

**For discussion on  
12 February 2019**

**Legislative Council  
Panel on Food Safety and Environmental Hygiene**

**Development of Mariculture**

**PURPOSE**

The moratorium on designation of new fish culture zones (“FCZs”) and issuance of new marine fish culture licences (“MFCLs”) (together referred to as “the mariculture moratorium”) has been imposed since 1990. This paper briefs members on the proposals for lifting the mariculture moratorium to facilitate sustainable development of the fisheries sector.

**REVIEW OF THE MARICULTURE MORATORIUM IN 1990**

2. The mariculture moratorium was imposed in 1990 due to the then rising concern that unchecked mariculture growth would degrade not only the water quality of FCZs, but also the marine environment in the vicinity. Over the years, environmental conditions in most FCZs have improved with the use of less polluting feeding methods, reduction in stocking density of fish rafts, close monitoring of husbandry environment, and deployment of biofilters<sup>1</sup> at some FCZs. Consequently, nitrogen loading (the most serious environmental problem brought about by mariculture) was reduced by more than 90% from 1990 to 2018. The original rationale for imposing the mariculture moratorium is no longer valid.

3. Having regard to the above developments and to pave the way for an overall review of the mariculture moratorium, we partially lifted the moratorium (vide LC Paper No. CB(2)1284/12-13(05)) in 2013, and the Agriculture, Fisheries and Conservation Department (“AFCD”) launched a pilot scheme, under which a total of 10 new MFCLs in three FCZs with surplus carrying capacity (viz. O Pui Tong, Wong Wan and Sham Wan FCZs<sup>2</sup>) were issued. AFCD has been monitoring closely the operation of the new licensees

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<sup>1</sup> Biofilters are artificial reefs that can remove suspended particles in water through filter feeding animals on them.

<sup>2</sup> As at end December 2018, four licences issued under the pilot scheme remain valid, three at Wong Wan and one at Sham Wan FCZs.

in accordance with the licence conditions. The water and sediment quality data collected from these FCZs from 2015 to 2018 shows that the increased mariculture activities arising from the new licensees had minimal impact on the marine environment, affirming the feasibility of issuing new MFCLs in existing FCZs with surplus carrying capacity.

4. Aside from studying existing FCZs with surplus carrying capacity, AFCD has also commissioned a consultancy study to explore suitable sites as new FCZs. The study has shortlisted possible sites on the basis of a list of social and environmental criteria, with reference to the latest international culture practices, and the potential of these sites in accommodating farms for culturing in sheltered areas as well as farms adopting more advanced-technology for operation in open-sea. Areas that are being planned for development works projects and other marine uses (e.g. marine vessel fairways) have been excluded. Relevant stakeholders, including Government bureaux / departments and mariculture representatives, have been consulted throughout the study to gauge their views on site selection.

5. Four sites have been recommended in the consultancy study with higher priority for designation of new FCZs (see paragraph 9 below), including two each for sheltered-area and open-sea operations. The carrying capacity of each site has been evaluated with WATERMAN<sup>3</sup> hydraulic modelling to ensure environmental sustainability.

6. A map showing the locations of the four proposed sites and the existing FCZs is at **Annex A**.

## **TRANSITION TO SUSTAINABLE MODE OF OPERATION**

7. As at end December 2018, there were 931 licensed fish farms operating in 26 designated FCZs. In 2018, about 850 tonnes of live marine fish valued at \$71 million were produced. It is estimated that about 1 900 people are engaged in the mariculture sector.

8. The existing mariculture moratorium restricts the expansion of mariculture activities and is not conducive to the long-term development of the mariculture sector. The Chief Executive announced in the 2018 Policy Address

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<sup>3</sup> WATERMAN is a computer modelling system developed by the University of Hong Kong in 2012 with the assistance of AFCD. Its fisheries management system takes into account factors such as tidal flushing rate of the site, organic and nutrients loading from fish farms, and the statutory/indicative water quality objectives applicable to the local waters to determine the carrying capacity of FCZs, providing an objective and scientific assessment on the environmental acceptability of FCZs.

that the Government would recommend designating new FCZs at suitable locations, as well as resuming issuance of new MFCLs. By fully lifting the mariculture moratorium, we can create room for the mariculture sector to grow further, including allowing capture fishermen to switch to this sustainable mode of operation, making it possible for the development of newer type deep-water mariculture in open-sea, and attracting new entrants.

