



Are Hong Kong's Policies For Climate Change-Induced Displacement In Low Lying Fishing Villages Adequate?

University of Hong Kong and Earth Refuge

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HKU x Earth Refuge

Typhoon Hagupit put its full might on display in Hong Kong at 10 p.m. in September of 2008. Along with astronomical tides, the cyclone picked up water from the sea, elevating it to 3.5 metres high.

Nobody saw this coming.

Seawater, mingled with mud, came pouring into the houses of Tai O, one of the last-standing fishing villages of Hong Kong. Within a short time, the ground floors of several buildings became engulfed by the incoming floods. Residents scrambled to climb out of their windows in search of safety, thrown into the darkness of the night as their homes and possessions were destroyed.

This paper tells the story of Tai O, and of its residents, destined to become “the first batch of climate migrants” in the city.

INTRODUCTION

As climate change worsens, Hong Kong sees more frequent and severe extreme weather events. Typhoons in the city are forecast to follow the global trend of increased severity,¹ with the Hong Kong Observatory writing in its summary of findings of the UN ESCAP/WMO Typhoon Committees that the Northwest Pacific is expected to experience a rise in the proportion of typhoons marked 'very intense', as well as a rise in the risk of coastal inundation.² By as early as 2030, Hong Kong may face the threat of storm tides at 5.87 metres brought about by typhoons, according to CWR's New Base Case Scenario in the recent CLSA report.³ This is twice the 2.35-metre surge, the highest on Hong Kong's record, when Typhoon Mangkhut tore through the city.⁴

Adding to the mix, are gradually rising sea levels - another byproduct of climate change. As the research of the Air Pollution & Climate Secretariat shows, even a two-degree celsius increase in average global temperature could raise sea levels by 1.5 to 4 metres,⁵ potentially submerging considerable portions of many of Hong Kong's most populated areas below the sea.⁶

Were this to happen, large swathes of Kowloon and Hong Kong Island would be affected. This includes Central, the city's financial hub that houses the Exchange Square, and the headquarters of multinational banks HSBC and Standard Chartered. Almost three quarters of Hong Kong's GDP will be at stake.

¹ Tropical Cyclone Warning Signals are issued to indicate the severity of typhoons in Hong Kong, in which the gravity grows with the increase of number. See further in Hong Kong Observatory (HKO), "Hong Kong's Tropical Cyclone Warning Signals," https://www.hko.gov.hk/tc/publica/gen_pub/files/tcws.pdf.

² HKO, "Global Climate Projections - Tropical Cyclones," https://www.hko.gov.hk/en/climate_change/proj_global_tc.htm.

³ China Water Risk, "CWR Guest Authors New CLSA Report: Thirsty & Underwater: Rising Risks in the Greater Bay Area," August 30, 2019, <https://www.chinawaterrisk.org/notices/cwr-guest-authors-new-clsa-report-thirsty-underwater-rising-risks-in-the-greater-bay-area/>.

⁴ HKO, "Storm Surge Records in Hong Kong during the Passage of Tropical Cyclones," https://www.hko.gov.hk/en/wservice/tsheet/pms/stormsurgedb.htm?t=RANK&v=STORM_SURGE.

⁵ Air Pollution & Climate Secretariat (AirClim), "Sea Level Rise Already at 2-Degree Warming," October 2012, <https://tinyurl.com/2p8786cb>.

⁶ Li Jing and AFP, "Rising Sea Levels Set to Displace 45 Million People in Hong Kong, Shanghai and Tianjin If Earth Warms 4 Degrees from Climate Change," South China Morning Post (SCMP), November 9, 2015, <https://www.scmp.com/news/hong-kong/health-environment/article/1877284/rising-sea-levels-set-displace-45-million-people>.





Location of Tai O (extracted from Hong Kong government's map)

Whilst the economic implications of climate change that are often cited by governments when casting a spotlight upon climate change, the human cost for those forced to flee their homes is all too often minimised. The impact of climate change on everyday citizens, such as those currently staying in Tai O, is widely overlooked.



Tai O Rural Committee Historic and Cultural Showroom, which shows Tai O's history as a fishing village (extracted from Wikimedia Commons, taken by Wpcpey)





Stilt houses⁷ of Tai O (taken by the research team)

A Tradition to Carry On

A stark contrast to the skyscraper-packed skyline that Hong Kong boasts, Tai O is characterised by tin-roofed houses that hover above the river, propped up only by a few wooden beams. Commonly known as “stilt houses”, they were first built by a small group of fishermen of the Tanka ethnic group, who decided to settle in Tai O for its proximity to the Pearl River. Tens grew to hundreds, and later to thousands. With that, a fishing village came to being – and bloomed.

The prosperity of the rural was replaced by that of the metropolitan starting in the 1970s.⁷ Some embraced the urban lifestyle, and never looked back. Some come back occasionally, treating the place they used to call home a holiday resort. Some have remained loyal to the sea, but are retiring. The stilt houses once housed generations of modest fishermen who fed their families with daily catches – and now, mostly memories remain. Many of these structures now stand vacant,⁸ marking Tai O’s legacy as one of the four remaining fishing villages in Hong Kong. Still suffering from the blows of urbanisation, the distinct heritage is now vulnerable to the devastation of our changing climate.



⁷ School of Hotel and Tourism Management, the Hong Kong Polytechnic University, Feasibility Study of Fishing Tourism in Hong Kong (Central Policy Unit, the Government of HKSAR, January 2011), https://www.pico.gov.hk/doc/sc/research_reports/Fishing%20Tourism.pdf.

⁸ Interview with the fisherman representative of the rural committee

Residents of Tai O, mainly made up of the elderly, have borne the brunt of the typhoons that have struck, and continue to strike Hong Kong with increasing intensity. These typhoons have brought in floods that have damaged homes and belongings.⁹ After typhoon Hagupit in 2008, 37% of its residents reported serious losses, including entire fridges, washing machines and personal items like photo albums.¹⁰

What This Report Will Cover

The gravity of the impact of climate change upon Tai O's community speaks to the necessity for measures to be put in place to urgently safeguard the rights of those living there. In the aftermath of the 2008 typhoon, detailed research led to new policies being brought into force, designed to protect Tai O residents from future climate-induced harm. However, there is a scarcity of follow-up research in recent years, which provides little accountability to the affected population following the implementation of such policies.

The needs of Tai O residents, obtained through surveys and in-depth dialogues, were consolidated in Tai O under climate change: A preliminary study into the sophistication of emergency responses of Tai O residents, a report put together by the Carbon Care InnoLab, the Tai O Sustainable Development Education Workshop and the Hong Kong Jockey Club Disaster Preparedness and Response Institute, with the help of other NGOs such as the Hong Kong Young Women's Christian Association (the "2016 report"). Focusing on accounts of the aftermath of Typhoon Hagupit, the detailed impacts of climate-change-induced typhoons are also documented in the 2016 report.¹¹

Building upon the perspectives brought to light by the 2016 report, this field report endeavours to examine whether existing policies meant to protect Tai O residents are adequate. This report will also briefly provide suggestions of improvement.

The authors would like to thank all those who have provided testimonies, shared lived experiences, and supported with the documentation of this research.

