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Editorial Board

Contents

Editorial

Stock & flow of land: Freeing land from rigidities for urban development in Hong Kong

Lawrence WC Lai, KW Chau & Lennon HT Choy

Land is a *stock* and housing a *flow* concept.

Mixing up stocks and flows cannot properly help address the problem of unaffordable housing prices for Hong Kongers who wish to become homeowners.

Legitimate public expectations that the government should increase developable land supply as quickly as possible are, in the final analysis, a result of a past strategic planning failures. The age-old government town planning practice of the timely conversion of land stocks into a supply or "flow" of building units to feed the process has not been sustained.

Housing supply can increase when the government dynamically expands land stock over a period of time through forward strategic planning and/or speeding the conversion of stock into a flow of housing using suitable institutional mechanisms.

New land acquisitions (notably through reclamation and buying up/leasing land stocks from Hong Kong's neighbours) and greater efficiency in converting land stocks into a flow of land resources, rather than tighter Pigovian regulation of the property market, is the decisive step for efficiently and equitably tackling the problem of Hong Kong's housing shortage.

It is well-understood that there is indeed a huge stock of unallocated government and private land resources in Hong Kong that can be formed and utilized for long term housing and other developments.

However, a given plot of land at any time, however big and simple it is in terms of ownership, can only modestly increase the supply of new housing units in the absence of determined and sound *forward planning* or supportive *development controls*.

Worse still, much privately-owned land in the New Territories that has long been ripe for urban development has amazingly remained unplanned for non-rural uses and is, in any case, constrained for major housing by fragmented and communal ownership, as well as a preference of some landowners for hoarding land.

All these are forms of rigidity in the development market.

In economics jargon, this is a situation

in which, under current institutional practices, the transaction costs of planning and land assembly are prohibitively high.

Therefore, much "idle" land stock, whose owners take the longer view of waiting until prices go up, is prevented from being used by the public for housing.

Fortunately, a mechanism exists that does not necessitate a major departure from the existing administrative prerogative over land of the government as the landlord.

It can, to borrow a Chinese strategic planning concept, "use distant water to put out a near fire" in order to hasten the flow of land stock into the hands of homebuyers without compromising the economic freedom of those landowners who prefer to "stick to their holdings."

The "water" is the land (which might well be in presently remote and hence "distant" areas) freely released by the landowner, and the "near fire" is the current and valid public demand for a rapid increase in well-planned housing in the absence of any committed major land production programme.

The idea is for the government to commandeer private land plots anywhere in Hong Kong fit for planned housing development, but especially in the New Territories, and pay their owners internationally tradable land bonds.

These bonds entitle their holders to exchange their holdings for a comparable plot of new land formed by the government through reclamation or hillside terracing, for example.

Unlike the defunct Letter A/B, this new land bond would be openly traded in a public exchange so that transactions would be perfectly competitive and transparent.

Furthermore, whereas any Letter A/B was issued when land was resumed within a government layout, the proposed bond could be obtained by any landowner who surrendered his/her land even if there is no layout.

Besides, the bond's value would not be calculated at the time of the land's surrender, but by the number of years until 2047.

Such a bond can give homebuyers a new purchasing option. Instead of scrambling for limited housing units now, they could purchase a bond or bonds.

The bonds' fluctuating exchange prices would provide the government with information on the amount of land to be produced (or "borrowed" from China), which is not limited to reclamation beyond Victoria Harbour.

Predicated on the concept of land exchange, the proposed scheme avoids the ill effects of land resumption (as invoked in government-led urban renewal). For land resumption violates

the private property rights expressly protected by the *Basic Law* and can result in costly litigation.

The issue of land bonds could assure the general public that the government is fearlessly determined to tackle Hong Kong's land supply problem.

This could produce an instant stabilizing effect on property prices and should be conducive to the stable long-term development of the SAR.

It should also break the deadlock in land transactions posed by various forms of rigidity in assembling collectively-owned farmland for development.

For now, the disposal of *Tso* or *Tong* land in the New Territories requires the consent of a significant majority of the beneficiaries of any village clan.

This has prevented land from being committed to higher value uses.

Exchanging *Tso* and *Tong* land for land bonds should be a better alternative than land resumption.

The property rights of comprehensive development in the future are assigned to landowners holding fragmented and scattered parcels.

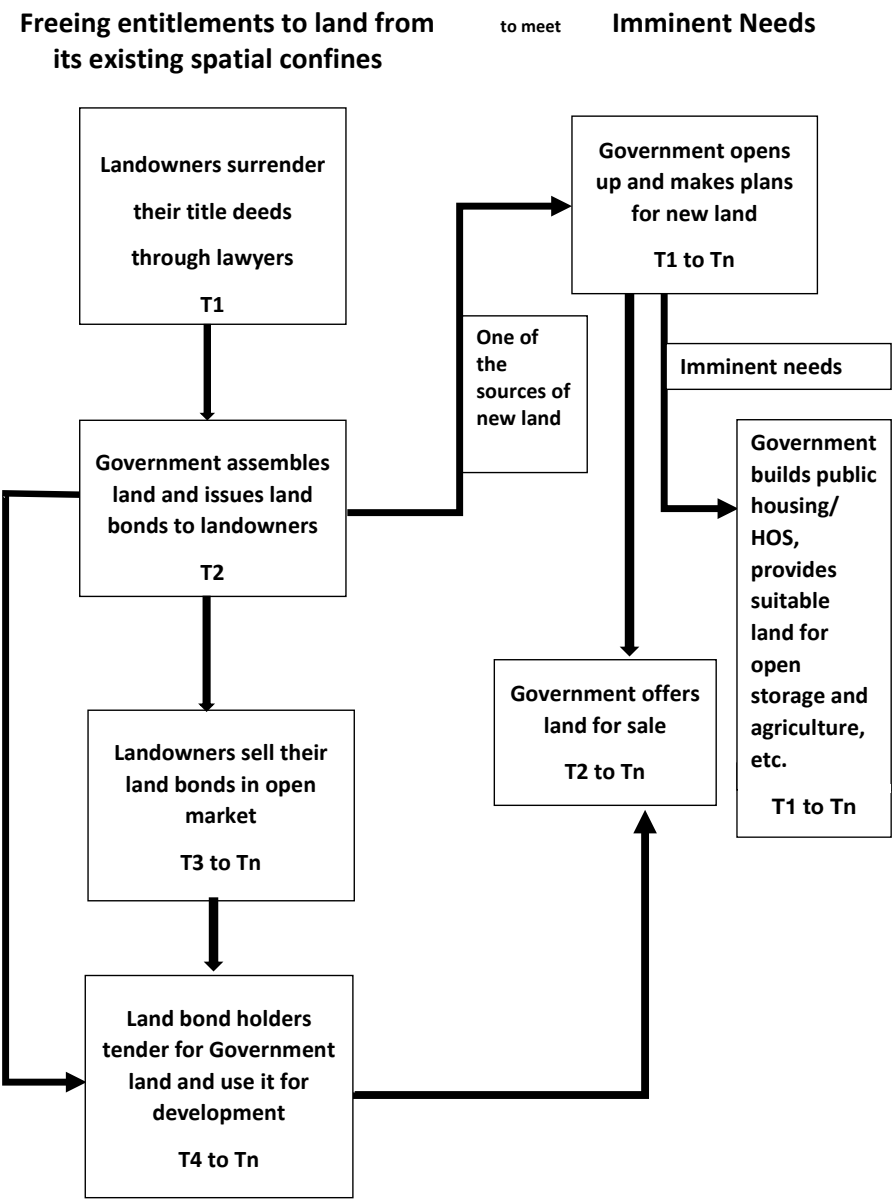
Arguably, the trading of land bonds is a transaction reduction method in the inter-temporal Coasian bargaining process.

An associated lower transaction cost process will release invaluable land resources to be utilized by the highest value users, thus attaining greater economic efficiency.

A complex city with a complicated property rights structure for land requires a transaction cost-reducing, institutional innovation in the development market for achieving sustainable economic development.

The land bond proposed here can be a workable innovation in this regard for Hong Kong.

28 July 2018



Appendix - Flow Chart

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Surveying & Built Environment

Two Dialogues on Land Readjustment in Hong Kong

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ABSTRACT

This essay begins with two imaginary dialogues that shed light on the transaction costs of using communal land for urban housing development in Hong Kong according to modern layouts. The dialogues are followed by an account of the historical and institutional background for the present need for land readjustment. This policy is explained as a means to reduce the costs of implementing layouts often hindered by objections from minority owners. Finally, the developer's scope of obligations and their rationales are elucidated, followed by a justification of the policy.

KEYWORDS

Land readjustment, Letter A/B, DD lots, *Tso/Tong* land, developer

DIALOGUE 1

Standing near the summit of the tallest mountain of Hong Kong, an economy under formal constitutional capitalism, a planner, A, has a conversation with his friend B.

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A: "What can you see down there in that direction?"

B: "I see a mess!"

A: "What kind of mess do you see?"

B: "I can see a sea of scrapped vehicles and machines, workshops and sheds."

A: "Do you think they are proper economic activities?"

B: "I suppose so!"

A: "So, you see a mess of economically proper things."

B: "Well they could be more orderly."

A: "What do you mean by orderly?"

B: "I mean that the sites could be better planned."

A: "So, why do you think they are not well planned?

B: "Well, there is no environmental or green buffer and the activities really look messy."

A: "Good. However, do you know why they look so messy?"

B: "I suppose that is the nature of brownfields! Often they are illegal. We must step up enforcement and pass better laws."

A: "You think we don't have enough laws? If you do some research, you would know that most of the unsightly, seemingly almost random activity you see is in fact "planned" use either because the sites conform to "existing use", or because they are operating with planning permission."

B: "Nonsense, that is not proper town planning."

A: "Perhaps better to say, improper countryside planning."

B: "Yes, indeed. I wonder why the land has not been used for housing to meet public demand. What a waste!"

A: "Do you think it is very easy to use the land for housing?"

B: "Why not? This is a plain and the environment is good. Once government relaxes zoning controls, things should go fine especially since there is a strong public demand for more affordable housing. I know developers have hoarded much of the land down there."

A: "For sure they hold a lot of land. They publish the amount of land holdings in the New Territories in their annual reports. But do you know why they cannot easily start development now?"

B: "I don't suppose it is harder for large developers to get planning approvals or for them to agree to the lease modification premium!"

A: "I won't comment on that. However, you may not know that it is now harder for developers to buy up all the land parcels they need for a project."

B: "They cannot buy all the required land? This is a new thing to me. The government started to build new towns in the New Territories in the 1950s and developers have participated in the process right from the start."

A: "Times have changed!"

B: "I don't understand. Apart from planning, our development approval system is now basically the same as in the early 1980s."

A: "The heart of the matter is not so much planning as land tenure."

B: "Please come to the point."

A: "Two major changes. First, Hong Kong has got rid of a voluntary land exchange mechanism that, via land sales, released private agricultural land owned by village communities to government for planned urban development. I am talking about when the land was required for development in a government layout, then the land owner surrendered land to the government in exchange for a transferrable "I owe you" document known as a Letter B. Second, the land under ancestral (communal) ownership cannot now be easily acquired."

B: "Would you please elaborate on the second point? I thought it was just a matter of money!"

A: "Not that long ago, government would still approve the transfer of land under communal ownership, such as a "*Tso*" and "*Tong*", when it was ascertained that the majority of the male members of a clan consented to the sale. Now, for reasons not publicly known, there is a tendency to grant approvals only on condition that there is nearly unanimous consent.

B: "Now I see, this new policy has rendered the transfer of land belonging to a clan to outsiders exceedingly difficult. After many generations of male descendants, the village ties and unity amongst such clans may be weak. I would imagine it would be difficult to obtain majority or unanimous consent."

A: "Exactly! On the assumption that the ancestors would wish clan land to remain forever in the hands of the clan, government dare not change the ownership. Moreover, there are court judgments and academic research on traditional Chinese customary law, which conclude that such land cannot be sold to a third party unless all clan members agree. The government's recent change in policy appears to reflect this risk. Under the *New*

Territories Ordinance (Cap 97) the manager(s) of *Tso* and *Tong* is(are) allowed to deal with the land as if he(they) is(are) the actual owner. However, any sale of land requires the approval of the District Office (of the Home Affairs Department). As I heard, to grant approval the District Office's practice is to require consent from 80% or more of the clan members!

B: "I see the government is very concerned about the good people, or should I say the "indigenous villagers" of the New Territories. I can appreciate there being a need to protect the clan members from dishonest managers, but is this too much? These clan members are "co-owners" of their land, and if they do not protect their own interests, why should the government try so hard to protect their property for them?"

A: "That is an interesting observation! The law and policy seem to be very tilted towards the indigenous villagers of the New Territories."

B: "It is also worth noting, unlike in the imperial era, the NT land owners today are lessees[1]. The ultimate land owner is the government. Under the *Lands Resumption Ordinance* (Cap 124), the government can take back land as long it is for a 'public purpose' and for just compensation. It may be in defiance of the *Convention of Peking* for the government to be able to resume such land under the *Lands Resumption Ordinance* except for military or related purposes.[2] But if it can or does do so, then the transfer of communal land according to a unanimous rule means the government is assuming the role of the real landlord and disregarding the "true" wishes of the clan ancestor."

A: "Well, whatever the actual rationale, what has happened is that the manager of the communal land must have nearly unanimous consent to transfer ownership of land to outsiders. Where he doesn't, which is now in most cases, the most accessible communal land parcels have become what people call "brownfields" as the second

[1] This is glossing the Imperial Chinese Empire's distinction between the holders of "land bones", who were sort of tenants of the Emperor, and those who merely held rights to "land skins" as sub-tenants, who paid rent to the bone right holders.

[2] *Winfat Enterprises (HK) Co Ltd v AG [1984] HKLR 32*: Court of Appeal held breach of Peking Convention not something capable of redress in ordinary courts and right to enforce is with UK and China. One problem with resumption of NT land is whether it is a legitimate 'public purpose' if government allows developers to build luxury houses on land resumed. In light of s.19 of the *Lands Resumption Ordinance* and *Fok Lai Ying v Governor in Council [1997] HKLRD 810*, it is difficult to have a judicial review of a decision to resume land. It is more of a problem of perception and how, if they resume land in the New Territories (a lot owned by developers), there will be legal challenges regardless of legal merit and therefore lengthy delays.

best option. That is the mess below the mount."

B: "Resumption should be the last resort, as it involves infringement of private property rights and it would undoubtedly give the impression of the government colluding with developers. It defies common sense to resume land for 'public interest' when it eventually becomes private development of luxury homes."

A: "I agree!"

B: "Perhaps land exchange is the only way out…"

A: "That is perfect if such "exchange" is not deemed a transfer."

B: "But an exchange is better than compulsory acquisition or sale if we grant that the intention is to keep the same quantum of land in the village."

A: "Good idea. Let's go downhill before sunset."

DIALOGUE 2

Three young villagers C, D and E are chatting in a tea house in the rural New Territories.

C: "Why won't you agree to sell the "tong" land?"

D: "This is our land! Though money is attractive, there is a special meaning in keeping the land because once it is sold, it is gone forever. What is the use of money after all?"

C: "You are so stubborn! The land is no longer arable as we now have no clean water, no labour and no market for commercial crop farming. It's now been concreted over! Pig farming has been banned by government and poultry farming is risky. Land in the next village has been all built up"

D: "Aquaculture may be viable. Have you forgotten about our *fung shui*? Whilst so many clans in the New Territories have abandoned their land, our clan has stayed on the land. As our village head said, our village *fung shui* must be excellent. Can you not see that our ancestors want us to keep the land?"

C: "I think they want us to be happy. Us holding onto under-utilized land would not have been their true intention."

D: "You may only be happy with more money, I am happy with seeing our own land here. I do not need the money."

C: "Well, I respect your preference but most brothers want the money for their dreams!"

D: "I just want that our land stays whole and isn't eaten away bit by bit."

