QIGU FLOATING ESCAPE
七股離漂

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Qigu Floating Escape
七股離漂

漁電共生與傳統產業
Fishery and Electricity Symbiosis and Traditional Industries

本項目聚焦於臺南市七股區採用的「漁電共生」模式，作為對傳統養殖業衰退的回應。七股區位於臺灣西南沿海，以潮間帶、沙洲及潟湖聞名，這些地形不僅為包括黑面琵鷺在內的瀕危物種提供了重要棲息地，也支持了當地的農業與漁業產業。然而，近年來傳統養殖業逐漸式微，許多養殖池遭到廢棄。這片地區主要由潮間帶、沙洲及潟湖組成，沿岸分布著許多紅樹林，並成為候鳥的棲息地。該區的曾文溪濕地更是瀕危鳥類黑面琵鷺的重要棲地。七股區屬於熱帶季風氣候，當地產業以農業和漁業為主。

為了應對這一挑戰，透過如臺南七股太陽能光電場等專案引入的光伏綠能，推動了漁業與能源生產相結合的混合模式，重新激活了該地區的景觀與經濟潛力。本研究旨在探討該模式的環境與社會影響，特別聚焦於創新的浮動微型住宅單元設計，以支持當地漁民可持續的浮動生活方式。這些單元採用交錯層壓木材（CLT）和現有的太陽能基礎設施，打造節能的半戶外生活空間，並整合能源、水資源及氣候系統。

本研究目標是評估該模式的可持續性，分析其在資源效率、棲地保育以及提升臺灣沿海社區經濟韌性方面的益處。

This project focuses on the "fishery and electricity symbiosis" model in Qigu District, Tainan City, responding to the decline of traditional aquaculture. Located on Taiwan's southwestern coast, Qigu is known for its tidal flats, sandbanks, and lagoons, which support endangered species like the black-faced spoonbill. In response, the introduction of photovoltaic green energy, like the Tainan Qigu Solar Farm, has promoted a hybrid model combining fishery and energy production, revitalizing the region's economy. This study explores the environmental and social impacts of this model, focusing on innovative floating micro-housing units for fishermen. Using cross-laminated timber (CLT) and existing solar infrastructure, these units create energy-efficient living spaces that integrate energy, water, and climate control systems.

This research aims to assess the sustainability of this model, evaluating its benefits in resource efficiency, habitat conservation, and enhancing coastal communities' economic resilience in Taiwan.

