



Spatial landuse planning using land evaluation and dynamic system to define sustainable area of paddy field: Case study in Karawang Regency, West Java, Indonesia

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Indonesia is the country with the 4th largest population in the worlds; the population reached more than 237 million people. With rice as the staple food for more than 95 percent of the population, there is an important role of paddy field in Indonesian food security. Actually, paddy field in Java has produced 52,6% of the total rice production in Indonesia, showing the very high dependence of Indonesia on food production from paddy fields in Java island. Karawang Regency is one of the regions in West Java Province that contribute to the national food supply, due to its high soil fertility and its high extent of paddy field. Dynamics of land use change in this region are high because of its proximity to urban area; this dynamics has led to paddy field conversion to industry and residential landuse, which in turn change the regional rice production capacity. Decreasing paddy field landuse in this region could be serve as an example case of the general phenomena which occurred in Javanese rice production region. The objective of this study were: (i) to identify the suitable area for paddy field, (ii) to modelize the decreasing of paddy field in socio-economic context of the region, and (iii) to plan the spatial priority area of paddy field protection according to model prediction. A land evaluation for paddy was completed after a soil survey, while IKONOS imagery was analyzed to delineate paddy fields. Dynamic system model of paddy field land use is built, and then based on the model built, the land area of paddy field untill 2040 in some scenarios was developed. The research results showed that the land suitability class for paddy fields in Karawang Regency ranged from very suitable (S1) to marginally suitable (S3), with various land characteristics as limiting factors. The model predicts that if the situation of paddy field land use change continues in its business as usual path, paddy field area that would exist in the region in 2040 will stay half of the recent area. Based on the model, the scenario were developed for the protection of priority area. With such scenario, paddy field remains close to the value predicted officially. Spatial information then can play a role by presenting the scenario spatially. Combining spatial information with land suitability, priority areas of paddy field protection can be delineated. Policies that followed also then be compiled, including the location of protection.

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