C: "Now, brother, what if the buyer gives us a bigger piece of land in the vicinity served by a road in exchange for our existing stock of land, would you consider accepting?"

D: "It is hard to believe that this can be done! I won't believe it until I see the land and government underwrites that."

E: "Excuse me, I object! The exchange means we are moving our ancestor's legacy."

D: "Well, getting the exact same piece of land may not be possible but what about a better and bigger piece in lieu of cash? Government has re-sited many villages to places inside new towns with good planned layouts. I think land exchange on favourable terms can solve many problems and we are not losing any quantum of land that can be shared by our clan or by other owners. However, we need a supportive government policy."

LAND BOUNDARIES AND URBAN DEVELOPMENT ON DEMARCATION DISTRICT (DD) LOTS IN THE NEW TERRITORIES

The two dialogues help us better understand the applicability of "land readjustment" to help release resources under communal land tenure under a common law legal system. A and B in Dialogue 1 and C, D and E in Dialogue 2 all agree that it is workable, though the term "land readjustment" is not used.

Land readjustment has a long history and has been put to practice in many countries including Japan, Korea and India. In Hong Kong, this approach is a special way of executing a "transfer of development rights" (TDR) within the existing land administrative framework. The Demarcation District (DD) lots under agricultural use in the New Territories are invariably irregular in shape, size and level. They are hence individually and even collectively unfit not only for urban development but also modern agricultural purposes. In the Hong Kong case for example, they frustrate land conversion from open storage spaces to urban development unless all neighbours cooperate in agreeing to a joint development scheme in the form of a master layout plan (MLP), the institutional setting for Dialogue 1. Such cooperation is often missing especially when urban land values are expected to rise. The lack of cooperation can be due to missing owners; sentimental attachment to land; or simply holding out, as hinted in Dialogue 2. Holding out is now particularly problematic for land held under ancestral ownership by a *Tso* or *Tong*.

The historical setting for the above situation can be traced back to 1898 when the New Territories, today Hong Kong's largest "land bank", were leased to Britain by China as part of colonial

Hong Kong under the British common law system. At about the same time Japan annexed Taiwan.

In the nineteenth century, the morphology of land ownership for farmland in China and Japan, like other countries in Asia, was similar. Plots of farm land were irregular in shape, size and level with lots of communal holdings. Meiji Japan soon introduced land readjustment to transform her traditional land pattern to a modern rectilinear one and original land owners obtained re-delineated land in proportion to the amount of land they originally held, net a contribution to the state for public facilities like roads and other uses. Japan soon applied this policy to colonial Taiwan, treating it as an agricultural and mining base in their empire. In Mainland China, soon after 1949, all rural land was collectivized and old cadastral boundaries became history. Interestingly, Hong Kong was the only place where the traditional Chinese form of rural land patterns has survived political upheavals and shaped land uses and politics up to now.

For the New Territories, the first thing the colonial administration did quickly after 1898 was a cadastral survey with the recording of the lot boundaries, owners and land uses on maps for various DDs. However, unlike Japan and Japanese controlled Taiwan after 1895, the British colonial government did not modernize the rural land ownership pattern of the New Territories except for the land mass to the immediate north of Kowloon, called New Kowloon, where urban development was contemplated very early. The approach was for the government to purchase the DD lots from villagers followed by the laying out and formation of the land into saleable leasehold lots for urban development.

When the then Governor of Hong Kong, Murray Maclehose, boldly launched a ten-year housing programme in 1972, which relied on building massive new towns each to accommodate 0.5 million people in the New Territories, agricultural land lots were efficiently acquired by the government under a voluntary land surrender mechanism system by way of what was called a "Letter A". This system was commenced as early as 1960 under which villagers and *Tso* or *Tong* managers could surrender their private or communal holdings to the government in exchange for a tradable certificate that entitled them to a cash value or an exchange for urban land on sale by government in proportion to the lands they gave up. This system enabled the colonial government to save trouble and money in compulsory acquisition of land and gave villagers a source of income or windfall gains during the cold war period. When government had no choice but to resume land within a layout, Letters B were issued in lieu of cash compensation (Crown Lands & Survey Office, 1977). This also worked well as a way for government to lay out New Territories land for urban development. It was a system devised

to facilitate the speedy acquisition of private land for public projects, which avoided payments of cash compensation and/or lengthy arguments over the level of compensation (Nissim 2016).

With hindsight, the system of Letters A and B was an excellent way for the government, as a landlord, to gather leased land for higher value uses after modernising its layout. It had the advantage of government not having to pay any money upfront to villagers. It was an efficient way for developers to buy entitlements to land that they could produce in the future. The villages got a liquid personal asset that could and can be sold to any developer, who became in effect the creditor for the government (which did not want to pay out cash compensation) with the *economic obligation* to wait for suitable land - which hopefully government might sell in exchange for those letters they held. As a result the developer became the government's creditor. However in becoming so the developer also assumed the risks entailed in both waiting for suitable land to be available and in hoping that when that happened, government would accept their accumulated Letters A and B in exchange. In return for this risk bearing function, the developer had no fear of a rise in land values as the entitlement can be used to bid for a fixed amount of land.

On the other hand, the system of Letters A and B placed a burden on the government to produce new urban land under Crown control, for which the Letters could be exchanged, by such means as reclamation or terracing the hills. Under the Sino-British Agreement, the issue of both Letters A and B was discontinued, probably because of fears of a backlog of unredeemed certificates beyond the land production capacity of the government. With hindsight, this fear was excessive. All extant Letters A/B were satisfactorily redeemed before 30 June 1997 by cash or exchange for land. Both types of Letter were for the sale of private and communal agricultural land. Disposal of communal land under Letters B was always approved by the District Office according to a majority rule: once the *Tso* or *Tong* manager got the consent of the majority of male clan members, the District Office would also consent to the disposal of the ancestral land to outsiders.

There are about 4000 *Tso* and 2,000 *Tong* in the New Territories, controlling roughly 6,000 acres of land (Nissim, 2016). One problem now is that the layout of New Territories land falls on the shoulder of developers, who have no similar tools like Letters B to acquire *Tso* or *Tong* land, i.e., the available policy instruments are not effective (Van de Krabben and Needham 2008). Letters B may provide an alternative (if not better) incentive for *Tso* or *Tong* land owners to sell their land.

One possible proposal to facilitate land readjustment is this: a developer who intends to implement an MLP approved by the Town Planning Board but who cannot assemble all DD lots

in a planned area may apply to the government land administration with a "Land Adjustment Plan". In such a plan each owner of hitherto communal land, for which there is no unanimous consent to transfer ownership, is given regularized sites, say twice as big as the original lot or lots, either in-situ or in other locations in the MLP already acquired by the developer, with road access provided by the developer. In addition, private land within the MLP area already acquired by the developer is dedicated to government for homeownership scheme or public housing. Upon acceptance by government, the ownership issue of the master layout plan is deemed settled and the lot boundaries on the land readjustment plan become the *de jure* boundaries of the relevant DD and are registered at the Land Registry.

This broad-brush approach respects private property rights of all land owners without frustrating good, comprehensively planned projects approved by the Town Planning Board. It saves the transaction costs of the compulsory sale of private land, resumption of private land by government, litigation among parties, and of surrenders and re-grants of land on a piecemeal basis. This land readjustment process helps release a large quantum of land, currently arrested by minority land interests, for housing and other suitably planned urban, suburban and rural uses in the interest of parties involved, achieving a win-win-win outcome.

This proposal, which should satisfy C and D (perhaps even E), is however still subject to the majority or unanimous approval for the land sale of the *Tso* or *Tong*. As elucidated by the Court of Appeal in *Man Ping Nam (as the Manager of the Man Sham Chung Wui) v Man Tim Lup* CACV 39/2010, 13/12/2010, whether majority or unanimous approval is required is not a simple matter even where there are straightforward, uniform rules for the respective *Tso*, *Tong* or *Wui* (association). Where land is for ancestral worship, it may very well require unanimous approval. Where land is not for ancestral worship, it may be sold by majority consent. However, as many clan members live abroad and may be untraceable, the government's practice is that the District Office needs to be satisfied that there is 80% consent from the members. As alluded to in Dialogue 1 above, section 15 of the *New Territories Ordinance* (Cap 97) provides the means for *Tsos* and *Tongs* to dispose of their land (or interests in the same) through their manager(s). Revisiting the District Office's practice of 80% consent would be welcomed and conducive to sale of land in the New Territories.

SCOPE AND RATIONALE FOR DEVELOPERS' OBLIGATIONS

In our proposal, the developer has the social obligation to survey all cadastral boundaries, acquire most of the private lots, identify minority owners and devise a sound master layout plan for a DD with sites for minority owners to choose as a matter of land readjustment. In the layout, the developer also has the obligation to specify sites and even build housing for the Housing Department as part of a "Public Private Partnership" scheme, as a *quid pro quo* for government provision of road access and other public utilities.

The government as landlord should enable this land readjustment by approving the master layout plan and deeming it also the basis for a land exchange that does not amount to a sale of communal property, merely an adjustment to it.

For government as landlord and land manager acting for the public, the above proposal would be desirable, from an efficiency and equity angle, to facilitate cooperation, in bothersome MLP cases, by adopting a policy of positively enabling the transfer of property rights based on land readjustment within the same DD. This proposal will be most feasible within the existing government administrative framework. There would thus be neither any need for legislation nor major government spending, whilst the process will be acceptable to key stakeholders, i.e. the general public, owners and developers.

The policy should be acceptable to the public as it is development according to MLPs approved by the Town Planning Board in a statutory planning process in which the public can inspect the proposal, air opinions and raise objections as usual under the *Town Planning Ordinance* (Cap 131, as amended in 2006).

It would not involve highly contentious issues of re-entry, compulsory acquisition or resumption of private land by government. No expropriation of land rights in terms of area or value is involved and the minority land owners actually derive benefits from betterment of their land due not only to doubling the size of their holdings but also gaining vehicular access and other infrastructural services. Their right to put a certain amount of land under agriculture is unfettered and no forced demolition of buildings is involved. The development process can be streamlined, saving developers time costs of statutory appeals, litigation or paying those who are holding out with their tiny land parcels, and saving the public time costs of waiting for new housing supply.

The past experience in Letters A/B was not all positive. Nissim (2016) notes that New Territories Land Owners were caught up on a wave of speculative prices for Letters B. The four major property developers at the material time

also had a very definite advantage in the trading of Letters B. Nonetheless, market conditions at present are different from the past. Also, with past experience the government would be in a better position to overcome and/or manage these challenges.

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Surveying & Built Environment

Finding a Sustainable Solution to Chinese Street Shops Development

Virginia K Go*

ABSTRACT

With the help of two case studies this paper presents a humanistic and arguably sustainable approach to heritage conservation in face of government-led urban redevelopment that has affected family owned street shops in Hong Kong. The cases studied show an odd disparity of heritage conservation and redevelopment criteria. In one case, such redevelopment displaced street shops, their families and business to produce high-end commercial/residential buildings despite public protest. In another case, similar street shops were spared after a locally made film publicized the street. Both places should be considered heritage sites because of the existence of at least three generations of family owned street shops. A humanist approach predicated on the principles of subsidiarity and solidarity rooted in respect for the human person, as informed by the integral approach of Aguirre (2013), is offered. This approach should provide a more internally consistent way towards heritage conservation in redevelopment (i.e., a win-win scenario informed by the model of Yu et al (2000)) that does not insist on an all or nothing choice.

KEYWORDS

Street shops redevelopment, human person, integral approach to economic development, Yu's model of sustainability, solidarity, subsidiarity

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INTRODUCTION

With the help of two case studies, this paper presents a humanistic and hence sustainable approach to heritage conservation in face of government-led urban redevelopment that has affected family owned street shops in Hong Kong. Since 1988, to tackle urban decay and find some solutions to its housing crisis, and instead of a piece-meal approach that started since the 1960s (Adams and Hastings 2001), the Hong Kong Government has launched a more structured urban renewal policy through the establishment of the Land Development Corporation (LDC). It has regarded the areas where low-rise buildings are located as having redevelopment potential, both in terms of economic gains and suitable remedies for housing scarcity. However, the legitimate owners or occupants of these low-rise buildings are stakeholders in these family-owned street shops.

To reach a win-win scenario, this paper offers a more internally consistent heritage conservation policy in redevelopment. It is predicated on the principles of solidarity and subsidiarity rooted in respect for the human person, and as informed by an "integral approach on economics development" (Aguirre 2013), as tuned by Yu et al's (2000) model of sustainability.

THE VALUE & THEORETICAL CONTEXT

Aguirre (2013) presented an approach that considers man in his entirety. It holds that it is insufficient to postulate the human person as self-interested, with no concern other than obtaining his material end, although there is no denying that he might act to achieve what he thinks is best for him.

Maslow's hierarchy of needs lists, in a pyramid form, the different needs of an individual, or the different facets of humanity, i.e. the physical, emotional, environmental, sociocultural, intellectual and spiritual dimensions. Maslow theorized that man has to meet his physical needs first before he is able to pursue other, higher needs.

Yet, at the same time, it is a common experience that the human person can choose to act and work for the good of his family, his community or even that of his nation over and above his own needs.

It has been proven empirically that a person may be willing to forego material satisfaction for the sake of achieving a higher need such as friendship or good relationships, care of others, or self-recognition; or for higher principles such as making a morally right decision in spite of the sacrifices that it might entail.

In other words, humans are complex beings for whom happiness can lie outside the person and can be shared

with others. His spiritual and emotional needs and his rights are just as essential, or even more important, than his material needs. Therefore, it is not sufficient to view humans in terms of economic gains or decisions. There is more to consider in humans aside from their material needs.

These premises lead us to a view that solving any societal issues such as street shop conservation and/or redevelopment requires the consideration of the proper understanding of the human person and its impact on him and the community.

Pioneered by Aguirre and promoted as a graduate program in the Catholic University of America, the approach was used by her to assess the success and impact of programs in various countries: Guatemala's educational programs such as: Civic Values in Nqatoqi (Aguirre 2013), Enlace (Aguirre, Cruz Zuniga and Papakosta 2013), Aprendamos Juntas (Aguirre and Cruz Zuniga, 2015), and Banana Farms Cooperative (Aguirre and Vasquez, 2015); Haiti's World Vision Saving Groups (Cruz Zuniga and Felizor 2014); Nigeria's Training of secondary school teachers (Cruz Zuniga, Kamto and Mahmoud 2015); the Dominican Republic's "Café con Leche" Program (Cruz Zuniga 2015) among others. One of the aims of evaluation was to determine the improvement in the quality of life of the participants, their families and the community. While the Integral Approach has been used in different fields such as education and cooperatives, it has never been applied in the assessment of heritage conservation projects.

The model of Yu et al is about the possibility that innovation enabled by appropriate entitlements may avoid a tradeoff between two beneficial but resource consuming activities. The model was applied to planning studies by Lai and Lorne (2006) and Lai, Davies and Lorne (2016).

TWO CASE STUDIES

This two cases explained here are controversial. They are igniters for the author to participate in the on-going debate and seek a solution to the dilemma. These cases show an odd disparity of heritage conservation and redevelopment criteria. In one case, such redevelopment displaced street shops, their families and business to produce high-end commercial/ residential buildings in spite of public protest. In another case, similar street shops were spared after a film publicized the street. Both places could be considered heritage sites because the shops had existed for more than 3 generations in Hong Kong, which has only a brief urban history of about 176 years, prior to government's decision to redevelop them. The cases are detailed below, followed by an appraisal.

Case 1 Lee Tung Street

Lee Tung Street or Wedding Card Street gained prominence in the 1970s

when the printing of wedding cards and related items like calendars, laisee pockets, etc. by family-owned printing shop operators started to prosper (Wissink 2015; Tieben and Govada 2011). However, its history can be traced further back to the 1950s when the British Government sanctioned all printing shops to move to this street as a way of control against illegal printing activity (Chen and Szeto, 2015, p. 451, note 20).

