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Individual Decision-Making: Where Climate and Policy Meet

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Agriculture is one of the most climate-sensitive sectors of society. Furthermore, agricultural decisions overwhelmingly are made by individual decision-makers (exceptions may include planned economies or corporate farming). For these reasons, to understand potential implications and acceptability of climate-related policies in the agricultural sector it is important to be aware of decision-makers' perceptions about climate, their personality characteristics and decision contexts, and their decision-making processes. This work presents a few examples of the linkages between climate, policies, and decision-making.

Agricultural production decisions are, in most cases, driven by the desire to achieve economic profits or sustain livelihoods. Adaptation to a changing climate and the motivation to learn or experiment with new technologies may be triggered by dissatisfaction with the outcomes of decisions made within an expected context (e.g., "normal" climate). We describe a decision model that highlights the importance of a decision-maker's "aspiration level" (a special outcome that separates acceptable results from those considered unacceptable). The aspiration level is adjusted endogenously as a consequence of own experiences, different contexts (including climate), and social interactions.

"Best agricultural practices" often are based on strong assumptions about decision-makers (e.g., that they are fully rational, know the outcomes and likelihoods of all alternative actions, and seek to maximize the utility of their actions). Instead, decision-makers have limited cognitive abilities and operate in uncertain environments. Furthermore, individuals exhibit strong "loss aversion" (the psychological impact of economic losses is often larger than the perceived benefit of gains of comparable magnitude). We show how different assumptions about what decision makers are trying to achieve (i.e., their objective functions) may change what actions are considered as "optimal" for a given climate context. In turn, these differences may influence the acceptability of climate policies or the diffusion of innovative adaptation/mitigation technologies.

Climate data, seasonal climate forecasts, and technical assistance with the use of climate information are often publicly provided and highly subsidized. Estimates of the economic value of climate information and forecasts help justify investments in such publicly provided technology and infrastructure by comparing rates of return to those available from investments into other innovations. Estimates of value of information (VOI) often simulate "optimal" responses with and without access to a forecasting system. However, realistic estimates of the value of climate information should be based on models closely linked to observed decision processes. We present alternative estimates of the economic value for agricultural decisions of an ENSO phase forecasting system based on (a) the often-assumed utility maximization and (b) the maximization of Prospect Theory's value (that involves strong consideration of loss aversion).