Shikoku: An Island Among Islands

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In 1765, during the Edo period (江戸時代, 1603-1868), the city of Ōsaka was a bustling commercial center as large as London, with a population of 423,453 (OURIR 2008). The nearby island of Shikoku, however, remained essentially nothing more than an undeveloped, rural backwater despite being located only 100km away from this bustling metropolis. Shikoku's isolation has continued even into modern times, with the island's four, comparatively untouched prefectures home to just 3.16% of Japan's population (総務省統計局 2009) and accounting for a mere 2.6% of its total GDP in 2007 (ESRI 2010). Shikoku's underdevelopment and relatively untouched environment, however, is not a result of explicit, legislative protection but rather the natural consequence of a combination of geographic and socioeconomic factors. It thus serves as a compelling model for the study of economic barriers and incentives as a mechanism for environmental protection within a fully-developed, high income state.

Until approximately 15 million years ago, Shikoku (四国, literally "four kingdoms") did not exist as a distinct geographical entity; rather, like the rest of the Japanese archipelago, it was simply a part of the continental edge of the Eurasian continent (Barnes 2003). While the formation of the Japanese islands is not yet completely understood, it is widely accepted that, during the Miocene (23.03 to 5.33 Ma) and Pliocene, Japan began to slowly separate from Eurasia and rotate outwards towards its current position as a result of

interactions between the Philippine Sea Plate, Amurian Plate, and Okhotsk Plate (Barnes 2003 and Nishiwaki 2009). By the beginning of the Quaternary Period (2.588 Ma), the four major Japanese islands of Hokkaidō, Honshū, Shikoku, and Kyūshū had settled in their present positions and modern shapes (Nishiwaki 2009).

The smallest of the four primary islands forming the Japanese archipelago, Shikoku is presently divided into four prefectures – Ehime (愛媛県), Kagawa (香川県), Kōchi (高知県), and Tokushima (徳島県) – with a combined area of 18,800 km^2 and a total population of 4,040,000 (総務省統計局 2009). The island's interior is extremely mountainous, effectively separating its northern and southern halves and requiring the use of circuitous, coastal routes when traveling between regions. As a result of accessibility issues, even today, the vast majority of the island's population is concentrated in the two northernmost prefectures of Ehime and Kagawa, as is the majority of economic activity (JETRO 2010).

Despite its close proximity to the rest of Japan, geography plays a surprisingly significant role in accounting for Shikoku's relative economic insignificance. It is separated from Kansai (関西), the large, economically powerful region of Honshū that is home to the major urban centers of Ōsaka, Kōbe, and Kyōto, by the small, intermediate island of Awaji (淡路島) and the Naruto Strait (鳴門海峡). This precarious, narrow body of water is most famous for its unique tidal whirlpools (鳴門の渦潮), among the world's most vicious. With

extremely fast, 20 km/h currents that routinely generate vortices exceeding 20m in diameter, the crossing between Shikoku and its larger neighbor has long been considered dangerous.

As early as 1889, during the first years of the fledgling Japanese empire, the role of Shikoku's geographic isolation in retarding development was raised by government officials. In that year, at the ribbon cutting ceremony for Shikoku's first railway, prefectural parliament member Ōkubo Jinnojo (大久保諶之丞) suggested that a bridge be built connecting the island to Honshū:

> 塩飽諸島を橋台として山陽鉄道に架橋連結せしめば、常に風波の憂いなく、実に南来北向、東奔西走、瞬時を費さず。其国利民福、是より大なるはなし 。
> (Watanabe 2001)

> If a bridge were built to connect with the Sanyō Railway via the Shiwaku archipelago, it would allow for passage without fear of terrible wind or waves and foster development everywhere. It would be extremely beneficial to national interests.

Despite this appeal for construction, however, the bridge project was pursued no further until 1955, when, on 11 May, the lives of 168 travelers attempting to cross to Shikoku were lost in a ferry accident during heavy fog (Japan Marine Accident Tribunal). After the resulting public outcry, the Japanese government finally began plans for what would eventually become the Great Seto Bridge (瀬戸大橋) in 1959. However, the Honshū-Shikoku Bridge Construction Authority (本州四国連絡橋公団) was not formally created until 1970, and, as a result of the 1970s oil crisis, work did not actually begin on the project until 1978. At a cost of nearly 1.2 trillion yen and 13 lives (City of Sakaide 2005), the 13.1km network of ten

interconnected bridges was finally completed in 1988, nearly a century after Ōkubo first recommended the endeavor. The second network of bridges connecting Shikoku to Honshū, formed by the Akashi-Kaikyō (明石海峡大橋) and Ōnaruto (大鳴門橋) bridges, was not completed until ten years later, officially opening to traffic on 5 April 1998 (本州四国連絡高速道路株式会社 2010).

