

## **Inequality in Development Futures Tourism Economies and Construction Technology in Tai O, a Village near Hong Kong**

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### **Abstract**

**This paper concerns research conducted in Tai O Village, a stilt house settlement within the Hong Kong Special Administrative Region (HKSAR). Tai O is subject to tourism development planning by the Government of the HKSAR. Planning documents rely on Tai O's historic stilt house vernacular architecture to position Tai O Village as a cultural and ecological tourism destination. In preparation, the Government began infrastructure development to better connect Tai O's remote location to nearby transit centres. However, because of stilt houses' status as "surveyed squatter structures," there is inequality in Village residents' ability to participate in tourism development. Stilt house owners and residents may not renovate or improve their homes at risk of removal. In spite of the centuries Tai O's population lived in stilt houses, residents face futures in which they are subject to development planning strategy, yet less able to take advantage of its benefits, and vulnerable to economic and ecological threats it causes. This paper examines two ongoing research themes in Tai O. First, the paper discusses Tourism and Fishing Economies in Tai O through resident field interview responses. Second, this paper discusses progressions in construction technology evident through site survey in Tai O's stilt house districts. In conclusion, this paper frames research responses anticipating future additional research and design projects. These efforts connect to a spatial activist framework, with activist structure research support,**

**collective development action, and network-based prototyping methodologies.**

### **Introduction**

This paper concerns research conducted in Tai O Village, a stilt house community on the Tai O River, within the Hong Kong Special Administrative Region (HKSAR). Situated on the Western coast of Lantau Island, Tai O is subject to tourism development planning by the Government of the HKSAR, in particular the Civil Engineering and Development Department (CEDD), Lands Department (LD), and Tourism Commission. The CEDD-authored Sustainable Lantau Blueprint (SLB) relies on Tai O's historic stilt house vernacular architecture to position Tai O Village as an intensified cultural and ecological tourism destination. In preparation for this role, the Government began a number of infrastructure development programs to better connect Tai O's remote location to nearby transit centres Tung Chung, Mui Wo, and, Ngong Ping Village. However, based on the stilt houses' status as "surveyed squatter structures" under the 1982 Squatter Control Policy on Surveyed Squatter Structures (SCPS), there is inequality in Tai O Village residents' ability to participate in this tourism development transition. Under this policy, stilt house owners and residents may not renovate, improve, or enlarge stilt houses at the risk of losing their "tolerated" status and subjecting their homes to Lands Department clearance. In spite of the centuries of history Tai O's Tanka-descendant population have lived in stilt houses and near the shore, including central importance in the Qing Dynasty (1636-1912) salt production monopoly, Tai O residents face complex future prospects in which they are subject to Governmental development planning strategy, yet unequal in their ability to take

advantage of development, and substantially vulnerable to economic and ecological threats. This paper examines two themes related to ongoing field research in Tai O. First, the paper discusses the state of Tourism and Fishing Economies in Tai O based on field interview with stilt house residents and community activists. Second, this paper discusses progressions and changes in construction technology evident through site survey in Tai O's stilt house districts. In conclusion, this paper discusses ongoing research response strategies within multiple Tai O resident constituencies, in anticipation of research and design projects. The paper connects these efforts to a general spatial activist framework, with activist structure research support, collective development action, and network-based prototyping methodologies.

### **Tourism and Fishing Economy**

Tai O Village's memorable stilt house architecture, earning the Village the nickname the "Venice of Hong Kong,"<sup>1</sup> is intrinsically connected with the Tanka ethnic group that founded the stilt house districts, and the fishing economy upon which they depended. Tai O's stilt house typology separates into three or four generations, dependent on division of the initial phase. The first and second phases of Tai O stilt house development began as over-water platforms for Tanka fishermen's families to occupy during day-long or multi-day fishing trips. These over-water platforms transitioned into round-topped stilt houses based upon *sampan*-type boats, which are the oldest in Tai O Village, generally with a low ceiling height around three metres high and the smallest occupied area. After this period, Tai O's stilt houses progressed through a pattern of low-slope pitched roof, single or one-and-one-half story dwellings with relatively small liveable areas. Most recent developments in the Tai O stilt house type include two liveable storeys up to the maximum allowed height of fifteen meters, and larger floor plans when allowed by the Lands Department Squatter Control Office. Many renovations and improvements upon the stilt house type visible in Tai O Village appeared after the year 2000 fire that destroyed a number of stilt houses and prompted rebuilding projects.<sup>2</sup> Habitat for Humanity Hong Kong also conducted two rebuilding missions in Tai O Village.