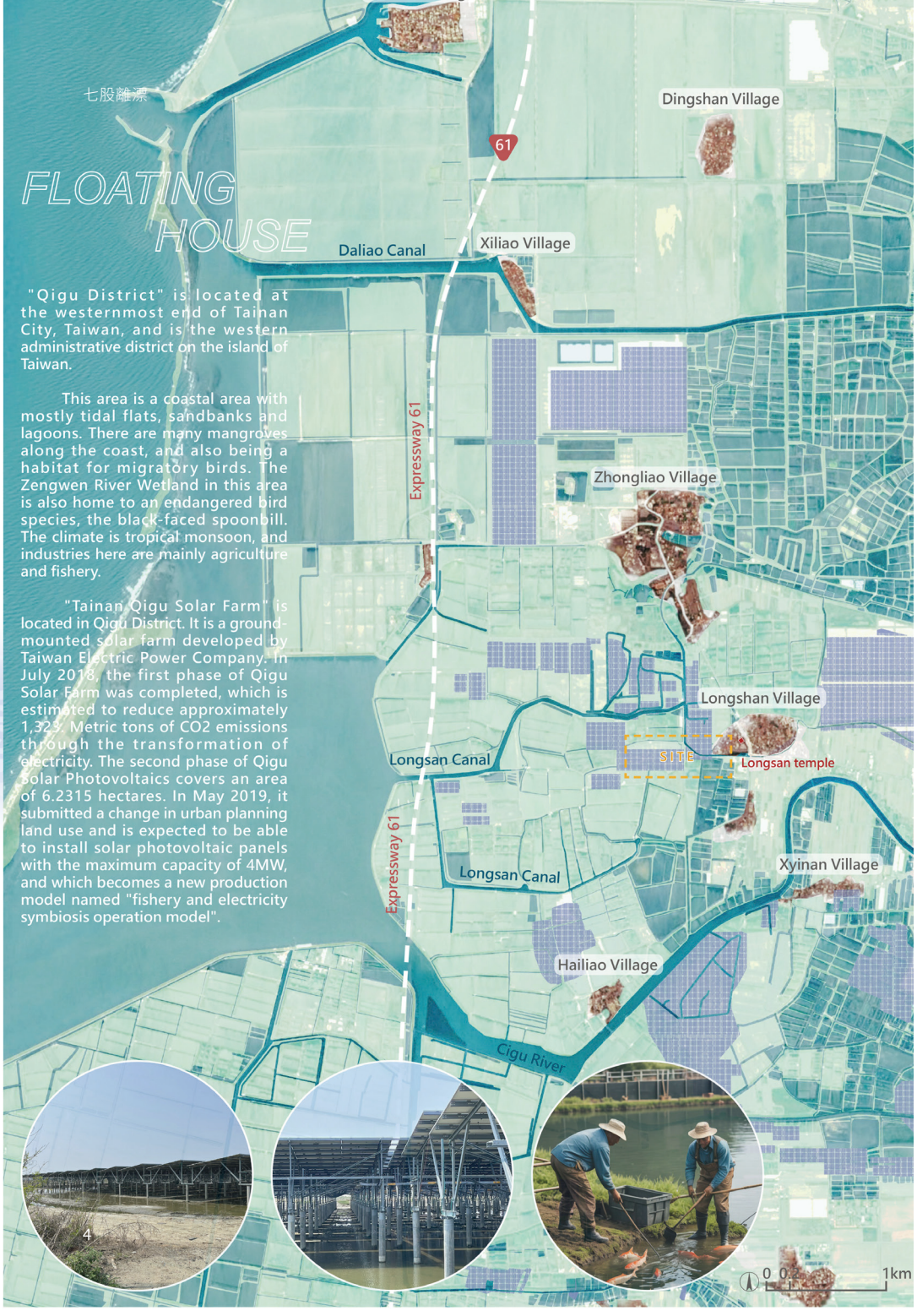
七股離漂

FLOATING HOUSE

"Qigu District" is located at the westernmost end of Tainan City, Taiwan, and is the western administrative district on the island of Taiwan.

This area is a coastal area with mostly tidal flats, sandbanks and lagoons. There are many mangroves along the coast, and also being a habitat for migratory birds. The Zengwen River Wetland in this area is also home to an endangered bird species, the black-faced spoonbill. The climate is tropical monsoon, and industries here are mainly agriculture and fishery.

"Tainan Qigu Solar Farm" is located in Qigu District. It is a ground-mounted solar farm developed by Taiwan Electric Power Company. In July 2018, the first phase of Qigu Solar Farm was completed, which is estimated to reduce approximately 1,323. Metric tons of CO_2 emissions through the transformation of electricity. The second phase of Qigu Solar Photovoltaics covers an area of 6.2315 hectares. In May 2019, it submitted a change in urban planning land use and is expected to be able to install solar photovoltaic panels with the maximum capacity of 4MW, and which becomes a new production model named "fishery and electricity symbiosis operation model".



Fishery and Electricity Symbiosis Operation Model

- Original aquaculture farmers have priority in leasing.
- Site design is communicated with the fishermen.
- Aquaculture species remain unchanged.
- Installation only occurs with agreement from both the landowner and the aquaculture farmers.
- Only clean water is used for cleaning.

Electricity provider
Provide funds to improve the surrounding environment of the fish ponds and obtains a usable solar energy field.

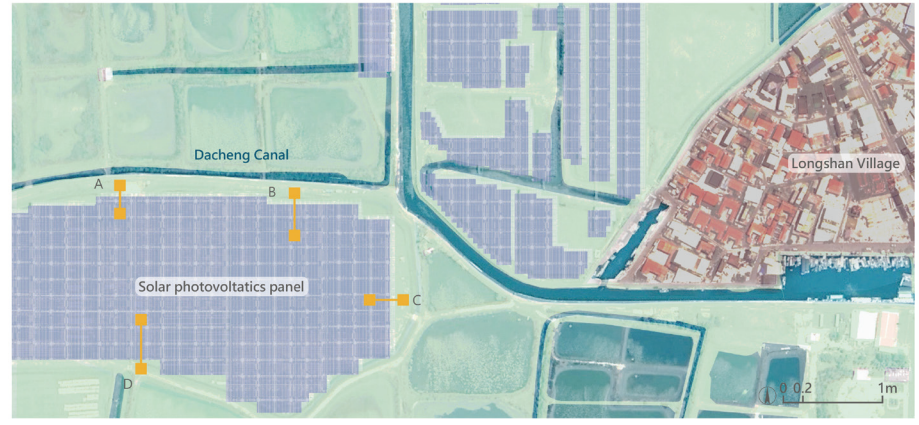
Provide land and land management services