In order to conduct this research, authors of this report met with two NGOs:

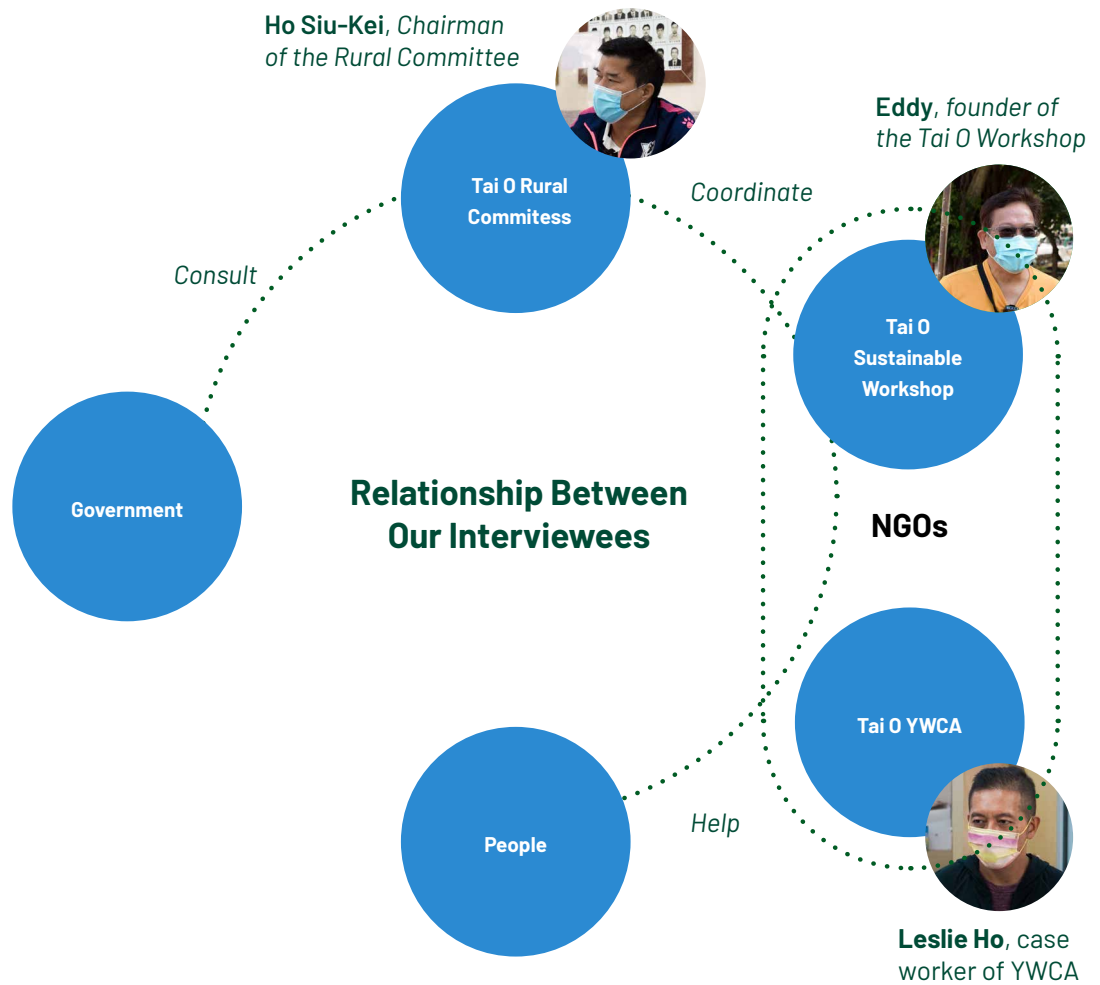
- Tai O Sustainable Development Education Workshop ("Tai O Workshop")
- Hong Kong Young Women's Christian Association (YWCA) Tai O Community Work Office ("YWCA").



⁹ The most damaging typhoons in Tai O's recent history were Utor (2001), Nuri (2008), Hagupit (2008), Koppu (2009), Hato (2017) and Mangkhut (2018).

¹⁰ Carbon Care InnoLab, Tai O Sustainable Development Education Workshop and Hong Kong Jockey Club Disaster Preparedness and Response Institute, 氣候變化下的太澳社區防災應變能力初探 (Tai O under climate change: A preliminary study into the sophistication of emergency responses of Tai O residents) (2016), <https://www.ccinnolab.org/uploads/media/氣候變化下的太澳社區防災應變能力初探.pdf>.

¹¹ See Appendix I for more information about the 2016 report



In addition, interviews were conducted with two representatives of the Tai O Rural Committee, which is the only officially-recognised bridge between the government and the community:

- Ho Siu-Kei, Chairman of the said Committee and an Ex-officio Member of the Islands District Council
- Wong Yung-kan, Representative of Fishermen in the same committee ("Rural Committee").

Biographies of these interviewees are attached in Appendix I. These interviews were all conducted in Tai O in November 2021.

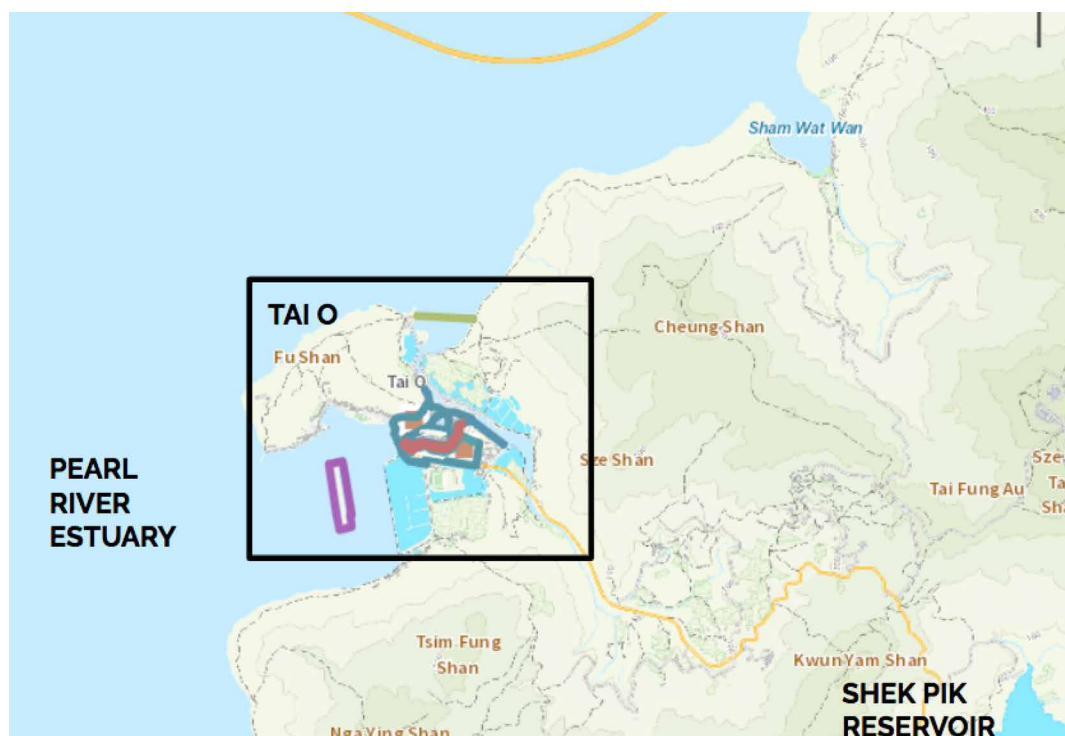


CAUSES OF FLOODING IN TAI O

To lay the groundwork for the analysis of government measures, this report will first explore some of the main causes of flooding in Tai O.

By far, the primary cause of flooding in Tai O can be attributed to flooding, such as in the case of typhoon Hagupit in '08. When a typhoon approaches from the west, seawater from all sides of the Pearl River Estuary, directed by the currents of the wind, leaps towards Tai O. As a result, the narrow rivers in Tai O, inundated by the sudden influx of water, overflow and threaten the surrounding structures with flooding.

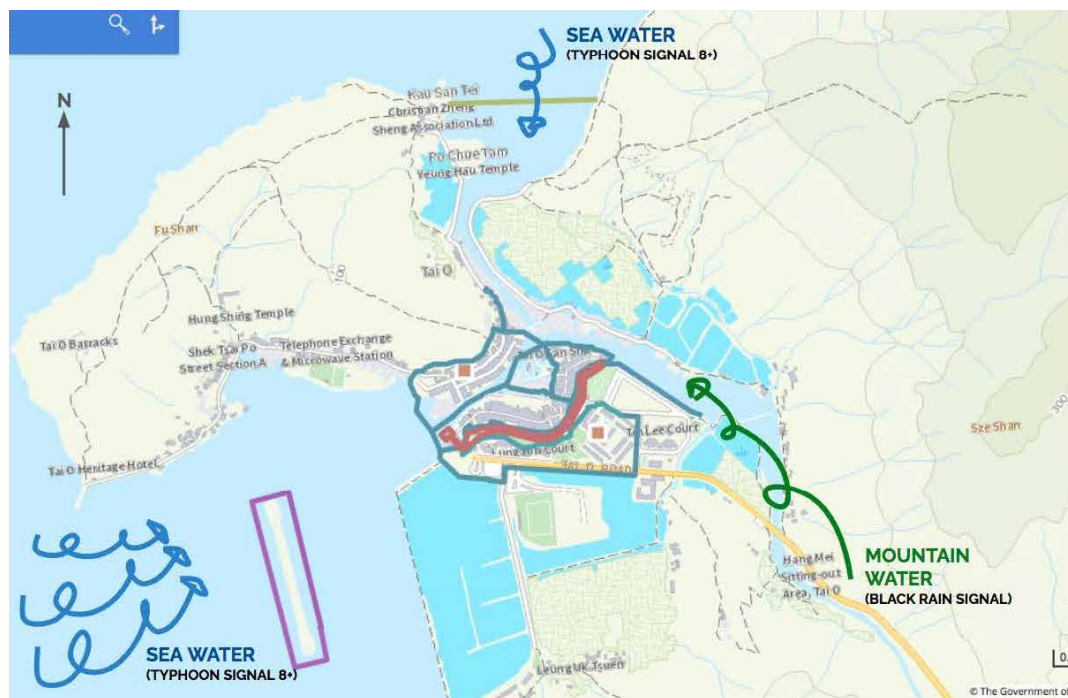
A second, yet rare, source of flooding are mountain streams. There has only been one recorded instance of such flooding, which also occurred in 2008. When the Black Rain Signal was hoisted in June 2008,¹² mountain water from Fung Wong Shan Shek Pik Reservoir (see Map 1 for location) came bursting out of the pipes that were meant to hold them. The spilt water, along with eroded soil, rushed all the way down to Tai O, causing both dangerous landslides and floods.



