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Ecologically Unequal Exchange and Landesque Capital on Kinmen Island

Eric Clark* and Huei-Min Tsai**

I. Introduction

Two conceptual tools in historical analyses of environmental issues and political ecologies have gained much attention in recent years: ecologically unequal exchange and landesque capital. The former narrows in on how societal relations of power allow for the physical transfer of environmental degradation—upon which our daily consumption rests—to places far away from our environmentally clean (and therefore often presumed sustainable) homes, cities and regions. The latter focuses instead on the power of human activity to improve environmental conditions, commonly in terms of soil fertility, biodiversity, land cover, carrying capacity, resilience vis-à-vis ecological degradation, or other dimensions of sustainability. One draws attention to the geographically uneven and ecologically detrimental consequences of human activities, while the other draws attention to the potential of human activities to reinforce the resilience and sustainability of social-ecological systems. There is an interesting tension between these processes which calls for closer inspection. The purpose of this paper is to bring them together in the same empirical analysis.

In earlier work, we have analyzed the environmental history of Kinmen Island from the perspectives of biocultural coevolution, globalization and boundary dynamics (Clark and Tsai 2002) and island biocultural assemblages (Tsai 2003). In this paper, we revisit this earlier

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work, bringing the analytical perspectives of ecologically unequal exchange and *landesque* capital onto the workbench. First we briefly present the two key concepts, and research into the formation of *landesque* capital is critiqued for its silence on how land rent enters into the process. We then re-interpret our earlier analyses of the historical-political ecology of Kinmen Island in the light of these concepts. We should emphasize that this is work in progress. What is presented here should be seen as a first-cut at analyzing the historical-political ecology of Kinmen Island from the perspective of ecologically unequal exchange and the formation of *landesque* capital. Guided by these concepts, we continue to examine historical records and conduct fieldwork to expand the basis for a second-cut analysis.

II. Ecologically Unequal Exchange

Trade is commonly seen by economists as necessarily equal, since those who trade voluntarily exchange what they possess for currency or goods which they assess to be of at least equal value: otherwise they would not trade. Through comparative advantages, trade benefits all. Critical economic historians have problematized this simple view of trade between equals with the notion of unequal exchange, based on uneven development between core and periphery and inequalities in strength between societies engaging in trade. Unequal exchange entails “moving accumulated capital from politically weak regions to politically strong regions” (Wallerstein 2004: 28). The concept of ecologically unequal exchange leaves the issue of value aside, focusing instead on material flows of trade and their ecological consequences. To paraphrase Wallerstein, it entails moving the ecological footprint of politically and economically strong regions to politically and economically weak regions (Hornborg 1998, 2001). Key concepts include social metabolism, physical trade balance (Muradian and Giljum 2007; Weisz 2007), environmental load displacement (Hornborg 2006, 2008) and material and energy flow accounting (Haberl, Fisher-Kowalski, Krausmann, Weisz

and Winiwarter 2004; Krausmann, Haberl, Erb and Wackernagel 2004).

In taking the material flows of trade into consideration, ecologically unequal exchange problematizes simple territorial analyses of environmental degradation. Extractive and productive activities in one country result in a set of ecological consequences for that territory. The set of ecological consequences of total consumption in the same country may however be considerably greater, if much of what is consumed is extracted or produced abroad.

III. Landesque Capital

The concept of landesque capital was coined by Amartya Sen in an article on choice of agricultural techniques. Here he juxtaposed capital goods “which replace labor (e.g., tractors) and those which replace land (e.g., fertilizers)”, referring to the former as laboresque capital and the latter as landesque capital. Sen’s focus is however limited to annual yield and issues surrounding choice of technique to enhance annual yield. He assumes for instance that “landesque capital goods wear away in one year” (Sen 1959: 280). Far and away the most common usage of the concept has rather been that formulated by Piers Blaikie and Harold Brookfield in their seminal book on *Land Degradation and Society*: “any investment in land with an anticipated life well beyond that of the present crop, or crop cycle” (Blaikie and Brookfield 1987: 9; cf. Brookfield 1984). In practice what is commonly identified as landesque capital includes terraces, ditches and dams, irrigation systems and stone walls. These “leave the most persistent of all visible records on the land, and for this reason they have been heavily emphasized in the literature ... But”, Brookfield goes on to argue, “there are many other forms of landesque capital, including field systems as a whole, and major modifications to the soil” (Brookfield 2001: 184).