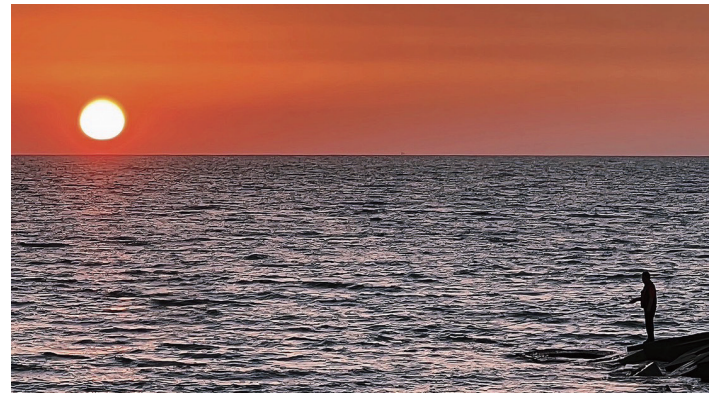
Reduce farming costs, introduce smart aquaculture, enhance farming areas
Offer aquaculture expertise and technology

Landowner
Maintains existing fish pond usage and receives rental income.

Maintain good interactions

Aquaculture farmers
Pay a lower rent to continue their aquaculture activities and gain an improved farming.





遮是阮生長的所在，遮的內海孕育了阮

This is where we grew up, and these inner seas have nurtured us.

空間與環境系統

Space and Environmental Systems

半戶外的養殖生產環境能有效減少養殖所需的勞力並促進產業升級，亦透過發電能源增加農民的收入，實現漁業與電力的雙贏效益。

此微型住宅單元，提供了浮動生活方式的可能性。依靠原有的太陽能光伏板和電力系統，滿足遮蔭與能源需求，使這棟採用 CLT 建造的浮動房屋創造出舒適的半戶外空間。實現節能、可持續、環保的住宅設計。

設計上，電力、水系統與浮動房屋在此被有效整合，並透過智慧管理系統與高效設備，使住宅成為一棟被動式建築，能以高效節能的模式自動運作。在太陽能板的遮蔭下，涼風從魚塘吹入，熱氣則透過高窗排出，形成空氣的流通與對流。CLT 浮動房屋藉由下方的浮筒提供浮力，漂浮於魚塘之上，讓人們與水保持適當距離。房屋內還配備了清水與污水的儲存系統，並與屋頂上的雨水收集槽相結合，形成可自行處理水資源的系統。

The semi-outdoor aquaculture environment reduces labor and promotes industrial upgrading, while increasing farmers' income through energy generation, benefiting both fisheries and electricity.

This micro-housing unit combines work and living in a floating lifestyle. Using solar panels and power systems, it provides shading and energy, creating a comfortable semi-outdoor space in a CLT-built floating house with an energy-efficient design.

Electricity, water systems, and the house are integrated with a smart management system, ensuring high energy efficiency. Cool air flows from the pond, hot air exits through high windows, and the house is buoyed by pontoons above the pond, with a self-sustaining water management system.

若是無龍山宮，阮可能無法度佇遮一直生活到今

If not for Longshan Temple, we might not have been able to live here until now.

翻轉的想像

Flipped Imagination

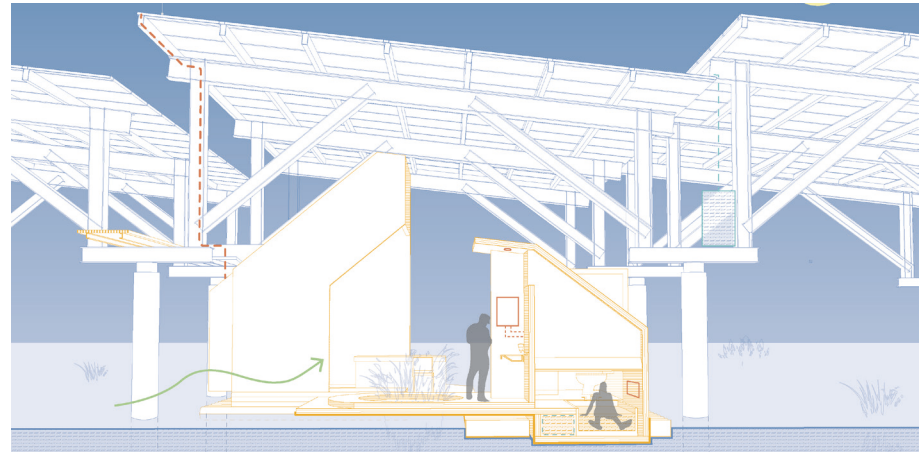
這項設計透過可翻轉的牆面和可滑動的家具，提供了一種自由生活的想像。當人們希望獨處時，臥室單元便可以分離並漂浮到其他地方，提供一個逃離的機會；而當餐桌與椅子滑出時，則形成一個半戶外空間，讓夫妻可以在廣闊的養殖魚塘上方用餐，享受獨特的自然景觀，促使人們在浮動的生活環境中體驗到與自然的親密接觸。 這座浮動房屋不僅成為工作時的後備空間，還大大提升了漁民的生活便利性和工作效率。借助現行能源政策的支持，浮動房屋將傳統的養殖漁業升級為一種生活與工作相結合的混合形式，並通過太陽能等節能方式進行能源管理。

