Decision-analysis modelling

Resilience aims to incorporate the response of systems to the full range of plausible shocks and stressors; this is a central constraint to assessing resilience through observations alone. The Technical Consortium and the World Agroforestry Centre (ICRAF), with the technical assistance of Hubbard Decision Research (HDR), are undertaking the building of a decision analysis model, the aim of which is to understand resilience under the uncertainty and data deficiencies which exist. This approach draws from decision analysis procedures and techniques of Applied Information Economics (AIE).

The model-building process aims at providing 'ballpark' estimates of important variables and relationships, rather than using 'best guesses' that would introduce potentially consequential assumptions into the decision analysis process. Once estimates of all-important variables are available and a first aggregate model has been developed, a large number of simulations are run, with input variables randomly selected from probability distributions defined by estimated confidence intervals. All results are collected, providing a large dataset of plausible input variables coupled with modeled system outcomes. If system processes are modeled over time, multi-year estimates of food security, household income or ecological integrity of the modeled system allow characterization of system resilience. Data mining techniques are then applied to identify the input variables that had the greatest influence on modeled system outcomes, including measures of resilience. The process described above will be executed for a selected socio-ecological system in the Horn of Africa.

Intended outputs Decision Analysis Model

1. List of determinants of resilience

2. List of observable resilience indicators: This list will attempt to define resilience indicators that could be observed on the ground and monitored over time. This list will also be correlated with the concurrent work being carried out on assessing datasets for indicators to build Member State Baseline Datasets to monitor impact of investments on resilience.

3. Entry points for resilience-enhancing interventions

Critical variables for resilience will be evaluated with a view to defining interventions. From this assessment, a list will be compiled of possible interventions that could address each critical parameter that emerged from the model. ■

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