In his analysis of pre-colonial landesque capital, Mats Widgren emphasizes what is otherwise rather tacitly suggested in the literature, namely that the concept of landesque capital “confronts stereotyped images

of relations between humans and nature” in so far as “it acknowledges the role of humankind in improving ‘natural’ conditions. In many areas of the world, humans may have altered conditions for future sustainable use for the better, and not only for the worse, as is often the unproven assumption in much writing on environmental history” (Widgren 2007: 63; cf. Håkanson and Widgren 2007). In the same vein, Brookfield argues that “Just as human use can have the effect of stripping and gulying soils, so it can also create enduring beneficial changes that yield capital for use by future generations” (Brookfield 2001: 185). Enduring beneficial change creeps into the very definition of landesque capital. There are human practices such as the formation of landesque capital that contribute to sustainable development, and then there are practices which contribute to stripping and gulying soils and other forms of land degradation.

It is important to avoid categorizing types of material objects as landesque capital *per se*. Ditches are for instance commonly considered examples of landesque capital. But are all ditches landesque capital—even those which generate land degradation? The analytical problem arises: what about all those “investments in land with an anticipated life well beyond that of the present crop” which result in stripping and gulying soils, exploitative investments in land characterized more by extract-and-move-on than by soil husbandry? One solution is to more explicitly incorporate such considerations into the definition. Landesque capital is—perhaps—not any and all investments in land with an anticipated life well beyond that of the present crop, but only those which prove to create enduring beneficial changes through improving the capability of land, and certainly not those which have the effect of stripping and gulying soils.

It is also important to distinguish between landesque capital as an explanatory framework for analyzing the genesis of human interventions in landscapes, and landesque capital as a characteristic of the consequences of such interventions, regardless of genesis. As Tim Bayliss-Smith very perceptively argues, a ditch may be dug for a number of different reasons, of

which investment in future security is one. Landesque capital facilitates increased production in the future, for exchange or subsistence, constituting part of a social strategy for risk avoidance. Bayliss-Smith distinguishes between six rationales for digging a ditch, of which future security and risk avoidance is one (Bayliss-Smith 2007). This *ex ante* perspective places the formation of landesque capital in a broader range of explanations for the genesis of objects commonly associated with landesque capital, and does so with praiseworthy analytical rigor. From an *ex post* perspective, however, the unintended consequences of a ditch dug for other purposes than future risk avoidance may nevertheless be deemed beneficial or degrading—landesque capital or not. Is a ditch landesque capital? If digging the ditch can be shown to be done for future security, in order to avoid risk, it is landesque capital in the *ex ante* perspective. Regardless of rationale for digging the ditch from an *ex ante* perspective—for instance if the ditch is better explained in terms of formation of symbolic capital and the marking of boundaries of private property—it may nevertheless be considered landesque capital from an *ex post* perspective to the extent that the ditch constitutes an enduring beneficial installation in the landscape, improving the capability of land.