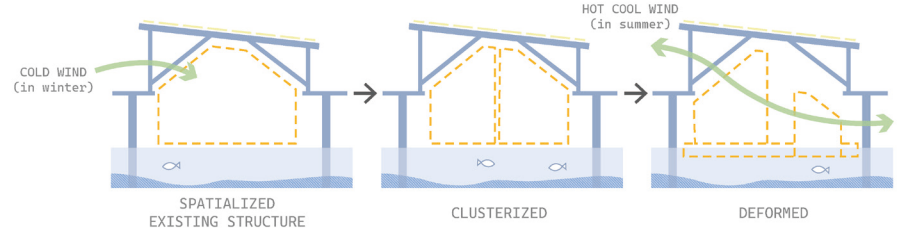
我們希望這項目能夠持續發展，在改變了傳統漁業生產方式的同時，也能夠促進了地方經濟的轉型，讓當地社區得以受益於更加環保和高效的產業模式。 期許這種創新型住宅系統為漁民提供了更靈活的工作環境，並促使整體社會對綠色能源和可持續生活方式的關注與實踐。

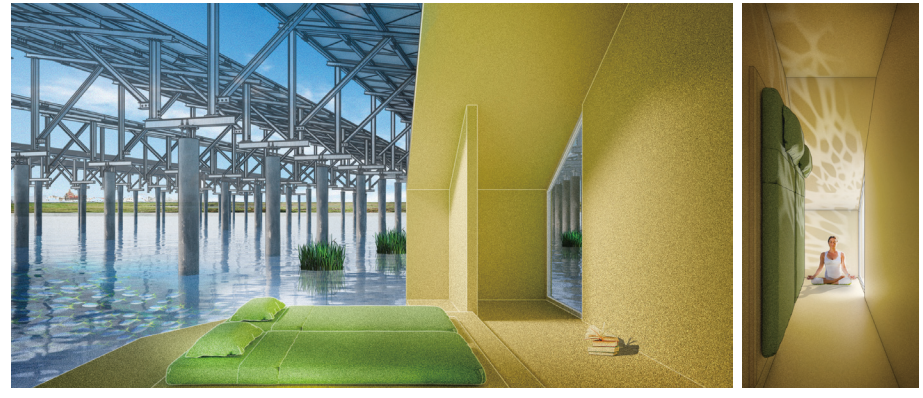
This design offers a vision of free living through flip-able walls and sliding furniture. When the dining table and chairs slide out, they form a semi-outdoor space where the couple can dine above the vast fishpond, enjoying the unique natural scenery and experiencing an intimate connection with nature in a floating living environment.

This floating house enhances convenience and efficiency for fishermen. With the support of current energy policies, it upgrades traditional aquaculture into a hybrid model combining living and working while managing energy through solar power and other energy-saving methods.

We hope this project continues to develop, transforming traditional fishing methods and promoting the economic transformation of local communities.

