Local Expert Risk Mediation (LERM) for a Sustainable Forestry Development in Kochi Prefecture/Kami City, Japan

論 文 内 容 の 要 旨

This dissertation presents a mixed exploratory and explanatory inter-functional sustainability analysis of the present forest management system for industrial private forest in Kochi Prefecture/Kami City, Japan to (1) based on findings, determine sustainability risks on the basis of the concept of sustainable forest management (SFM), and (2) propose an alternative management framework named: Local Expert Risk Mediation (LERM) which is capable of tackling these sustainability risks through collaborative risk management processes at local level. The sustainability of various aspects of Japanese forest management and their long-term effects has been subject of national and international criticism for being ineffective and creating environmental spillover effects, some of which have also become observable in the study area. Various problems concerning the efficient utilization of resources, forestland accessibility, production efficiency and stakeholder integrity have been a matter of concern in the study area affecting the realization of the general character of SFM. Controlling these problems is complex due to their inter-relationship with each other, as previous research suggests.

The methodology of this study followed a mixed inter-disciplinary research approach which involved quantitative and qualitative analysis of the five independent variables: market (x_1), situation (x_2), governance (x_3), implementation (x_4), and cognition (x_5), that directly influence the preservation of the SFM character. In the exploratory part of this research, possible unsustainability risks within the independent variables ($x_1 - x_4$) and their inter-connection were analyzed in respective separate sub-studies (Chapters 3 − 6). The key findings were five unsustainability risks: (1) environmental degradation, (2) discontinuity, (3) resource maldistribution, (4) inflexibility (being a process risk) and (5) future market inefficiency were identified through discussion based Cause-State-Effect-Risk and SWOT analyses. The inter-connection and severity of these five unsustainability risks was discussed based on theories of macroeconomics and sustainable development. It was argued that the current forestry system in Kochi Prefecture shows probable signs for a planned economy with imperfect competition, imperfect distribution of income and economic and natural wealth, and which shows signs of economic and environmental spillover effects. It was also found that forest management follows a segregative rather than a sustainable integrative management approach.

In the explanatory part of this study, a proposal is made for risk mitigation through a derived risk mitigation plan. This plan is meant to be implemented by the above mentioned alternative

integrative collaborative risk management framework LERM which is the internal component of the Application-Integration-Adaptation-Development (ACAD) strategic management cycle which aims national strategy and policy development through bottom up – top down inter-communication.

To test the risk mitigation effectiveness of ACAD – LERM forest management, the short (20 years), mid (40 years), and long-term (60 years) risk probability and impact perception was measured in a key-stakeholder survey for two scenarios: once without and once with an ACAD – LERM management scenario. Given results, risk factors for these scenarios were determined. It was found that although risk perception for ACAD – LERM was significantly lower for mid and long-term durations, risk progression still increases over time. This finding suggests that the perception of risk is reduced with ACAD – LERM management, however, a certain degree of uncertainty remains. This finding supports previous research where claim has been made that SFM approaches improve sustainable development, however, cannot fully eliminate management uncertainty due to the large amount of external influence. As part of this risk perception assessment, level of agreement for an integrative forest management approach, and agreement for considering five external factors to affect the certainty of successful internal implementation of LERM: Support and promote (1, 2), involve (3), legislate (4), sustain (5) was also measured. It was found that more than two thirds of participants agree or somewhat agree that these external factors in should be incorporated in management decisions. The highest agreement was measured for a management adaptation to integrative management – 97%.

For realizing the dependent variable of the SFM Character the final independent variable cognition (x5) was measured in a separate key-stakeholder opinion survey in which participants were asked which of the four SFM functions: economy, environment, protection and recreation, forest management in Kochi should focus on. It was found that two thirds of the participants explicitly prefer function segregation, however, the majority implicitly agrees to integrative management leading measures. Given the integrative focus of LERM, leadership through expert risk mediation has the potential to facilitate the realization of SFM by decreasing the uncertainty of sustainability risks in Kochi Prefecture/Kami City.