## **PROPOSALS**

### ***Designating New FCZs and Issuance of New MFCLs***

9. We propose designating new FCZs in the following four priority sites as recommended in the consultancy study in two phases:

- (a) Wong Chuk Kok Hoi;
- (b) outer Tap Mun;
- (c) Mirs Bay; and
- (d) Po Toi (Southeast).

10. To meet the statutory requirements under the Environmental Impact Assessment Ordinance (Cap. 499), environmental impact assessments (“EIAs”) will be conducted for designating the above sites as FCZs. We plan to commence the EIAs in stages starting from 2019.

11. FCZs are set out in the Schedule to the Fish Culture Zone (Designation) Order (Cap. 353B). Upon completion of the EIAs and identification of suitable site(s), we will initiate the legislative exercise to amend the said Schedule by negative vetting for designating new FCZ(s)<sup>4</sup>.

12. To complement the designation of new FCZs, we propose granting new MFCLs for operation in the new FCZs to fish farmers for business expansion and to new entrants interested in venturing into modernised fish farming. Applicants should provide business plans to support their applications, and should demonstrate how the proposed operation can achieve sustainable use of the mariculture environment. These applications will be evaluated according to a set of predetermined criteria including, among others, strategy for environmental and efficient productions; measures to ensure food safety; plans to introduce species with higher market demand / value, etc. Priority will be given to applicants who can bring in modern fish farming technology or management practices.

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<sup>4</sup> In addition, a consequential amendment to the Water Quality Objectives Statement for the Mirs Bay Water Control Zone (Cap. 358U) under the Water Pollution Control Ordinance (Cap. 358) would also be required if new FCZs are designated at Wong Chuk Kok Hoi, outer Tap Mun and Mirs Bay.

### *Issuance of New MFCLs in Existing FCZs*

13. We also propose issuing new MFCLs for existing FCZs with surplus carrying capacity to better utilise their production capacity. To this end, six FCZs have been identified (**Annex B**). The maximum number of new licences in each FCZ will be granted in accordance with its carrying capacity, and an environmental review on each of these zones will be conducted to confirm the issuance of new licences has no adverse impact on the marine environment. We estimate that these six FCZs, if fully utilised, can provide some 1.5 additional hectares of licensable raft areas. At the same time, AFCD will step up its management and inspection of all 26 FCZs to ensure that existing licensed areas are fully utilised for mariculture purpose and the production of each raft must reach a minimum level for licence renewal, with a view to freeing up the farming space from inactive fish rafts. Successful applicants of new MFCL should comply with a set of licence conditions to ensure the fish farms will be actively used for sustainable mariculture.

### **ANTICIPATED OUTCOMES OF THE PROPOSALS**

14. The proposals will significantly increase the capacity of local marine fish production, which will help meet the local demand for fresh and quality seafood. In particular, it is estimated the four new FCZs mentioned in paragraph 9 above, when fully exploited, can produce an addition of about 5 000 tonnes of marine fish per year, raising the current level of production by more than five times. The designation of new FCZs and issuance of new MFCLs will help attract new blood to join the mariculture sector, provide a window for existing fish farmers to modernise and expand their operations, and provide an avenue for capture fishermen to switch to this sustainable operation mode.

15. AFCD will closely monitor the water and sediment quality of new and existing FCZs to ensure that expansion of mariculture activities following the issuance of new MFCLs will not cause any unacceptable environmental impact.

16. We will continue to enhance the supportive measures for mariculture (summarised in **Annex C**) alongside the proposals.