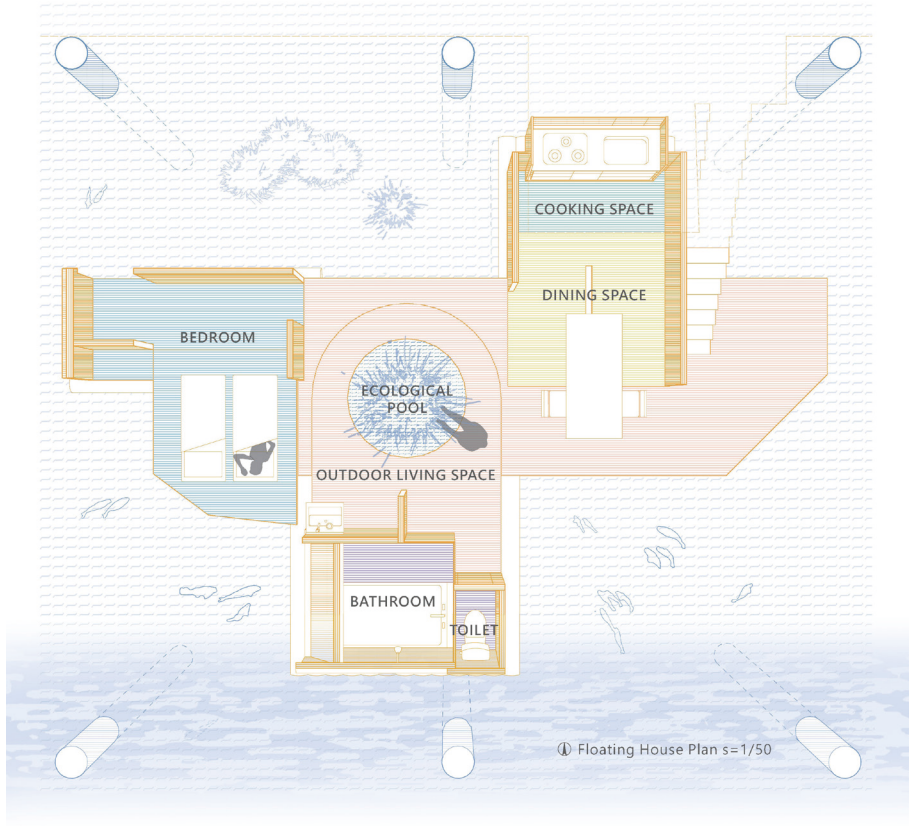






這片烈日與勁風中的土地與海洋，從自然孕育的海產養殖與瀉湖美景，到高科技帶來的光電清潔與能源產出，表面上似乎充滿了衝突與矛盾，但不變的，是七股人敬天樂命的頑強信仰與自由不羈精神。

This place where the land meets the sea, shaped by the scorching sun and howling winds, is home to both the natural beauty of aquaculture and lagoons, and the clean energy harnessed from high-tech photovoltaic solar power. Though these elements may seem contradictory, they are bound together by the enduring faith of the people of Qigu in respecting nature's will, along with their resilient and free-spirited nature.



① Floating House Plan s=1/50

Fishery-based

Enhanced by green energy

Sustainable development

Green energy industry
Establishing a non-nuclear, energy-secure homeland.

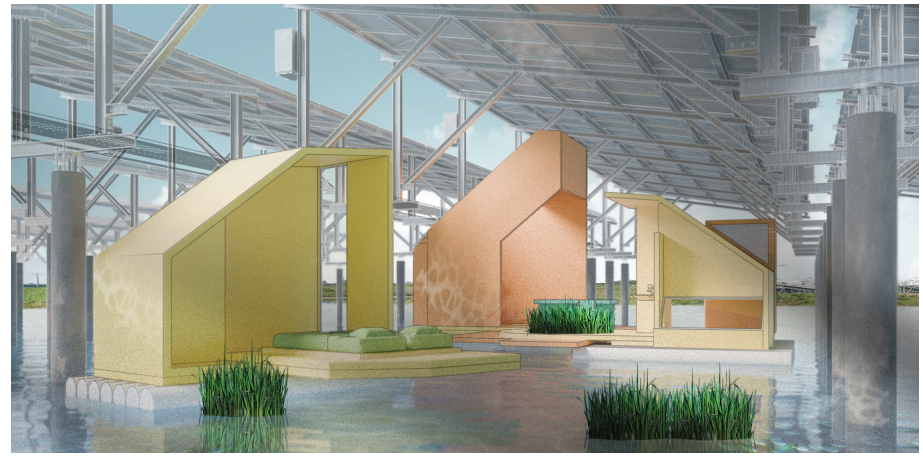
Fishermen's rights
Dual consent of aquaculturists and landowners to safeguard production and income.

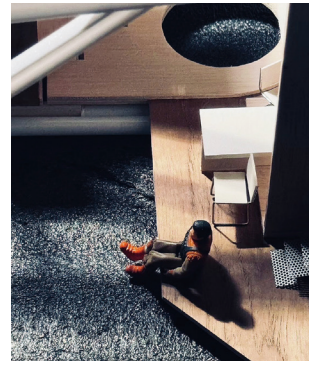
Aquaculture upgrading
Disaster prevention and intelligent management.

Environmental sustainability
Meet social and environmental demands while mitigating ecological impact.

Passive housing
Reducing non-renewable energy consumption through architectural design.

Friendly housing
Reducing rental and transportation costs to create a friendly living environment.





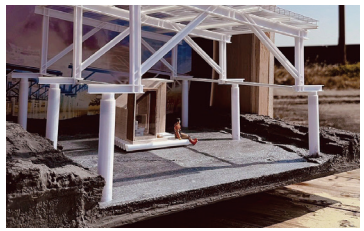
七股離漂

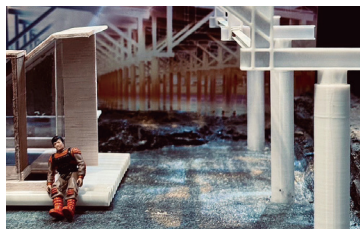
守護村落的龍山宮，魚塭旁的海鮮餐廳，漂浮的神祕 KTV，掛著釣魚竿的摩托車，強烈的陽光，冷冽的風，來去自由的候鳥，浮啊浮 ~ 飄啊飄 ~。

在複雜及充滿衝突的世界裡，建築應讓人回到簡樸隨心的生活可能性。

Inspiration emerges in gazing upon the views of the Longshan Temple guarding the village, along with the seafood restaurants by the fish ponds, the mysterious floating KTV, motorcycles adorned with fishing rods, the intense sunlight, the cold wind, and the migratory birds drifting freely—floating, wandering.