Although stilt house construction and aesthetics have changed over time, Tai O's economy and social life remained connected to fishing and salt

production until around the 1920's, when continued British colonization and the Second World War brought considerable social change. Since then, Tai O Village residents are increasingly dependent on tourism-related revenue to support themselves. Three residents interviewed, themselves Tanka descendants, stated that fishing as a means of primary income is no longer viable. Reasons for this change given include, 1. Government construction of an artificial sea wall in the West Harbour of the village, complicating the mooring of large fishing boats; 2. A government restriction on trawling, and;<sup>3</sup> 3. Construction of the Hong Kong-Zhuhai-Macau Bridge and accompanying environmental disturbance. Residents interviewed generally offered pragmatic responses to this change, and suggested that grievances they have with the economic change relate to their ability to participate in tourism development and the effectiveness, as they see it, of Government improvement projects to connect Tai O more directly with the rest of Hong Kong.

Tourist and commuter transit to Tai O Village from Hong Kong's central business district takes approximately two hours travel time by ferry and bus via Mui Wo, train and bus via Tung Chung, or cable car and bus via Ngong Ping Village. Private ferry service is available from Tuen Mun, Tung Chung, and Sha Lo Wan. The Sustainable Lantau Blueprint (SLB) encompasses most recent Government efforts to better connect the remote location and encourage tourism traffic and development. CEDD project expenditures total approximately HK\$855 million for slope stabilization, road improvement, and a recently-completed transit plaza for bus, taxi, and private car arrivals to Tai O.<sup>4</sup> Though a cable car extension project from Ngong Ping stalled,<sup>5,6</sup> these investments and Tai O Village's predominance in Government publications illustrate the Government's determination to increase Tai O's tourism development density.

Along with gathering basic household accounting data,<sup>7</sup> researchers surveyed and interviewed Tai O residents on their intentions to participate in tourism development. The project team sought survey responses reflecting potential spatial changes for tourism development, including home expansion, renovation, alienation, new construction, or new programming and land use. Along with

significant enlargement of one stilt house into the Triple Lanterns café through the 1980's and '90's, several residents indicated desire to renovate, enlarge, or repurpose stilt houses for other uses and programs. These spatial use changes correlate well with increasing tourism development: renovations for small food or beverage vending, souvenir shops, or short-term home stays in some cases. The viability of such spatial programming and land uses changes is evidently complex, given the success of the Triple Lanterns' proprietors and a small number of other residents in altering their stilt houses for new purposes. As alluded to in the first author's previous work<sup>8</sup> and discussed in anthropological literature about village life in Hong Kong,<sup>9</sup> it is difficult to extract such details due to residents' self-protective omission of information regarding squatter control officers' discretionary power. However, two residents indicated that squatter control and other Lands and Buildings Departments' officials restricted their efforts to repurpose parts of their stilt houses to take advantage of tourist traffic. As a result, the statutory conditions in Tai O Village, and the discretionary enforcement of development restrictions for stilt house residents, arguably create inequality in their development opportunities. Tai O residents are subject to the effects of Government tourism

development strategy, but constrained in their ability to take advantage of its benefits, and manage its negative externalities.

### Construction Technology

The statutory constraint upon stilt house residents in question is the Lands Department's Squatter Control Policy on Surveyed Squatter Structures (SCPS). This policy governs enforcement of un-regularized squatter dwellings based on the 1982 Government survey, which registered Tai O's stilt houses along with thousands of other unpermitted structures.<sup>10</sup> Along with subsequent 1984 survey of squatter dwelling *occupants*, effectively a census,<sup>11</sup> this document describes surveyed structures status as "tolerated," conveying no right or lease to occupation of the land on which the structure stands, and severely restricting residents' right to change or rebuild. The SCPS maintains dimensions and geometry of surveyed structures at the time of survey as limitations upon any future construction, along with mandated "temporary materials" for future renovation or rebuilding. SCPS enforcement is the LD's Squatter Control Office purview, and Squatter Control Officers visit Tai O Village, according to residents interviewed,



Figure 1. A semi-composite concrete and steel floor, built in place of a burned-down stilt house and subject to work stoppage. Photograph by Daniel Keith Elkin.



Figure 2. Connections in a newly-rebuilt stilt house. The contractor's use of galvanized steel tube sections led to a work stoppage approximately sixty days long. Photograph by Daniel Keith Elkin.

approximately once a week. Stilt house residents found in breach of the SCPS face work stoppage and clearance of any construction. These restrictions have additional complex consequences for Tai O residents. Tai O Community Work Office staff cite the difficulty in rebuilding stilt houses after fires and typhoons, as re-building works require lengthy permitting processes. Squatter Control Officers have, according to residents and Work Office staff, subjected permit applications to additional scrutiny after the 2000 fire because of the fire risk stilt house construction poses, and the ongoing problem of insufficient sewerage. In effect, Squatter Control Officers both mandate, and cite as inadequate or dangerous, the construction technology intrinsic to Tai O's vernacular architecture. In addition, the policy prohibits rebuilding a demolished squatter structure in an "urban" area, suggesting future difficulties for stilt house residents if development density increases in Tai O.

