

論文内容の要旨

Several behavioral theories in economics and other disciplines consider that a set of preferences determines individual and social decisions. Risk and time preferences (or intertemporal problem) are the examples of preferences that shape several individual behaviors, while prosociality, reciprocity and trust represent several collective or social behaviors. Despite the overarching roles of the preferences on people's progress and development, they are also considered the causes of several social and environmental problems. In modern times, sustainability has emerged as the significant social problem, reflecting climate change, environmental pollution, depletion of various resources and COVID-19. A vast majority of literature links these problems with equality, fairness and justice, arguing that they emerge because of people's actions who only care their benefits without considering others, particularly future generations. Since the problems are complex and multifaceted, their solutions need to be identified at the same level. For instance: the current political system does not include children and future generations in its decision-making process (i.e., institutional level); households are reluctant to mitigate the sources of climate change and/or do not adequately adapt in response to it (i.e., household level); and myopic tendency of individuals (i.e., individual level). Given the trends in decision-making processes at different levels, the literature suggests that global communities need various strategies and interventions to maintain sustainability and resolve climate change for future generations' welfare. More particularly, scientists and policymakers indicate the necessity of addressing these problems at institutional, social, household and individual levels. However, little is known about whether and how these problems can be resolved at different levels of decision making. To fill these gaps, the studies in this thesis apply survey and experimental approaches and examine individual and group behaviors to resolve sustainability and climate change in Nepal and Japan under various levels of decision making.

The first study examines group behavior for intergenerational sustainability (IS) under various forms of democracy. IS has emerged as the most serious social problem reflecting climate change and accumulation of public debt in modern democratic societies, undermining the potential interests and concerns of future generations. However, little is known about whether or not deliberative forms of democracy with majority voting helps support at maintaining IS by representing future generations' potential interests and concerns. Intergenerational sustainability dilemma game (ISDG) was instituted with three forms of decision-making models with majority voting and examine how they maintain IS in laboratory experiments. In ISDG, a sequence of six generations is prepared where each generation consisting of three subjects is asked to choose either maintaining IS (sustainable option) or maximizing their own generation's payoff by irreversibly costing the subsequent generations (unsustainable option) with anonymous voting systems: (1) majority voting (MV), (2) deliberative majority voting (DMV) and (3) majority voting with deliberative accountability (MVDA). In MV and DMV, generations vote for their choices without and with deliberation, respectively. In MVDA, generations are asked to be possibly accountable for their choices to the subsequent generations during deliberation, and then vote. The analysis shows that decision-making models with only majority voting generally does not address IS, while DMV and MVDA treatments induce more and much more generations to choose a sustainable option than MV, respectively. Overall, the results demonstrate that deliberation and accountability along with majority voting shall be necessary in models of decision making at resolving IS problems and representing future generations' potential

interests and concerns.

The second study empirically analyzes the effects of the economic and cognitive factors on farmers' adaptation behaviors in agricultural sector of Nepal. This research addresses what matters for farmers' responses to the climate change, hypothesizing that farm size, climatic perceptions and the interplay between the two are key determinants. A questionnaire survey was conducted with 1000 farmers in Nepal, collecting data on their adaptation responses, farm size, climatic perceptions and sociodemographic information in Nepal. With the data, the statistical analysis is conducted by employing the index to reflect farmers' effective adaptation responses. The result reveals that farmers take adaptations as the farm size becomes small or as they have good climatic perceptions & social network with other farmers. It also shows that small-sized farmers tend to adapt much more in response to their climatic perceptions than do large-sized ones. Overall, this research suggests that agriculture may be losing responsiveness to climate change, as large-sized farmers become dominant by holding a majority of land in developing countries. Thus, it is advisable to reconsider the tradeoff between productivity and responsiveness to climate change regarding farm size as well as how large-sized farmers can be induced to adapt through their cognition, policies, social networking and technology for food security.

The third study in this thesis examines people's intertemporal and intergenerational choices for resource sustainability, and analyzes how these choices are affected by the degrees of uncertainty (or survival probability), successors' existence and accountability to the successors. Field experiments are conducted by instituting sustainability game (SG) where a user is probabilistically determined to live up to the next period, and the probabilities are parametrized to represent different uncertainty by strategy method. In SG, a subject is asked, each period, to choose either prioritizing her current payoffs by irreversibly overutilizing the resource (unsustainable option A) or sustainably utilizing the resource (sustainable option B) for the future. Three treatments are prepared: (i) "no successors" (NS) in which a subject decides between options A and B in each period until she dies without successors, (ii) "existence of successors" (ES) in which another subject takes over the game as a successor when it ends for one subject by her death, and (iii) "intergenerational accountability" (IA) in which each subject is asked to write and pass the reason for her decisions and advice to her successors. Results demonstrate that improved survival probability and successors' existence are keys to improve resource sustainability. In particular, provided with successors, "IA" is found to further contribute to the sustainability, and the IA's positive effect nonlinearly inflates with survival probability (or life expectancy). This implies that not only arranging a successor but also institutionalizing accountability between current users and successors shall drastically enhance resource sustainability, even when societies suffer from aging and depopulation.

Keywords: sustainability; democracy; deliberation; intergenerational accountability; decision making; majority voting; experimental research; future generations; climate change; agriculture; farm size; cognition; adaptations; perceptions; interplay; successors; uncertainty; survival probability