

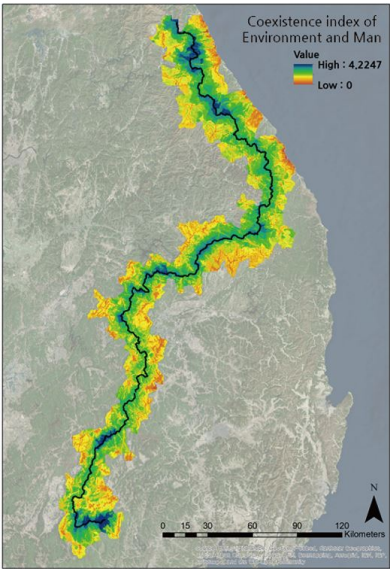
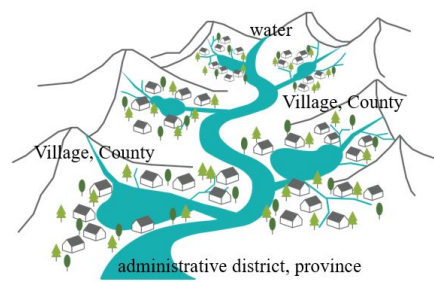
A study on the development of the Coexistence Index of Environment and Man for zoning Baekdudaegan mountain range in South Korea as a biosphere reserve

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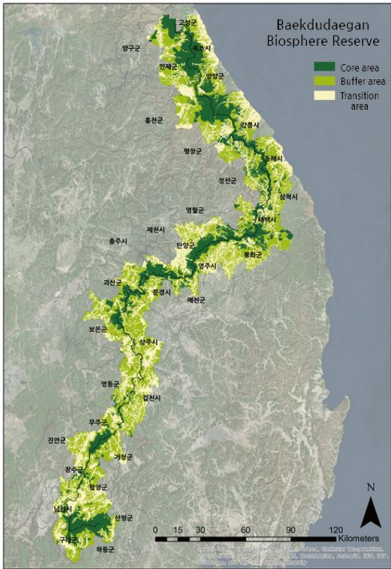
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Baekdudaegan Mountain Range(BDDG) in Korea is both a symbolic ecological area with diverse flora and fauna and a unique geographical system. Reflecting the saying “Mountain ranges divide streams, but streams do not cross mountain ranges”, BDDG has constituted an administrated district of Korean territory. However, BDDG was heavily damaged by human activity from 1970s, during economic Korea’s development period. BDDR was designated by Korean government as a protected area, and many challenges remain for local residents due to strict laws around the area. In this research, considering local human and nature resources, we applied the biosphere reserve(BR) of UNESCO’s Man and the Biosphere Programme. The BR consists of core, buffer and transition areas and pursues the interacting of man and nature, aiming for harmonious life. Therefore, taking a long-term view, we concentrated on development of BR index for efficient conservation of BDDG. Firstly, we established the BR index related to the protected area by reviewing laws and policies from Germany, Japan and South Korea. The collected data were reclassified through an analysis of the frequency of each indicator. Secondly, the nine contents of the final Index were constituted as “elevation,” “slope,” and “watershed” as physical indicators; “ecological naturalness,” “crown density,” and “forest ages” as ecological indicators; and “land-cover,” “protected area,” and “resident population” as management indicators. Applying the concepts of BR, 9 thematic maps were generated based on a score from 1 to 3 points for each indicator. Thirdly, an index map was created by overlying nine maps, and the AHP (Analytical Hierarchy Process) method was conducted by relevant experts to reflect BDDG’s conditions and reality. The coexistence of the Index of Environment and Man(IEM) was developed by weighting the results of the AHP Method on the Index map. Finally, the BR zonings were designated by IEM through natural breaks classification of Jenks in ESRI ArcGIS. The significance of results was determined by area. Firstly, most of core area (IEM: 4.2247–1.93) was “protected area” as designated by the law. Secondly, “ecological naturalness” in ecological value of buffer area (1.92–1.6) was high, as in the core area. Thirdly, “resident population” in management indicators effected the transition area (1.59–0). In summary, areas with high natural value were conserved as the core and buffer area, while the transition area was a residential area where excellent nature resources abound. The research aims at exploring the coexistence of nature and humans in BDDG from the perspective of long-term conservation. Through the application of BR, BDDG was found to be a potential area and a living area for residents who conserve precious natural resources. Many BRs hope to become area where humans live in harmony with nature. In particular, the participation of residents is essential in zoning transition areas to maximize the effects of BR, and a lot of research on this topic using various methods is needed.

Keywords: Biosphere Reserve, Baekdudaegan mountain ranges, BR index, Coexistence Index of Environmental and Man, Protected area



Applying Coexistence index of Environment and Man



Zoning for Baekdudaegan Biosphere Reserve