Research staff intermittently survey Tai O Village for construction or rebuilding projects in spite of these restrictions and, in particular, evidence of changing construction technology. Of most interest are construction technology changes respondent to meaningful collective threats, or indicating substantive change from the existing stilt house vocabulary. For the

purposes of this project, researchers prioritize meaningful threats to Tai O's development sustainability in construction technology terms as: 1. Fire risk due to combustible construction; 2. Lack of connected sewerage, and; 3. Flood risk and estuary site disturbance. The project team prioritize these threats based upon historical precedent, stakeholder and resident feedback, and climatic/climate change vulnerability in the Village, respectively. According to interview, a stilt house reconstruction project begun after the 2000 fire evidences one household's specifications to reduce fire risk. In the construction concerned, the resident specified an unorthodox composite slab of concrete and steel wide flange sections rather than the traditional softwood subfloor. As the composite slab construction still spans between *kwan din* wood columns on the predominating eight- or ten-foot structural bay, deduction that residents sought to slow the spread of fire seems reasonable (Figure 1). Similarly, a stilt house rebuilding recently started (2019) with galvanized steel tube sections and flux-core welding, sheathed with laminated polystyrene and gypsum panels, offers somewhat increased fire resistance (Figure 2.). Squatter Control Officers stopped work on both of these projects on the grounds of *permanent* material use. This suggests that any solutions to reduce fire risk must negotiate the discretionary power of these Government officials, for whom concrete and steel use amount to violations, in spite of fire risk reduction. While the Government extended sewerage to the West side of the Tai O River in 2009,<sup>12</sup> stilt houses on the East side of the river continue to drop black and grey water into the River estuary. Residents interviewed indicate the Government allows residents to connect these stilt houses to the new sewerage lines, but residents find this is often not viable due to required sewer line slope and obstruction to the river way. Residents interviewed state that flooding has increased due to sea level rise. Despite indications that Tai O and stilt house residents are substantially vulnerable to climate change-induced flooding and wind damage,<sup>13</sup> individual actors' flooding responses through improved construction technology have not materialized.

## Discussion and Further Research

Project staff situate ongoing research projects in Tai O Village in a multi-disciplinary spatial activist framework<sup>14</sup> with the following



Figure 3. Network-based prototyping design one is a concrete footing formwork designed to improve footing surface finish and column load distribution. Researchers built the mould shown to transfer to a fiberglass boat repair contractor in Tai O Village. The fiberglass contractor will cast a two-part fiberglass mould from this master. Contractors in Tai O can then use the fiberglass mould to cast higher-quality footings. Design, fabrication, and photograph by Daniel Keith Elkin.

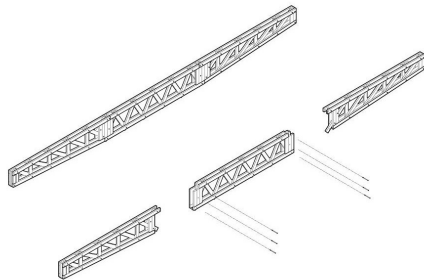


Figure 4. Network-based prototyping design two is a built-up wood truss, designed to reduce site disturbance. The design is within stilt house contractors' tooling and capability, and built in demountable segments to navigate Tai O Village's small-scale infrastructure. Design and drafting by Daniel Keith Elkin.



Figure 5. Research Assistant Yu Chui Sang acts as interpreter while discussing truss fabrication details with Mr. Sin (left), a stilt house contractor working and living in Tai O. Photograph by Daniel Keith Elkin.

methodologies: activist structure research support, collective development action, and network-based technology prototyping. Researchers' work supports social welfare organizations like the Tai O Community Work Office, collecting and providing data on tourism development, and resolving weaknesses in similar organizations' connection to residents. For example, residents indicate their connection to the Tai O Rural Committee, the body meant to negotiate Government development decisions, functions poorly due to residents' advanced age and poor notification for community meetings. The British Council in Hong Kong recently supported the team's work to increase social inclusion in development decision making by resolving such lapses. From an architectural point of view, researchers anticipate collective development action, such as community facilities designed to regulate tourist population influx and spread tourism revenue more broadly in the community, could support community needs and reduce negative externalities in tourism development. Finally, network-based technology prototyping, with stilt house contractors working in Tai O, allows researchers to integrate construction technology improvements that reduce negative development impacts into the Village's construction technology network (Figure 3-5).<sup>15</sup> While Squatter Control Officers' reactions remain to be seen, researchers have commissioned prototype built-up floor trusses and reusable concrete footing formwork to reduce stilt house site disturbance. These, along with an anticipated floating mooring prototype, are hoped to positively influence stilt house contractor's construction language, while maintaining resident control over development decisions. While the relationship between Tai O

