



Land use patterns and landscape structures on the islands in Jeonnam Province's Shinan County occasioned by the construction of *mainland bridges*



Jae-Eun Kim

Institution for Marine and Island Cultures, Mokpo National University, 11, Songnim-ro 41 beon-gil, Mokpo, Jellanamdo 58645, Republic of Korea

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Abstract Land use in a specific region reflects the prevailing socioeconomic circumstances and cultures within that region. To this end, the current study analyzes the landscape structure of Shinan County using landscape indices based on land use to compare various socio-economic factors of the culture found on the islands of Shinan County. In addition, a cluster analysis was conducted to learn about the characteristics of islands exhibiting the same landscape structure. This analysis revealed that the landscape of the second largest island in Shinan County, Jido, was more fragmented than that of the biggest island Aphae. The cluster analysis led to the creation of three groups of islands exhibiting similar landscape structures. Group 1 is composed of the islands which are connected by a *mainland bridge* (called 'yeonyukgyo' in Korean). Group 2 and 3 also include the upper islands (those islands located in the northern area) and lower islands (those islands located in the southern area) in Shinan County. The presence of more advanced transportation systems and structures occasioned by their proximity to the island of Jido which was connected at an early date to the mainland ensured that the upper islands have historically been more frequently visited.

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Introduction

Surrounded by water, islands are by nature difficult to access. This reality has historically led the residents of islands hard-

Mainland bridges are fixed bridges that connect an island with the mainland; called 'yeonyukgyo' in Korean.

E-mail address: ecokimje@gmail.com

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pressed to secure resources from the outside world searching for various methods to use the natural resources at their disposal. As a result, numerous unique cultures were created during the process of preserving such systems (Baldacchino, 2007b; Kim, 2013). Over time, islands began to boast characteristics that differed from the mainland in both a biological and cultural manner, to the extent that, based on the physical characteristics of islands, the word 'islander' emerged to refer to people residing on islands (Ryan, 2010; Baldacchino,

2007a). Eco-cultural and socio-economic characteristics of a certain region are represented well through the landscape structure (Forman, 1995; Turner et al., 2001).

Recently, governments have constructed the bridges in islands to relieve the traffic inconvenience and due to development pressures.

The construction of *mainland bridges* has been perceived as an essential factor that has helped improve the convenience and quality of life of island residents. Nevertheless, discussion of the characteristics of islands from the standpoint of their geological characteristics has been limited. More to the point, there has been a serious lack of attention paid to the stories of islanders' lives that is rooted in an understanding of the various biospecies and unique culture prevailing on their respective islands. The numerous islands of Shinan County, Jellanamdo province have traditionally been home to a wide variety of biospecies and cultural characteristics (Kim, 2015). However, the construction of *mainland bridges* has had an indelible impact on such biospecies and cultures (Karr, 1982).

In particular, the construction has taken place in various situations of socio-economic changes such as population decrease, number of tourists changes and so on.

The construction of *mainland bridges* led to the emergence of development pressures from the mainland. This is evidenced by a look at land use patterns, and an analysis of the landscape structures rooted in these land use patterns (Szabó et al., 2008; Turner et al., 2001). Land use patterns can be used to explain the characteristics of an area's spatial use by demarcating the landscape characteristics of different areas. Land use serves as an important tool in terms of exhibiting the socioeconomic characteristics of an area (Forman, 1995; Kim, 2013; Turner et al., 2001). It can also be utilized to read and analyze the social and economic changes based on land use patterns. Land use patterns also serve as an implement to predict long-term landscape changes.

Socio-economical changes by bridge constructions have already been discussed in studies outside Asia (Baldacchino, 2007a,b). Research focusing on the specific case of Korea, however, appears to be missing. Therefore, this study analyzes the landscape structures of the main islands in Shinan County based on changes in land use patterns, and discusses the influences of mainland *bridge* construction based on an analysis of similarities in landscape structures of these islands.

