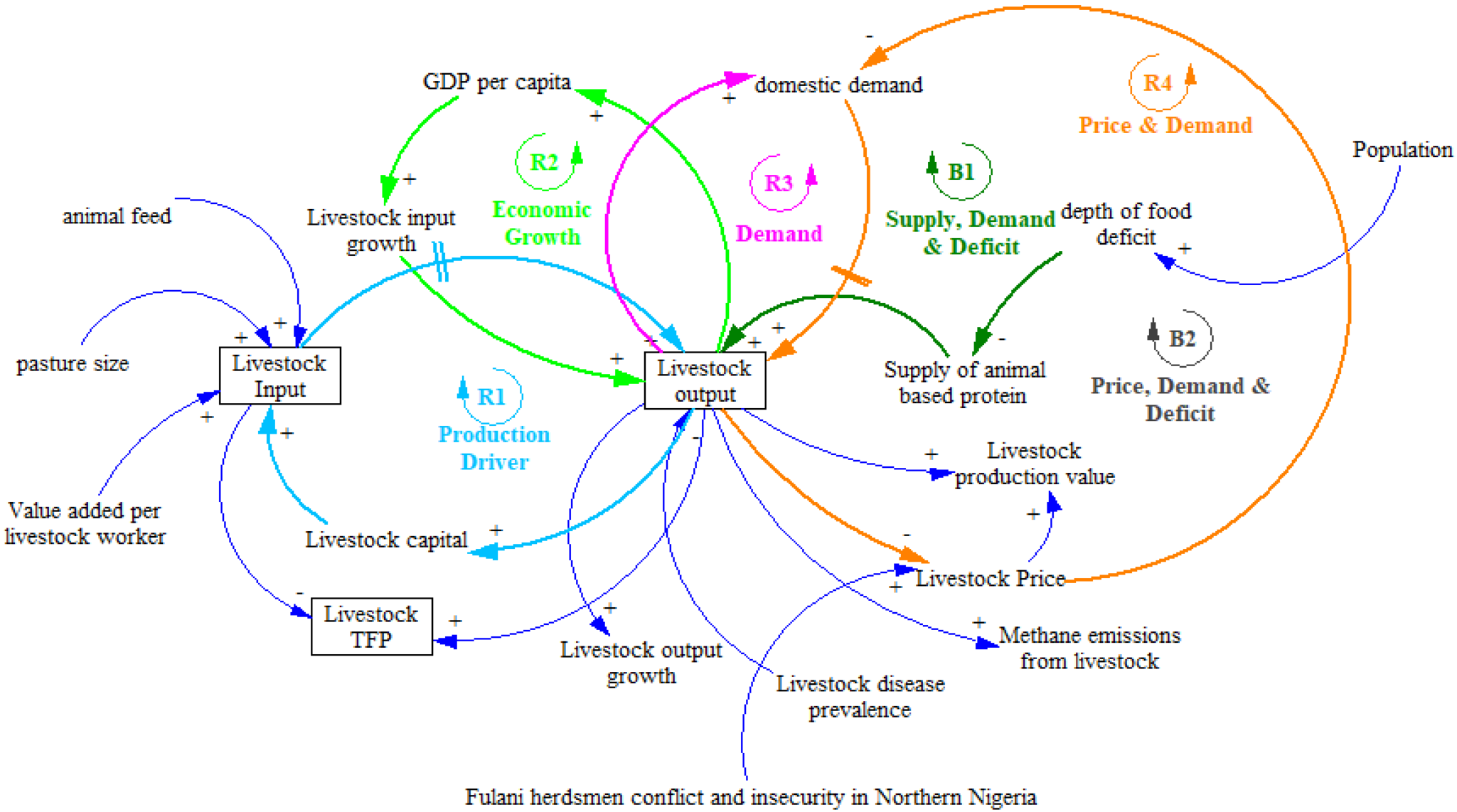


Source: Author's conception, 2017

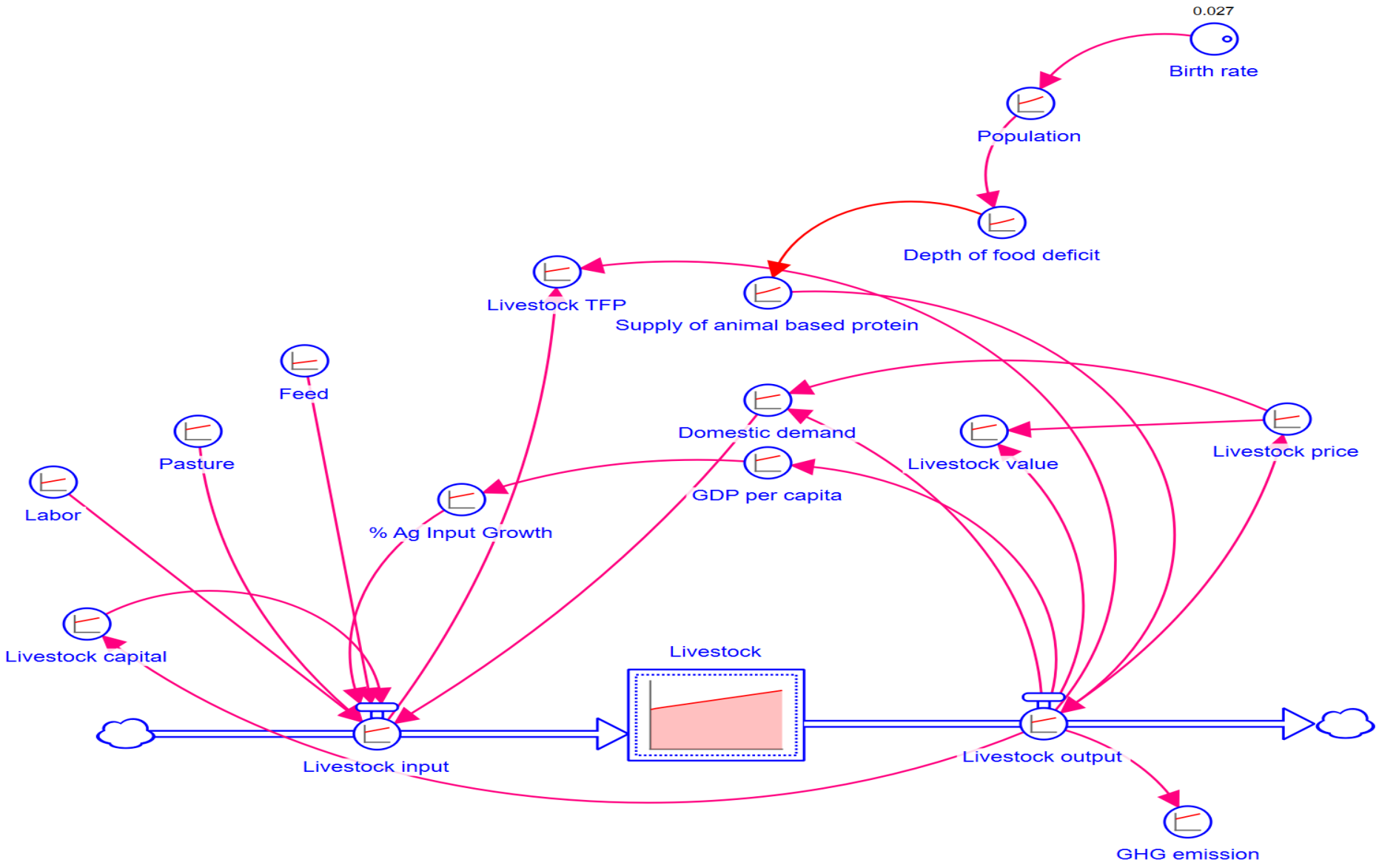
Research Methodology

- The study covered livestock productivity in Nigeria
- Quantitative data was obtained from sources like the World Bank, FAO, NBS and USDA
- The data set used in the study ranged from 1980 - 2016
- The data was analysed using trend line, regression, Causal Loop Diagram (CLD), Stock Flow Diagram (SFD) and sensitivity analysis
- Forecast simulation period ranged from 2017 – 2041 (25 years)