Despite the special identity of the place, thriving businesses and a lively neighbourhood, the Hong Kong Government began the redevelopment project of this street, coded H15 Project, in 1998. To provide a good mix between redevelopment and the protection of local businesses and culture, the H15 Concern Group, composed of local residents, academics and heritage conservation experts, and a long standing NGO "St. James Settlement", submitted the "Dumbbell Proposal" to the Town Planning Board. The proposal had three main goals namely: "real" compensation based on a "seven-year rule"; the option of a "flat-for-flat" and "shop-for-shop" arrangement; and, finally, the preservation of Lee Tung Street (Chen and Szeto 2015; Wissink 2015; Ng 2011). This was rejected twice on grounds of insufficient documentation and on technical grounds.

The H15 Group also joined hands with another NGO, The Community Museum Project (CMP), in organizing the Street as Museum Event in 2005, with a special focus on Lee Tung Street (Siu 2008). The event was intended to provide an avenue for personal experiences and histories (Siu 2008) that could be visualized and heard by the public with the aid of photographic and visual technology. Residents of the streets were present to give witness to Lee Tung Street.

Despite all these efforts, the redevelopment project went ahead as planned, adopting a 'wedding' theme in recognition of the identity of the street and the promise to shop owners of a priority allocation. Demolition works were completed in December 2007.

Shop spaces in the new redevelopment project were offered to the previous residents at market rates and without guarantee of renewal. As a contribution to heritage conservation, three pre-war shop house buildings classified as Grade II were preserved. In total, the affected population was 1,613, comprising 647 property interests in 52 buildings.

Completed in 2015 and now renamed Lee Tung Avenue, the street is replete with high-end modern restaurants, boutiques, pubs and gated residential complexes. The 'wedding' theme is currently reflected in an atmosphere of festivity, two representations of an engaged couple at the beginning and end of the street, and a few wedding-related shops.

Of the former street shop owners, only two were able to return namely: H2 Cards located at the ground level, and

Sun Kai Tat in the basement. In a spontaneous interview, the owner of Sun Kai Tat laments the bygone days of Lee Tung Street when a HK$4,000 shop would have been twice the size of what he is renting now at five times the rent. Customers came streaming in without much publicity. Business was definitely more lucrative than the present times. He faces an estimate of 30% to 40% loss in income. The redevelopment has also cost the loss of relationships among friends, neighbours, colleagues and even clients. With this panorama, previous wedding card shop owners have relocated to more affordable locations, or they are doing online business.

No major restructuring of the outdated street pattern was made as can be seen from extracts of survey maps in 1996 and 2018 shown in **Figure 1**.

Figure 1. (a) Lee Tung Street 1996, (b) Lee Tung Street 2018

Case 2 Wing Lee Street

Like Lee Tung Street, the buildings in the neighbourhood can be traced to the 1950s. Its residents were mostly Chinese workers who lived away from the Central Business District in Hong Kong. Later they also became engaged in the printing industry. **Figure 2** is an extract of a survey map that shows this street.

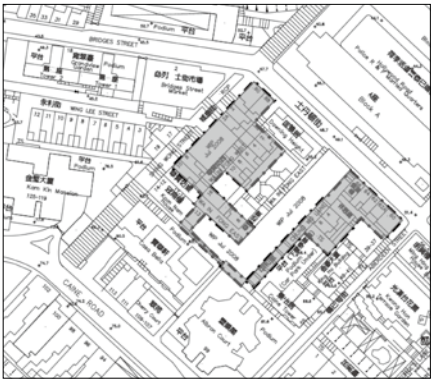

Figure 2. Wing Lee Street 2018

Wing Lee Street is located in Sheung Wan and is one of the remaining streets where a series of post-war "tong laus" (Tang houses) is located. What is referred to as "tong lau" here is actually a common misnomer used in the media to describe what was used to be called "yeung lau" (European houses), i.e., built in reinforced concrete and with water closets[1]. Settlers in these "tong lau" buildings designed by architects A.H. Basto and N. H. Fok, were mostly Chinese workers who lived away from Central, the "Capital for the British" (Yeung 2010).

Wing Lee Street was the setting of a local film, "Echoes of the Rainbow", the winner of the Crystal Bear Award at the Berlin Film Festival in 2011. Under the plan entitled *G7 Centre* of the original *H19 Redevelopment Project,* only 3 out of the 12 tenement buildings were to be preserved. Because of calls for its preservation coming from the Hong Kong community including the film director Alex Law and producer Mabel Cheung (Pan and Ryan 2013), the project was halted for the full preservation of the 12 tenement buildings. The award and the movie publicity brought to light the scarcity of districts where a 1960s setting could be filmed. Both director and producer considered filming in Malaysia because of the dearth of a 1960s location. Despite the decision favouring full conservation, the residents of Wing Lee Street expressed disappointment as some hoped for fair compensation from the Urban Renewal Authority, the quasi-government body replacing LDC (Ley and Teo 2014).

The total affected population was said to be 288, in 12 buildings (URA website). Some properties already bought out by the Hong Kong Government currently house a few non-government organizations to "enhance the community sense of the area" (URA website). Other owners lost interest and their properties remain in the same decrepit condition. It was a lose-lose outcome.

The street is currently undergoing renovation work. With an empty street and the lack of community life as occupancy rate is low, sustainability is certainly an issue.

Appraisal

Shops in both places were worthy of conservation because of the unique characteristics of the environment attributed to the community living there. From media reports, we can see that the Hong Kong community cherishes this as a fact, as part of their cultural identity. The developers of Lee Tung Street likewise acknowledge its distinctive contribution in their choice of the new name. Though not officially made heritage by designation in the traditional sense of the word, they qualify as heritage by appropriation (Tweed and Sutherland 2009) for the recognition given by Hong Kong public to these streets and shops.

[1] The author owed this point to her supervisor Professor Lawrence W. C. Lai.

It seems case 2 was preserved merely because there was international media coverage of the place and by inference it was a vector of cultural prestige for Hong Kong. Case 1 did not enjoy a similar profile. Faced with the uncompromising options of either preserving historical or architecturally meritorious buildings, or of keeping the generations of families so that their community endures, or of redevelopment, it seems the last necessarily implies the destruction of the other two.

An emerging fact about both cases is that the public is favouring conservation without rejecting en bloc the redevelopment proposal. A win-win outcome that satisfies both redevelopment needs and heritage conservation seemed possible but the chance was lost in both cases. One was complete demolition and the other preservation without renewing its strength.

AN INTEGRAL APPROACH TO A WIN-WIN OUTCOME BETWEEN HERITAGE CONSERVATION AND URBAN REDEVELOPMENT

There is therefore a need to find a way to win-win (no trade off), and thus sustainable, outcome that takes into account the aspirations of all stakeholders. In recent years, there have been calls for a stronger community inclusion in redevelopment projects.

A cost-sharing scheme to foster public-private partnerships was used in Hong Kong in the 1990s in the 7,600 sq. m. Hanoi Road Redevelopment Project, popularly known as Four Streets, as it covered Hanoi Road, Mody Road, Bristol Avenue and Cornwall Avenue in the Tsimshatsui district (Li 2012). Its aim was to foster engagement of existing property owners as cost-sharing or non-cost sharing participants in the redevelopment project. On a pro-rata basis to their property holding, cost sharing participants gave additional capital outlay for the differential redevelopment costs. This is on top of their own property value. The scheme was considered unsuccessful, as it faced uncertainties over fairness, cost variation and risks (Li 2012). The scheme was a good attempt to provide a solution based on property owners' engagement. However, Li concludes that, based on the case study of Four Streets, the humans involved have to be viewed as "money-oriented" (Li 2012, p. 524), or *homines oeconomici*. The implied incentive was to offer the residents economic gain. We join him in questioning whether "the financial incentives for individual property owners to participate (sic) owners in the redevelopment are the only pull factor in this partnership" (Li 2012, p. 524). In short, what is the real consideration that motivates humanity. Most of us experience that humans are willing to forego financial advantage for what would be for them an integral improvement to their being better persons, or even a better community.

As a contribution to heritage conservation that is sustainable, this section offers a humanist approach predicated on the principles of subsidiarity and solidarity rooted in respect for the human person, as informed by the integral approach of Aguirre (2013), which can be combined with the idea of Yu et al (2000) about sustainable development through innovation enabled by the granting to stakeholders of some entitlement rights. These rights we argue should include the rights of the stakeholders in a government urban renewal project in shaping the project outcome.

The approach should provide a more internally consistent way to heritage conservation in redevelopment informed by the model of Yu et al (2000) that shows that innovation can convert a trade off into a win-win solution.

The components of this approach are as follows.

The integral approach of Aguirre (2013) and Yu et al's model of sustainability (2000)

The issue of sustainability has been a recurring theme in these recent years. It can mean different things to different people. In reality, something can be understood as sustainable only after a period of time has passed. It is a test of time. At times new redevelopment projects promise immediate profitability but financial and economic crises are the yardstick of sustainability.

The Brundtland Commission defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland 1987 chapter 2). This definition highlights some important concepts:

a) The needs of two generations: present and future. Both needs have to be met and have to be addressed.

b) The underlying reality that resources to attend to these needs are limited. There cannot be a solution that sacrifices one generation for the other.

This definition is not enough as it is vague in terms of translating it into action. Given that there are constraints of time, needs and resources in sustainability, this paper adopts Yu et al's model of sustainability (2000) that speaks of transformation, rather of a certain economic outcome. A sustainable development that is possible through the transformation of negative into positive externality through technology and innovation is likely compatible with inclusivity of the different sectors of the community.

The present generation is faced with the burdensome issues of aging and the obsolescence of buildings deemed to be unlivable – no lifts for an ageing population, no central management for maintenance and service repairs. Though these are not dangerous buildings under the *Buildings Ordinance*, profits may not be

maximized because of the low-rise, sub-standard buildings. It is easier to resort to demolition because otherwise they incur a high cost of renovation. Often viewed as a negative externality, these old buildings or streets are nonetheless inhabited by communities that cannot and should not be ignored.

The inclusion of family owned street shops in redevelopment projects can be an innovation to achieve a win-win outcome combining conservation with redevelopment, depending on the architectural solution, in Yu et al's model. Technological innovations are in themselves no guarantee of sustainability, if the stakeholders remain enclosed in their own self-interest. Yu et al's model accepts stakeholder participation and it also calls for "a change in the mindset" of all involved to achieve an outcome that does not veto the interest of a legitimate party.

Aguirre's Integral Approach to Economic Development

Aguirre focuses on the person as the "economic agent who generates and is served by the economic activity" (Aguirre 2013), respecting their dignity as human beings who have bodily and spiritual needs, together with their families and social responsibilities.

She explains that sustainable development is the result of several economic processes, i.e., economic, social and political (Aguirre 2013). Social needs and relationships are indisputably factors in the eventual outcome – whether success or failure – of this economic process for the main reason that human beings are sociable by nature. These social aspects, including the networks and the relationships one has created over time, are attributes of "social capital" (Coleman 1988, Woolcock 2001). Jacobs (1961, p. 138) long defended these networks forged by the community as irreplaceable, and the income deriving from the disappearance of this social capital as indefinitely lost.

Principles of subsidiarity and solidarity

Given that in the perspective of an integral approach to economics (Aguirre 2013), with humans as the economic agents, it is proposed that some fundamental principles founded on the human person are the key to sustainable economics. The Principles of Solidarity and Subsidiarity, rooted on the dignity of the human person and incorporated into the governance of the European Union (EU), as explained in the papal encyclical *Caritas in Veritate* (Benedict 2009), are significant to the discussion. To receive this, it is essential to recall that the rational and social nature of the human person.

Pope Benedict XVI, in his encyclical *Caritas in Veritate* on the Integral Human Development on Charity and Truth, addressed the socio-economic issues of our ailing society because of a lack of right perspective on and consideration of the Human Person. Though this is an ecclesiastical document and as such it may be taken as

utopic or moralistic by some who react to Christian ethics, it covers various issues of globalization, economy, unemployment, technology, human life among others that are certainly relevant today. One needs to put aside some preconceived notions in favour or against Christian thoughts, and think through the message presented to people of good will. The essential message of the encyclical is that for *authentic development* to exist in society, it must "promote the good of every man and of the whole man" (CV2009, 18). He went on to say that "man is the source, the focus and the aim of all economic and social life" (CV2009, 25), and therefore that the "primary capital to be safeguarded and valued is man, the human person in his or her integrity" (CV2009, 25). As individual persons and communities may have different interests perceived as a good to themselves, they must work out a common good that can benefit the community.

A human person is a being with intelligence and will and is bound to act for and with a reason to attain his needs. Humanity has a natural capacity for social interaction. No human is completely self-sufficient. Nor does he develop on his own. He naturally enters into a social bond with others to satisfy his needs. And these bonds construct a community that grows further in solidarity, through mutual help, contributions, and camaraderie. The stronger the sense of solidarity is, the stronger will their determination be when in pursuit of a common goal. From this arises mutual care and concern within the community, a safety net to shelter the community, the families, and the individual in times of crises.

Solidarity is a social virtue necessary to create a more humane society. It entails every person, as a member of the community and as an economic agent, to be concerned with the other. This is shown by mutual interaction, affection and friendliness among people that will eliminate any divisive prejudices (Cheung and Ma 2011). This requires the recognition and respect for every person together with his rights and duties.

The principle of subsidiarity complements the above. It is a concept that can be found in economic, religious and European political realms. This concept is adhered to by the European Union as provided in the Maastricht Treaty of 1992. The European Union recognizes the competences of individual member countries and as such, their contribution for building a better relationship. It states that "decisions are taken as closely as possible to the citizen…; the principle whereby the EU does not take action (except in the areas that fall within its exclusive competence), unless it is more effective than action taken at national, regional or local level" (European Union website).

The notion of subsidiarity can also be found in organizational ideas of empowerment, delegation, decentralization and people-orientation

(Murray 1995) in our present-day society, when individuals clamour for greater participation and involvement in all areas of both the private and the public sphere. Business firms are referred to as a "human community" or a "community of persons" (Melé and Mammoser 2011), where individual persons learn to share and are given responsibility with others to achieve a common end. And this comes with getting them involved within their competency. In doing so, the contribution of each member of the team is recognized and this helps him develop his potential to a higher degree.

Subsidiarity regulates the involvement of a higher authority making sure that they do not usurp what the lowest *appropriate* unit can do. This is different from the current concepts of delegation, empowerment or decentralization mentioned earlier, though these may reflect some characteristics of the principle. They simply imply a right vested in the individual, while subsidiarity is inherent to the dignity of man because of his right to work. This principle, embedded in EU governance, facilitates his right to self-actualization through work. Among the hoped for benefits of subsidiarity are a greater sense of belonging and a stronger sense of ownership that, in the case of a community, can contribute to creating a sense of identity with a place. Once this is achieved, it further contributes to good economic outcomes. It does not, however, denote that the government is free from the problem, but that its interference will be only needed in cases of failure after allowing the appropriate unit to act. This principle has been adopted in various areas such as business (Melé and Mammoser 2011) and tourism (Zahra 2011).

These two complementary principles act as checks and balances. One exists together and better with the other. Otherwise, there will easily be cases of abuse of power. Solidarity identifies one with the community concerned. Subsidiarity, in turn, regulates the extent and power of a government in excessive solidarity that can lead to authoritarianism.

How preservation of shops may be incorporated into an urban renewal project

The two cases above are summed up as follows. On the one hand, the Government faces a demand for new office and housing space, and views the development and economic potential in low rise buildings.[2] Needless to say, there has been a growing change of building standards in terms of acceptable public and private hygiene, livability such as lifts, air circulation, lighting of public areas), fire safety, maintainability, traffic management, among others. And on the other, these low-rise buildings are legitimately

[2] This is not to deny the factors of changing standards of acceptable public and private hygiene, livability (e.g. lifts, air circulation, lighting of public areas), fire safety, maintainability, traffic management, etc. These reasons do not justify expropriation that is problematic under the *Basic Law*. See Lai et al (2018) and Lai (2019 forthcoming).

occupied by generations of family-owned street shops and are viewed as their cultural heritage by the community.