Study area

Shinan-gun (County) is a local government entity located in the southwestern area of Korea. It is unique in that the area under its control consists solely of islands (Fig. 1). Shinan County is composed of two *eup* (towns) and twelve *myeon* (townships), and includes about 1000 inhabited and uninhabited islands. With the notable exception of Heuksan-myeon situated at a relatively distant location from the Korean peninsula, the majority of the Shinan County's islands feature broad tidal flats. This region's well-developed tidal flats are well known as areas conducive to the collection of small octopus and the cultivation of laver. The average temperature over the past six years has been 13.5–14.5 °C; meanwhile, the average annual precipitation has been 960.5–1483.3 mm. However, the majority of such precipitation has occurred during the summer months of June–August (Shinangun, 2013).

Shinan County includes the largest tidal flat in Korea. Tidal flats have been reclaimed from the 1800 s and after the Korean War with very large areas to make agricultural fields. The main land use found on the islands in the area is agriculture (Kim, 2015, 2014).

Jido-eup in Shinan County was connected to Muan County in Jeonnam Province on February 25, 1975. Aphae-eup was connected to Mokpo City in 2008, and is physically no longer an island. In addition, Jeungdo-myeon was connected to Jido-eup on March 30, 2010, thus making it possible to access

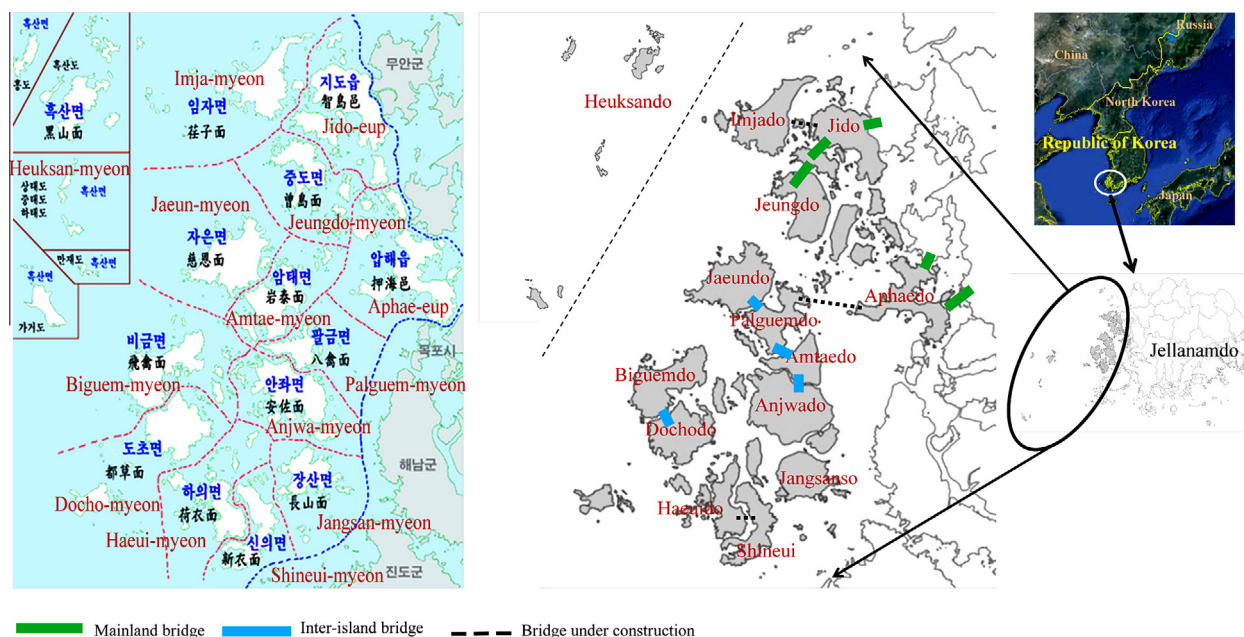


Fig. 1 Location of Shinan County and Jellanamdo in Republic of Korea (left: boundary of each myeon, right: main island of each myeon).

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