Map 1 - location of Tai O (extracted from Hong Kong government's map and further edited by the research team)



¹² There is a rainstorm warning system in Hong Kong, which is designed to alarm the public about the (potential) occurrence of heavy rain. Level of seriousness increases from amber, red and to black.



Map 2 - sources of water flowing into Tai O (extracted from Hong Kong government's map and further edited by the research team)

BACKDROP: A GOVERNMENT BLIND TO CLIMATE DISPLACEMENT

Perhaps the most notable policy relating to climate change that Hong Kong has announced is its 'Climate Action Plan 2030+' in 2017. This plan was created with a view of incorporating the Paris Climate Agreement in local policies. Included in this plan is also a pledge to reduce Hong Kong's carbon intensity by 65% to 70% of the 2005 base year's level by 2030.¹³ This would require that Hong Kong moves from primarily coal generated fuel to a combination of natural gas and non-fossil fuels.

Outside of emission targets, the *Climate Action Plan* outlines how the territory aims to deal with continued, and potentially increasing, risk of natural disasters such as typhoons, flooding and landslides. Such action generally focuses on the development of infrastructure that can withstand such disasters, as well as the expansion of disaster management and mitigation systems such as flood prevention and slope safety mechanisms.¹⁴

However, as climate change heightens both the intensity and unpredictability of natural disasters it remains to be seen whether such infrastructure will be able to protect those on the receiving end of more extreme weather events.



¹³ Environment Bureau, the Government of HKSAR, Hong Kong's Climate Action Plan 2030+ (Hong Kong: Environment Bureau, January 2017), <https://www.enb.gov.hk/sites/default/files/pdf/ClimateActionPlanEng.pdf>.

¹⁴ Ibid

Concerningly, there is barely any reference within the Climate Action Plan made to the ways in which the Hong Kong government intends to respond to the displacement of persons due to natural disasters. Climate change-induced displacement is only alluded to once in the 102-page document, when the government, in writing about the ramifications of higher sea levels, states that “there are longer-term considerations that will need to be discussed in the coming years ... areas [in] which a retreat in the future might have to be considered”.¹⁵ No further elaborations were made. Despite displacement as a result of sea level rise posing a serious challenge to communities, the government has not adequately addressed the problem.

THE GOVERNMENT’S RESPONSE TO FLOODING

While climate migration has not been at the forefront of government discourse, flood mitigation projects have nevertheless been implemented. With the far-reaching impacts of climate change, coupled with the catastrophe that the typhoon-induced flooding in 2008 caused, the Hong Kong government built preventive infrastructures and introduced an emergency response plan for Tai O residents. This report will assess the effectiveness of each of the key measures brought into force.

Preventive Infrastructure

With hopes to curb floods, the government tasked the Civil Engineering and Development Department, as well as the Drainage Service Department with the construction of various preventative infrastructures.¹⁶

At this juncture, it is helpful to identify some areas within Tai O, unofficially known among its residents: Sun Ki, Kat Hing, Yat Chung, Yee Chung, Sam Chung, Tai Ping, Wing On and Lung Tin. In the following, this report delves into the projects that the government embarks on in each of the aforementioned areas, and answers the question of whether they are able to deliver on their promises.



¹⁵ Ibid, p. 73.

¹⁶ INeha Jain, “Hong Kong’s Preparedness and Resilient Infrastructure Cut Economic Losses from Typhoons,” United Nations Office for Disaster Risk Reduction, December 4, 2021, <https://www.undrr.org/news/hong-kongs-preparedness-and-resilient-infrastructure-cut-economic-losses-typhoons>.



Map 3 – preventative infrastructure (red) and different areas in Tai O (blue) (extracted from Hong Kong government's map and further edited by the research team)



Elevation of Car Park (taken by res Aerial Shot of Lung Tin (taken by research team))



Lung Tin

Lung Tin is largely residential, with government-built subsidised and public housing estates that dot the area. There, the government elevated the car park (i.e., the white area directly below the red line in the map) by one metre. Likewise, the fencing along Tai O Road (i.e., pink line 1 in the map of this section) was buoyed up. The government spent around HK\$100 million (US\$13 million) for these structures.

The Tai O Workshop pointed out that whilst they have shielded Lung Tin and Wing On from flooding, they have not yet attempted to mitigate the flooding in Kat Hing.



Aerial Shot of Lung Tin (taken by research team)

Wing On

Wing On is frequently visited by tourists. However, it is also the area of Tai O that is most prone to flooding.

The government undertook several construction projects to grapple with the issue. The most substantial one in this area is the flood barrier (i.e., red line 4 in the map) along parts of the coast of Wing On. Costing the government another HK\$100 million (US\$13 million), the barrier is 220 metres long, three metres tall and 0.6 metre wide. People were opposed to a taller barrier, citing poor views and potential ventilation issues in Wing On. But to ensure sufficient protection, according to the Tai O Workshop, the government came to a compromise with locals: screws were to be installed on the three-metre fence, so that the relevant personnel can securely stack an additional 0.5-metre barrier on the three-metre fence when needed.

The Tai O workshop further elaborated that while it is true that the people living in Wing On were the intended beneficiaries of the barrier, locals living outside of Wing On are now faced with a different, more alarming, reality. The barrier closes the width of the river dividing Wing On and Kat Hing. The sea water that is now barred from entering Wing On, instead flows into other areas, such as Kat Hing, Yat Chung, Yee Chung or Sam Chung. According to the Tai O Workshop, anecdotal evidence from people residing in Tai Ping and stilt houses in Yat Chung suggest that other areas are now actually more prone to floods because of the barrier. It has been speculated that Wing On's interests are prioritised, as it houses many businesses that go to the heart of Tai O's economy.





Wing On (taken by the research team)



(Left) The left lump of concrete is the three-metre barrier. Eddy's arms show how tall the barrier with additional blocks can be (taken by the research team). (Right) The screws on the three-metre barrier (taken by the research team)



Location of the barrier, Wing On and Kat Hing (taken by the research team)



Tai Ping

Tai Ping sees a mix of modest private housing and stilt houses, both passed down through generations. Aside from the Wing On barrier, which has unfortunately increased the severity of floods, the seawater also ripples through the gaps between the poles of the stilt houses at the riverbank of the area.

In an attempt to avoid flooding, water gates are installed at doorways. Their effectiveness is questionable though, since water can also flow into the house from its walls. Moreover, the government installed screws on several structures so that government officials can attach barriers, in case of an impending flood. It is unclear to authors of the report how often they are utilised.



