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Land use scenarios for evaluation of ecosystem services - A case study in the Kushiro watershed -

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For appropriate decision making in ecosystem management for global warming prevention and biodiversity conservation, a reliable and practical method to evaluate ecosystem services is necessary. The research objectives are (1)integration of biophysical and socio-economic data related to ecosystem services, (2)development of a practical evaluation method of ecosystem services and (3)contribution to mitigate conflicts between environmental mitigation options such as climate change prevention and biodiversity conservation.

For the purpose, the pre-evaluation of ecosystem services was conducted relating to climate regulation and reservoir of biodiversity. The study area, Kushiro watershed was preliminarily mapped using the InVEST, which is the mapping tool of ecosystem services developed by Natural Capital Project. The change in ecosystem services was spatial-explicitly quantified based on the land cover maps in 1970s and 2000s. The climate regulating service and the biodiversity reserving service were totally degraded, and the change was depends on location due to various land use change happened in the area. Furthermore, the scenario analysis was applied to provide more practical evaluation to communicate with stakeholders. Four scenarios were developed to evaluate ecosystem services: BAU scenario, biodiversity conservation scenario, agriculture and forestry scenario and climate adaptation scenario. The trade-off analysis based on the scenarios will improve understanding of the ramifications of land management choices.

Keywords: land use change, ecosystem services, scenario analysis, biodiversity conservation, climate mitigation and adaptation