



Hong Kong International Airport Contract P152 – Third Runway EIA Review Consultancy Services

Fisheries Management Plan

21 March 2016

Environmental Resources Management

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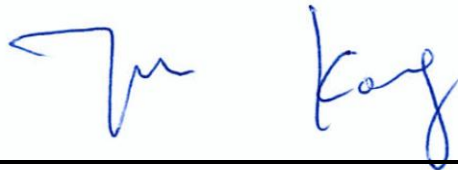
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Summary: This document presents the Fisheries Management Plan for the AAHK consultancy for the Hong Kong International Airport – <i>Third Runway EIA Review Consultancy Services (Contract P152)</i> .		Date: 21 March 2016			
		Approved by: 			
		Craig A Reid Project Director			
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Revision	Description	By	Checked	Approved	Date
<p>This report has been prepared by Environmental Resources Management the trading name of 'ERM Hong-Kong, Limited', with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.</p> <p>We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.</p> <p>This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.</p>		<p>Distribution</p> <p><input type="checkbox"/> Public</p> <p><input type="checkbox"/> Government</p> <p><input checked="" type="checkbox"/> Confidential</p>			
				 	

This Fisheries Management Plan has been reviewed and certified by

the Environmental Team Leader (ETL) in accordance with

Condition 2.13 of Environmental Permit No. EP-489/2014.

Certified by:



Terence Kong
Environmental Team Leader (ETL)
Mott MacDonald Hong Kong Limited

Date

29 March 2016

Our Ref : 60440482/C/JCHL160330

By Email

Airport Authority Hong Kong
HKIA Tower, 1 Sky Plaza Road
Hong Kong International Airport
Lantau, Hong Kong

Attn: Mr. Lawrence Tsui, Senior Manager

30 March 2016

Dear Sir,

Contract No. 3102
3RS Independent Environmental Checker Consultancy Services

Fisheries Management Plan

Reference is made to the submission of Fisheries Management Plan under Condition 2.13 of the Environmental Permit No. EP-489/2014 certified by the Environmental Team Leader and sent to us on 29 March 2016.

We would like to inform you that we have no adverse comment on the captioned submission. Therefore we write to verify the captioned submission in accordance with the requirement stipulated in Condition 1.9 of EP-489/2014.

Should you have any query, please feel free to contact our Isabella Yeung at 3922 9348 or the undersigned at 3922 9376.

Yours faithfully,
AECOM Asia Co. Ltd.



Jackel Law
Independent Environmental Checker

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1

PREAMBLE

The **Airport Authority Hong Kong** (“AAHK”) is responsible for operations of the Hong Kong International Airport (HKIA). Its HKIA Master Plan 2030 (MP2030) recommended expansion of HKIA into a three-runway system (3RS) (“the Project”) as the best way forward to cope with the projected increase in air traffic demand and to secure the continual growth of HKIA operation for the benefit of the economic development of Hong Kong. For planning purposes, this development option for HKIA received approval in principle from the Government of the Hong Kong Special Administrative Region (HKSAR) on 20 March 2012.

An Environmental Impact Assessment (EIA) Study Report for the Project was prepared in accordance with the study brief requirements (ESB-250/2012) issued by the Environmental Protection Department (EPD). The EIA Report for the Project (Register No. AEIAR-185/2014) was approved by EPD on 7 November 2014 and the Environmental Permit (EP) (EP No. EP-489/2014) granted on 7 November 2014.

As part of the EIA Study, AAHK has proposed to formulate and implement a *Marine Ecology and Fisheries Enhancement Strategy (MEFES)*. The MEFES for the Project has been set up for the purpose of enhancing the marine environment for the benefit of marine ecology (including Chinese White Dolphins (CWDs)) and fisheries resources in the vicinity of the project area, in Hong Kong western waters and further afield into the Pearl River Estuary (PRE). It is also for the purpose of providing support and assistance to affected fishers to achieve more sustainable fishing operations. *Figure 1.1* presents a schematic overview of the different elements of the MEFES and their proposed funding sources. Details of the MEFES are provided in *Annex A*.

In accordance with EP Conditions 2.8 and 2.13, AAHK will establish independent Marine Ecology Enhancement Fund (MEEF) and Fisheries Enhancement Fund (FEF), respectively, to fund initiatives proposed by third-parties (eg Non-Governmental organisations (NGOs), researchers and the fishery sector) that support the objectives of the MEFES. A Marine Ecology Conservation Plan (MECP) and a Fisheries Management Plan (FMP) are developed to describe the proposed mechanism for the implementation of the MEEF and FEF as well as the goals and themes under which funding applications can be made.