(Left) Gaps between poles that hold up stilt houses (taken by the research team) (Middle) Water gates at the doorway (taken by the research team) (Right) Screws on the ground for temporary barriers to be inserted (taken by the research team)

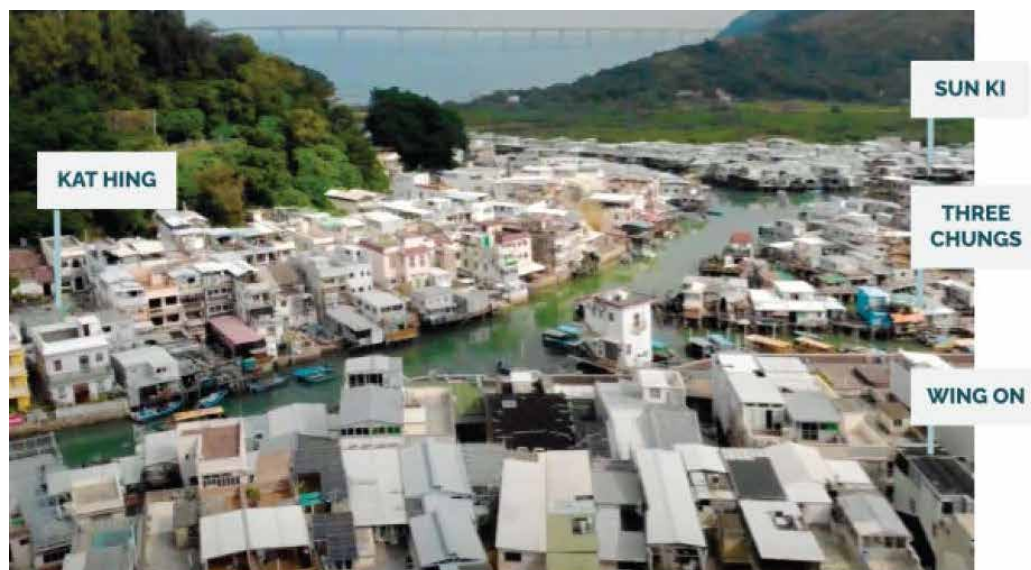
Yat Chung, Yee Chung & Sam Chung

The Three Chungs, known to local residents as Yat Chung, Yee Chung and Sam Chung, are very low-lying areas covered in stilt houses – a living testament to Tai O's extensive history as a fishing village. Currently, there are no preventive infrastructures protecting residents in this area.

Residents in this section of Tai O are also negatively affected by the flood-mitigation infrastructures in other areas. What is more worrying is that The Three Chungs are dominated by stilt houses, which, by their very nature, are prone to floods. Whenever a typhoon hits, wooden floorboards of the houses frequently get washed away, and most of the furniture is soaked in water.

Elevating stilt houses, either by the government or civil society, may mitigate such impacts. This is, however, an impractical path to tread, with financial factors and peculiarities of Hong Kong's laws at play. The endeavour averages at around HK\$300,000 (US\$39,000) to HK\$400,000 (US\$51,000), on an inexpensive end, and around HK\$700,000 (US\$90,000) to HK\$800,000 (US\$116,000) for materials of higher calibre, according to the YWCA. These





Aerial Shot of Sun Ki, the Three Chungs and Wing On (taken by the research team)

prices are unrealistic expenditures for stilt house dwellers, many of whom are elderly retired fishermen.

Coming to face is also an entangled bundle of legal issues. Under current housing policies, stilt houses constitute squatter units. The question of ownership itself is thorny, given that most stilt houses are passed from one family member to another, usually without leaving any documentary evidence or adhering to proper legal procedures. The government is therefore reluctant in introducing measures for improvement.

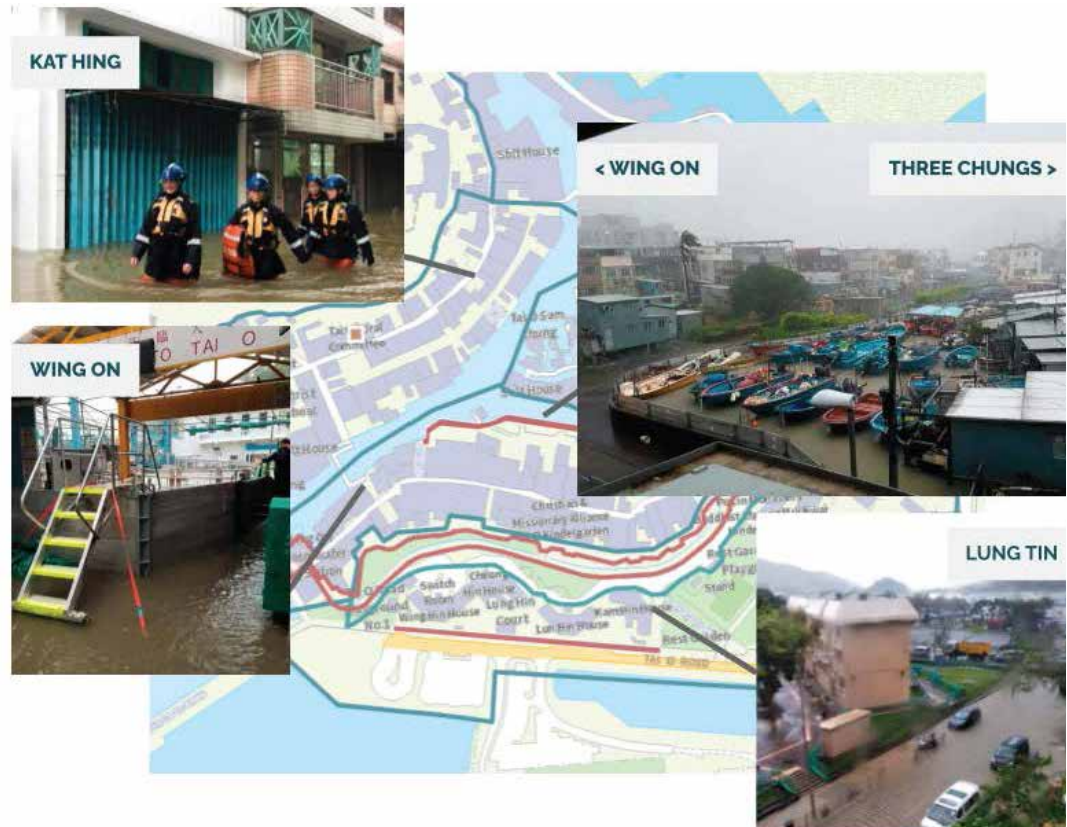
Key Findings

The government's infrastructure was put to the test in 2018 when Super-Typhoon Mangkhut reached the shores of Tai O, bringing with it intense gusts and floods. As observed in the photos, different areas saw vastly diverse effects. Wing On seems to have been the least affected place, with floods touching only the foot of a postbox. The same can be said about Lung Tin, where the incoming seawater covered only half a tyre of a car. For Kat Hing, on the other hand, the flood was at least thigh-high. The Three Chungs was affected the most, as the sticks that support the stilt houses there, usually more than 3 metres tall, became fully submerged in the river (for comparison, refer to the photo below). Wing On was sheltered by the barrier at the bank.

The aftermath of Typhoon Mangkhut exemplifies a running motif in this section: not all areas appear to be equal.

The palpable disproportionate impacts of flooding in Tai O have led to claims that anti-disaster infrastructure has aggravated flooding in some areas of

Tai O, represented by the Tai O Workshop. This may also create an impression that the government displays favouritism for some pockets of the population over another.



Map 4 - preventative infrastructure (pink) and different areas in Tai O (blue)(extracted from Hong Kong government's map and further edited by the research team). Overlaid with photos of flooding caused by Typhoon Mangkhut in 2018 (provided by the Tai O Workshop, geo-located by the research team)

The workshop notes that opinions as such have long been denounced by the government. The Rural Committee echoes this denial. In the authors' interview with the Committee, they said that intensified flooding in certain areas should more properly be attributed to water levels that happen to be higher there for geographical reasons. Casting the blame on the infrastructure represents a wrong way of thinking about flooding in Tai O, the Committee says. It is noteworthy that rural committees generally harbour pro-establishment views.

While either side is not empirically backed, at least one thing remains clear: some areas go through worse floods than others.



Aerial Shot of Wing On and Three Chungs, when Tai O is not hit by floods. Pink circled part demonstrates how the poles at the stilt houses are normally exposed in the air, instead of being immersed in water (taken by the research team)

TAI O EMERGENCY RESPONSE PLAN

The emergency response plan is intended to minimise damage from flooding in Tai O by allocating resources, preparing shelters, keeping emergency response teams at standby and providing warnings and advice to residents. It is activated when the Hong Kong Observatory forecasts a sea level rise of 3.3 metres or more in the imminent hours.