"In a world full of complexity and contradictions, architecture should offer a return to simplicity, where life flows with ease and spontaneity."





Qigu Floating Escape

Workshop on the Environmental Planning of the Qigu Coast
七股海岸環境規劃參與式工作坊

氣候變遷調適與海岸防護
Climate Change Adaptation and Coastal Protection

2023 年七股海岸環境規劃工作坊，旨在探索對於廢曬鹽業、養殖漁業、及近海牡蠣與漁業、七股區域沿海濕地、地方發展及海岸防護的課題上，如何在海平面上升的考驗下展望未來的各種可能性。

目的在因應未來政策規劃及結合在地觀點，探討沙洲流失，極端氣候、及海平面上升等海岸環境變化對於地方發展、海岸安全防護與生態資源的影響。本工作坊透過民眾、政府相關權責機關、以及非政府組織之參與討論，從未來情境考量下的環境管理規劃角度進行溝通，將公民參與的機制作為海岸氣候變遷調適及保護管理之具體展現。透過此次的參與式規劃探討，並藉由研究團隊持續發展，冀能研擬出具體方案，明確回應《氣候變遷因應法》下之氣候變遷調適行動方案之擬定。

The 2023 Qigu Coastal Environmental Planning Workshop aimed to address challenges faced by salt production, aquaculture, and oyster industries, as well as coastal wetlands and local development, under the pressure of rising sea levels. The workshop sought to integrate local perspectives into future policy planning, exploring issues such as sandbar erosion, extreme weather events, and their impact on coastal protection and ecological resources. Through collaboration among local residents, government agencies, and NGOs, the workshop emphasized participatory approaches to environmental management. It served as a platform for public involvement, highlighting how community input can guide climate adaptation and conservation efforts under the Climate Change Response Act.

氣候變遷調適與海岸防護

Climate Change Adaptation and Coastal Protection

工作坊流程包括背景與操作方法說明、分組討論、跨部門討論、問卷調查四部分。 參與者依地區區位分為北、中、南三組，並將各機關單位分散到各組進行小組討論，北區包括青鯤鯓及頂山社區，涵蓋將軍鹽田濕地；中區包括西寮、塭埕、中寮及龍山社區，涵蓋七股鹽田濕地；南區則包括三股及十份社區，涵蓋臺 17 以西的大片漁塭。 討論結果呈現，共通點在於三區皆期望以創新產業吸引青年回鄉；強調環境的保護策略，優先維護基礎設施減少居民撤退的成本；關切太陽光電與排水、景觀、生活品質的互動與影響。相異之處則在於各區針對地理條件的差異，各自提出的潟湖保護策略。

對此結果，參與其中的機關部門則列出下列幾項應持續推動之工作，包括科學與視覺化呈現：將地方特性與社區關注議題反映到科學圖資系統並研究分析；民眾參與：納入民眾表達的需求，滿足切身性議題；議題盤點：釐清議題的所包含的綜合性因素。

除了環境保護議題，也調查住居環境、淹水經驗與氣候變遷洪災的調適對策。面對調適策略（迴避、撤退、順應、保護），42% 選擇禁止危險地區開發（迴避），42% 支持加強堤防或濕地保護（保護），8% 選擇墊高房屋地基（順應），8% 支持提供搬遷機會（撤退）。

儘管居民主要訴求保護，若政府提供必要協助，如房產購置支援或低風險區搬遷選項，居民仍可能考慮搬離，顯示搬遷意願並非全無。因此，政府應在制定政策時，提供更多搬遷選擇，以滿足居民需求與居住期待。

最後的問卷顯示，多數參與者認為工作坊有助於了解氣候變遷調適策略。

The workshop was structured into four parts: background briefing, group discussions, cross-departmental discussions, and a survey. Participants were divided into northern, central, and southern groups, with representatives from various agencies distributed among the groups to ensure diverse perspectives. The northern group covered Qingkunshen and Ding Mountain communities, including the Jiangjun Salt Pan Wetlands. The central group encompassed Xiliao, Yan Cheng, Zhongliao, and Longshan communities, incorporating Qigu Salt Pan Wetlands. The southern group focused on San Gu and Shifen communities.

Discussions revealed common desires for innovative industries to attract youth, environmental protection strategies prioritizing infrastructure, and addressing the impacts of solar energy on drainage, landscape, and living quality. Agencies identified key actions, including incorporating local concerns into scientific mapping, enhancing public participation clarifying interconnected issues for comprehensive planning.