Yu et al's model allows for the positive and sustainable outcome through resource entitlements and innovation, leading onto technological changes, but without being explicit on the anthropological approach to achieve it. The integral approach offered by Aguirre provides the crucial component of the approach: the consideration of the social nature of the human person to be further guided by the principles of solidarity and subsidiarity rooted in his dignity as a human person. Urban renewal and family-owned street shops should not be seen as forces of inevitable opposition, but as an organic whole. Solidarity calls for a change of mindset on the part of stakeholders, soliciting their mutual cooperation.

By stakeholders, we mean the different interested parties in the redevelopment/ conservation of traditional street shops, including street shop owners, property developers, non-governmental organizations, academics, the public and naturally, the Government. When this is achieved, a natural and logical consequence would be the willingness of the stakeholders to engage in cooperative and creative negotiations based on trust and respect.

Subsidiarity calls for architectural and institutional solutions in addressing this dilemma. The role of the Government as policy setter and enforcer is crucial. It starts with the Government recognizing the legitimate rights of these traditional street shop owners and consequently, they must be respected. These rights are to be granted and fitted within the framework of a new redevelopment plan. It can include re-allotting spaces for these street-shops in the high-rise architectural building designs by developers. Some architectural innovations may add in the erection of tower blocks on a podium that hovers above these street shops embrace part or whole of an old building organically in a new one as in the case of many basilicas in Europe, or provides spaces at street level amidst tall buildings. In doing so, a blend of the old with the new, preserving its culture and bolstering economic growth is present. Cultural heritage fostered by the family-owned street shop owners can retain for the new street the irreplaceable character that was already existent in the old street. A diagram found in **Figure 3** sheds some light on this humanistic approach.

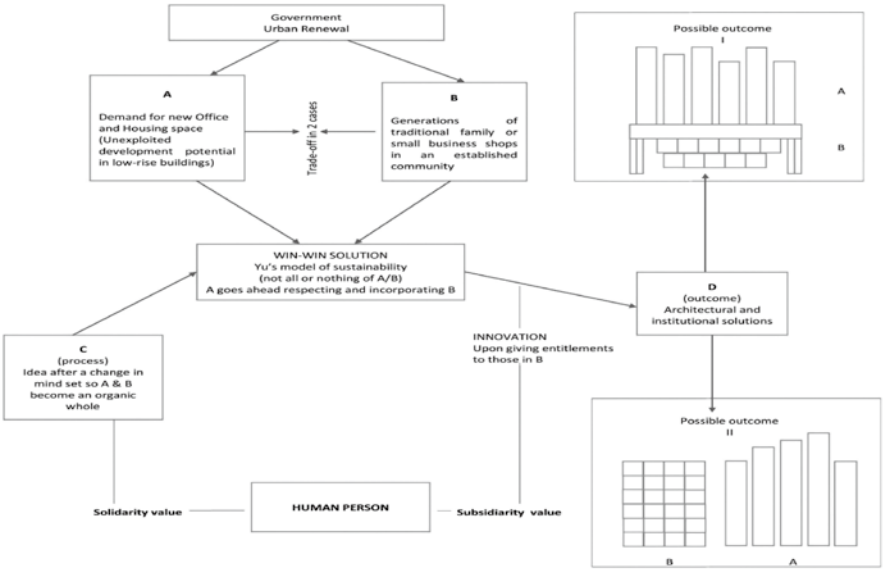

Figure 3. Diagram of an integral approach on economic development (informed by Aguirre)

Without being explicit to its use of the integral or humanistic approach, the case of Dihua Street in Taipei, Taiwan is commendable when viewed in the light of this approach, despite some controversy (Tan and Waley 2006):

a) Yu's approach of sustainable development deals with the transformation of negative externality through innovation. Dihua Street in the Dadaocheng area is known for historical buildings and the sale of dried products and cloth. Old dilapidated buildings have been restored through innovative techniques. Besides, there is also an innovative aspect of including Urban Regeneration Stations (URS), a quasi-government initiative to involve the young people in the revival of the area. A good number of traditional shops continue to exist.

b) Aguirre's integral approach centering on the human person is observable. The contribution and welfare of the old community, of the human person, was not overlooked, but was in fact a motor of regenerating the area.

c) Solidarity is a salient feature of the redevelopment project. Though it may have some tinge of political motive in enhancing Taiwan's identity, which can be a reason for its solidarity, all stakeholders, namely

the Government, NGOs, shop owners, families and the concerned public, worked together through public meetings and negotiation. In such a big project involving many people, it is not surprising that some shop owners preferred to do what they could in their private property. The process of negotiation bespeaks of the principle.

d) Subsidiarity is obvious with the respect for and therefore, retention of these traditional shops. Original storeowners of these dried products and cloths had the option to remain or be transferred to another location.

The principles of solidarity and of subsidiarity are principles of the spirit for conservation and redevelopment policies for which all stakeholders should abide. It is not all or nothing, i.e., redevelopment vs. heritage conservation, with one losing out over the other. A win-win solution is feasible when the principles mentioned are accepted.

CONCLUSION

This paper, with the aid of two real world examples, seeks to bring into the limelight the contribution and the plight of the community affected by government redevelopment policies if they are not grounded on the principles of solidarity and subsidiarity.

The two examples expose the need for an approach that avoids a win-lose or a lose-lose situation and that must be based on the principles founded on the human person as a social being, i.e., that of solidarity and subsidiarity informed by the integral approach for economic development combined with Yu et al's model. It is an area deserving of further discussion as it has potential impact on cultural heritage and redevelopment policies.

Solidarity and Subsidiarity are not new concepts. The United Nations was formed to avoid repeating the experiences of the World War II. Nations held hands in a spirit of solidarity, which is something one can discern notwithstanding presence of forces of realpolitik. The same can be said of the EU. The proliferation of many non-governmental organizations is to this author also a witness to the spirit of solidarity among people working towards the betterment of humanity. While subsidiarity is an integral principle of the EU included in the Maastricht Treaty in 1992 (Guitián 2010; European Union 1992), the Catholic Church has already used it since the 19th century and revived it in *Caritas in Veritate* (Benedict 2009) to tackle the ensuing social problems (Guitián 2010).

This is an appeal to revive and implement these fundamental principles in protecting family-owned street shops in Hong Kong and elsewhere. Plans to ensure that the urban fabric does not vanish into a lost narrative of "once upon a time" should be available. In some cases, redevelopment is a must

(Tam 2007) for a real and serious lack of necessary facilities and safety of an area. In fact, it is crucial and necessary especially when an area becomes un-inhabitable or unsafe. But it is arguably best done with social inclusion of the affected people of the community (Ng 2002, 2014) whose contribution is significant to cultural heritage.

Though this paper may be considered visionary in nature, traditional street shops can be retained as viable businesses, given *security of tenure* against easy expropriation, in actual practice if the principles of solidarity and subsidiarity are followed. This principle necessitates that respect is due and should be given to the community whose contribution to the society is their trade. While temporary reallocation is necessary as redevelopment is underway, the intention of returning the community to their original habitat is an act of solidarity and somehow promotes the sustainability of the unique trade of the community.

The more important contribution of this humanistic approach in the discussion of conservation cum redevelopment policy is the shift of focus, from the buildings to the human persons in the community. It is the human persons that create the buildings and the culture. Preserving the buildings is simply retaining a legacy, but preserving the human persons of that community is preserving the creators of legacy and culture, of heritage.

It is, therefore, worth studying how the principles of solidarity and subsidiarity discussed above are to be translated within conservation and renewal process. Hong Kong and its officials may need to do some soul searching to establish an authentic, humanistic, sustainable approach of heritage conservation-cum-urban renewal. If this could be implemented, perhaps it could abate surging housing costs without causing social resentment against "collusion between officials and capitalists", a common charge against developers in gaining from urban renewal projects, that are increasingly difficult for low-income families to bear. And ultimately, retaining the family-owned street shops in new redeveloped areas may become a defining characteristic for Hong Kong, making it not just a world city but a unique city.

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Surveying & Built Environment

Fieldwork, Archives, Photographs, Architectural Software and Recovering Lost Heritage

Stephen Davies[*], Anthony KH Leung[**], Steve H Ching[**]

ABSTRACT

The finding of a 'lost' photograph in a British collection in the spring of 2017 led to the recovery of the actual appearance of China's first purpose designed and built pagoda lighthouse on Xiyu in the Penghu Islands. Work on the photograph using modern architectural CAD software enabled a virtual reconstruction of the Xiyu Pagoda Lighthouse. It also led to an evaluation of the dimensions of the structure, which in turn created a basis for understanding the values of the traditional *chi* (尺) used in the building's construction. The discovery of further photographs and more data in 2018 has clarified the date of the older structure and enabled earlier research to be taken further. Parts of the old structure are now known to have outlasted the demolition of the pagoda. The date of the first photograph has been revised. The new photograph showing what remained ensures that where the old pagoda lighthouse stood can now be located exactly in relation to the present Yuwengdao Lighthouse compound, correcting mistaken earlier inferences. The new finding also suggests possibilities for fruitful on-site archaeological work. A second new photograph, identified later in 2017, has also given a strong indication of the identity of the photographer, highly likely to have been the noted Hong Kong based Chinese entrepreneur and 'photographic artist' Lai A Fong (賴阿芳).

KEYWORDS

Pagoda lighthouse, CAD software, photographs, Taiwan, Xiyu, Penghu, Wai'an, *chi*, Lai A Fong

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INTRODUCTION

In early 2017, researching for the City University of Hong Kong's Lighthouse Heritage Research Connections (LHRC) investigation of the Yuwengdao Lighthouse (1875) in the Penghu Islands, the lead author discovered a hitherto 'lost', or at least unknown photograph of the preceding, indigenous Imperial Chinese lighthouse long known to have existed, but about which almost no detail was known (**Figure 1**). The discovery of the photograph, which showed immediately what possibly a 1778, and certainly an 1828, purpose-designed Chinese lighthouse looked like, was in itself a significant example of the recovery of lost heritage. However, working together using state of the art architectural design software and archival research, the authors were able to go beyond merely knowing for the first time since it was demolished in 1875 and folk memory died out, what the Pagoda Lighthouse on the Penghu Islands' Xiyu Island looked like. They were able to establish to within fairly tight tolerances its dimensions, highlight aspects of the traditional Chinese building techniques employed, clarify historical data from contemporary Chinese sources, identify the design provenance of significant parts of the structure, pinpoint exactly its orientation and where it had stood and revise mistaken earlier estimates as to the date the photograph was taken.

A full analysis and description of this exercise has appeared elsewhere (Leung, Davies and Ching 2018). In this article an abbreviated summary of the original research will be presented along with important updates. The first is the discovery of a new photograph that has enabled us to identify two additional and important bits of data. One is that one building of the old structure survived the demolition of the pagoda lighthouse in 1875 and stood until sometime in the early 20th century. Accordingly, thanks to that survival, we can now revise our original estimate of the original position of the Pagoda Lighthouse based on earlier conjectures. Now, thanks to the new photographic evidence, we can place the old pagoda light and its accompanying buildings exactly where they would originally have stood. Second, we have been able with some confidence to identify who took the 'lost' photograph of the pagoda lighthouse, which provides a most satisfying link to 19th century Hong Kong and in doing so, along with more recent archival information sourced in Taiwan and Japan, revised

Figure 1. The Xiyu Pagoda Lighthouse (courtesy Royal Geographical Society, image P043108)

our conclusions as to when in 1875 the photograph of the old pagoda light was taken.

THE ANALYSIS SO FAR

In early 2017 a long lost, indeed effectively unknown photograph of the Pagoda Lighthouse that had been built on the south-western tip of Xiyu Island in the Penghu Islands, was discovered by the lead author in the image archives of the London based Royal Geographical Society. This revealed a remarkable building, quite unlike the only contemporary depiction, which is of a very conventional, traditional pagoda that appeared in a presentation, ink-painting map given to Jiang Yuanshu, the Taiwan Prefect who had the 1778 light constructed (**Figure 2**).

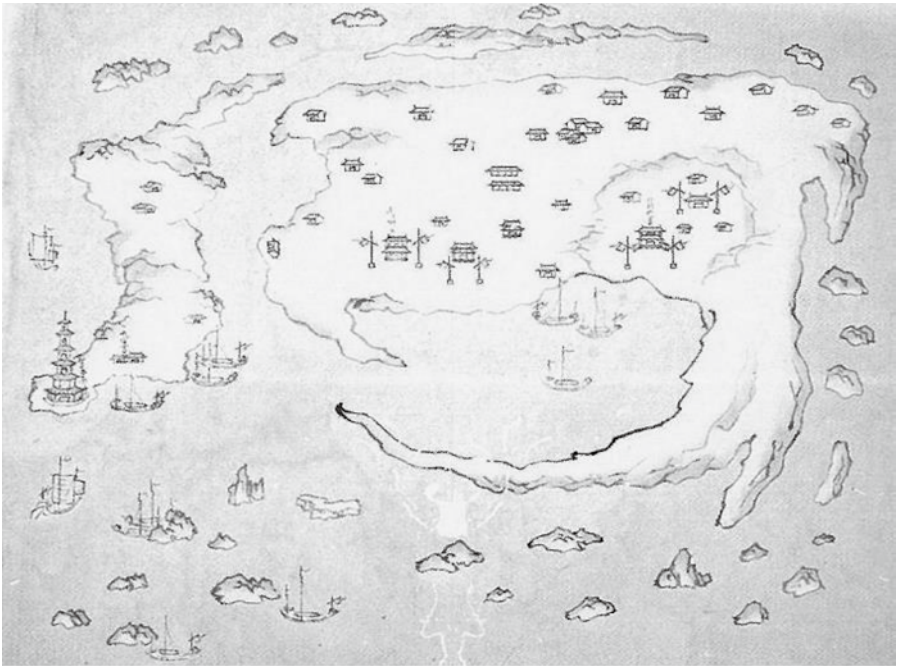

Figure 2. Presentation scroll to Jiang Yuanshu, 1778, (courtesy of National Palace Museum, Taipei)[1]

[1] Map of Penghu's West Island Lighthouse, Diagram Showing the Reconstruction of Various Structures in the Prefecture of Taiwan [重修台郡各建築圖說: 澎湖西嶼浮圖圖]. Retrieved 9.6.2018 from, 順風相送: 院藏清代海洋史特展 [Voyage with the Tailwind: Qing Archival and Cartographical Materials on Maritime History in the National Palace Museum], https://theme.npm.edu.tw/exh102/tailwind/en/ch02.html

With the aid of Chinese materials contemporary with the lighthouse, including carved commemorative steles from 1778, 1779 and 1828 still extant in Wai'an Village, Xiyu, and using the photograph of the lighthouse, we were successfully able to identify a number of still existing relics long locally believed to have come from the pagoda, but without any evidence as to exactly where on or in the structure they had come from. We could also provisionally identify the elements of the structure in the photograph though with some unresolved and perhaps unresolvable questions.

The commentary on Jiang Yuanshu's memorial scroll states clearly that a Tian Hou temple was built "in front of" the pagoda.[2] We have taken this to mean that the very traditional Xiyu village dwelling style building on the south frontage of the pagoda, with its small courtyard inside a double-doored gate in front of a main hall between two small wing buildings, was most probably the Tian Hou temple as well as being the lodgings of the temple monks. The latter are said to have been responsible for the light under the supervision of the army garrison. Some doubt as to whether this remained always the case comes from the narrative of a visit to Taiwan by the American scientist Joseph Beal Steere in 1873-74, in which he specifically states that the temple was in the pagoda, not in the building in front, and indicates that a monk was in charge. It has to be said that Steere's general descriptions, now we have the photograph, are so ill-observed and inaccurate that it is far from clear what, if anything, of his material should be taken as credible (Steere 1938).[3]

We were aware, however, that because severe typhoon damage in 1823 had required the pagoda to be extensively and expensively repaired, taking it out of action until 1828 when it was relit, the apparent mismatch between what we saw in the photograph and in the small, very conventional depiction on Jiang Yuanshu's presentation scroll could indicate that the pre-typhoon and post-typhoon buildings had been different. However, in contemporary Chinese sources descriptions of the building of the pagoda in 1778 identified Xiamen (Amoy) granite as the main construction material. Even the most cursory glance at the newly discovered photograph showed that the main pagoda and its plinth used massive granite stones, suggesting continuity rather than change. In short, the appearance of the Xiyu Pagoda Lighthouse of 1823 we considered to be a fairly reliable guide to how it will have appeared when it had first been built some fifty years previously.