All available temporary shelters in the Rural Committee Office will be made available, as well as spaces in various community buildings.¹⁷

The plan which was set up by the Islands District Office is divided into three parts, namely: warning systems for floodings; evacuation and rescue; and post-flooding emergency aid.¹⁸



¹⁷ The Government of HKSAR - Press Releases, "Inter-Departmental Drill on Emergency Response to Flooding in Tai O (with Photos)," May 28, 2021, <https://www.info.gov.hk/gia/general/202105/28/P2021052800506.htm>; Security Bureau, the Government of HKSAR, <https://www.sb.gov.hk/eng/emergency/ers/pdf/ERSc5.pdf>, <https://www.sb.gov.hk/eng/emergency/ers/pdf/ERSc6.pdf>; <https://www.sb.gov.hk/eng/emergency/ers/pdf/ERSc7.pdf>.
¹⁸ reference Carbon Care InnoLab Report 2016



Part I: Warning System for Floodings

A warning system, which was specifically designed for Tai O, is triggered when the Hong Kong Observatory predicts that a typhoon is near, and that Tai O's mean sea level is at 3 metres and may go above 3.3 metres in the coming few hours. The Observatory notifies the relevant government departments, the Rural Committee, NGO representatives, Village Representatives and others through SMS. The Island District Office then activates the emergency coordination centre in Tai O (jointly set up by the Island District Office, the Fire Services Department, the police, and the Social Welfare Department). Residents, amongst those, fisherman representatives, are tasked with disseminating the information to the rest of the community. This facilitation of information is intended to make residents aware of the risks and to encourage them to take refuge in safer locations where necessary.

Adequacy of Warning System for Floodings

When asked about the adequacy of the warning system, the Tai O Workshop noted that one of the shortcomings is that the warnings are not sent out to the general public. The residents must therefore rely on village leaders to spread the message that a warning has been issued.

Interestingly, the 2016 report shows that 71% of respondents do not recall receiving such a warning. Only a minority of the respondents, a meagre 29% said that they have been sent a warning before (Figure 1). Moreover, only 15% of the respondents answered correctly when asked when the warning system will be triggered (Figure 2). The fact that the general public is not directly addressed via the warning system reflects the inadequacy of government protective mechanisms.

Another issue that the Workshop drew the authors' attention to is that the warning system is not triggered when the Hong Kong Observatory hoists the Black Rain signal warning. In other words, under the government's warning system tailored for Tai O (separate from the Hong Kong Observatory's warning system), residents will not be notified of water hazards that may be subsequent to landslides in nearby mountains, albeit rare.

Regardless of its efficacy, little reliance has been placed on the institutional warning system. Many have continued to count on traditional methods to predict natural disasters: drawing correlations between the Observatory's projections of where the typhoon will be landing and how serious the flooding can be, based on past experience - and more so, putting their trust in fishermen, having spent most of their careers manning their boats and shielding them against the perils of the sea. Tai O residents' judgements of the weather are mostly backed by indigenous knowledge, and are therefore driven largely by bottom-up forces.



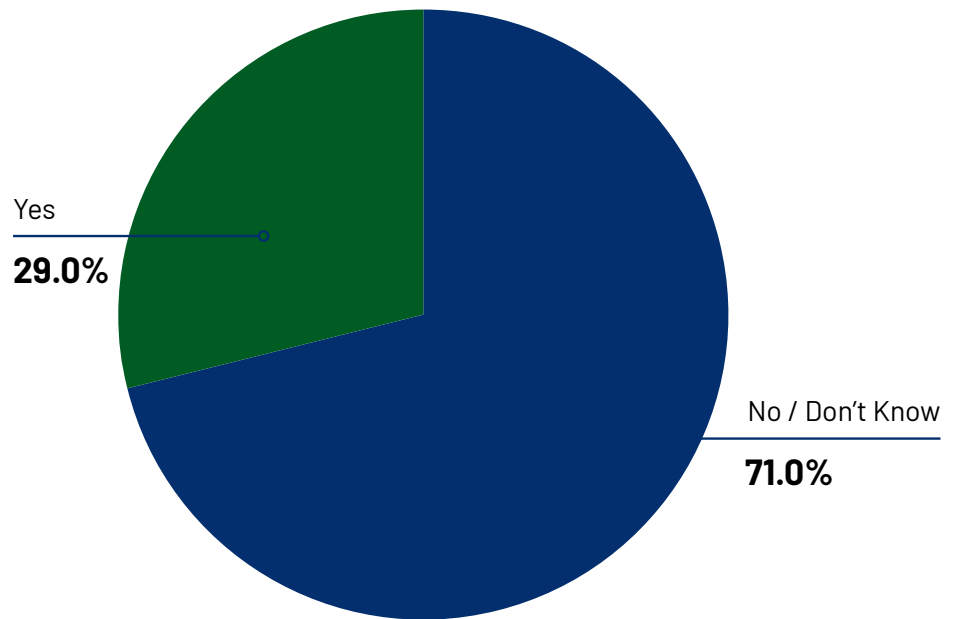


Figure 1 (extracted from the 2016 report and translated by the research team)

Do you know when the flooding warning will be sent to Tai O representatives/government departments?

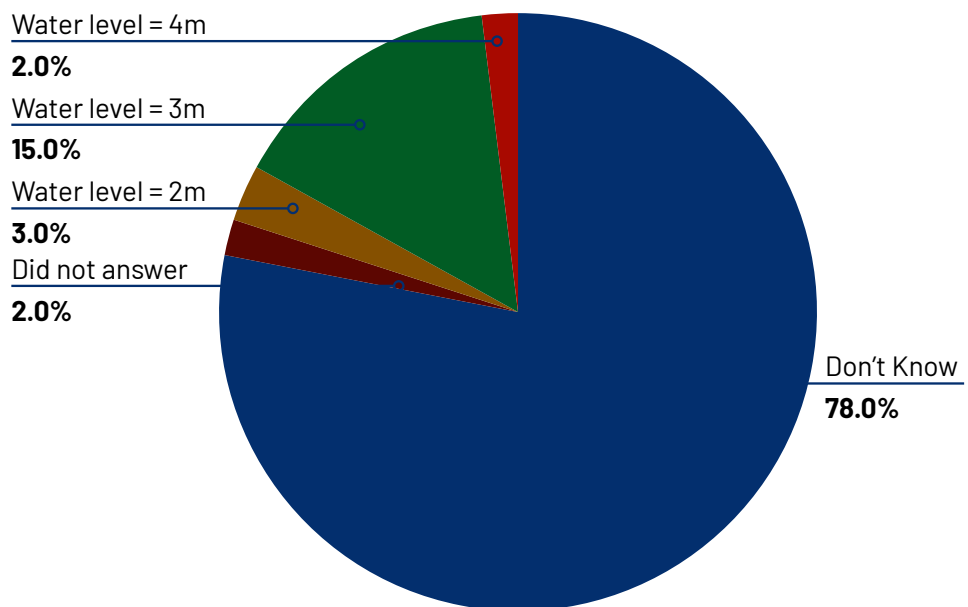


Figure 2 (extracted from the 2016 report and translated by the research team)





Part II: Evacuation and Rescue

Evacuation and Difficulties Encountered

When Typhoon Hagupit struck in 2008, residents were stranded – along with the firefighters that were meant to save them. Unfortunately, the fire department at the time was not equipped with any rubber boats to save the casualties.

While the government has since purchased proper equipment for the firefighters, one problem remains unresolved, which is their confusion as to which particular house corresponds to the address given to them in emergency phone calls. Although instruction plates were installed in the village after 2008, Tai O, from the team's experience in the field trip, remains difficult to navigate. With the many stilt houses that dot the landscape of Tai O, it is almost impossible to tell one from another, especially when there is no comprehensive map in existence that documents where all the structures are. One can only imagine that the difficulty will be heightened at a time of emergency, or at night time, when flooding commonly takes place.

Typhoon Shelters

Instead of resorting to the work of rescue services, it is perhaps more preferable to get residents themselves to evacuate before the onset of flooding – and that is exactly what the government's policy on evacuation and rescue pivots on. To help residents evacuate, the government designated the YWCA centre in Lung Tin and Tai O Rural Committee Office in Kat Hing of Tai O as typhoon shelters. Their locations are indicated as "A" and "B" on map 3.

The opening of temporary shelters due to adverse weather conditions is largely contingent upon warning signals issued by the Hong Kong Observatory. Temporary shelters may be opened when there are tropical cyclone warnings of signal number 8, landslip warnings, red/ black rainstorm warnings or during other emergency situations. But as the Home Affairs Department clarified, the question of whether to activate a shelter is ultimately under the discretion of the District Office.¹⁹ It may be that District Officers are unwilling to incur the risk of keeping shelters shut at a typhoon at level 8 or above, and that logically speaking Observatory warnings are effectively an official mandate to allow public access to shelters, but the discretion remains.