Beyond environmental protection, the workshop explored residential conditions, flood experiences, and adaptation strategies for climate-induced flooding. Regarding adaptation approaches—avoidance, retreat, accommodation, and protection—42% supported prohibiting development in high-risk areas (avoidance) and reinforcing infrastructure like levees or wetlands (protection). While protection was the primary preference, participants expressed openness to relocation if the government provided sufficient support, such as financial aid or alternative sites in safer areas. This indicates that relocation willingness hinges on adequate governmental assistance and options.

Consequently, policies should balance practical needs with expanded relocation opportunities to align with residents' expectations. The workshop reinforced the importance of participatory planning in addressing local and environmental challenges.

調適策略與路徑評估

Adaptation Strategies and Pathway Assessment

延續 2023 年工作坊的成果所出的氣候變遷海岸調適策略：迴避、順應、撤退、保護。針對上述四種選項，我們希望與民眾一起深入探討其中的影響，因此在 2024 年舉辦以「調適策略與路徑評估」為主題的海岸還規劃工作坊。

本次工作坊流程包括，生態系統服務評估：幫助民眾思考並辨識環境生態對人們的益處；未來路徑：協助民眾思考不同策略對於經濟、文化、環境在中長期策略中的差異、預防性撤退：協助指認社區最重視的面向，思考可接受的影響程度；問卷調查：了解社區的社經狀況。 本場活動分為二個階段，首先是由民眾針對目前及未來各項調適策略可能對在地的經濟、文化、環境與韌性所以造成影響進行評分，1 分表示非常負面影響、 2 分表示負面影響、3 分表示普通、4 分表示正面影響、5 分表示非常正面影響。第二階段再以海報呈現 2050 年及 2080 年的五項調適策略進行投票，以綠色貼紙表示相當喜歡、藍色表喜歡、黃色表普通、橘色表不喜歡、紅色表相當不喜歡。

Building on the outcomes of the 2023 workshop, which explored coastal adaptation strategies—retreat, accommodate, protect, and avoid—a 2024 workshop titled "Adaptation Strategies and Pathway Assessment" was organized. This event aimed to engage the public in a deeper exploration of these strategies and their impacts. Specific pathways and measures were proposed for discussion, with particular focus on sandbar and lagoon-related concerns, leading to the selection of Longshan Community, closely tied to the Qigu sandbars and lagoons, as the venue.

The workshop included ecosystem service assessments to help participants identify environmental benefits, discussions on future pathways, evaluations of preventive retreat options, and a socioeconomic survey. Activities were conducted in two stages: first, participants rated the impacts of current and future adaptation strategies on the local economy, culture, environment, and resilience using a 1–5 scale; second, they voted on five adaptation strategies for 2050 and 2080 using colored stickers to express their preferences.

	Horizontal Levee	Sandbar Restoration	Accommodate	Avoid	Renature
Hard Protection	-0.09	0.57	-0.38	-0.22	0.00
Soft Protection	0.64	1.29	0.35	0.50	0.72
Wise use plan	-0.65	0.00	-0.94	-0.79	-0.56
Watergates	-0.15	0.50	-0.44	-0.29	-0.06
Dredging	-0.28	0.37	-0.57	-0.42	-0.20

	Economy	Culture	Environment	Resilience	Overall
Horizontal Levee	3.4	3.1	3.0	3.4	3.2
Sandbar Restoration	3.8	3.4	4.0	4.4	3.9
Accommodate	3.2	2.7	2.8	3.0	2.9
Avoid	3.2	2.7	2.9	3.6	3.1
Renature	2.7	2.9	3.8	3.9	3.3
Hard Protection	3.8	2.6	3.1	3.8	3.3
Soft Protection	2.6	2.7	2.8	2.3	2.6
Wise use plan	3.7	4.1	4.1	3.7	3.9
Watergates	3.7	3.3	3.3	3.2	3.4
Dredging	3.3	3.5	3.7	3.6	3.5

調適策略與路徑評估

Adaptation Strategies and Pathway Assessment

第一階段的成果中，沙洲復育及溼地保育利用計畫評分較高，居民較傾向於保護沙洲作為潟湖的屏障，但施行中則需仰賴政府與民眾的良好溝通。在後續短期及長期策略的偏好調查中，可以看到，無論中期或長期，「保護」選項最得到支持，其中沙洲復育整體分數 4.3 為最高。參與者了解到恢復自然的重要性，但仍舊重視堅守家園的意識，堅守居住土地仍為他們的首選。可以看出七股民眾對家鄉的關注點有明顯的排序。民眾最重視的是自然系統的韌性及其調節能力。這表明他們對於環境保護和生態平衡的高度重視，期望通過強化自然系統的韌性來應對各種環境變遷和挑戰。 七股居民在面對氣候變遷帶來的嚴重衝擊和搬遷的可能性時，對於各種變化有明確的優先考量。他們首先重視防護設施的建設，其次是照護與福祉的保障，然後是公共服務的延續，再來是自然系統的恢復與調節，最後是社區內部的人際關係維持。這些優先事項反映出居民希望在新環境中，能夠保持安全、健康和社會支持，並且在生態環境和公共服務方面得到持續的保障。

In the first stage, plans for sandbar restoration and wetland conservation received high ratings, reflecting a preference for protecting sandbars as lagoon barriers. However, effective implementation requires strong communication between the government and the community. Preference surveys for short- and long-term strategies showed that "protection" garnered the most support, with sandbar restoration achieving the highest score of 4.3. Participants emphasized the importance of restoring natural systems while maintaining a strong attachment to their homeland.

