Shitindi Regnard Francis ‘FOOD SUPPLY IN TANZANIA BASED ON SYSTEM DYNAMICS APPROACH’

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○Summary of the Examination Result of Doctoral Dissertation Paper

This paper, using the system dynamics analysis, examines the food supply problem in Tanzania, especially the food supply problem centering on Mpanda district in Rukwa Region. The results are as follows:

First, food supply is a critical issue in developing countries such as Tanzania. However, existing research, such as econometric and optimization models on the food supply, have not solved the problems and are without promising sustainable solutions. Different from existing research, this study introduces system dynamics to analyze and resolve the problem.

Second, this study reviews the existing research related to the food supply, agriculture, the environment, the social, and the economic and system dynamics modeling and simulation analysis such as the food availability decline (FAD) model of the Food and Agriculture Organization (FAO) by the United Nations, the food entitlement decline (FED) model by economist Amartya Sen, the basic quantitative tool in agricultural production systems, and modeling techniques.

Third, this study shows, through reviewing the existing research, that system dynamics analysis is more desirable to resolve the food supply problem in Tanzania and other developing countries. This study used Vensim software to solve the food supply problem in Tanzania and designed the Mpanda System Dynamics Food Supply Model (MSDFSM) of Tanzania, and performed the simulations. This study reflected changes of many variables that impact food supply in connection with population, agricultural production, and land resources.

Fourth, this study provides three Cases of Simulation Model and Analysis: Case I assumptions are land resources are fixed without technological advancement; Case II assumptions are land resources are fixed with technological advancement; and Case III assumptions are land resources are not fixed with technological advancement.

Fifth, this study presents policy recommendations, which are based on modeling and simulations of the food supply to the various relevant stakeholders.

○Findings of the Review Board

The public hearing and the review board were held twice for examination of this paper. The first time was January 19, 2009, and the second was April 20, 2010. The following comments are from the first public hearing and review board: the food supply prediction in Tanzania is too simplistic because the paper has the somewhat unrefined design of Mpanda System Dynamics Food Supply Model (MSDFSM), and the simulation is too simplistic. More precise analysis about the uniqueness, validity, and practicability of the paper is necessary.

Receiving such comments from the review board, Mr. Shitindi Regnard Francis strove for corrections in the paper. He validated his model and developed several scenarios: Case I, Case II, and Case III. The final product from Mr. Shitindi's work is policy recommendations to policy and decision makers based on his analysis and findings such as the requirement of the formation of very strong small and medium sized farmer groups; the importance of the rural transportation infrastructure; the necessity of a specific plan for complex agricultural industries and so on.

The review board accepted this paper as a doctoral dissertation (doctor of business administration) in view of the paper's valuable contributions to the rural economics and resolving the food supply and agricultural problems in developing countries such as Tanzania.