¹⁹ Home Affairs Department, the Government of HKSAR, "Emergency Relief Services Provided," https://www.had.gov.hk/en/public_services/emergency_services/emergency.htm#1.



(left) entrance of the Rural Committee Office (right) entrance of the YWCA centre (taken by the research team)

An Inside Look at the Shelters

To get a better grasp of how the system is operationalised, the team conducted a site visit to one of the shelters, the YWCA centre. To ensure that the shelter is run properly during flooding, the NGO is mandated to have in-store food (noodles), clothes (donated from the Red Cross) and towels. Whenever they anticipate flooding, according to the person-in-charge, the centre would prepare sleeping arrangements and meals. While not required by the government, the centre has also installed a television in the centre so that residents who come to the shelter can stay occupied. YWCA says that the centre can seat around 30 to 50 people.

From the team's observation, however, the shelter is quite small and would not be able to comfortably accommodate as many people as the centre suggested, especially once the beds are set up.



These shortcomings are worrying, especially in light of the fact that the shelter is supposed to serve the needs of most Tai O residents (those living in Wing On, Yat Chung, Yee Chung, Sam Chung, Tai Ping, Lung Tin, parts of Sun Ki). However, the other main shelter - the Rural Committee Office, in which the team had an interview with the Rural Committee Chairman and the Fisherman Representative of the Committee, seemed a lot more spacious. Given its location on the map though, it predominantly serves residents of Kat Hing and parts of Sun Ki. It appears to the team that there is a mismatch between the needs of Tai O residents and the selection of the shelters by the government.



Interior of the Rural Committee Office (taken by the research team)

Use of the Shelters

The government only permits entrance into the shelters once the Typhoon Signal 8 is hoisted. In strict adherence to the policy, it used to be that the relevant government officials would only arrive at the shelter upon the announcement of Typhoon Signal 8. This sort of bureaucracy caused delays in the opening of the shelter, ultimately defeating its primary purpose. In response to YWCA's and Tai O Workshop's repeated requests for the government to open the shelter to the public at least an hour before it raises the Typhoon Signals to 8, the government has now effectively decided to notify the organisations that run the shelters (in this case, YWCA) of potential floodings, days in advance. To prepare the shelter adequately for an influx of residents, government officials have also agreed to arrive earlier.

Despite these improvements, it is unclear whether the use of these shelters is optimised. For example, many Tai O's residents are not even aware of their existence. The 2016 report indicated that only 9% of the respondents were able to locate the two temporary shelters in Tai O and others either failed to name the location of any shelter or could only name one correct location. Another interesting finding in that report was that 47% of residents stated that they had not received any help in the process of evacuating (e.g. they had to

pack up their belongings by themselves). Only 13% of the respondents said that the government department helped them to evacuate. The report emphasised that having to evacuate without proper help can often be dangerous, especially to the elderly residents, taking up large portions of Tai O's ageing population, and because evacuations can take place at any time, including during the night. The effects that shelters are intended to bring about will be greatly discounted, if the residents' journey to them is arduous in the first place.

Can you locate where the two shelters are?

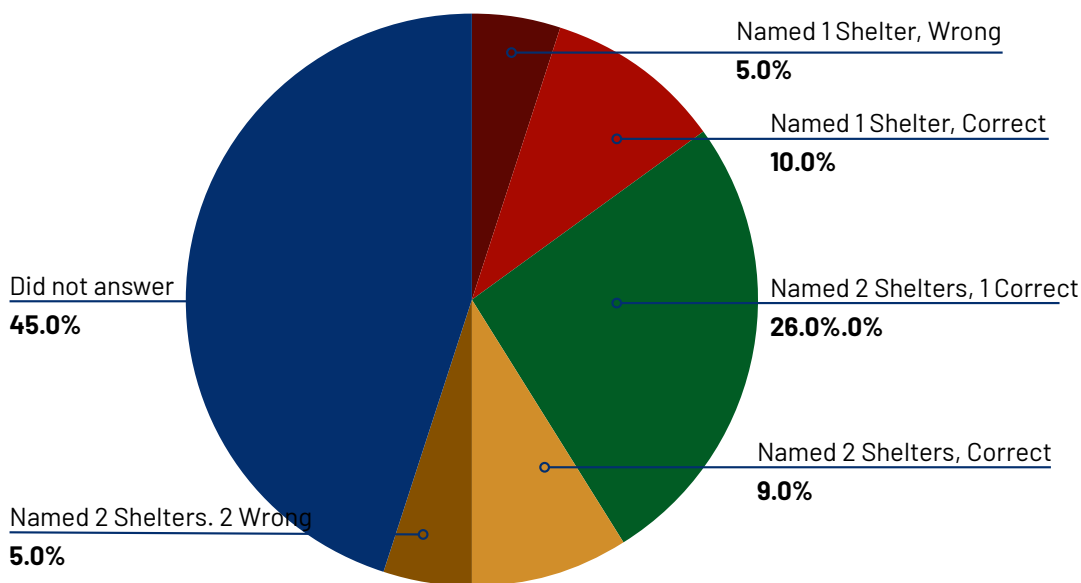


Figure 3 (extracted from the 2016 report and translated by the research team)

Since the shelters are only opened when Typhoon Signal 8 is hoisted, they have yet to address potential flooding that originates in the mountains, triggered by heavy rain or Black Rain Signals. Though rare right now, unpredictable weather induced by climate change may increase the possibilities of such flooding.

Did you get any help when evacuating?

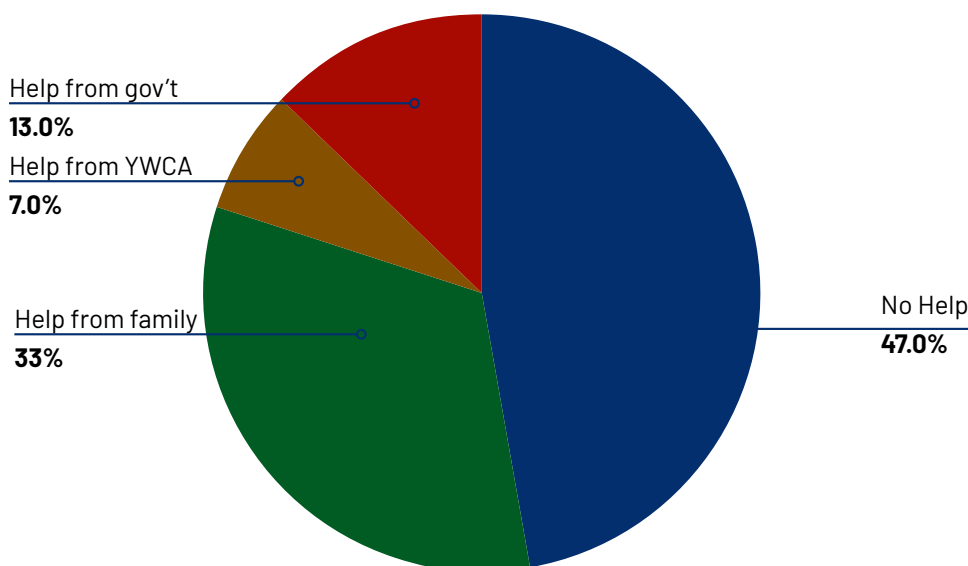


Figure 4 (extracted from the 2016 report and translated by the research team)





Part III: Post-flooding Emergency Aid

It is uncommon to see the government giving compensation and aiding affected residents after floods and typhoons. Such compensation and assistance can be divided into two parts - monetary and material compensation, which includes temporary housing, according to information provided by the interviewees from the Tai O Workshop and YWCA Tai O Community Work. Yet, complaints towards these efforts were made by interviewees during the interview as well.

Monetary and Material Compensation

Prior to 2008, there was not any comprehensive compensation system. Money was not given in the form of compensation, but as “emergency relief to those who were in need”, which requires a financial needs assessment.²⁰ Only around 30 families were given HKD2,700²¹ from the government, as deduced by information given to us by the Tai O Workshop and media reports. Criteria for the selection of recipients was also unclear.