[2] Ibid.

[3] Steere's itinerary used to be available on a University of Michigan website, but is no longer accessible. A copy can be found at https://docplayer.net/49562425-The-university-of-michigan-beal-steere-expedition-itinerary-and-chronology-of-joseph-beal-steere-s-first-expedition.html, accessed 21.8.2018.

In our previous article (Leung, Davies and Ching 2018), we created a virtual reconstruction of the lighthouse using CAD software (**Figure 3**) along with an actual printed 3D model (**Figure 4**). These proved essential tools for further analysis. They enabled us by analysis of the image and its shadows to provisionally date the photograph to late spring 1875 (on which more below).

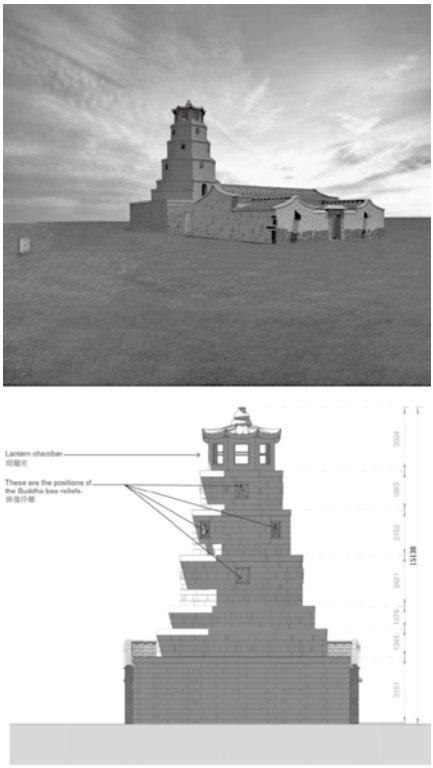

Figure 3a. The virtual reconstruction using Revit CAD software, **3b**. The modelled dimensions

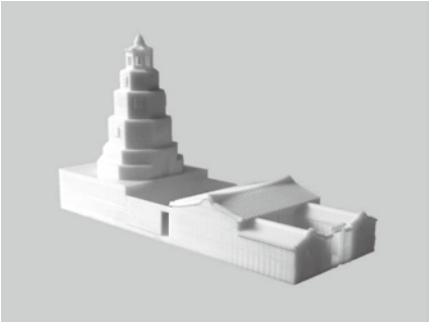

Figure 4. The 3D printed model

Using the photographic and shadow analysis, along with contemporary nineteenth century navigational sources, we were also able to identify the orientation of the lighthouse – it faced south (**Figure 6**). As noted, we could narrow down to fairly close tolerances its dimensions (**Figure 3b**) and roughly identify where it must have stood (**Figure 6**). The dimensions of a height of 15.13m, a square podium 10.3m on the side, a walled set of annexes stretching north-to-south including the podium of 23.337m and a total footprint of the whole of 260.97 m^2, enabled us to analyse the dimensions given in traditional units of measure in contemporary Chinese sources. This enabled us to come up with some conjectures relating to the probable traditional measurement system used in the building's construction and how that was applied in practice. The practice seems to have entailed thoughtful flexibility in achieving fortunate (Chiou & Krishnamurti, 1995) dimensions for the finished structure as can be seen with respect to the height of the podium on which the pagoda was erected (**Figure 5**).

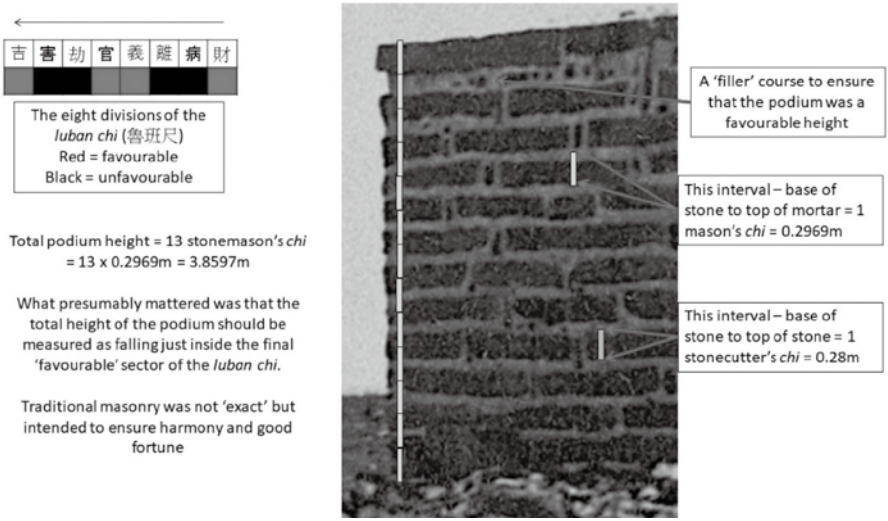

Figure 5. The podium, the *luban chi* and its equivalent metric values for stonecutters' and stonemasons' *chi*

Analysis of the photograph and virtual model argued that the Xiyu Pagoda lighthouse had been built using stones cut to a traditional Fujian stonecutter's *chi* (traditional foot, 尺) of around 0.27 m. It also argued that the stonemasons who built the pagoda used a *chi*, which included a layer of mortar, of around 0.28 m. These are an interesting departure from the commonly accepted value of a Qing Dynasty *chi* of 0.305m, and confirm the variability of such traditional measures by trade and region common in traditional China, as was the case indeed in most traditional societies.

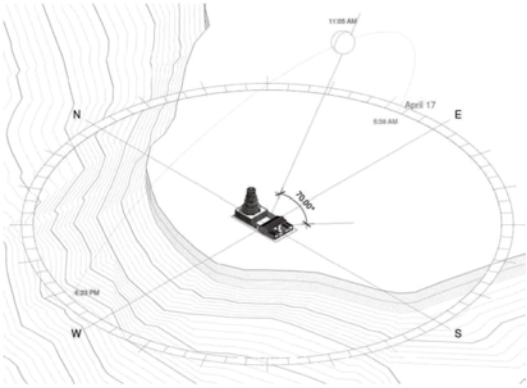

Figure 6. The orientation of the Xiyu Pagoda Lighthouse and the early dating of the photograph to April 1875.

Although the astronomical calendar in the Revit software that we used when shadow matching has given an incredibly precise time and day for the image (17.4.1875, 1100 hrs.) we were far from attaching great significance to the precision and, as we shall see, now have some doubts. We had considered a time bracket from some time at the end of April through until late May or possibly even early June to be a reasonable conclusion, but for reasons to do with our more recent research, we are now inclined towards a significantly later date.

CONTEXTUALISING THE XIYU PAGODA LIGHTHOUSE

It has long been known both that Chinese navigators had used pagodas as sea marks including, at night, showing lights from them to guide mariners. This practice can be dated back at least to the Tang Dynasty (618-907 CE) when, somewhat unreliably, the Guang Ta (光 塔) mosque minaret is said to have been built in Guangzhou in the 7th century and the Mao Ta Pagoda near today's Shanghai in the 9th century (Lipman 1997: 25; Steinhardt 2008).[4] However, it seems widely accepted that, whenever it first occurred, this use of the pagodas was a secondary function. None of the earlier pagodas seems to have been intended from the outset to act as a sea mark or to function as a permanent, primary function lighthouse in the Mediterranean and by derivation western sense of the term, as exemplified by the Egyptian Pharos of 280BCE. They were built and served other purposes, most often religious. It would seem that once their usefulness to mariners in this role had been appreciated, so their guardians supplemented the daytime, visual usefulness of their pagodas with the displaying of lights at night on the occasions, like the expected return of a fishing fleet, when such a beacon could assist the inbound mariners to identify their haven. Examples are also known in Chaozhou and Wenzhou on the coast, and Anqing and Wuhu (Anhui) on the Yangzi River. Such pagodas are, in their appearance and construction significantly different from the image in the newly discovered photograph, which we took to be indicative of the structure that had been erected in 1778.

[4] As with much similar historical data in China, exactly what was where and exactly when is not actually known to any degree of evidential security. The Guang Ta minaret is claimed by most to be of an unknown date. Lipman (1997: 25) makes the point that there are no entirely reliable records of any permanent mosque buildings in China until the Song Dynasty. However the present structure may date from the Ming Dynasty, when there is a record of the original – of unknown date but probably Song Dynasty – having been destroyed (Steinhardt 2008: 335). Our knowledge of the history of the Mao Ta Pagoda seems to rest rather heavily on a 17th century compilation, the *Jiangnan Tongzhi* (江南通誌 Vol.45, p.15), which specifies the Tang Dynasty and identifies the builder as the monk Ru Hai (如海), see also *Si Ku Quan Shu*, Wenyuange Edition (四庫全書, 文淵閣). Other sources date the structure to 874CE. However, all are rather vague as to exactly why it was built, and how, when and for whom a light was displayed. There seems to be no hard, quantified, 9th century data. No source produces what to a modern historian would be acceptable as clear and unequivocal evidence.

The Xiyu Pagoda Lighthouse has long been known to Chinese historians and is commemorated in Penghu by the carved steles created both on the occasion of the original light being built, and of the repair to the light 1823-28. It has also long been known to world navigational literature, being described by western mariners as a usable sea mark within a generation of it being built (Broughton 1804). But it does seem to have been a new departure in China's approach to aids to navigation when it replaced what seems to have been an earlier, seventeenth century fortification. In our earlier paper (Leung, Davies and Ching 2018), therefore, we had argued that the Pagoda Light in Xiyu was unique in being an example of a lighthouse, designed and built as such from the outset.

Figure 7. Sumiyoshi lighthouse, Funimachi near Nagoya, 12-13th century, restored 49th Showa (1975)

Once we had discovered the photograph, we could see that the Xiyu Pagoda showed interesting 'family resemblances' to the lighthouses that had been being built in the western world since the original Pharos in Alexandria. That is, it was a tapered tower with the light placed on top in a glazed lantern in such a way as to shine over 360°. What tended to support our belief that the Xiyu Pagoda was unique, therefore, was that in general the structure we were looking at did not show equally strong affinities to China's indigenous pagoda designs, including those reported as having been lit. None of these has an all-round lantern as its top storey: the hallmark of the normal meaning of 'lighthouse' and, if in a different way, characteristic also of all the pre-western impact traditional Japanese lighthouses the earliest of which dates back to the 12-13th century (**Figure 7**).

Since we were unaware of any other, similar examples, and the literature we consulted did not mention any, we concluded that for reasons we could not unravel, Jiang Yuanshu and those who helped in Penghu took an unusual and unique step, with their new Pagoda Lighthouse, in coming up with a singular design. Possible sources might have been, in addition to Japan, some sort of knowledge of western lighthouses culled perhaps from Dutch or Portuguese sources, though that can only be conjecture. However, whatever the provenance of a light tower with an all-round lantern on top,

we suggest that the design was perhaps also developed from the indigenous Fujian tradition of the Shita (石　塔 , stone tower – **Figure 8**), known to have been used as navigational marks, to which the old pagoda image showed a family resemblance. However, we have been unable to find any unequivocal and reliable evidence as to the design provenance of the lighthouse.

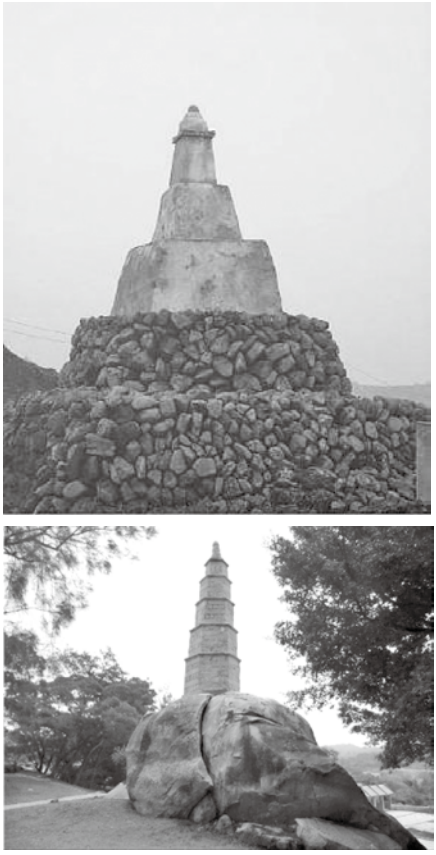

Figure 8. The Shita in the nearby Xiyu village of Nei'an (內垵) and the Wentai Pagoda, Jinmen (金門).

NEW EVIDENCE ON THE TRUE LOCATION OF XIYU PAGODA LIGHTHOUSE

The most interesting new data was turned up in 2018 in Penghu by the third author. It was not related to the earlier, Xiyu Pagoda Lighthouse but was devoted to the modern, Yuwengdao Lighthouse that replaced it, erected in 1875 by the Chief Engineer of the Marine Department of the Chinese Imperial Maritime Customs, David Marr Henderson (1840-1923). Specifically, the images dealt with the Yuwengdao lighthouse once it had been taken over by the Japanese authorities following the annexation of Taiwan (Formosa) in 1895, on through the period during which the light was under Japanese administration, and then to the early days of its return to the Republic of China.

In our original analysis of the photograph of the Xiyu Pagoda Lighthouse in the context of the modern lighthouse compound, we were struck by three walls – which enclosed a pen where the 19th and early 20th century staff kept their chickens and pigs. The walls were out of the broad alignment of the rest of the compound being orientated north-to-south rather than, as the modern compound is, more south-south-west to north-north-east. Local anecdote suggested that they had been part of the original pagoda lighthouse and, working on that assumption, we located the old lighthouse as shown in **Figure 9**, presuming that the

northernmost wall of the enclosure was a surviving part of the original pagoda lighthouse, most probably the front or back wall of the larger, east-west hall of the Tin Hau temple-cum-guardians' accommodation.

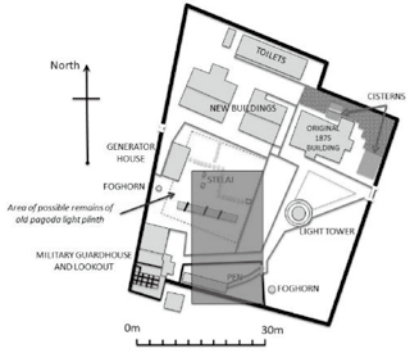

Figure 9. The presumed location of the old Xiyu Pagoda Lighthouse structures on the original analysis

In the images of the period of Japanese administration, one in particular was discussed by us because it showed that at some stage there was a traditional Xiyu style village house structure in the compound and there was speculation as to when it was built, why and when it was demolished, since there is no evidence of it remaining in the compound today (**Figure 10**). The third author's research uncovered that the photograph was published in a book in 1932 by an expatriate Japanese photographer living in Makong (the main town of the Penghu Islands) from c.1910.[5] It is not known at present whether the photograph was taken by the photographer.

Figure 10. Photograph of the period of Japanese administration, pre-1909

Rather later the first author was visited with one of those sudden putting of two and two together that comes from something drifting out of focus and, thus, able to enter another frame of reference that does not predetermine what one thinks one is looking at (Tversky and Kahneman 1981). Suddenly what was in the image was not a hitherto unknown but evidently temporary, whitewashed traditional Penghu village house but an extremely familiar structure.