This document presents the FMP of the 3RS Project.



Marine Ecology and Fisheries Enhancement Strategy (MEFES)

Direct Funding by AAHK

Voluntary surveillance

- Land-based surveillance
- Vessel-based surveillance



Artificial reef deployment *

- To provide complex hard surface habitat in North Lantau waters
- To provide shelter and promote the recruitment of fish larvae and juveniles
- Restocking of fish fry and shrimp seedling



Restocking of fish fry and shrimp seedling *

- To strengthen fisheries resources in North Lantau waters
- Monitoring of fisheries resources at appropriate locations



Eco-enhancement of seawall design

- To design for the future extension of artificial seawall with eco-enhancement elements
- To help re-colonisation of intertidal and sub-tidal fauna as well as recruitment of juvenile fish



Restriction of access to selected areas for SkyPier High Speed Ferries (HSFs) and construction vessels

- To develop further measures for better protection of Chinese White Dolphins in western Hong Kong waters



Marine Ecology Enhancement Fund (MEEF)

Carrying capacity enhancement

- To enhance carrying capacity in nearby important marine habitats, including marine parks
- To investigate and implement enhancement measures in key habitats in the North Lantau / Hong Kong / PRE waters



“Dolphin friendly” activities

- To investigate the feasibility of implementing measures to support protection of marine habitats and Chinese White Dolphin hotspots



Recovery of fisheries resources

- To restore fisheries resources through feasibility studies and scientific research



Scientific Research

- To identify and conserve important marine habitats through objective-driven, well-executed scientific research
- To provide technology and innovation that can benefit conservation programmes



Fisheries Enhancement Fund (FEF)

Support the fishing industry

- To identify opportunities to assist fishermen operating in the western Hong Kong waters
- To promote the sustainable development of the fishing industry



Fisheries resources enhancement

- To enhance habitats for fisheries resources in nearby sites of fisheries importance and beyond when implementing the land formation works
- To bring benefits to fisheries resources and subsequently to fishermen operating in north and west Lantau waters



* Implementation would be subject to outcome of feasibility studies



2

INTRODUCTION

2.1

BACKGROUND

As part of commitments included in the EIA Study, the AAHK proposed to formulate and implement a MEFES. Initiatives under the MEFES will be to assist fishers operating in the western Hong Kong waters who may need to change fishing activities due to the proposed Project, and to enhance marine ecology and fisheries resources in western Hong Kong waters especially Lantau waters (refer to *Section 14.11* of the EIA Report). Through its discussions with stakeholders and experts, AAHK identified the following key enhancement aspects for inclusion in the MEFES:

- Support and enhance on-going fisheries operations;
- Support measures that assist in shifting fisheries operations; and
- Support the promotion and enhancement of fisheries-related business opportunities.

Following a request for further information, supplementary information to the EIA Study was provided to EPD to elaborate the commitments for the MEFES that were outlined in *Section 14.11* of the EIA Report (available at http://www.epd.gov.hk/eia/register/report/eiareport/eia_2232014/further_info/pdf/Marine_Ecology_and_Fisheries_Enhancement_Plan.pdf).

The three key enhancement aspects were discussed in more detail in the supplementary attachment, and opportunities for additional enhancement of marine habitats during construction phase were also described.

Supplemental information was also provided to outline the public consultation/stakeholder engagement plan for proposed arrangements for funding and management of the enhancement initiatives, through the establishment of the FEF and MEEF and the associated Fund Management Committees. Details of the mode of operation of the Committees, as well as procedures for allocating and awarding funding, were proposed to be devised in consultation with relevant stakeholders before commencement of construction.

Additional detail on the design, operation and management of the MEFES and the implementation of the FEF and MEEF was presented in the 200th meeting of the Advisory Council on the Environment (ACE) held on 15 September 2014 which discussed the EIA Report of the 3RS Project. ACE provided views on the EIA report to the Director of Environmental Protection (DEP) with conditions that AAHK shall establish independent MEEF and FEF for implementation of a MECF and a FMP. AAHK shall also set up a management committee for each of the funds.





The Permit conditions set out in the EP ⁽¹⁾ related to the submission of a FMP and the establishment of a FEF are as follows.