### **PUBLIC CONSULTATION**

17. Relevant stakeholders including fish farmer representatives, fishermen and their organisations, academia and green groups have been consulted on the

proposals throughout the course of the consultancy study mentioned in paragraph 4 above. The mariculture sector in general supported the designation of new FCZs and agreed that the sector should be modernised. On the other hand, notwithstanding the fact that designating new FCZs and ensuring full utilisation of fish rafts (the latter explained in paragraph 13 above) are complementary measures, some existing MFCL holders had objected to tightening the management of fish rafts or changing the licence conditions. AFCD will continue to engage the trade and listen to their views before implementing those measures, and will provide technical advice and allow sufficient time for the trade's compliance.

18. Some capture fishermen also welcomed the opportunity to switch to mariculture while some had appealed to the Government to strike a balance between mariculture development and conserving fishing grounds when designating new FCZs. AFCD will take that into account in the EIAs, with a view to ensuring sustainable development of fisheries.

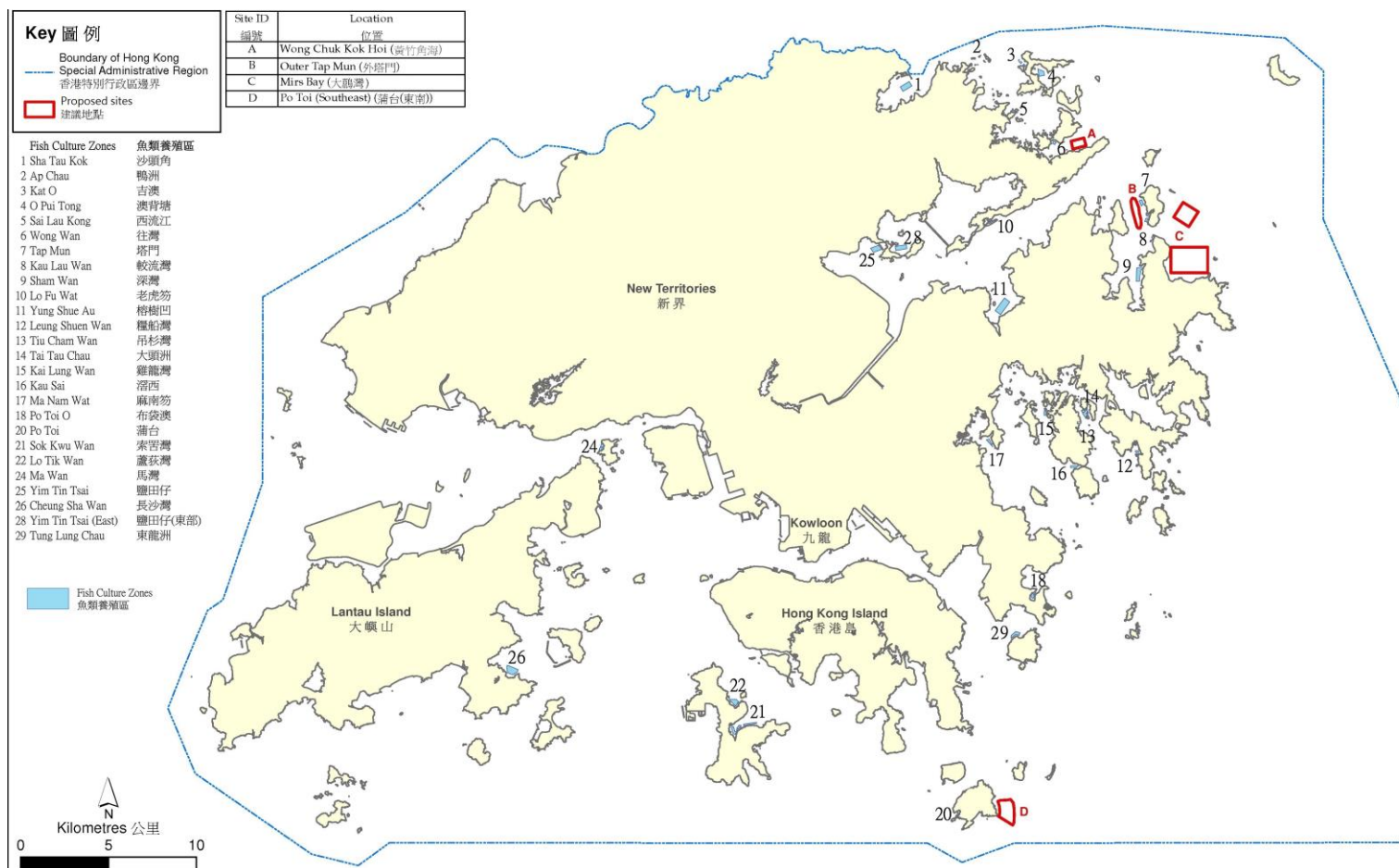
19. The academia and green groups generally considered that Hong Kong had the potential to develop sustainable mariculture, and the Government could take this opportunity to assist the trade in adopting new and modern technologies and management practices.

