Spatial and Quantitative Assessment of Ecosystem Services for Land Management

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1. RESEARCH BACK GROUND AND PURPOSE

Japan has faced declining population society. It is required to identify regions that are important for land conservation because Japan has limited human resources and financial resources. Various plans and strategies for land use management explain that Introducing ecosystem services for land use management is important. But specific methodology has not shown yet. In this research, in order to contribute to decision-making of national land management with ecosystem services as an indicator, I evaluate ecosystem services spatially and quantitatively using geographic information system (GIS).

2. RESEARCH METHOD

I selected the Noto Peninsula in Ishikawa Prefecture, which is also designated as GIAHS. 1) I selected ecosystem services that are regarded as particularly important from the description of national land conservation plan. 2) Gathering geographical information (GIS data) and I tried to model simulation for assessment of 5ecosystem services by software InVEST and calculating by unit consumption method (1km mesh scale). I choice the 5 ecosystem services for indicator (Water Yield, Nutrient Retention, Sediment Retention, Carbon Storage and Crop Production). 3) I tried to did hierarchically cluster analysis for evaluation results with software SPSS 12.0 and the entire target area was classified from the viewpoint of supply services and regulating services. 4) I tried to depiction and counting cultural services point and make integrating indicator of   supply services, regulating services and cultural services. 5) I tried to perform cross tabulation of integrating indicator of ecosystem services and population indicator. I defined important area of land management as the area which is contribute to
Supply high ecosystem services supply but facing serious population decline. In order to these process, I have mapped important area of land management.

3. RESULT AND CONSIDERATION

In the cluster analysis using regulating services and supply services, the research areas are divided 6 clusters. Forest hilly type (48% of the whole), Low forest hilly type (13%), Urban area dominant type (1.3%), Paddy field dominant type (7.5%), mosaic - city dominant type (19%) and mosaic – upland field dominant type (10.6%). In Paddy field dominant type and Mosaic - city dominant type, Crop Production service capacity is high. In Forest hilly type and   forest low hilly type, Water Yield, Sediment Retention and Carbon Storage services capacity is high. The result of counting cultural services show that many cultural services point in Urban area dominant type. Forest hilly type and Mosaic – upland field dominant type face high risk of depopulation. In the future, the risk of depopulation will be more serious so these areas may supply low-level of ecosystem services. Phenomenon of depopulation will also affect cultural services. Matsuri and fine sight and scene of a residential area will be dangerous for upkeep and succession.

4. CONCLUSION

In Noto Peninsula, depopulation is very serious problem. Depopulation make agricultural fields and forest that have been abandoned. The areas which have high risk of depopulation will be changed the land which need low cost for land management or easy management.