The trauma of typhoon Hagupit in 2008 left a profound scar on Tai O. Since then, after constant lobbying by the civil society, the government started drawing up policies to give out subsidies. Marking a watershed in the development of subsidies for climate-induced injuries, the government poured more than HKD1 million into two foundations, the General Chinese Charities Fund (GCCF) and the Emergency Relief Fund (ERF), as suggested by the Tai O Workshop. The two funds were designed to provide assistance to persons in need of urgent relief due to natural disasters or accidents (only applicable for GCCF).²²

The encouraging endeavours, however, were put to a halt in 2017. The government’s reasoning for doing so is that private companies had already provided monetary relief for residents affected by typhoons at the time: the Tai O Heritage Hotel gave families HKD2,000 and the Wa Wing Fund provided them with HKD3,000 – 4,000, as per the Tai O Workshop. It was only upon angry protests of residents that the original funds were put back in place by the government for registration; except this time, with stricter bars of eligibility. Bureaucratic processes are involved to, among others, prove causation between the damage sustained by the family seeking help and the natural disaster at issue, as well as the number of family members. The causation issue here may be difficult to prove, as the affected residents could not draw two-tier causation directly. There is not a simple scientific or a factual notion of causation between the damages and the natural issue. Regarding the “but-for” test, it is also difficult to argue that the damages would not have happened

20 The Government of HKSAR - Press Releases, “Government offers financial assistance to Tai O residents,” October 10, 2008, <https://www.info.gov.hk/gia/general/200810/10/P200810100209.htm>

21 陸納 (Luk Nam), “大澳風災水浸 居民批評政府遲發援助金 (Tai O in typhoon and flood. Residents condemned the government for late assistance,” Citizen News, September 1, 2017, <https://www.hkcnews.com/article/6613/大澳·災情惡化 災民逾6613/>

22 Home Affairs Department, the Government of HKSAR, “General Chinese Charities Fund and Special Aid Fund,” https://www.had.gov.hk/en/public_services/general_chinese_charities_fund_and_special_aid_fund/index.htm; Social Welfare Department, the Government of HKSAR, “Emergency Relief,” https://www.swd.gov.hk/en/index/site_pubsvc/page_socsecu/sub_emergency/.

without the occurrence of the typhoon and its corresponding protective measures. Although the causation test is not designed to deter recourse, complications still remain as not only the burden of proof is placed on affected residents, but the finding of the proof itself can be very challenging.

In terms of aid, a family visit is a prerequisite. To add to the burdens of families under distress due to climate change, these processes are not resident-friendly. For instance, the family visit is only done on a weekday after the typhoon takes place. This generates problems because, one, most residents usually stay in urban districts for work purposes and only come home during the weekends. Two, the time lapse of the visit means that victims of flooding will have to wait for a few months, without fixing the damage posed by typhoons on their possessions - just to prove their honesty for government officials, in order to be given money that is barely enough for repairs. In practice, the funds run counter to what they are set up for.

Further impeding the effectiveness of government subsidies is the lack of promotions. Some victims affected by 2018's typhoon Mangkhut relayed that the District Offices never deployed staff members to inform them of the two aforementioned funds. They have only become privy of it through word of mouth of their neighbours.²³

In the department of post-disaster assistance, the ball seems to be passed to charity groups and NGOs.²⁴ Among the groups that provide extra compensation is the Yan Chai Emergency Assistance Relief Fund and the Wa Wing Fund. NGOs like the YWCA and the Neighbourhood Advice-Action Council are also involved, mainly in aid that entails physical work. In 2017, the Yan Chai Emergency Assistance Relief Fund sent HKD2,000 to Tai O suffering residents, of whom the elderly can choose to have a fridge instead; YWCA helped with funding floor repairment. In 2018, the Wa Wing Fund distributed HKD2,000-3,000 to affected victims. Note, it was not treated as compensation, but as relief. The work initiated by civil society is generally regarded to be more extensive than that by the government.²⁵



²³ The Government of HKSAR - Press Releases, "LC09: General Chinese Charities Fund and Emergency Relief Fund," June 5, 2019, <https://www.info.gov.hk/gia/general/201906/05/P2019060500394.htm?fontSize=1>

²⁴ Catherine Lai, "Are You Treating Us like We're Dead?: Flood-Hit Tai O Villagers on Front Line of Typhoon Hato Decry Gov't Response," Hong Kong Free Press, September 2, 2017, <https://hongkongfp.com/2017/09/02/treating-us-like-dead-flood-hit-tai-o-villagers-front-line-typhoon-hato-decry-govt-response/>.

²⁵ Ibid

Temporary Housing

To access temporary housing, the place of permanent residence must no longer be habitable. In reality though, merely fulfilling this requirement does not suffice, as shown by anecdotal experience recounted by the Tai O Workshop. In one of the cases he presented, a Tai O resident's bed was completely soaked wet after serious flooding at his home, making it unfit to live in. In spite of this, he was initially not granted temporary accommodation by the Housing Department of the government, until he threatened to break the lock with a hammer. Having stayed two to three days there, he was asked by government officials to vacate the flat, even though the defects in the original place he had been dwelling in were not fixed yet. The debacle, this report hypothesises, can be attributed to an absence of concrete definitions of what constitutes "uninhabitable" in the context of flooding. Discomfort itself may not be sufficient in constituting uninhabitability,²⁶ but severe damage of a premises, as to render it unfit for use (not merely dilapidated and in need of repair or the destruction of a premises) may be sufficient to prove a residence uninhabitable.²⁷

It is understandable why the government sought to limit access to temporary housing. After all, it is aligned with public interest that a robust approach to temporary housing would deter squatters. That being said, given the helpless circumstances that victims of climate change often find themselves in, the government is encouraged to build a set of guidelines tailored for climate-induced displacement to make sure no one is left unhoused because of natural disasters.



²⁶ *We Sharp Ltd v Samtani Anand P* [2016] HKCU 2073 [9]

²⁷ *Choi Chee Ming v Lecleq Yu Mi* [2019] HKDC 414 [11], citing page 104, *Hong Kong Tenancy Law 6th Edition* by Malcolm Merry 2016 and paragraph 67 of the judgement of Hon B Chu J in *Time Rich 08 Limited v DBE (HK) Limited & Others* (HCA 566/2017). While the definition of uninhabitability of the case concerns a "suspension of rent" clause in the tenancy agreement, the case is useful to a certain extent in determining uninhabitability in other kinds of premises.

RECOMMENDATIONS



I. Improvement of Current Policies

Infrastructure

The government should build a barrier (e.g. levee, embankment) in Kat Hing, as the severity of flooding in that area is very high.



Warning System (partly referencing to Carbon Care InnoLab Report 2016)

The government should collaborate with other telecom companies to improve the warning system, so that the messages can be sent directly to all Tai O residents.



Mitigation and Post-flooding Work

In general, it can be said that more intervention from government departments (particularly the Home Affairs Department, the Civil Engineering and Development Department and the Drainage Service Department) is needed, as donations and help from NGOs are not enough to mitigate the effects of the floods. It is important for the affected citizens that the government not only has preventative measures in place but also mitigation and post-flood measures.

An example of this would be to have helpers assist people when they elevate their furniture to avoid any flood-related damage.

In terms of post-flood policies, YWCA stated that a more detailed and active policy on monetary compensation, financed by taxpayer revenue, would help the affected community. The compensation policy should provide a more efficient payment and registration system.

Moreover, aside from monetary compensation, individuals would benefit from a scheme that would support them in getting their damaged items restored and fixed.

RECOMMENDATIONS



II. Suggestion for Future Policies

Building a Gate (proposed by Mr. Ho, Chairman of the Rural Committee)

An idea would be to build a gate that would prevent pearl river estuary water from flooding Tai O entirely (green line in P.4 map 2). Such gates are often built in the Netherlands and have effectively prevented floods.²⁸ The government in Hong Kong stated that it would be willing to consider building such a gate but so far no specific development plan has been published. Reasons for this could be that various factors have to be taken into account, such as the cost of building the gate, which would be around HKD 10 billion, plus if such an investment would make sense considering the small population size of Tai O. Moreover, NGOs might have considerations about such a project in terms of sustainability and environmental protection and residents themselves may oppose large infrastructures as it could block their view.



Improvement of Squatter House Policy (suggested by YWCA)

The government should also issue renovation permits and funding should be given to fishermen to elevate their stilt houses, under the name of cultural preservation to avoid floodgate applications from other squatter house owners.