## **ADVICE SOUGHT**

20. Members are invited to give their views on the above proposals.

**Food and Health Bureau  
Agriculture, Fisheries and Conservation Department  
February 2019**

**Locations of the Four Proposed FCZs and the Existing FCZs**



*Note: The numbering of existing FCZs is in accordance with the Schedule to the Fish Culture Zone (Designation) Order (Cap. 353B). 3 of the FCZs were repealed in the 1990s.*

**Annex B**

**Fish Farming Area Available at Fish Culture Zones  
with Surplus Carrying Capacity**

<b>Fish Culture Zone</b>	<b>Zone area (sq. m)</b>	<b>Current licensed area (sq. m)</b>	<b>Additional licensable area (sq. m)</b>
Cheung Sha Wan	214,200	10,350	6,130
O Pui Tong	105,600	453	2,752
Sham Wan	180,600	16,190	2,725
Yung Shue Au	342,000	44,589	2,297
Ma Nam Wat	40,100	5,247	766
Wong Wan	22,500	2,091	426

**Enhanced Measures for Sustainable Development of Mariculture**

- (a) Efforts have been made to transfer modern mariculture technologies and good husbandry practices to local fish farmers through on-farm training.
- (b) A modern mariculture demonstration farm is being established with the assistance from the Mainland specialists<sup>5</sup> to serve as a centre for promotion of modern technologies as well as training and research purposes. Weather resistant steel truss will be used in place of traditional wooden frame as the main structure of the rafts. Automated feeding and monitoring systems will also be installed in the farm to save manpower. These technologies will help equip the mariculture sector to move to an open-sea environment. The demonstration farm will also be used as a training platform offering new entrants hands-on practical experience of fish culture.
- (c) The coverage of the real-time water quality monitoring systems is being expanded to enhance the capacity of managing risks associated with water quality and red tide. Other advanced environmental monitoring technologies including real-time phytoplankton imaging and computer modelling tools are also being explored under a project supported by TechConnect.
- (d) Environmental enhancement measures will be introduced, including deploying biofilters, removing sediment accumulated at the seabed of some existing FCZs, and controlling the use of trash fish for feeding purpose. In addition, communal “green” space featuring photovoltaic cells, pellet feed storage and seawater desalination will be introduced to encourage sustainable mariculture practices.

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<sup>5</sup> AFCD has commissioned the South China Sea Fisheries Research Institute (SCSFRI) of the Chinese Academy of Fishery Sciences under the Ministry of Agriculture and Rural Affairs to design a modern mariculture demonstration farm for Hong Kong. SCSFRI is nationally recognised as an expert in offshore mariculture farm design and advanced mariculture technology.



- (e) The \$500 million Sustainable Fisheries Development Fund established in 2014 provides financial assistance to the fisheries sector for carrying out development programmes that will help the fisheries community move towards sustainable or high value-added operations. As at end December 2018, eleven applications involving a total commitment of over \$58 million have been approved, among them eight projects seek to promote the development of the local aquaculture, including the mariculture using enclosure net cages, establishment and demonstration of the recirculation aquaculture system for fry culture on rafts, supply of marine fish fry by a local hatchery, production of pellet feed using food waste, and the provision of veterinary services for fish farms. The technologies developed and experience gained in these projects will be promoted to the whole fisheries sector
  
- (f) Credit facility is provided under the Fisheries Development Loan Fund, a revolving loan fund with a capital of \$1,100 million, to help local fish farmers develop aquaculture or improve their businesses operations.