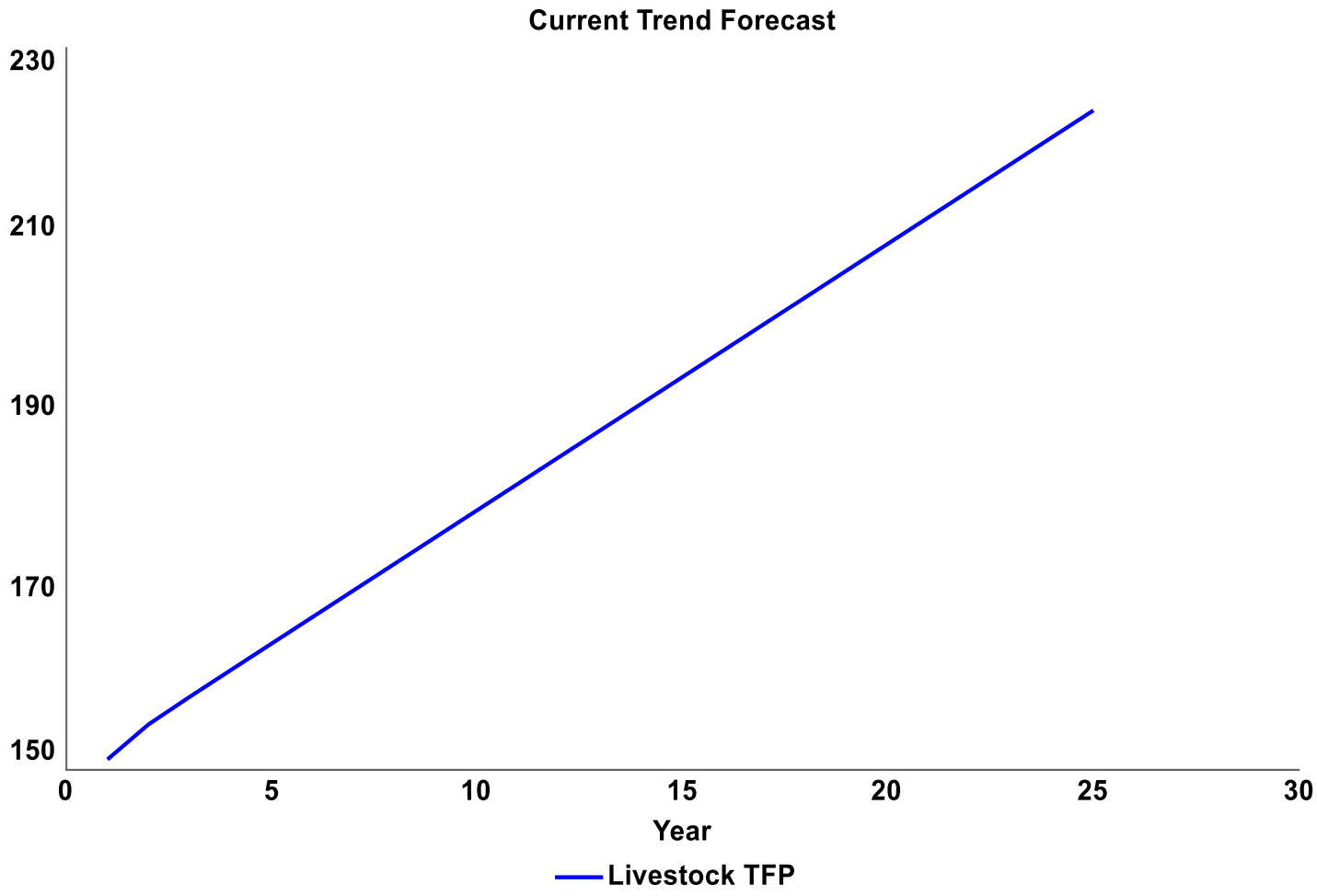
Results (Causal Loop Diagram)



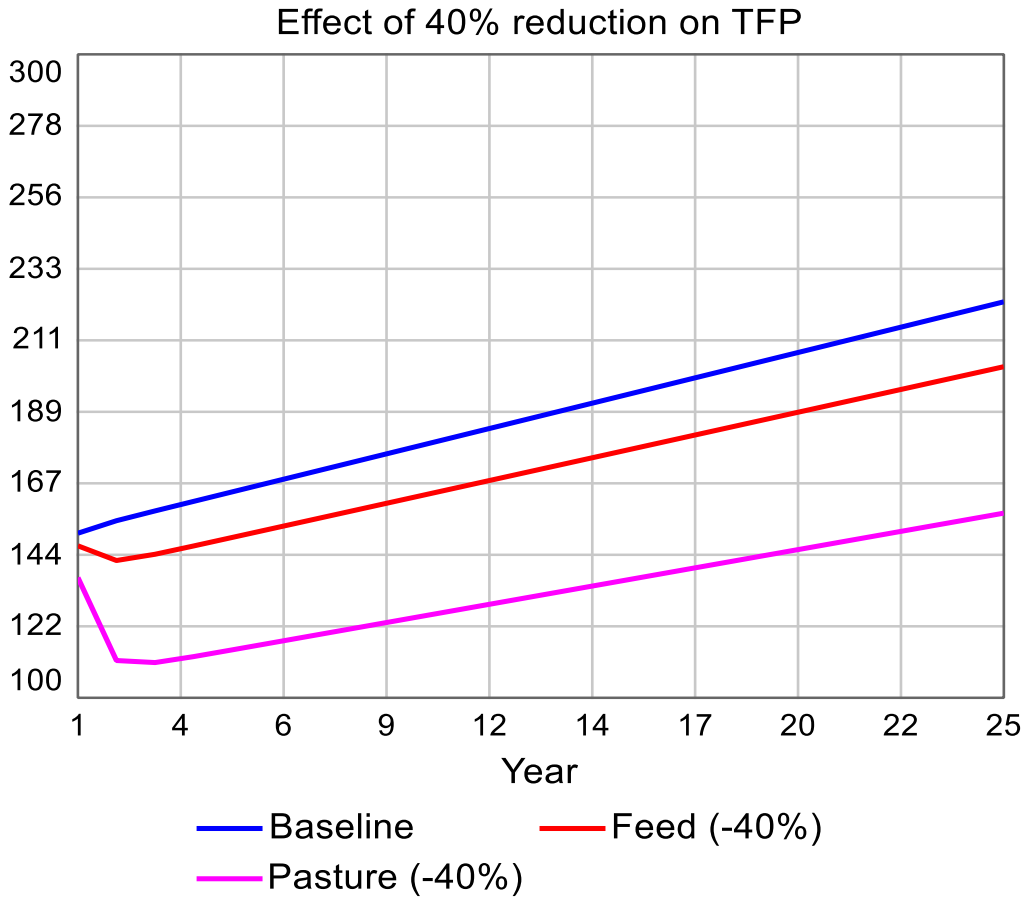
Results (Stock and Flow Diagram)

