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Modelling Decision Making in Communal Areas: The Identification of the Utility Function

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Abstract

In the Kavango Region (North Namibia) the natural resource base is partly degraded depending on rainfall, population density and actual land use. The average rainfall is 550 mm per annum and the natural vegetation consists of dry forest and tree savannah. The dominant farming system can be described as a mixture of subsistence crop and livestock production. Villagers in this region face imperfect labour markets, high transaction costs and a pure infrastructure. Their nutrition is highly based on natural resources, is barely supplemented by purchased groceries and is frequently endangered by environmental conditions. The objective of this case study is to construct a dynamic bio-economic model of a communal village which evaluates alternative management options. The model is supposed to balance the trade-offs between the conservation of natural resources and food security for the inhabitants.

Production and consumption decisions are non-separable for peasant households in developing countries. Therefore, the objective function of the model is maximising utility subject to several constraints.

The focus of the present research phase is laid on identifying the utility function with a modified conjoint analysis approach. Conjoint analysis is a method that raises values for the overall utility on the basis of preference judgements of decision makers in a given choice setting. In general this method is used in market research. However, in this context it manages to uncover the preferences of decision makers for different household activities.

It is assumed, that livestock keeping represents the most important household activity. Particularly the extent of livestock numbers is supposed to contribute to utility on a high level. Moreover, preferences will be based on an adequate subsistence crop production and cash income generating activities.

The increase in livestock and field numbers will contribute to further degradation of rangelands and forests. This will cause a supplementary instability of the eco-system and thus the nutrition base. It is supposed that the subsequent modelling process will deliver more suitable management alternatives that generate a sufficient nutrition and conservation level.

Keywords: Conjoint analysis, decision making, nutrition level, utility function