Permanent Move

Moving residents out of Tai O permanently does not seem to be an option for the moment, especially because the residents are not willing to do so and because a permanent move would be at odds with culture preservation. Nonetheless, such a drastic step could be used as a last resort.²⁹



²⁸ CBS News, "Sea Change: How the Dutch Confront the Rise of the Oceans" May 21, 2017, <https://www.cbsnews.com/news/sea-change-how-the-dutch-confront-the-rise-of-the-oceans/>.

²⁹ Carbon Care InnoLab Report 2016, <https://www.ohchr.org/sites/default/files/documents/issues/climatechange/cfi-promotion-and-protection/non-states/2022-07-04/CarbonCare%20InnoLab-cfi-promotion-and-protection.pdf>

CONCLUSION

Government policies under the Emergency Response Plan are evidently not able to guarantee that displaced residents will be safe under its measures. Against this backdrop, as aptly put by YWCA, it is mainly civil society that is there to deal with matters relating to warning systems, evacuation and post-disaster relief in Tai O. The Rural Committee, composed of those with a close relationship with residents of Tai O, as well as NGOs like YWCA have played a key role in facilitating post-disaster relief and maintaining shelters so that they are ready for use.

Particularly, the camaraderie shared among Tai O residents has become vital to the survival of the community. The way in which Tai O residents warn each other of the likelihood of flooding is a testament to this. Many respondents stated that their neighbours, even if they did not know them, had offered to let them stay in their houses during the floods. And these floods have only made the community stronger over time. According to YWCA, compared to the staggering loss of 500 fridges in 2017 when Hato, classed by the Hong Kong Observatory to be the maximum category 10 typhoon, slammed into the city, Typhoon Mangkhut, equally a number-10 typhoon, took away only 30 fridges. Previous episodes of natural disasters seem to have equipped Tai O residents with better preparedness. Similar observations are made by the Rural Committee.

Self-help can only do so much. The limitations of communal support become most pronounced when it comes to building infrastructure to reduce the impacts of flooding. With the government holding the reins over how land is used with its building regulations, civil society can only do so much to put in place physical barriers to guard themselves from the devastating impacts of natural disasters - a sort of sentiment that is perhaps most poignant among those who stay in stilt houses, arguably the oldest and poorest in Tai O.

The question of governmental assistance boils down to this: at a time when resources are strained, whether the government should bear responsibility for addressing the concerns of Tai O residents, when there are so many other groups in need, bigger in size and higher in stake, to attend to at the same time. Fundamentally, the priority of their worries hinges upon whether they are, merely, a "worry" to take note of, or are elevated as a right: a right to be protected against climate-change-induced displacement, a right that is part-and-parcel of the right to life and security, a right that demands rigid and adequate governmental protections. As the status quo shows, there is no recognition of such right. And this, is the root of the challenges that Tai O residents face, and will mount in the near future.



Appendix I - About the Sources

Background Information on the 2016 Report

The report from 2016 was conducted by the NGOs CarbonCare InnoLab and Tai O Sustainable Development Education Workshop, and by the Hong Kong Jockey Club Disaster Preparedness and Response Institute (HKJCDPRI) and the Hong Kong Jockey Club Charities Trust.

Methodology of the Report

Residents of Tai O were randomly approached between the 31st of July 2016 and the 16th of October 2016 and asked to fill out a questionnaire. 204 people aged 15 or above, which according to 2011 government statistics constituted around 10% of the Tai O population aged 15 or above, were given the questionnaire and 197 effective questionnaires were obtained.

For in-depth interviews, 70 elderly residents living in Lung Tin, Sun Ki, Tai Chung, Shek Tsai Po Street, and Kat Hing Back Street, were interviewed, with the help and assistance of Hong Kong Young Women's Christian Association (YWCA) Tai O Community Work Office as well as The Neighbourhood Advice-Action Council. The interviews were conducted on the 6th of September 2016, 9th of September 2016, and 10th of September 2016. These interviews focused on the interviewees personal experiences and feelings during flooding in Tai O and comments on the natural disaster management of the government.

Background Information on the Interviews in Tai O in November 2021

Four interviews were conducted in November 2021 in Tai O. Two of the interview partners were representatives of civil society organisations, one was the founder of Tai O Workshop and the other represented YWCA Tai O Community Work Office. The other two interviewees were politicians, the Chair of the Tai O Rural Committee, also an Ex-officio member of the Islands District Council (Ho Siu-kei), and the Representative of Fishermen of the Committee (Wong Yung-kan).

Tai O Sustainable Development Education Workshop³⁰

Tai O Sustainable Development Education Workshop is an independent and registered non-governmental organisation whose members include residents of Tai O and people who care about sustainable development. Its purpose is

³⁰ <https://www.facebook.com/taio.sdworkshop/>



to promote the awareness of sustainable development of the community, and encourages residents in Tai O and the general public to pay attention to the sustainable development of the community. The main work of the NGO is to hold workshops/guided tours/experience activities/lectures, etc., to reflect on Hong Kong's development and planning issues. The Workshop also tries to implement a "Zero Waste" and a recycling campaign in Tai O.

Hong Kong Young Women's Christian Association (YWCA) Tai O Community Work Office³¹

The organisation has 100 units all over Hong Kong and describes themselves as a diversified Christian social service organisation that serves different groups of people in need. Amongst other things they strive to promote gender equality and women's empowerment, women's leadership.

Tai O Rural Committee³²

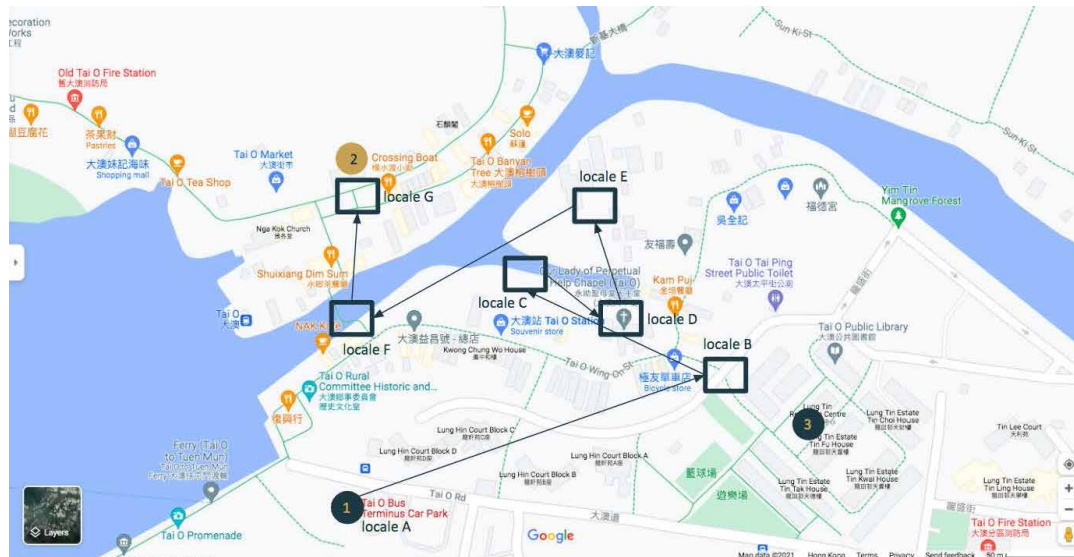
The Tai O Rural Committee is one of 27 rural committees of Hong Kong. Tasks of the committee members vary but include reflecting views on the affairs of an indigenous village on behalf of the indigenous inhabitants of that village and reflecting views on the affairs of a village on behalf of the residents of that village.



³¹ <https://www.ywca.org.hk/services/centre-location>

³² <https://www.had.gov.hk/rre/eng/intro/background.html>

Appendix II - About the Field Trip



Time	Purpose	Interviewee	Venue	Perspective
0900 - 1000	Interview + Mini tour	Tai O Sustainable Development Education Workshop	Tai O Bus Terminus	Civil Society Organisation
				Resident
1100	Interview + Site visit	Chair, Tai O Rural Committee + Ex-officio Member, Islands District Council, Ho Siu-kei 何紹基 **No stated affiliation	Tai O Rural Committee Office (Disaster Shelter 1)	Politician
		Tai O Representative of Fishermen in the Rural Committee, Wong Yung-kan 黃容根 **DAB		Politician
				Fisherman
1200	Site visit + interview	HK YWCA Tai O Community Work, case worker, Mr Leslie Ho	YWCA Tai O Office (Disaster Shelter 2)	Civil Society Organisation