This priority was evident in the clear ranking of concerns by Qigu residents, who valued natural system resilience and its regulatory capacity the most. They prioritized protective infrastructure, care and well-being, continuity of public services, restoration of natural systems, and preservation of social ties within the community. These preferences highlight the desire for safety, health, and social support in new environments while ensuring sustained ecological balance and public access.

Overview Table of Local Priority Item Ratings

Category	Item	Average	Priority
Economy	Economic income	4.33	5
	Employment opportunities	3.87	11
	Housing, Land (e.g., farmland, fish ponds)	3.96	9
Culture	Places with special psychological significance (e.g., fishing ports, parks, temples, cemeteries, ancestral homes, etc.)	4.08	7
	Community interpersonal relationships (family, friends, neighbors, etc.)	4.17	6
	Rituals and traditions (e.g., temple festivals, aquaculture culture)	3.64	14
	Public services (e.g., schools, libraries, clinics))	3.83	12
Environment	Ecosystem services (e.g., provision of food, habitats, tourism value, etc.)	3.70	13
	Ecological environment (e.g., salt pans, sandbars, lagoons, migratory birds)	4.08	7
Resilience	Disaster response capabilities (e.g., alarm systems, floodgate operations)	4.44	3
	Care and well-being (e.g., long-term care, subsidies for disadvantaged families)	4.42	4
	Protective infrastructure (e.g., seawalls, pumping stations)	4.46	2
	Participation in public affairs discussions (e.g., patrol teams, neighborhood disaster preparedness mobilization)	3.96	9
	Regulatory capacity of natural systems (e.g., wetland	4.58	1

七股離漂

Qigu Floating Escape

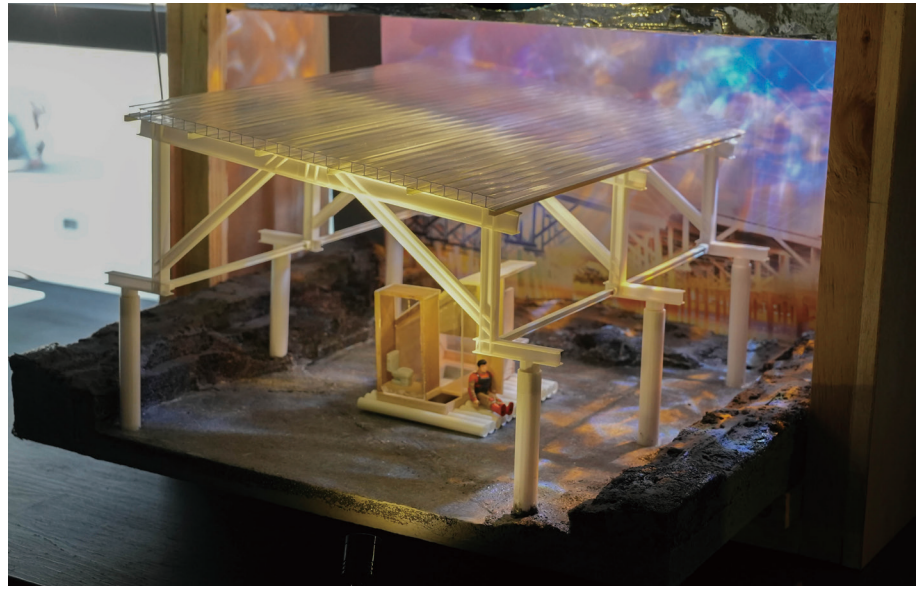
Integrating CLT structure and intelligent systems, as well as energy and water resources, the design provides energy-efficient and sustainable semi-outdoor living spaces, enhancing the work and life quality of fishermen.

整合 CLT 結構與智慧系統，以及能源與水資源，提供節能與可持續的半戶外生活空間，增強漁民的工作與生活品質。

Fishery and Electricity Symbiosis
Floating Lifestyle
Environmental Sustainability
Energy Efficiency
Aquaculture Upgrading

Qigu Floating Escape_Model　　Photo by Pan-Yu Li

Qigu Floating Escape_Model　　Photo by Pan-Yu Li



Qigu Floating Escape_Model　　Photo by Pan-Yu Li