

論文内容の要旨

Resource sustainability issues are a growing concern today due to the overexploitation of natural resources with increasing population, market demand and mass production. For example, Indonesia is the second largest marine capture producer, contributing to food security in the world (FAO Fisheries and Aquaculture Department, 2016). However, some important fish stock in Indonesia is reported to have been severely depleted due to overexploitation. One of the main reasons for overexploitation is that fishermen tend to choose environmentally unfriendly fishing gear or advanced technology to catch more fish for immediate profits without considering fish stock sustainability. To ensure resource sustainability and food security, it is important to understand the possible myopic behavior or time preferences of societies; therefore, this study seeks to address these issues by conducting field experiments.

Our research start with the analyzing individual time preferences fishermen and farmers as two main occupations that produce food utilizing natural resources. In the second stage, we analyze individual and group time preferences among fishermen, farmers and urban people. Finally, we analyze individual time preferences of married couples in a fishing society. The first experiment which is presented in the second chapter of this dissertation examines individual time preferences fishermen and farmers. We have conducted a discounting elicitation experiment for fishermen and farmers in Indonesia. The statistical analysis shows that fishermen are much more shortsighted than farmers, implying that fishermen should be induced to nurture a culture of cultivating and growing for sustainability of fish stock.

In chapter 3, we present the second experiment which examine individual and group time preferences and their relation across the three societies. We conduct a field experiment to elicit individual and group discount factors in three societies of Indonesia—(i) the fisheries, (ii) the farming and (iii) the urban societies—as proxies of the hunter-gatherer, agrarian and industrial societies, respectively. We find that both individual and group discount factors are the lowest (highest) in the fisheries (agrarian) society, while those in the urban society are in the middle. We also observe that the determinants of group discount factors differ across societies: members of the lowest and middle discount factors in a group play an important role in determining the group discount factor in the fisheries society, while only the members with the middle discount factor are key in agrarian and urban societies. Overall, our results suggest that individual and group discount factors non-monotonically change as societies transition from fisheries to agrarian and from agrarian to urban and that comparatively shortsighted people (the lowest and middle) are more influential than farsighted people in determining group time preferences.

The results in the first and second experiment show that fishermen are more shortsighted than farmers and urban people. Therefore, we analyze individual time preference in a fishing society in third experiment to identify what factors induce fishermen to be sufficiently farsighted to ensure the sustainability of marine resources that is presented in chapter 4. We conduct an experiment to elicit individual discount factors with 200 married couples (200 fishermen and 200 fishermen's wives) in an Indonesian fishing society, Karawang regency. We find that the fishermen's discount factors are slightly higher than those of their wives on average, with a positive correlation between the two. We also find that their incomes have idiosyncratic influences on the individual time preferences of a couple. Fishermen's incomes weakly influence only their wives' time preferences, while wives' incomes significantly and positively cause both fishermen's and wives' time preferences to be farsighted. This result suggests that the economic empowerment of fishermen's wives is

important for the sustainability of marine resources and societies in Indonesia. From these findings, effective policies or new education systems, such as training/conservation programs or institutions to change people's cultures to be more patient, are essential along with economic empowerment of fishermen's wives. Without such a policy, the resource sustainability in Indonesia might pose a greater danger in the future.

Key Words: discount factors; individuals and groups; fisheries society; farming society; urban society.