Village residents, their Government, and larger development actors is substantially unequal, researchers are optimistic that better informed, organized, and empowered residents in Tai O can participate in their village's future with more agency.

## Endnotes

1. Ngo, Jennifer. "Tai O: The Venice of Hong Kong Is Stilt Standing." South China Morning Post, July 10, 2013. <https://www.scmp.com/news/hong-kong/article/1124968/tai-o-venice-hong-kong-stilt-standing>.
2. Yeung, Gary. "Practicing the Built Tradition in Tai O Hong Kong." *Internet Resources on Sustainable Buildings*, no. 48 (2007): 2–7. [http://old.hkia.net/en/pdf/journal/journal\\_issue48\\_part4.pdf](http://old.hkia.net/en/pdf/journal/journal_issue48_part4.pdf).
3. Chu-Fi, Cheung. "Trawling Ban Means End of an Era for Hong Kong's Fishermen." South China Morning Post, December 31, 2012. <https://www.scmp.com/news/hong-kong/article/1116809/trauling-ban-means-end-era-hong-kongs-fishermen>.
4. "On-going Projects." CEDD - Improvement Works at Tai O. Accessed November 01, 2018. <https://www.cedd.gov.hk/eng/projects/major/nt/hki7417ro.html>.
5. Ng, Naomi, and Raymond Ng. "Stargazing Centre and Tai O Cable Car Axed from Lantau Plan." South China Morning Post, July 20, 2018. <https://www.scmp.com/news/hong-kong/economy/article/2096782/hong-kong-government-scales-back-lantau-development-plan>.
6. Fung, Fanny. "Hong Kong Cable Car Operator Worried about Tai O Extension Warning Former Fishing Village Will Become Overcrowded." South China Morning Post, September 7, 2015. <https://www.scmp.com/news/hong-kong/economy/article/1855848/hong-kong-cable-car-operator-expresses-concerns-over-tai-o>.
7. Under the "household accounts" method described in: Turner, John F. C., and Robert Fichter. *Freedom to Build; Dweller Control of the Housing Process*. New York: Macmillan, 1972.
8. Refer to the "camouflage" premise in: Elkin, Daniel, Gerhard Bruyns, and Peter Hasdell. "Appropriate Construction Technologies for Design Activism: Material Research Practices in Response to Globalisation." *Architectural Research Quarterly* 22, no. 4 (2018): 290-309. doi:10.1017/s1359135518000507.
9. Allen Chun discusses the difficulty in conducting anthropological work caused by distrusting village residents in: Chun, Allen John Uck Lun. *Unstructuring Chinese Society: the Fictions of Colonial Practice and the Changing Realities of "Land" in the New Territories of Hong Kong*. London: Routledge, 2002.
10. Hong Kong Special Administrative Region. Lands Department. Squatter Control Office. *Squatter Control Policy on Surveyed Squatter Structures*. Hong Kong: Government of the Hong Kong Special Administrative Region, 2016.
11. Smart, Alan. "Unruly Places: Urban Governance and the Persistence of Illegality in Hong Kong's Urban Squatter Areas." *American Anthropologist* 103, no. 1 (2001): 30-44. doi:10.1525/aa.2001.103.1.30.
12. AECOM Engineering. Project Profile for Upgrading of Tai O Sewage Collection, Treatment and Disposal Facilities , Project Profile for Upgrading of Tai O Sewage Collection, Treatment and Disposal Facilities § (2009).
13. "Climate Change Tai O." *Climate Change Tai O*. Hong Kong, HKSAR: Hong Kong Jockey Club Charities Trust, 2014.
14. Fuad-Luke, Alastair. "Design Activism 's Teleological Freedoms as a Means to Transform Our Habitus." Design Activism 's Teleological Freedoms as a Means to Transform Our Habitus |. January 4, 2017. Accessed March 14, 2018. <http://agentsofalternatives.com/?p=2539>.
15. Turner, John F. C., and Robert Fichter. *Freedom to Build; Dweller Control of the Housing Process*. New York: Macmillan, 1972.