In **Figure 10** the whitewashed village house structure is in the foreground with someone, probably male and wearing a short coat and breeches that reach just below the knees, so possibly a soldier, leaning back against what will have been its west wall. Behind is the 1875, cast iron light tower with other Japanese figures lining the exterior walkway. As the third author noted,

[5] For the image see https://penghu.info/OB2D029D0ECC52519FA5 accessed 21.8.2016. For the Japanese photographer and his book, personal information to Steve Ching by a Penghu historian.

the tower was painted black. We know that during the administration of the Chinese Imperial Maritime Customs it had been painted black and that this was the state of affairs on the Japanese takeover in 1895 (Chinese Government 1875). There is data in Japan that indicates that in 1908 the light was still black (Japanese Navy 1908). Data from Taiwan government archives has an announcement of 18th November 1909 to the effect that the colour had changed, which is confirmed by a hand amendment to the archive copy of the 1909 *Admiralty List of Lights* in the United Kingdom Hydrographic Office Archives.[6] So the new photograph dates from after 1895 and before the autumn of 1909.

To the left rear is the original lighthouse keeper's building that still stands today with, behind it, the original flagstaff flying a very large Japanese flag. On the right of the picture is the west-to-east aligned north wall of the animal enclosure or pen with the access gate in the east wall in view, all still part of the present-day lighthouse compound. The sudden realization was that our original conclusion as to the location of the old pagoda lighthouse was mistaken. What our 're-framed' perception had led us to see was that the 'new' building was not a new structure, but a significantly remodeled remnant of the original pagoda lighthouse complex.

Further analysis suggested that the odd alignment of the animal enclosure did not result from it being the last relic of a wall from the original buildings, as we had initially supposed. Rather it was a new wall built as part of the new compound. But it had to be aligned the way it was, curiously out of true with the alignment of the compound enclosure walls, and placed where it was because at least some of the original buildings still stood and there was a need for space to be left for an access path to run between the wall and the southern façade of the old building with its doorway. Thus, rather than any old local Fujian village house that for some reason or another had been built in the compound of the new lighthouse, what we were seeing was what was left of the southern annexes of the original building. It is possible to match the two north-to-south wings, the gateway to the small courtyard and the east-to-west aligned main structure of the annex and to see how they map onto the annex on the southern side of the old pagoda lighthouse in the rediscovered photograph (**Figure 11**).

[6] For the announcement from the Taiwan Governor, Zuo Matei, Earl Taku, see「漁翁島燈臺燈塔塗色發更ノ件」（1909年11月18日）. For 1909 and 1910 confirmatory data see Hydrographic Office (1909) pp.207-208 and Hydrographic Office (1910), pp.177-178.

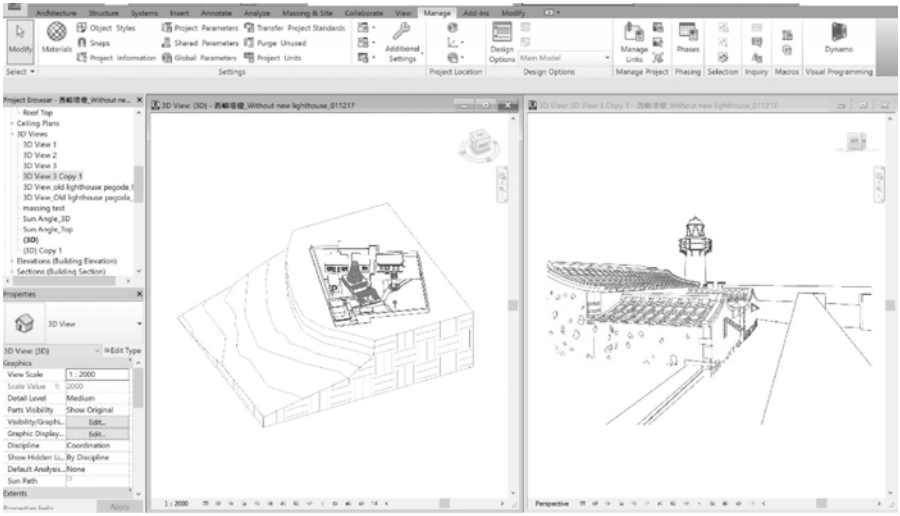

Figure 11. An exercise mapping the new photograph onto both old and existing structures. The relationship between an orthographic projection view and a perspective view showing how Revit links the two models (In the original image, Red: Xiyu Pagoda Lighthouse; Blue: Yuwengdao Lighthouse).

It is clear, from the pre-1909, **Figure 10** photograph, that the old buildings had by this time been modified from their original appearance. It looks as if the two north-to-south wings had been reduced in width by their outer roofs being cut back almost to the ridge line. The east wing had been given a chimney on its east side. The main east-to-west building had been reduced in length and re-roofed, with a much more shallowly pitched roof and a lower ridge. All the roofs had lost their original tiles and had been given a roofing material similar to those of the buildings of the new compound designed to optimize the catching of rain water. The larger transverse building had also had a pair of double doors set into its west wall, possibly to allow ingress and egress for some piece of machinery. As with the two annex buildings, it would appear that the larger transverse building had also been reduced in its east-west dimension. What is also probably true by inference is that if the original building had been a Tian Hou Temple, before 1909 it had ceased serving that purpose.

There is no evidence as to what the building complex was used for once the old pagoda lighthouse had been demolished. The probability is that it was used for junior staff (i.e. Chinese staff) quarters and a store, leaving the main 1875 building for the western (and subsequently Japanese) lighthouse keeper and his family. Equally, we have no idea yet as to when the old building

was finally demolished, on which matter research is ongoing. What we have now learned, we think, is the exact location of the old pagoda lighthouse and, assuming the dimensions we derived from our virtual model are accurate, its location and the area that it once occupied on the site of the present lighthouse (**Figures 11** and **12**).

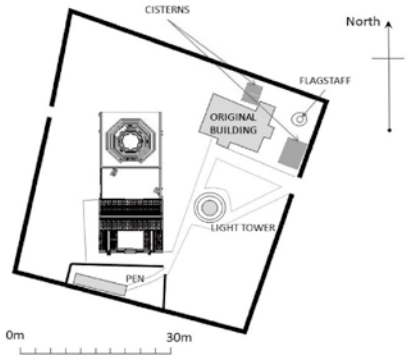

Figure 12. Plan view of the orthographic projection view in **Figure 11** showing the probable location of the original pagoda lighthouse and first likely layout of the 1875 compound

THE ROYAL GEOGRAPHICIAL SOCIETY PHOTOGRAPHS AND THEIR PHOTOGRAPHER

Along with the image of the old pagoda lighthouse, the Royal Geographical Society in London has a number of other images of Taiwan that all seem to have been taken at around the same period by an unknown photographer or photographers. All come with what appear to be image numbers from a catalogue of the kind that it is known photographers active in the 19th century Treaty Ports used to enable customers to select images of which they wanted copies when putting together souvenir albums. The image numbers are not in a continuous sequence, although a sequence can be inferred. All the known numbers fit into a 45 to 79 sequence without repetition, although there are large gaps amongst the known numbers. So far research has identified a possible twenty-one of thirty-six images in the possible series which begins in the Penghu Islands and ends in Tamsui, the port of departure for mainland China before the development of today's Keelung.[7]

At present the first, No. 45, is of the Xiyu Pagoda Lighthouse and was provisionally dated by our research project as having been taken on or close to 17th April 1875. No. 46, catalogued solely as a "Town in Taiwan" and identified as being in the Pescadores, the old western name for the Penghu Islands, we have now also identified as of the nearby small village of Wai'an, about 1.2 kilometers from the light by the old track (it is 3.3 kilometers by car today). Once we had seen the image (**Figure 13**), it was clear that indeed the image was of Wai'an because it is instantly recognizable and its broad location is confirmed by the caption, which read, "Pescadores. No. 46 – Fisher Islands". The image was almost

[7] The images we have identified are 45, 46, 48, 49a, 49b, 50, 52, 56, 60-64, 67, 68, 70, 72-74, 77 and 79.

certainly taken at the same time as No. 45 and equally probably by the same photographer. The only clue as to when it was taken is that it was at what looks like a low tide during springs.[8] As the footnote indicates in 1875 spring tides, which coincide with or closely follow full and new moons, fit well with the potential target dates for when the photograph of the old pagoda lighthouse was taken.

Figure 13. Wai'an from the west (Royal Geographical Society, Image P043109).

In the Royal Geographical Society catalogue neither photograph came with a date or any other provenance, a product of the early history of the collection, which did not begin to be properly catalogued until after 1900, so images given to the Royal Geographical Society before 1900 are simply catalogued as being pre-1900 with what appears to have been a post-hoc identification of the subject, where that was not otherwise given.[9] This had resulted in some of the Taiwan images being initially identified as in Japan. It follows that as far as the Royal Geographical Society catalogue is concerned, the photographer on Nos. 45 and 46 is unknown. However, we are confident of our identification of place and year in which the images must have been taken and have begun work to try to identify the photographer.

From where we have got to so far, thanks to advice of an expert on historical photographs of Taiwan, Lambert van der Aalsvoort, we believe the images were taken by the noted, Hong Kong based photographer Lai A Fong (賴 阿 芳) (c.1839 - 1890)).[10] A Fong, as he is usually named, is described as "The pre-eminent nineteenth-century Chinese photographer, especially gifted in both landscape and portrait work, working as a commercial photographer in Hong Kong from 1870, possibly as early as 1859" (Bennett 2013). It appears unlikely that A Fong was working in Hong Kong before 1865, when he is recorded as working at the Hong Kong studio owned by José Joaquim Alves de Silveira. After that he seems to have worked also in Fuzhou, though perhaps as an itinerant. He is known to have established his Hong Kong studio

[8] *The Chronicle & Directory for China, Japan and the Philippines for the Year 1875*, pp.15-16 & 21-21 indicate there were New Moons on 6th April, 5th May, 3rd July and 1st August and Full Moons on 21st April, 20th May, 18th July and 17th August.

[9] Information on the Royal Geographical Society collection from Joy Wheeler, Assistant Picture Librarian, Royal Geographical Society.

[10] Lambert van der Aalsvoort personal communication. A Fong was also known as Lai Ah Fong, Huafang, Fang Lai, Lihua Fang, Li Fang, A Fong Lai, 賴華芳, 黎華芳, 芳華

and main office in April 1870. After his death, it continued operating in his name until 1940.

A Fong took photographs not just in Hong Kong, but also elsewhere in China. Images by him are known of Guangzhou, Xiamen and Fuzhou. On 25th November 1875 the *North-China Herald* reported, recycling a story from the short-lived *Hong Kong Times* newspaper, that "Mr A Fong, photographic artist, has lately returned from the interior of Formosa" (*North-China Herald and Supreme Court and Consular Gazette* 1875). Terry Bennett interprets this as implying Lai A Fong's visit to Taiwan was during the autumn of 1875. Given the date we originally attributed to the Xiyu Pagoda Lighthouse photograph, this poses a problem. Of course travel in the 1870s was far from swift. Taiwan at the time had almost no roads, so that all inland travel was by foot, and coasting traffic could often be significantly delayed by weather. This allows the possibility that A Fong could have been in Taiwan perhaps somewhat earlier than the autumn.

The American scientist Joseph Beal Steere, who visited Taiwan on an exploratory and photographic expedition in 1873 and 1874, spent from September 1873 until nearly May 1874 completing his visit. He was not of course on a commercial journey. Part of Steer's journey more or less replicated what Lai A Fong did, as we can see from A Fong's photographs. That lets us roughly calculate A Fong's itinerary as having taken at least three months or possibly four (Steere 1938). If news reached Shanghai in November – to be given under its 'Swatow' (Shantou today) rubric, recounting that at the time of the report A Fong was in Xiamen taking studio portraits – then if, as seems probable, A Fong had travelled from Taiwan, via his main studio in Hong Kong, to Xiamen by November, where he was when the report of his activities appeared in the Hong Kong newspapers, he is likely to have left northern Taiwan by sometime in October at the latest. Counting back, and given that the Penghu Islands would appear, from the photograph numbers, to have been his first port of call, then it seems possible that he could have been there in July and possibly as early as June, moving on afterwards to take the bulk of the thirty-six images of Taiwan that it seems he may have taken.

It follows that if A Fong took the photograph of the old pagoda light, our original date of April 1875 either rules A Fong out or the date is wrong. We feel that the evidence supporting A Fong being the photographer is rather stronger than our original estimate of when the photograph was taken. Can the differences be reconciled?

Our research shows that the initial reconnaissance of the site and the purchase of an additional area of land 200' by 154' for $150 took place in 1874. In the 5th lunar month (4th June to 2nd July, 1875) materials and equipment for the new lighthouse began to be

brought to the site in the customs cruiser *Ling-Feng* (凌風). The site was not formally handed over until work began on the 11th day of the 7th lunar month (Friday 11th August 1875).[11] Demolition proper took place at some point after that, since we know it was complete, as it had to be because it blocked the view to seaward to the west, before the new light was lit on the 18th day of the 11th month (Friday, 15th December 1875), according to *Penghu Gazette (1894)*.

It follows that if A Fong took the photograph, as seems probable, and if the state of the buildings are as they are shown in the Royal Geographical Society photograph, then it cannot have been taken in April or May, but must have been taken in July or August. We are revisiting the CAD virtual model to see if running the calendar for those periods can produce as good a shadow match.[12]

CONCLUSION

Even when it seems that knowledge of a significant heritage building in China has been lost, it can sometimes be the case, as with the Xiyu Pagoda Lighthouse, that buried in an obscure collection in an archive, often in Europe or the USA, traces of that building remain. In the case of the pagoda lighthouse, we found records in 18th century Chinese gazetteers and images, though these were imprecise with respect to exact detail. We also found records in 18th century western travelogues, extensively in 19th century British Royal Naval hydrographic archives and most significantly in one of the many large collections of photographs of 19th century China that westerners took home with them at the end of their travels, or of time spent working in China, elements of which in this case were given to the Royal Geographical Society (Collinson 1844a, 1844b).

There is no question that luck matters. But so do modern search tools and the internet. We were extremely lucky that one of us, convinced an image was likely to have existed, managed to catch a trace of the key image during a search, follow it up and identify it. Without the internet that would never have happened.

If a trace yields a quality image, as in this case it did, then with the aid of modern computerized tools a great deal more can then be done including, as the authors describe in detail in their piece in *Virtual Archaeology Review* (Leung, Davies and Ching 2018), and which has been rehearsed in brief and extended here, discovering dimensions, orientation and exact location, as well as tracking down and identifying significant remaining relics from the long-disappeared structure. With that knowledge, historical photographs of

[11] The conversion of the dates are from Loureiro (1872), pp.247, 249, 251, 257, 259.

[12] In principle it should because once past the summer solstice the sun broadly repeats its passage through the sky, as any sun path diagram shows.

the site where the structure once stood can give, as in this case they have given additional clues as to what survived, if anything did and, with luck, help date when all obvious traces finally disappeared. By assisting focus, they can also correct early error, again as in this case where earlier, less complete information about the timeline of the construction of the new Yuwengdao Lighthouse had led us to suppose that work began on it some months before it in fact did. They can also, as we hope will be the case here, guide forensic archaeological work on an old site to see what else can be recovered of the lost past. Now we know to within fairly tight margins exactly where the old pagoda light stood, if nothing else we may be able to uncover clues as to the composition of the podium on which the pagoda stood. The result can also be, again as in this case with the heritage precincts of today's Yuwengdao Lighthouse, that we better understand a present structure.

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Surveying & Built Environment

How Will the New Land Sale Rule Affect Developers' Bidding Strategy? A Game Theoretic Approach

Char Leung*

ABSTRACT

Recently the Hong Kong government has announced a new rule that all non-winning bids in a land sale will also be disclosed in order to enhance the transparency of the land sale market. Given the heterogeneity of land, the effect of the new rule cannot be fully examined unless the same site is tendered twice, with and without the new rule. As such, this paper analyses its effect based on economic models from a game theoretic approach. It is found that the bidding behaviour will be less aggressive under the new rule and that, in response to the increased number of bidders, the optimal bid will converge to some asymptotic limit, providing an upper bound to the winning price.