A key issue inadequately addressed in the literature on landesque capital is its relationship with land rent. While the research into landesque capital often refers to itself as embedded in and focusing on political economy, and while intensification is consistently the context in which the concept is invoked, there is a curious silence on land rent. One would expect to find intensity rent, or what Marx referred to as differential rent II, at the core of political economic analyses of landesque capital in the context of intensification of land use (Marx 1981; cf. Clark 1987; Clark 2004). Instead there is a deafening silence. What such considerations may contribute to analyses of landesque capital opens up a set of complex relations which extend beyond the scope of this paper. But we suggest that bringing land rent theory into analyses of landesque capital, land degradation and

sustainability provides a fruitful path for further work.¹

IV. Kinmen Island

Kinmen (*Quemoy*)² is a small island with a land area of approximately 134 square kilometers and a population today of approximately 50,000. Located in Xiamen (*Amoy*) Bay off the southeast coast of mainland China, the island is mostly composed of granite gneiss, like that found on the mainland. The island terrain is mostly flat, with some low hills. The highest point of the island is Mt. Taiwu at 253 meters. The climate is subtropical, with an average annual temperature of about 21° Celsius. Yearly rainfall is about 1,000 ml, while evaporation reaches 1,750 ml per year. The island is dry most of the year, except in the spring, which is typically rainy and foggy. Water availability is therefore a key factor for biological assemblages on the island.

Kinmen is a near-shore continental island with a long and close relationship with the coastal region, especially the cities of Ch'uan-Chou and Chang-Chou which have held leading positions in the realm of maritime trade for centuries (Ng 1973, 1983). Eight kilometers to the west lies the island harbor city of Xiamen (*Amoy*), which in the 17th century superseded Ch'uan-Chou and Chang-Chou as major port of South Fukien. Xiamen's population today is around 1.5 million. Kinmen and Xiamen are the two largest islands in a small archipelago which aside from the two large islands consists of dozens of smaller isles and skerries. The island of Taiwan is nearly 200 kilometers to the east (see Figure 1).

¹ Thanks to Thomas Håkansson, Alf Hornborg, Jason Moore and especially Mats Widgren for discussions spurred by our critique of the concept of landesque capital in "Landesque Capital: A Sympathetic Critique", presented at the conference on Ecology & Power: Critical perspectives on the discourse on sustainability and resilience, Human Ecology Division, Lund University, September 17-19, 2008.

² The name of Kinmen is the current Romanization from the Mandarin Chinese pronunciation and is used officially in Taiwan. Quemoy was used in earlier English documentation, and is pronounced closer to the local South Fukien dialect.



Figure 1. Map Showing Position of Kinmen Island in Relation to the Mainland and Taiwan.

Source: Tsai (2003: 210).

The events of 1949 drew a line through this archipelago, cutting off connections for decades. The Chinese Civil War ended in the geopolitical formation of the Republic of China (Taiwan), which aside from Taiwan includes Kinmen, Matsu (another archipelago close to the mainland, northwest of Taiwan), the Penghu Islands (in the Taiwan Strait) and some other smaller islands. Chiang Kai-shek and the Nationalist Party Kuomintang retreated from the mainland to Taiwan over Kinmen, where a decisive battle was fought. Since then, Kinmen's ties to South Fukien have been tightly restricted, all flows having to go via Taiwan.

In this study we relate major changes in the landscape of Kinmen Island to what historical records can reveal about ecologically unequal exchange and the formation of landesque capital. For reasons of convenience we present our analysis under the separate headings of periods, some of which are divided by clearly pivotal events (e.g. 1949), others by less dramatic transitions. By this we do not mean to suggest that the processes of

ecologically unequal exchange and formation of landscape capital either take-off or come to grinding halts at these points in time. Nor do we wish to suggest that any of these periods is void of one of these processes, all landscape change being generated by the other process. Indeed, we cannot assume that these two processes are mutually exclusive or for that matter exhaustive of all considerations of landscape change. Quite to the contrary, our empirical analysis—limited as it is by existing records—suggests that the two processes are often enmeshed.