EP No. EP-489/2014, Condition 2.13

“The Permit Holder shall establish an independent Fisheries Enhancement Fund (The Fund). The Permit Holder shall, no later than 3 months before the commencement of reclamation related marine works of the Project, submit 3 hard copies and 1 electronic copy of a detailed Fisheries Management Plan (The Plan) to the Director for approval. The Plan shall be prepared in collaboration with fishermen for supporting the fishing industry and enhancing fisheries resources in the western Hong Kong waters especially the Lantau waters. A management committee shall be set up for The Fund with members from fishermen and relevant stakeholders for effective implementation of The Plan.

The Permit Holder shall consult the Director of Agriculture, Fisheries and Conservation in preparing The Plan and submit The Plan to the ACE [Advisory Council on the Environment] for comment prior to the submission to the Director for approval.”

2.2

PURPOSE OF THE FMP

As stated in the MEFES and EP Condition 2.13, the purpose of the FMP is, in essence, to support the fishing industry and enhance fisheries resources in the western Hong Kong waters especially the Lantau waters. A management committee will also be set up for the FEF with members from fishermen and relevant stakeholders for effective implementation of the FMP. By assisting third parties through the provision of funding for relevant measures and initiatives, AAHK intends to create the necessary stimulus to support the enhancement of fisheries resources and sustainable development of the fishing industry.

This FMP outlines the proposed mechanism for the implementation, the funding arrangement, and the setting up of a management committee for the FEF to manage and administer the FMP. Some potential fisheries management, support and enhancement initiatives are also included in an annex to this document to provide assistance to the management committee in effectively implementing the FMP.

2.3

STRUCTURE OF THE FMP

Following this introductory section, the remainder of this *FMP* is organized as follows:

- *Section 3* presents the overall goal of the FMP and the organisation, management and administration of the FMP;

⁽¹⁾ <http://www.epd.gov.hk/eia/register/permit/latest/ep4892014.htm>





- *Section 4* introduces the goals, objectives as well as the implementation and evaluation of the key themes under the FMP; and
- *Section 5* summarizes the overall framework of the FMP.





3 ORGANISATION, MANAGEMENT AND ADMINISTRATION OF THE FMP

3.1 GEOGRAPHICAL COVERAGE

The FMP has been formulated for the management, support and enhancement of the fisheries resources and the fishing industry in western Hong Kong waters especially the Lantau waters. The area of interest for this FMP therefore includes marine waters and habitats surrounding the 3RS land formation and north and west Lantau waters.

It should be noted that the initiatives and measures introduced to the fisheries habitats and fishing grounds of the area of interest could potentially introduce longer term benefits to the fisheries of adjacent marine waters. Also the area of interest can go beyond that identified above if it is reviewed in the future that management, support and enhancement initiatives and effort are well spent in this area and other areas in the vicinity would benefit from AAHK's enhancement strategy.

3.2 OVER-ARCHING ASPECTS

Annex B provides a high-level description of the physical and fisheries characteristics of western Hong Kong waters, in particular north and west Lantau waters. This review provides the basis for identifying key habitats, species or ecological resources that may warrant focused effort in supporting the fishing industry and enhancing fisheries resources under the FMP. A summary map of the identified sites of fisheries importance in north and west Lantau waters is presented in *Figure 3.1*. From the information presented it is noted that there are aspects of the broader environment that provide opportunities for supporting the fishing industry and enhancing fisheries resources. The EP for the 3RS Project references the above in Condition 2.13 as follows:

*"The Plan shall be prepared in collaboration with fishermen for **supporting the fishing industry** and **enhancing fisheries resources** in the western Hong Kong waters especially the Lantau waters"*