KEYWORDS

Game theory, land sale, bidding theory

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INTRODUCTION

Serving as the owner of almost all land in Hong Kong, the Hong Kong Government sells the rights of land use to promote urban development. Previously sold by auction, residential development land in Hong Kong has been sold by tender since 2011 as they are highly heterogeneous commodities and their values are generally intangible. This is demonstrated by surveyors' estimation using the residual method in which the approximate land value heavily depends on the cost of the development and the revenue generated by it.

Under existing land sale schemes, except for the winning bid, all other bids in a tender are never disclosed. However, this will no longer be the case as in 2018 the government announced a new rule that all bids will be published on an anonymous basis after the tender to enhance transparency (HKSAR Government Development Bureau 2018). A similar arrangement was also adopted by the Urban Renewal Authority (URA) in tendering their redevelopment projects (Urban Renewal Authority 2018).

The key question is how effective this new rule will be in discouraging aggressive bidding. Unfortunately, its effectiveness may not be able to be fully assessed even after the rule has formally been implemented. This is largely due to the heterogeneity of development land which is not limited to its geographical characteristics. For instance, a developer who already owns an adjoining site is likely to submit a higher bid for a joint development. Unless the same site is tendered twice under different land sale schemes, the effectiveness of the new rule cannot be fully examined.

Despite of the lack of empirical evidence, microeconomic theoretical models provide us with insights. Auction theory is the branch of microeconomics that concerns auctions and tenders. Under this theory, tenders are considered as one of the many types of auctions, namely first-price, sealed-bid auctions. A theoretical model in auction theory usually describes the optimal bidding strategy for a bidder taking into consideration certain assumptions and limitations of the format of the auction/tender.

This article is constructed as follows. The next section gives a brief review of auction theory as well as of the literature concerning land sales by auction or tender. The two subsequent sections give a derivation of the bidding rule under current and new land sale scheme to see if the new rule can effectively reduce the land price. The final section concludes.

AUCTION THEORY: WHAT IS IT?

Usually taught to postgraduate students in economics, auction theory, as its name suggests, studies auctions including bidding behavior, the seller'

surplus and the format of the auction. Like other economic theories, it is built on some assumptions that aim to simplify reality.

An auction can be classified as either a private value or a common value auction. The former assumes that each bidder has her own value about the good which is independent of that of other bidders. The current land sale scheme where each bidder does not have any bidding related information of other bidders is a good example. In contrast, the land sale scheme under the new rule of disclosing all bids is more common-value-auction-like. Disclosing previous bids gives bidders some information about other bidders' future bidding behaviour. While each bidder has its own plan on how the site should be developed, the site has a market value such as the average of all bids submitted. This market value constitutes some form of common value.

Another categorisation of auctions is whether bids are sealed or open, i.e. tender or auction. For private value auctions, the revenue equivalence theorem suggests that the seller's expected revenue remains unchanged regardless of sealed- or open-bid arrangement. However, this is not true for common value auctions where expected revenue is higher in open bid auctions, as suggested by the linkage principle (Milgrom and Weber 1982).

Unless using experimental data, most studies of auctions rely on theoretical models. Recently more studies have been empirically focused due to the popularity of online auction platforms. Empirical studies of land sale auction from an economic perspective are rare due to limitations of data availability. As such, many studies concerning Hong Kong's land sale market use other types of market data for analysis. For instance, Tse et al (2011) studies the developers' bidding strategies by examining the relationship between the stock market response and the outcomes of land sales. In testing the existence of the winner's curse in Hong Kong's land sale market, auction theory is applied to determine the reference price. Also using stock market data, Ching and Yu (2003) demonstrate that Hong Kong's urban land market is not perfectly contestable hence has an oligopolistic structure.

OPTIMAL BIDDING STRATEGY UNDER THE CURRENT LAND SALE SCHEME

The theoretical model outlined here does not aim to describe developers' actual bidding strategies as they remain unknown to the public. Instead, from an economic perspective, the model attempts to explain the effect of the new rule under a set of reasonable assumptions. The outcome of the analysis is an optimal bidding function, representing a Bayesian Nash equilibrium.

Except for the winning bid, all other

bids are not disclosed under the existing land sale scheme. This means that each bidder knows how much she values the land and this is her own private information. As a result, bids among bidders are independent. This is one of the three assumptions required for building our theoretical model. These assumptions include (Krishna 2010, p.37),

(i) Independence: Bids among bidders are independent.

(ii) Risk neutral: All bidders seek to maximise their expected gain.

(iii) Symmetry: Bids among bidders follow the same statistical distribution and the same bidding rule.

Assumption (i) will be relaxed upon the new land sale scheme when bidders can learn from previous non-winning bids. Assumption (ii) is trivial. While the bidder should make the bid high enough to win the tender, it should also be set low to increase the surplus. As the bid is considered as a cost to the bidder, the lower the bid below the willingness-to-pay, the larger the surplus gained by the bidder. With uncertainty arising from bids made by other bidders, each bid attempts to maximise the expected gain. Assumption (iii) is imposed to simplify the analysis and is mathematically represented by Equation (1) below. A justification for this assumption is that all bidders have access to the same set of information and there is no insider information for a particular bidder to win the tender. Therefore, all bidders should conceptually share the same bidding strategy.

Let v_i be the willingness-to-pay of bidder i above which, for example, the bidder is not able to make any profit from the development. The surplus gained by the developer in making the bid is then $(v_i - b_i)$ where b_1 is the bid made by bidder i.

Assume that the value of b_1 is a proportion of v_i. As such, the bidding function $b(\cdot)$ can be expressed as,

$$b_i = b(v_i) = av_i \qquad \text{(i)}$$

where $0 < \alpha < 1$. Note that α does not have the subscript i as it is assumed that each bidder makes its bid based on a fixed part of v_i, and also to satisfy assumption (iii). The probability that bidder i wins the tender is given by,

Pr (bidder i wins when bidding b_i) =

$$\prod_{i \neq j} \Pr\left(v_j < \frac{b_i}{\alpha}\right) = \left[F\left(\frac{b_i}{\alpha}\right)\right]^{n-1} = \left[F\left(b^{-1}(b_i)\right)\right]^{n-1}$$

where n is the number of bidders in the tender and F is the cumulative distribution function of the bids. We then maximise the expected gain $U=G\,(b^{-1}(b_i))(v_i-b_i)$ where $G=F^{n-1}$, by considering the first order condition below,

$$\frac{\partial U}{\partial b_i} = \frac{g\left(b^{-1}(b_i)\right)}{b'\left(b^{-1}(b_i)\right)}(v_i - b_i) - G\left(b^{-1}(b_i)\right) = 0$$

where $g=G'$. Substituting Equation

(1), this is equivalent to the differential equation below,

$$\frac{d}{dv_i}\left(G(v_i)b(v_i)\right) = v_i g(v_i)$$

Solving this for $b(v_i)$ to produce the optimal bidding function,

$$b(v_i) = \frac{1}{G(v_i)}\int_0^{v_i} xg(x)dx = \frac{(n-1)}{[F(v_i)]^{n-1}}\int_0^{v_i} x[F(x)]^{n-2}F'(x)dx \quad (2)$$

This optimal bidding function describes the optimal bid given the willingness-to-pay. While it is nothing more than an algebraic expression, it tells us how each bidder should react when more bidders submit their tenders. Note that both the numerator $\int_0^{v_i} xg(x)dx$ and denominator $[F(v_i)]^{n-1}$ are strictly decreasing at different rates as the number of bidders increases, meaning that Equation (2) can be a monotonic function. The usual thought of a more competitive land sale resulting in higher bids is reflected in the denominator. With $0 < F(v_i) < 1$, $b(v_i)$, $[F(v_i)]^{n-1}$ is strictly decreasing as n increases, meaning that an increased number of bidders lowers the probability of winning the tender and that the optimal bid has to rise. However, the term, $\int_0^{v_i} xg(x)dx$, the average willingness-to-pay with the condition that bidder i wins, decreases as n increases. This is due to this average being computed based on $[F(v_i)]^{n-1}$, which is also decreasing. Consequently, an increased number of bidders may not necessarily lead to more aggressive bidding behaviour. The actual outcome will heavily depend on F.

To provide a concrete example, we used the data from the most recent URA redevelopment tender. It is also the first tender where all unsuccessful bids are published. This tender attracted a total of 20 bids with the bids between HKD 545 million and HKD 1029.2 million; i.e. HKD 3,853 psf and HKD 7,277 psf (winning bid), under a maximum developable GFA of 144,344 sf. A Shapiro-Wilk test on the log-transformed data indicates that the bids are normally distributed with μ=8.588 and σ=0.166, estimated with maximum likelihood estimation. A Kolmogorov-Smirnov test and a Jarque-Bera test also give the same conclusion. Also if we arbitrarily assume that the bidder has a willingness-to-pay of HKD 10,000 psf, the model predicts that the optimal bid of a tender with 20 bidders is HKD 7,316 psf, fairly close to the actual winning bid. If the willingness-to-pay is set at HKD 9,813 psf, the model predicted optimal bid would be the same as the actual winning bid. The chart below shows the optimal bid against the number of bidders in the tender, assuming the willingness-to-pay of HKD 9,813 psf.

Not surprisingly, the optimal bid increases as n increases. However, the simulation result is subject to the choice of the underlying distribution and parameters. As Equation (2) implies, there may still exist a threshold above which the optimal bid and the number of bidders becomes negatively related. Still, even if the policy maker wishes to encourage less aggressive bidding by taking advantage of this inverse relationship, the threshold must first be

known and other polices are needed to attract a sufficient number of developers to submit their bids.

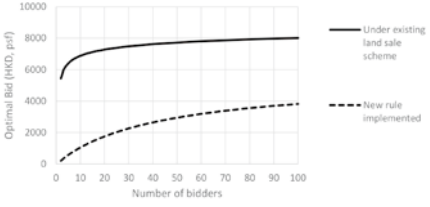

Figure 1. Optimal bids under existing and new land sale scheme

OPTIMAL BIDDING STRATEGY UNDER THE NEW RULE

We continue to use the theoretical framework developed in the previous section but with some modification to accommodate the new rule. Under the new rule where bidders have access to all historical bids, each bidder takes into account the past behavior of other bidders.

For bidder *i*, it is considered a loss to win the tender with her bid far above other bids. More specifically, it is ideal that the winning bid is close to the average of all bids while still winning the tender. As we assume that Equation (1) holds for all bidders, the willingness-to-pay of bidder *i* should ideally be close to the average of the willingness-to-pay of all. The gain of bidder *i* is then $(v\text{-}b_i)$ where $V=\frac{1}{n}\sum_{i=1}^{n}v_i$. However, v is not yet known during the tendering process. The gain should then be $E\left[V \mid b_i > b_j \text{ for } i \neq j\right]-b_i$ where the first term is the expected value of v with the condition that bidder *i* wins. Substituting $V=\frac{1}{n}\sum_{i=1}^{n}v_i$ into the expected gain *u* yields,

$$G\left(b^{-1}(b_i)\right)\left(E\left[\frac{1}{n}\sum_{i=1}^{n}v_i \mid b_i > b_j \text{ for } i \neq j\right]-b_i\right)=G\left(b^{-1}(b_i)\right)\left(\frac{v_i}{n}+\frac{1}{n}E\left[\sum_{i\neq}v_j \mid b_i > b_j \text{ for } i \neq j\right]-b_i\right)$$

Assumption (iii) implies that

$$E\left[v_j \mid b_i > b_j \text{ for } i \neq j\right]$$

for all $j \neq i$ are all equal hence,

$$G\left(b^{-1}(b_i)\right)\left(\frac{v_i}{n}+\frac{n-1}{n}E\left[v_j \mid b_i > b_j \text{ for } i \neq j\right]-b_i\right)$$

Similar to the previous example, v_i is assumed to be lognormal distributed with μ=8.588 and σ=0.166. The optimal bidding strategy then satisfies the following condition,

$$\max_{b_i>0}\left[\Psi_{\mu,\sigma}\left(\frac{b_i}{\alpha}\right)\right]^{n-1}\left[\frac{v_i}{n}+\frac{n-1}{n}e^{\mu+\frac{\sigma^2}{2}}\frac{\Psi_{\mu+\sigma^2,\sigma}\left(\frac{b_i}{\alpha}\right)}{\Psi_{\mu,\sigma}\left(\frac{b_j}{\alpha}\right)}-b_i\right] \quad (3)$$

where $\Psi_{\mu,\sigma}(\cdot)$ is the CDF of lognormal distribution with parameters μ and σ.

Unlike the previous case where the bidding rule, Equation (2), can be derived algebraically, Equation (3) can only be solved numerically using a computer. The result is shown in **Figure 1**.

It can be observed that the bidding strategy leads to less aggressive bidding behaviour; the optimal bid is lower at any level under the new rule. It is due to the fact that information about previous bids allows bidders to assess the market value of the site as well as other bidders' behaviour, preventing them from submitting unreasonably high bids. In contrast, under the existing land sale scheme, the lack of information encourages bidders to submit very high bids in an attempt to win the tender.

Moreover, the simulation shows that the growth of the optimal bid slows down as the number of bidders increases, approaching towards some asymptotic limit. This means that the new rule sets an upper bound for bids, further discouraging aggressive bidding behaviour. From Equation (3), such a limit is given by,

$$e^{\mu+\frac{\sigma^2}{2}} \frac{\Psi_{\mu+\sigma^2,\sigma}\left(\frac{b_i}{\alpha}\right)}{\Psi_{\mu,\sigma}\left(\frac{b_i}{\alpha}\right)} - b_i$$

It is important to address the limitations of our models. Our simulation is sensitive to the underlying parameters, which are derived based on 20 observations, constituting a relatively small sample. A much larger sample may result in different parameters hence very different results, such as the large reduction in the optimal bid, as shown in **Figure 1**. Another limitation of our model is our assumption that developers have the knowledge of the underlying distribution and that they follow the same bidding rule, i.e. assumption (iii). This means that developer-specific factors are not included. For instance, as addressed in the introduction section, if developers already own an adjoining site they are likely to adopt a more aggressive bidding strategy. Therefore, our analysis can be viewed as a hypothetical extreme case. Still, the results here provide insights on assessing the effectiveness of the new rule under a framework based on economic reasoning.

CONCLUSION

In order to enhance the transparency of Hong Kong's land sale market, the government will implement a new rule where all non-winning bids are published, as opposed to existing land sale schemes where only the winning bids are announced. Given that development land is a highly heterogeneous commodity, the effectiveness of the new rule cannot be fully assessed unless the same site is tendered under different schemes. This article then examines the effect of the new land sale rule by proposing theoretical models from a game theoretic perspective.

Existing land sale schemes do not provide bidders with sufficient information to assess the market value of the site being tendered. Under the private value auction framework, the optimal bidding strategy relies on each bidder's willingness-to-pay. The new rule being implemented enhances transparency and allows bidders to place their bids taking into account the past behaviour of other bidders, allowing a market value to emerge. By comparing the bidding behaviour under the private and common value auctions, our theoretical models suggest that bidding turns less aggressive under the new rule. Information regarding the market value of the site and bidders' bidding history enhances market transparency enabling bidders to place reasonably high bids in attempt to win the tender.

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Surveying & Built Environment

Field trip Notes

Hong Kong Border Security Facilities 1950-1997

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ABSTRACT

This is a short account of the context and observations of an initial field survey and interpretation of government aerial photos and survey maps of some post-war British defence structures built along the land border of Hong Kong when it was a colony. With a view to promoting the conservation of these structures – now disused, but with good potential for cultural tourism and history education – as Hong Kong's built heritage, this note covers military roads, "MacIntosh Forts", observation posts, helipads, barbed wire fences, foxholes, barracks and a firing range along the border with China.