A figure of the island's human population and biomass serves as back-drop for discussion (see Figure 2). Sources for population estimations are Hung Shou's *Recollections of an Unforgettable Island* (1568),³ occasional records in local gazetteers and, since 1960, regular census reports. Biomass estimation is based upon the ratio of forest and vegetation land cover. The historical analysis relies on historical documents and local gazetteers, while the analysis of contemporary issues is based on empirical field study including natural and cultural resource surveys and interviews with local people.

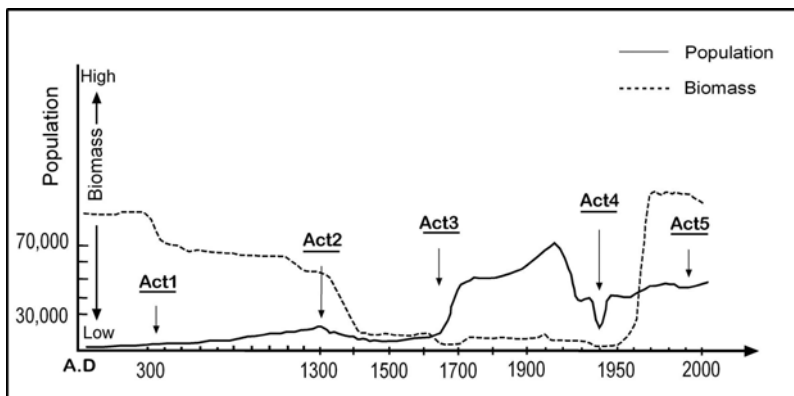


Figure 2. Population-biomass Dynamics on Kinmen Island

Source: Tsai (2003: 211).

Note: Three time scales: 300–1300, 1300–1900 and 1900–2000.

³ This is the earliest preserved historical geographical work on the island, written by a local scholar.

V. Ecologically Unequal Exchange and Landesque Capital on Kinmen Island

1. Agro-pastoral Ecosystem (317-1297)

Although the archeological evidence reveals human habitation on Kinmen dating back 6,000 to 7,000 years, the earliest historical records of migration flow from the mainland to the island are from ca 317 A.D., when northern tribes invaded China. Many of the local lineages trace their genealogies back to six large families that arrived on the island during the Eastern Chin Dynasty (317-420 A.D.). Another wave of migration to Kinmen took place during the late Sung Dynasty (1126-1297), when invaders from Northeastern China moved into the Central Plain. Lineage records show most of the migrants came from Ch'uan-Chou, the most populated prefecture and foremost harbor in South Fukien at the time.

In order to re-construct past landscapes on the island, the location of forests, lakes, heaths, and other biotopes have been mapped, based on descriptions found in ancient literature. Kinmen's landscape was still largely wooded and fertile during this period. Economic activities on the island consisted of traditional Southern Chinese agriculture, involving considerable investment of labor into the formation of landesque capital. Early immigrants built dikes, ponds and irrigation systems for crops, according to descriptions in ancient local literature.

This agriculture was gradually combined with the introduction of pastures for horse husbandry as an adaptation to the drier environment on the island. In 803 A.D. (Tang Dynasty), the Governor of Fukien designated Kinmen as one of five official horse ranches. Chen Yuan was appointed officer in charge of the ranch. Twelve families from Ch'uan-Chou followed him to settle on the island. According to Chen's poems, the island landscape was largely wooded and fertile. Kinmen became one of the major horse supply centers for Fukien. It is reasonable to believe that the population was increasing and the biomass was decreasing gradually as a result of agricultural and pastoral activities introduced to the island over the course

of nearly a thousand years.

Another key event was the founding of a school on Kinmen during the 12th century. Chu Hsi, leading Confucian scholar, served as officer in Tong'an County (which includes Kinmen), and visited Kinmen regularly. He established the Yen-Nan Academy (South of Yen Mt. Academy), encouraging the islanders to pursue good education. A century later another school was established, the Wu River Academy.⁴ For centuries, during the Ming and Ching dynasties (14th to 19th centuries), Kinmen islanders were disproportionately successful in the Imperial Examinations—a nation-wide tiered system of examinations from local to national, through which public officers were selected.