3.2.1 Support the Fishing Industry

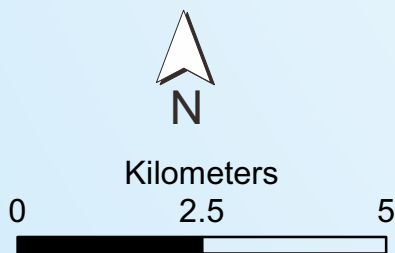
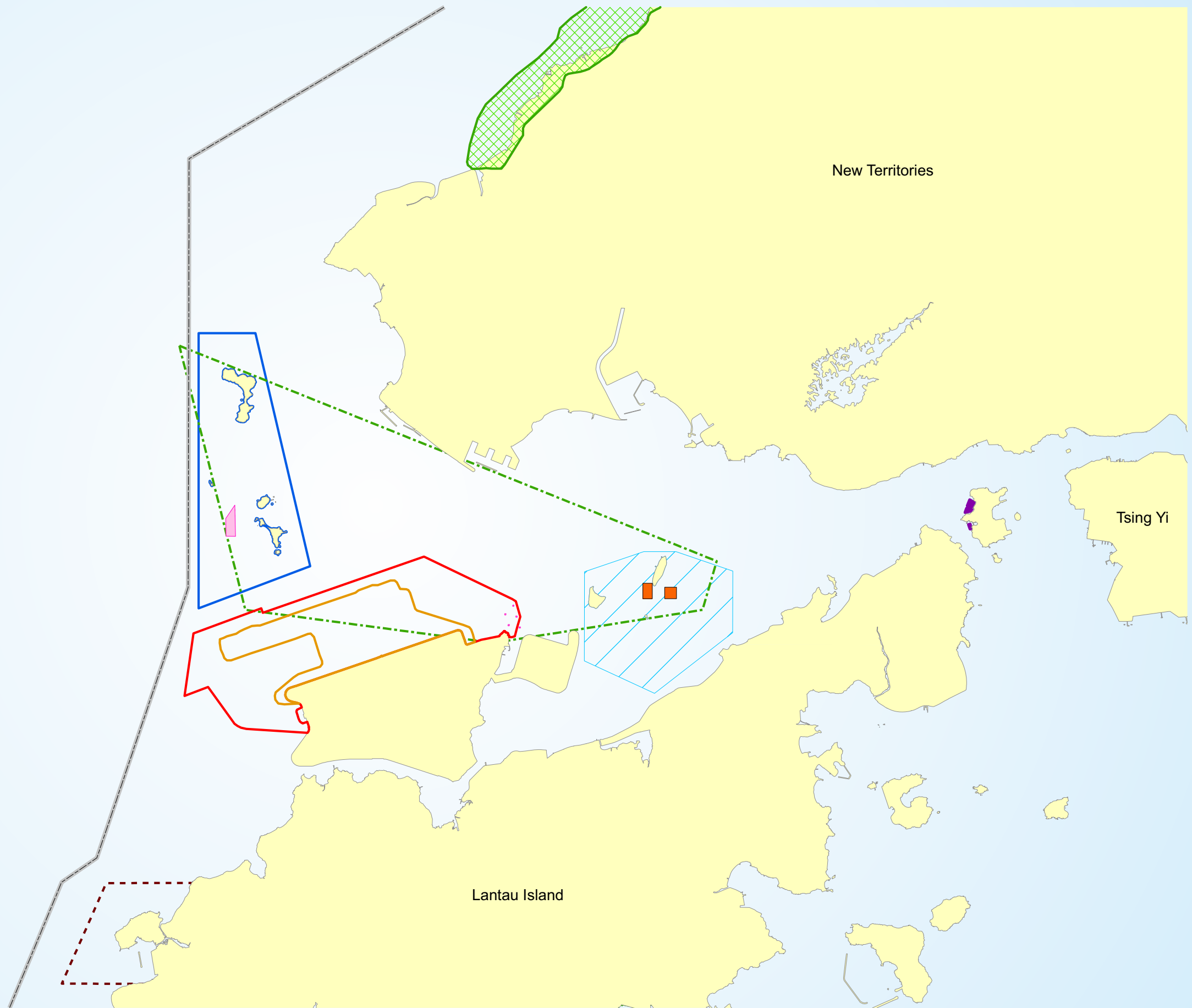
Given the numerous challenges facing the Hong Kong industry culminating from a variety of circumstances over many years, AAHK is committed to identifying opportunities to assist fishermen operating in the western Hong Kong waters. In order to provide extra assistance to the affected fishermen or fishing communities, and also to promote the sustainable development of the fishing industry as a whole, the FMP is tailored towards having a series of initiatives and incentives to help achieve sustainable fishing operations. A majority of these support measures are developed in collaboration with fishermen to ensure that they are practicable,



Figure 3.1 Sites of Fisheries Importance around the Project

Key

-  Boundary of Hong Kong Special Administrative Region
-  Proposed Land Formation Footprint
-  Temporary Works Area Boundary
-  Area of Oyster Production
-  Proposed Artificial Reef
-  Gazetted Artificial Reefs
-  High Production Capture Fisheries
-  Spawning Ground of Commercial Fisheries Resources
-  Fish Culture Zones
-  Sha Chau and Lung Kwu Chau Marine Park
-  The Planned Brothers Marine Park





feasible and fit for the sustainable modes of operations and businesses of the fishermen.