KEYWORDS

Post-war British defence, Cold War, Hong Kong, "MacIntosh Forts", observation posts

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BACKGROUND

British defence strategy in Hong Kong after WW2 changed from one based on fixed fortifications to one of mobile defence. Most of the pillboxes along the Gin Drinker's Line were blown up in the early 1950s. From the 1960s, defenders could move quickly to any spot of concerned by vehicle or helicopter. Tanks were used like mobile fortifications and replaced pillboxes. Long range firepower support was provided by the air force and mobile artillery. Defence installations like bunkers, batteries, and pillboxes were strategically superseded by roads, airfields, helipads, and other support facilities. However, some fixed positions were still maintained and developed. Gradually "defence" was replaced by "security" as it became apparent that China wanted to maintain Hong Kong's *status quo* for a period the length of which she decided.

The "border area" was the first security *zone* for colonial Hong Kong. It stretched from Sha Tau Kok in the east to Lok Ma Chau/Mai Po area in the west, with the Shenzhen River from the Lo Wu railway crossing being the main natural western divide. The extent of the "border closed area" which survived the handover of 1997 and some of the security sites therein is depicted in **Figure 1**.

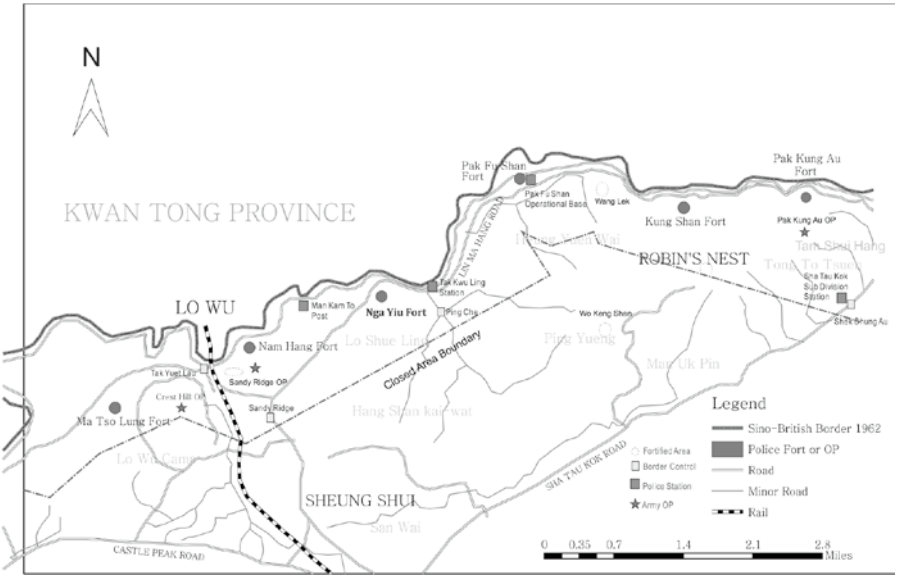

Figure 1. Security and observation posts along Hong Kong border

The area, falling within the "Frontier Police District" with its headquarters at the Fanling Police Station, was guarded by a system of fixed defence positions consisting of police stations/ posts, small forts (the MacIntosh

Forts[1]), observation posts (OPs), military roads, and helipads. Each position was usually protected externally by barbed wire, trenches, and foxholes. Outside but close to the enclosed area were barracks.

Though there was no colonial Hong Kong dream of resisting a major People's Liberation Army assault, border defence, in responding effectively to incidents of local confrontation and skirmishes, as in the case of the shooting incident at Sha Tau Kok in summer 1967 (Ho and Chu 2012), was important to win time for a diplomatic settlement. **Figure 2** shows an official press photo of Hong Kong security forces assembled near Sha Tau Kok in the aftermath of the saga.[2] Furthermore, there was a need to control illegal immigration from China (Mizuoka 2017).

Figure 2. Government photo of security forces at Sha Tau Kok taken on 8 July 1967 after a shooting incident

[1] The MacIntosh Forts (Chinese: 麥景陶碉堡) (Horsnell 1995) are a group of seven police observation posts built in Hong Kong between 1949 and 1953 at the border with China, named after Hong Kong Police Commissioner Duncan William MacIntosh (in office, 1946-1953) They have been listed as Grade II historic buildings since 1997. Six of these are covered in this note: they were from west to east at Ma Tso Lung, Nam Hang (Sandy Ridge), Nga Yiu, Pak Fu Shan, Kong Shan and Pak Kung Au. From an analysis of the relevant Block Crown leases, there was a block house at Kong Shan. From a 1971 memo (Ref 109) in the HKRS478-2-2 from the Commissioner of Police, all border police structures had to be painted white, likely to indicate to China that they were police and not military installations. However, they were painted in olive green "So that it more readily blends with the area" (Ref157) in 1972. https://en.wikipedia.org/wiki/MacIntosh_Forts.

[2] GIS archival photo no. P4479/28 dated 8 July 1967 taken by G. Lin.(Source: HKSAR Government)

A wire fence was erected along the border to help block the daily influx of Chinese subjects from the Mainland from 1949 with the passing of the *Registration of Persons Ordinance*, which effectively nullified the Treaty of Nanking provision for the free passage of Chinese subjects into and out of Hong Kong (Sutton 2017). This fence was strengthened in 1962[3] due to various stoning and shooting incidents, border violations and abductions during the Great Chinese Famine (1959-1961, Dikötter, 2010). The fence was furthered strengthened in the late 1970s (Ruan, 2011).

Apart from the British garrison in Hong Kong, the border was patrolled and monitored regularly by the Hong Kong Police (later Royal Hong Kong Police) Force, assisted by the Royal Hong Kong Regiment (the Volunteers), which was mainly formed by local Hong Kong recruits with many Chinese citizens (MacIntosh, 1952; Sinclair, 1983). British royal dignities and politicians occasionally visited the border posts to have a look across the border. **Figure 3** shows a royal visit by Princess Alexandria to Tsim Bei Tsui in 1980[4] and **Figure 4** the late Governor Youde with the Volunteers in a 1983 visit to the Crest Hill police fort[5].

Figure 3. A royal visit by Princess Alexandria to Tsim Bei Tsui in 1980

Figure 4. Governor Youde with the volunteers in a 1983 visit to the Crest Hill

Due to changes in the constitutional context and development pressures, some these structures have been abandoned (for instance the "forts" at Nam Hang (Sandy Ridge), Nga Yiu and Pak Fu Shan) or have fallen into disuse. None except the MacIntosh Forts, which were all graded "2" by the Antiquities Advisory Board (AAB), has been protected by any administrative or statutory measure. Yet, they form an interesting part of the built legacy of Hong Kong, which witnessed Hong Kong's colourful international and local history and offer good scenic views of Hong Kong and Shenzhen.

[3] See HKRS156-1-10413

[4] GIS archival photo No. 22570/3/16 dated 29 September 1980 taken by E. Cheng and S.T. Lok. (Source: HKSAR Government)

[5] GIS archival photo No. 28250/2 dated 15 October 1983 taken by D. Au. (Source: HKSAR Government)

Although there has been some academic research on the Cold War in Hong Kong (see for instance, Mark, 2007; Kwong & Tsoi, 2014), none has been known to the authors to have covered the security facilities mentioned in this note. It is hoped that this note will attract further and better research on the subject and bring to public attention the existence of these structures (and those left by the Japanese occupiers and the communist East River Brigade) in the countryside.

BORDER DEFENCE POSITIONS AND FACILITIES

The first author spends his leisure time locating ruins of pre-war and post-war British defence structures.

Along the border area, he has visited ten sites, taken photos, and mapped the terrain. The installations he saw at each site were confirmed to be absent on the 1945 series of RAF aerial photographs. These sites are:

1. Lok Ma Chau: a road and police station. (See 1:1000 Survey and Mapping Office (SMO) survey sheets 2-SE-3-A, B; and aerial photo No. 11877R[6].)

2. Crest Hill (Tai Shek Mo): a "MacIntosh Fort" (at Ma Tso Lung[7]) at about 100 m, an OP, as shown in **Figure 9**, a helipad, and a living house. (See 1:1000 SMO survey sheets 2-NE-24-B[8]; 2-NE-25A, B, C, D; 1: 10,000 SMO survey sheet 2 - NE of March 2018; 1973 RAF aerial photo No. 7842[9] and 1975 RAF aerial photo No. 11877R[10].)

3. Lo Wu: barracks (See 1: 10,000 SMO survey sheet 2 - NE of March 2018; 1973 RAF aerial photo No. 7842R and 1975 RAF aerial photo No. 11877R[11].)

4. Sandy Ridge: an abandoned "MacIntosh Fort" (at Nam Hang[12]) at about 50 m, as shown in **Figure 10**), a helipad, and some field defence installations. (See 1:1000 SMO survey sheets 3-NW-16-B, C[13], D; 1: 10,000 SMO survey sheet 3 - NW of March 2018; 1973 RAF aerial photo No. 7842R and 1975 RAF aerial photo No. 11873R[14].)

5. Gallipoli Lines (Sun Wai, Kwan Tei): barracks and a road. (See 1:1000 SMO survey sheets 3-SW-3C, D, 3-SW-8A, 8B; and aerial photo No. 11866R[15].)

6. Man Kam To and Nga Yiu area: a police post near a helipad; and an abandoned "MacIntosh Fort"[16] at

[6] RAF photo dated 24 December 1975 taken at 12,500 feet.
[7] GLA-DN-121 in Demarcation District 93.
[8] The police fort is shown on this map (June 1988).
[9] RAF photo dated 20 December 1973 taken at 12,500 feet.
[10] Same series as footnote 6.
[11] Same series as footnote 6.
[12] Unallocated Government Land, Demarcation District 89.
[13] The police fort is shown on this map (January 1985).
[14] Same series as footnote 6.
[15] Same series as footnote 6.
[16] Unallocated Government Land, Demarcation District 86.

about 63 m as shown in **Figure 11** (See 1: 1,000 SMO survey sheets 3-NW-12C, 3-NW-12D[17]; 1: 10,000 SMO survey sheet 3- NW of March 2018; 1973 RAF aerial photo No. 7842R and 1975 RAF aerial photo No. 11866R[18].)

7. Pak Fu Shan: an abandoned "MacIntosh Fort"[19] at about 95m as shown in **Figure 12**, and a helipad. (See 1: 1,000 SMO survey sheet 3-NW-9A; 1: 10,000 SMO survey sheet 3- NW of March 2018; 1973 RAF aerial photo No. 7833R[20] and 1975 RAF aerial photo 11862R[21].)

8. "Hill 150-metre" (Kong Shan) on north ridge of Wong Mau Hang Shan near Wang Lek: a fortified area with a "MacIntosh Fort"[22] at about 216m as shown in **Figure 13**, trenches, an underground OP, and various defence positions. (See 1:1000 SMO survey sheets 3-NW-9B, D; 3-NW-10A, C, D[23]; 1: 10,000 SMO survey sheet 3-NW of March 2018; 1973 RAF aerial photo No. 7833R and 1975 RAF aerial photo No.11857R[24].)

9. Robin's Nest" (Hung Fa Leng): a road, a radio station and some field defence facilities. (See survey sheets 1:1,000 SMO survey sheets 3-NW-15D[25]; 3-NE-11C; 3-NW-20B; 1: 10,000 SMO survey sheet 3-NE of March 2018 and 3-NE-16A; 1973 RAF aerial photo No. 7833R and 1975 RAF aerial photo No.11857R[26].)

10. Pak Kung Au: an "MacIntosh Fort,"[27] at about 280m as shown in **Figure 13**, an OP, and a living house. (See 1:1,000 SMO survey sheets 3-NE-7C,D and 3-NE-12 A, B; 1: 10,000 SMO survey sheet 3-NE of March 2018; 1973 RAF aerial photo No. 7833R and 1975 RAF aerial photo No. 11857R[28].)

Sites 8, 9, and 10 above are individually covered by the first author in other fieldtrip notes in the next issue.

ROADS

Roads played a major role in the post-war British mobile defence concept. They allowed security forces to move quickly to a location that became a matter of concern. Many were built along the Hong Kong-China border during the late 1940s to 1950s. Most had no name or even a number on government maps. **Figures 5 to 8** show four examples of these roads.

[17] The police fort is shown on this map (April 1984)
[18] Same series as footnote 6.
[19] Unallocated Government Land, Demarcation District 80. There are a number of Japanese pillboxes near it.
[20] Same series as footnote 9.
[21] Same series as footnote 6.
[22] GLA-TDN-28 in Demarcation District 47.
[23] The police fort is shown on this map (September 1993).
[24] Same series as footnote 6.
[25] The radio station is shown on this map (November 1990).
[26] Same series as footnote 6.
[27] GLA-TDN-26 in Demarcation District 72.
[28] Same series as footnote 6.

Figure 5. Road along the Border

Figure 6. Lin Ma Hang Road

Figure 7. Road on Wa Shan

Figure 8. Road to Robin's Nest

MACINTOSH FORTS

Built from 1949 to 1953, these were used by the Hong Kong Police as OPs for border control. They could also be used as military defence points when needed. Each fort was normally connected by road served by a helipad. These forts are shown in **Figures 9 to 14**.

Figure 9. MacIntosh Fort, Ma Tso Lung (1973)

Figure 10. MacIntosh Fort, Nam Hang (abandoned)

Figure 11. MacIntosh Fort, Nga Yiu (abandoned)

Figure 12. MacIntosh Fort, Pak Fu Shan (abandoned)

Figure 13. MacIntosh Fort, Kong Shan

Figure 14. MacIntosh Fort, Pak Kung Au

HELIPADS

Pending further and better research as regards their role, helipads appears to be an iconic postwar local security structure built near key defence positions without road access to provide quick support and reinforcement as well as civilian uses such as rescue. Those in the closed area were likely mainly for anti-illegal immigration purposes. See **Figures 15 to 20**.

Figure 15. Helipad at Nam Hang

Figure 16. Helipad at Pak Fu Shan

Figure 17. Helipad at Pak Fu Shan Police Post

Figure 18. Helipad at Robin's Nest

Figure 19. Helipad at Wu Shek Kok

Figure 20. Helipad at Crest Hill

BARBED WIRE

Several layers of barbed wire fences were erected along the border area and at each defence position. See **Figures 21 and 22.**

Figure 21. Barbed wire surrounding Crest Hill

Figure 22. Remains of barbed wire stands at Robin's Nest

FOXHOLES

Many foxholes were found along the border area. See **Figures 23 to 24.**

Figure 23. Foxhole along Sandy Ridge facing Lo Wu MTR Station and the (Kowloon-Canton now Eastern) Railway

Figure 24. Foxhole at Robin's Nest

BARRACKS[29]

[29] Prof. S.N.G. Davies offered two reasons other than border security for locating camps in the New Territories are twofold. (a) Immediately post-war and during the Korean War the very large British military presence needed to be distributed and in any case there was insufficient space in the urban areas. (b) Pre-war there was a standing practice of summer/late autumn camps in the New Territories for the resident garrison and the Volunteers, which were always centred on the military training camps/areas as Fanling and Sheung Shui. These seem to have been established c.1927 and to have been in regular use thereafter. By 1937 the Sheung Shui camp was mapped as Lowu Camp and the Fanling camp as San Wai Camp. He identified from the 1952 maps San Wai Camp, Fan Gardens Camp, Volunteer Camp, Dodwell's Ridge Camp, Lowu Camp, Beas Stables Camp, Dill's Corner Camp, Norwegian Farm Camp, Tam Mi Camp, Sek Kong Camp, Quarry Camp, Pak Yuen Camp, Far East Farm Camp, Garden Camp and Tai Lam Camp.

Many barracks were built near the border zone. Some examples were Ngau Tam Mei, Casino Lines, Dill's Corner Camp, Lo Wu off Castle Peak Road and Gallipoli Line (Sun Wai) along Sha Tau Kok Road. They were still some distance from the border fence. From these camps, the security forces could move quickly to any point along the border when needed.

FIRING RANGE

In the border area a military firing range can be found at Wa Shan, as shown in **Figure 25.**

Figure 25. Firing range below Wa Shan

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