2. Deforestation and Desertification (1297-1683)

The landscape of Kinmen changed from an agro-pastoral ecosystem to barren land after being designated for salt production during Mongolian rule from 1297 to 1367 A.D. (Yuan Dynasty). Kinmen became one of seven major centers of salt production along the Fukien coast. According to documents from the 14th century, most of the island's forest was cut for firewood in order to increase the volume and pace of salt production. After only a few decades, large areas of land became barren and sandy. Salt production shifted from boiling brine technique to utilizing tides and sun drying technique. At least nine salt fields were established on the island, mostly to the north and east. After only a few decades, the island had become barren and sandy (Hung 1568).

Biomass was further reduced in the 17th century when the island became a strategic location for the last emperor of the Ming Dynasty to locate a military base for opposing the emerging Manchu (Ch'ing) Dynasty and for launching attacks on Dutch-occupied Taiwan. Much of the better timber was used for warship construction. The environment eventually became so barren and sandy that moving sand dunes buried whole villages

⁴ Wu River is the major river on the island. The ancient name of Kinmen is Wu.

on the east side of the island. Biomass declined to very low levels, as did human population as a result of land degradation. People's livelihoods were threatened not only by food shortages due to desertification, but also by pressure from pirate attacks.

Six salt fields were still in use during the 18th century, all but one being abandoned during the 19th century. The last salt field was re-constructed during Japanese occupation (1937-1945), and produced salt until 1995 (Huang 2003).

3. Stable Adaptation to Barren Landscape and Enriched Cultural Landscape (1683-1937)

The population of Kinmen increased after the island was incorporated into the Ch'ing Dynasty in 1683. No longer a defensive site against invading powers, but still coping with barren and infertile land, Kinmen islanders both adapted in situ to their living environment and sought livelihoods elsewhere. Starting in the 18th century, the tradition of erecting *wind spirit lions*—statues at the four village gates—in order to defend against the sands and winds took hold. Kinmen benefited from increased trade owing to its location next to Xiamen (Amoy) Island, which possessed one of the best seaports in China and was designated one of five “treaty ports” after the British-Chinese (First) Opium War in 1840 (Ng 1983). By the mid 19th century, population growth combined with limited resources led to a wave of emigration to new frontiers in Southeast Asia.

Kinmen's population fell dramatically from 70,400 in 1915 to 37,500 in 1929 as a result of a wave of mass emigration to Southeast Asia, where Kinmen islanders established overseas bases. Remittances from family members abroad became an important source of income. The more successful emigrants often had schools, temples and new homes built in their home villages. The new buildings commonly introduced architectural design elements representative of various Western colonial styles from Southeast Asia, such as Dutch Indonesia, British Singapore and Spanish Philippines, which were adopted and hybridized with local building

traditions. Evidence of the emigrants' destinations is visible in the distinctive building styles of each village. The cultural landscape of the island consequently came to exhibit a patchwork of styles, mixing old Chinese architecture adopted from coastal provinces and various colonial styles, along with wind spirit lion statues, and other local elements.

4. Intensive Extraction (1937–1945)

In 1937, the Japanese invasion of China reached Kinmen, which again became a strategic military area. Between 1937 and 1945, the population continued to diminish due to evacuation of islanders to areas in the coastal provinces that were not as affected by the war. Most of these displaced Kinmen residents returned to the island after the war.

The Japanese established a military air-base on the island, which together with clay extraction and production of ceramic wares and opium for export to Japan became predominant activities. Once again the island was utilized for the purposes of distant powers with little concern for local economy or land management.

5. Military Closure, Reforestation and Agriculture Development (1949–1992)

The events of 1949 positioned the island on a critical frontier between the “free world” and the “communist world” during the Cold War era. From its new distant power of Taipei it came to be seen both as a stepping stone for the nationalist government of Taiwan to recover control over mainland China and as a site of defense against invasion of Taiwan by the Peoples Republic of China.