The construction of the Great Seto and Akaski-Kaikyō bridges undeniably made travel and trade between Shikoku and Honshū much easier. In one sense, however, the bridges themselves created an economic barrier to the free flow of goods and services between the two islands. As is characteristic of the Japanese highway system, tolls to cross the two bridges have been set deliberately high to discourage excessive automotive traffic and its accompanying environmental destruction. As of April 2010, transiting the entire Akashi-Kaikyō Bridge, from Kōbe on Honshū to Naruto on Shikoku, costs 5450JPY (~58USD) for passenger cars and 15750JPY (~169USD) for trucks (本州四国連絡高速道路株式会社 2010). Traveling across the Great Seto Bridge is similarly pricey; passenger vehicles pay 4100JPY (~44USD), while trucks are charged 12150JPY (~130USD) (本州四国連絡高速道路株式会社 2010).

Nevertheless, in the years immediately following the construction of the Akashi-Kaikyō bridge, Shikoku enjoyed unprecedented economic growth. Between 1999 and 2000, for instance, the combined GPP (Gross Prefectural Product) of Shikoku's four prefectures surged

by a remarkable 80% (METI 1999). Income inequality, as measured by the Gini coefficient, a number between 0 and 1 derived mathematically from the Lorenz curve, fell to a record low of 0.249, the world's second lowest (UNDP 2009). The catchphrase so beloved by 80s-era Japanese politicians – *ichioku soūchūryū* (一億総中流, "one hundred million, all middle class") – was definitely applicable.

This remarkable economic progress in the wake of reduced isolation was not, however, welcomed by all. Many residents felt that the new central government push for industrial development and infrastructure projects would threaten their traditional way of life and decimate the local environment. One example of the backlash against development occurred in January 2000, when the citizens of the city of Tokushima (徳島市), a prefectural capital in northeastern Shikoku, voted to reject a *jūmin tōhyō* (住民投票, referendum) on a dam construction project.

Japan's post-World War II system of government has frequently been described by critics as little more than a "rubber stamp" or "bureaucrats know best" democracy (Kuroda 2005). Indeed, the Liberal Democratic Party, or LDP (自由民主党 or 自民党), was in power for all but 11 months between 1955 and 2009, and major party initiatives were generally passed with little or no serious opposition (BBC 2009). Nonetheless, there are rare instances of concerted, local-level efforts by concerned citizens successfully blocking central government initiatives. The *jūmin tōhyō* held on the Tokushima dam project is one such example, clearly

highlighting the strong opposition to the undertaking that was present within the local community.

Two primary concerns formed the center of the opposition campaign: economic concerns over the project's nearly $1 billion USD price tag, and concerns over the impact that the dam's construction might have on the rich natural environment of the Yoshino River (吉野川). Based on these considerations, the citizens of Tokushima overwhelmingly voted against construction of the project on 23 January. A full 90.14%, or 102,759 local residents were opposed to the project, while only 8.22%, or 9,367, supported it (Jain 2000). Interestingly, and in stark contrast with opposition to other dam projects, both within Japan and internationally, environmental reasons were cited by voters as only a secondary factor in their opposition. According to a 1 February 2000 Los Angeles Times article, "Exit polls found that although environmental concerns were a factor, the primary motive for rejecting the $980 million project was that voters deemed it a waste of taxpayers' money" (Efron 2000).

The results of a *jūmin tōhyō* are entirely nonbinding; indeed, most scholars believe that, like many other aspects of Japanese democracy, the "*jūmin tōhyō* remains a fairly lame political instrument because institutionally the referendum is difficult to bring on and its results are neither mandatory nor even obliging on policymakers" (Jain 2000). Nevertheless, it represents one of the few significant tools of political expression available to the average Japanese citizen, and the success of the referendum Tokushima indicate the clear convergence of environmental and economic issues in Shikoku.

When viewed in a broader context, the economic incentives encouraging environmental protection in Shikoku may not be immediately apparent. The island's environment itself is not a significant source of prosperity for citizens; unlike many other islands, Shikoku is not a major magnet for conventional ecotourism activity. Though large swaths of its landscape remain relatively untouched, it is home to no particularly spectacular natural attractions – no Galápagos tortoises, no colorful tropical birds, and no beautiful, white-sand beaches. Nonetheless, since at least the Edo period, Shikoku has attracted hordes of Japanese travelers for a different reason, but one which is still closely tied to the natural world.

