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The impact of systematic landscape conservation planning on ecosystem: Chen Youlan river watershed

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Heraclitus said that “no man ever steps in the same river twice.” Everything continues to change. Land use change will keep redefine itself and subject the Earth and humankind to collateral changes. Humankind benefits from ecosystem in many ways. The ecosystem provides people with nutrients, enriches soil with sediment, and sustains all living organisms with water; these benefits are known as ecosystem services. In Taiwan, land use change has impacted ecosystem and biodiversity on various levels. Thus, we took six land use scenarios from 1999 to 2005 in Chen Youlan river watershed as our case study, intending to observe the course of ecosystem and biodiversity changes and the cause of it. Systematic Landscape conservation planning (SLCP) framework can be adopted when designing land use policy to safeguard human interests and ecosystem. This study use SLCP to develop ecosystem services and biodiversity protection strategies. Several strategies were designed by using 1999 to 2005 data as provision to protect the intactness of future ecosystem services and biodiversity. This research explores the potential and possible impacts of different land use protection strategies in the future.
It is possible to identify the conservation priority of a certain region by using the Zonation meta-algorithm. This study selects the zonation critical protection area (Joint set of Yushan National Park) as strategy A, B and C. Strategy D takes Yushan National Park as a protected area; unstable hot spots in 1999/03 (Joint set of Yushan National Park) are selected as strategy E.
Next, we used Kappa statistical method to find the minimal ecosystem services change and biodiversity hotspots change of the five aforementioned strategies and compared with those from 1999/03. By the Kappa statistical method, we further prioritized the important conservation areas by strategy A, B, C, E in the future.
The results can not only serve as management reference for government agencies, but also develop an ideal trajectory of policy making as well as human-nature dynamics, leading to a sustainable future. We do not have to be subject to changes passively, instead, we can evolve ourselves and actively initiate the evolutionary path towards sustainable coexistence with nature.
Keywords: InVEST , CLUE-s , biodiversity , ecosystem services, ecosystem services hotspots, land use change, SLCP, Systematic Landscape conservation planning, Chen Youlan river