The island experienced an extended period of limited access and strictly regulated development. Self-sufficiency became militarily important in the event of a blockade. Hence, military authorities implemented policies designed to improve the island's environment, primarily for the purpose of prolonged defense against a siege, but with considerable consequences for the island's ecosystem. These policies included construction of an

island-wide network of underground tunnels for defense against bombs and invasion (the island was extensively bombed in 1958 during a P.R.C. offensive against Taiwan), intensive reforestation for protection from wind erosion, digging enormous water reservoirs and ponds to ensure adequate water supply, development of agricultural and pastoral land to secure self-sufficiency of food supplies, and the introduction of drought resistant sorghum for large-scale production of liquor for export as a source of income.

Efforts of increasing landesque capital include reforestation, water engineering and management, soil improvement, and protection of coastal wetlands.

These policies of tight regulation and development were conducive to environmental recovery and improvements in land capability. According to environmental survey, wooded land now covers over 51% of the island, while sandy and barren lands have been transformed to arable land (Wang, Lee and Lue 1994). Reservoirs and ponds have become sanctuaries for migratory birds, with 283 recorded species. The protection of the coastline has provided opportunities for plant succession and increased biodiversity. Five hundred and forty-two plant species have been recorded, some rare. The island has experienced a significant increase in the abundance and diversity of biomes, and rapidly increasing biomass with reforestation. In addition, the regulation of development has also provided opportunities to preserve unique historical buildings, representing a historical stock of cultural diversity.

Vegetation cover is a key factor in protecting the land from erosion, especially for small islands with limited water resources and a dry climate. Photos taken on Kinmen in the early 1950s show that there were almost no trees or other vegetation on the island at that time. Intensive reforestation has introduced some species to the island. The first group of pioneer plants consisted mainly of Australian pines (*Casuarina equisetifolia*) and a few other windbreak tree species. About 2.2 million saplings were planted in the first

year (1955) and more were planted each year as additional areas were cultivated. Biomass increased dramatically on the island, as shown in Figure 2. In total, more than 65 million trees were planted up to 1997, and about 35 million grew to maturity, covering 51% of the island 42 years after the first saplings were planted. Early on, every soldier stationed on this military outpost was assigned the care of designated trees to help them survive in this hostile, dry environment. The intensive planting of Australian pines on Kinmen Island has helped reduce wind erosion and protect soil, while creating habitats for other species. Sand storms, once common throughout the island, no longer affect the inhabited areas of Kinmen, and biodiversity has increased.

A plan to plant endemic broad-leaf plant species, such as *Litsea glutinora* (which belongs to the camphor family) was initiated as part of a second-stage planting program in 1982. The saplings of endemic trees were planted behind the Australian Pines so that they could gradually replace the introduced pines. The total number of introduced and endemic tree species reached 114 in 1994.

Water is a key factor for soil capability. From 1950 to 1990, many small reservoirs, dams, and water ponds for villages have been built. In total, there are 15 reservoirs, 141 small dams, and 449 ponds for irrigation systems and drinking water.

Historically, the quality of food grown on Kinmen had been poor due to dry climate and infertile soils. Peanuts and sweet potatoes were the predominant crops. Not much else could grow on the barren land. In 1952, drought-resistant sorghum was successfully introduced. Since then, local agriculture experts on Kinmen have encouraged people to plant sorghum instead of other crops. However, because sorghum is used in the production of liquor, a crop exchange policy was initiated whereby sorghum yields could be traded for equal quantities of rice. This encouraged farmers to pursue sorghum farming. Imported fertilizers have also been applied to the agricultural land. About 10 percent of the area of the island has become

fertile farmland.