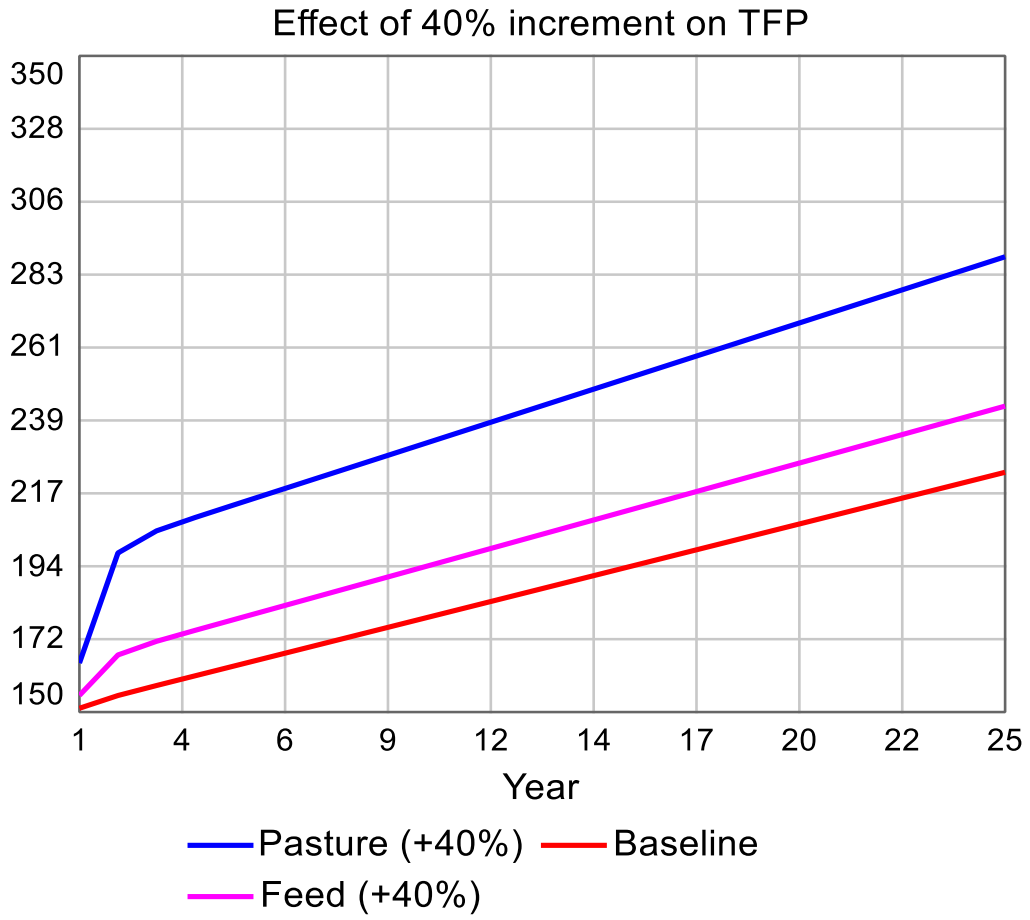


Results (Livestock Productivity Forecast)



Results (Productivity Forecast based on Scenarios)





Summary and Conclusion

- The system dynamics approach was well suited in analysis and prediction of livestock productivity
- There are 3 reinforcing and 3 balancing feedback loops
- The regression models had statistically significant variables
- Livestock productivity is expected to rise to 223% by 2041
- A commensurate increase in pasture expenditure raises livestock productivity more than feed expenditure

Recommendations

- Increase spending on pasture
- Limit feed expenditure
- Quantitative data gathering

Selected References

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