The Shikoku Pilgrimage (四国遍路), first undertaken by the Buddhist monk Kūkai (空海) in the 8th century, is a circuitous 1,200km trek to 88 Shingon school (真言宗) temples located throughout the island. Historically, the pilgrimage attracted a relatively small number of devout Buddhists who would travel to Shikoku from Ōsaka, Edo (江戸, modern-day Tõkyõ), and other areas of the more populated Japanese islands. Today, though, the pilgrimage attracts not only the deeply religious, but also more than 150,000 domestic and foreign tourists each year (NHK 2009). Many come not out of any specific interest in or dedication to the Shingon school of Vajrayana Buddhism but rather out of a simple desire to experience the unique, beautiful environment of rural Shikoku. In this way, though not officially classified as such, Shikoku can be viewed as an ecotourism destination.

For several reasons, however, Shikoku has avoided many of the most detrimental effects of ecotourism while still gaining a substantial economic benefit from such activity. First, and most importantly, the Shikoku pilgrimage is not heavily promoted as an ecotourism attraction. The pilgrimage route offers no five-star hotels with luxurious spas and vanishing-edge swimming pools, and the likes of Expedia and Apple Vacations offer no prepackaged tours to Shikoku's 88 temples. Thus, the island's famous pilgrimage, despite its natural beauty, attracts a very different type of tourist than, for instance, the deluxe, five-star safari package tours common in Kenya. Visitors who choose to undertake the Shikoku pilgrimage are not looking for a week spent in carefully-orchestrated, exotic luxury, but rather for the chance to participate in an often grueling trek along the coasts and through the rugged, mountainous interior of the island. They visit not because they are looking for a quick escape from the endless grind of their daily lives, but rather because they appreciate the pilgrimage's historical and spiritual significance.

Second, until the completion of the Great Seto Bridge, the island was only accessible via a dangerous and inconvenient ferry crossing. This effectively ensured the absence of casual tourists, making the more dedicated, respectful travelers and pilgrims the island's only visitors. Though Shikoku's northern coast is now easy to reach by train, car, or bus, its recent history of inaccessibility and the continued isolation of its southern prefectures has perpetuated an image of remoteness that to this day serves to discourage all but the most determined visitors.

Nevertheless, visitors who come to Shikoku to participate in its famous pilgrimage provide a substantial benefit to the island's local economy. Since the majority of the pilgrimage route is through underdeveloped, rural regions of Shikoku, local villagers directly benefit from providing inexpensive lodging and food to passersby. This is in stark contrast to the situation on many islands with a bona-fide ecotourism industry, where the majority of income from visitors flows to already-wealthy hotel owners, government officials, and multinational corporations rather than directly into the local economy. Individual citizens are thus provided with significant economic incentives to protect their island's natural environment.

Despite the economic benefits provided by Buddhist pilgrims and the increased access to both domestic and international markets provided by the opening of the Great Seto and Akashi-Kaikyō bridges, compared with other regions of Japan, Shikoku has been especially slow to recover from the global recession. Indeed, according to the Bank of Japan's 15 January 2010 Regional Economic Report (日本銀行地域経済報告), while other parts of the country have begun to show signs of economic improvement, Shikoku's "household income has declined substantially" and its "unemployment situation has been severe" (Bank of Japan 2010).

One major cause of Shikoku's recent economic woes has been a significant drop in the level of industrial production. The Index of Industrial Production (鉱工業指数), a statistic calculated annually by the Ministry of Economy, Trade, and Industry (経済産業省), fell by

14.1% between 2008 and 2009, to a record low of 90.3 (METI 2010). Despite a soaring national debt that, in 2009, exceeded 200% of Japan's GDP (IMF 2009), the national government sponsored a massive, 385 billion yen (4.1 billion USD) public works program in a largely unsuccessful attempt to stimulate Shikoku's economy (METI 2010). This represents a 16.1% increase in public infrastructure spending over the previous year, a rate substantially higher than the 10.2% national average (METI 2010).

Even before the recent recession, Shikoku remained largely dependent on the national government for funding. In 2003, the most recent year for which statistics are available, the island's four prefectural governments were able to supply just 38% of the funding needed to meet public expenditure needs before national assistance (MLIT 2003). For comparison, in the same year, the Tōkyō Metropolitan Government met nearly 72% of its public expenditures budget without national aid (MLIT 2003). This dependence gives local politicians significantly less ability to mount effective opposition to national initiatives that may adversely impact their island's ecology. In fact, despite the clear message sent by Tokushima's 2000 *jūmin tōhyō*, the national government went ahead with a revised version the dam project several years later.

Shikoku's environment has undeniably benefitted from the combined system of economic barriers and incentives that has worked to prevent ecological destruction and slow the development of modern industry. In many ways, Shikoku's citizens have also profited from these same factors, retaining a rich, traditional culture and cultivating a unique, hybrid

eco-spiritual tourism industry. Yet, with local economic conditions that continue to worsen in the face of the global financial crisis, politicians in Tōkyō who continue to press for massive development projects, and the improved infrastructure linking Shikoku with its larger neighbor to the north, it remains to be seen how long the island's environment and residents will be able to resist the siren call of modern development.

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