According to historical documents there have been as many as 36 harbors along the coast of Kinmen, eight of which were large enough to anchor more than 100 boats (Quemoy Gazetteer 1836). With the enforcement of martial law, only two harbors have been in service since 1949. More than four decades of port closure increased coastal sedimentation, which facilitated the formation of various types of wetlands, including salt marshes (Kuningtou bird sanctuary, earlier a port for two villages), mangrove swamps (Wu River estuary, earlier the main harbor for the island's capital), and extended mud flats along the entire north coast. These mud wetlands are now productive oyster farms. Mud flats and mangrove swamps provide habitats for horseshoe crabs (cultivated for bio-tech industry) and serve as bird sanctuaries. Isolation effects have allowed natural succession and restoration, as well as increased biodiversity. Most of these areas of higher biodiversity have subsequently been designated national park land.

6. Re-opening, National Park and Cross-strait Links (1992-)

Tensions between mainland China and Taiwan gradually diminished in the early 1990s. In this relatively peaceful atmosphere, the Taiwan government decided to discontinue martial law on Kinmen, releasing administrative power from the national defense authority back to civilian local government in 1992. The island thereby once again became accessible to the general public and has since become a popular destination for Taiwanese tourists. The population has increased slightly due to increased employment opportunities. After half a century of restricted development, political pressure built up to release all restrictions on development in a race to exploit the huge potential for development gains through land-use change and investment in construction of housing, hotels, and businesses. In response, conservation groups mobilized in an attempt to sway public opinion toward protection of the island's restored biodiversity, natural environment, and unique historical and cultural heritage.

After a series of resource surveys, a formal park proposal involving public participation was submitted (Wang, Lee and Lue 1994; Simpson and Tsai 1994). In 1995, about one-quarter of the land area of Kinmen was designated Kinmen National Park, and a new category in Taiwan's protected areas system was established. In the context of a small island, it was not possible to set aside one continuous area, or to exclude populated areas. The park thus consists of five patches connected by tree-lined roads. In addition to mountains, coastlines, lakes, and bird habitats, the patches also include historic villages, war memorials, and significant cultural relics within the national park boundaries. In addition to the usual national park purpose of natural habitat conservation, Kinmen National Park is also responsible for conserving historical memorials and the cultural heritage of the island. It is these cultural elements that have since become most popular among tourists.

Continued diplomatic progress towards openness between mainland China and Taiwan resulted in Kinmen being designated a trial stepping stone for cross-border trade in January, 2001. However, only residents of Kinmen gained the right to import from and export to mainland China. On February 10, 2002, for the first time in 53 years, Taiwanese with Kinmen residential status were able to travel between Xiamen and Kinmen. A regular ferry service began operating between Xiamen and Kinmen in April, 2002. The effects of increased flow to, from, and through the island on biological and cultural diversity remain to be seen.

VI. Conclusion

The environmental history of Kinmen Island displays periods of ecologically unequal exchange primarily in terms of resource extraction by distant political and economic powers, but also periods of considerable formation of landesque capital. We do not pretend to have carried out a carefully honed empirical analysis. This "first-cut" historical analysis on the formation of landesque capital and ecologically unequal exchange on Kinmen Island

builds on a rather simple linking of these two conceptual tools to previous empirical analyses which were admittedly not designed to address these specific issues. Clearly, methodological issues need to be more carefully considered concerning empirical measurement of ecologically unequal exchange and the formation of landesque capital. We offer these notes as brief and preliminary suggestions of what more rigorous empirical investigations might unearth.

Over seven centuries of salt extraction from Kinmen Island resulted in desertification and environmental impoverishment. This is ecologically unequal exchange. In recent decades, military interests in self-sufficiency and food and water security led to intensive investment in landesque capital. That these processes are not mutually exclusive is evident in that the same decades of intensive landesque capital formation and reforestation are also when the island shifts places in terms of ecologically unequal exchange, becoming an exporter of ecological footprints and environmental load displacement and an appropriator of time-space and resources from elsewhere.

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