3.2.2 ***Enhancement of Fisheries Resources***

AAHK has identified the potential to enhance habitats for fisheries resources in nearby sites of fisheries importance and beyond during project development and operation. Habitat enhancement is expected to occur over time in particular from the expanded matrix of marine protected areas, potentially bringing benefits to fisheries resources and subsequently to fishermen operating in north and west Lantau waters.

3.3 ***ENGAGEMENT WITH THE FISHERY SECTOR FOR PREPARATION OF FMP***

As part of the preparation of this FMP, consultations with the fishery sector have been undertaken to better understand their specific needs for support which could be formulated under the FMP. Focused discussions in the form of face-to-face meetings with representatives of the fishermen associations were completed. These consultations were conducted in 2015 with the LegCo member of the Agriculture and Fisheries Functional Constituency, Hong Kong Fishermen Consortium, the Aberdeen Fisher Women's Association, the Hong Kong Fishermen's Association, the Hong Kong Fishery Alliance, Lamma Island Fishing Promotion Association as well as fishermen representatives from Tuen Mun, Tung Chung, Tai O, Tsuen Wan, Cheung Chau, Lamma Island and Aberdeen. Overall the consultees acknowledge AAHK's effort in assisting the industry through the FMP and the associated FEF and are supportive of the FMP of the 3RS Project. Ideas on specific support and enhancement initiatives or incentives have been provided and these have been incorporated into this FMP where possible. Valuable feedback on the experience that they have for applying for similar funding has been shared with a view to improving the administration and operation of the FEF, and comments on the membership and operation of the management committee of the FEF were also sought.

It is AAHK's intention to continue this open dialogue with the fishery sector during the development and implementation of the FMP.

3.4 ***GOAL***

As described in *Section 14.11* of the EIA report, the ultimate goal of the MEFES is to provide support to assist fishermen operating in the western Hong Kong waters who have faced an increasingly difficult operating environment in recent years, and enhance marine ecology and fisheries resources in western Hong Kong waters especially the Lantau waters. In this way, the implementation of the 3RS Project is intended to provide an opportunity to give cumulative benefit to fisheries resources and the fishing industry in north and west Lantau waters.





3.5

MANAGEMENT AND FINANCING OF THE FMP

AAHK will ensure the FMP is implemented in compliance with the requirements of Condition 2.13 of EP No. EP-489/2014 and have oversight of the implementation of studies and projects under the key aspects and initiatives of the plan. Specific AAHK responsibilities for the key themes are presented below in *Section 4* of this document.

To meet the goal and objectives of the FMP, substantial resources, both financial and manpower support, are essential. Therefore an independent FEF, managed by a management committee, will be established for effective implementation of the FMP. It is noted that the FEF is intended to fund studies and projects that are non-profit making in nature only. Exceptions may be made for studies and projects with a commercial element to demonstrate the technical feasibility and commercial viability of new sustainable fisheries practices and this would be reviewed on a case-by-case basis. This is further described in the guidance notes of the FEF.

3.5.1

Fisheries Enhancement Fund (FEF)

The MEFES prepared as part of the EIA Study led to development of a preliminary budget estimate for the MEEF and FEF. The two Funds would be in total in the order of HK\$200 - 300 million, subject to approval from the Board of AAHK. Subsequently during the ACE discussion, AAHK had committed a substantial sum of up to HK\$150 million for each Fund, and both Funds were initially planned to run for around 10 years, with a large portion of the fund expected to be used for scientific research, studies and follow-on actions/ initiatives in the initial years.

Recommendations from initial discussions with fishermen representatives highlighted the need to provide sufficient resources for the long-term and sustainable fisheries conservation and enhancement effort. In response to the recommendations, the initial plan to run the FEF for around 10 years has been reviewed and it is apparent that a fund that can support initiatives over the long term would be much preferred and in line with the fishing industry's expectation. To achieve this it is considered that an endowment fund arrangement whereby seed money is invested to target the generation of investment return to meet an annual budget ("Annual Allocation") that is able to support the FMP in the long term. The endowment fund arrangement is targeted to generate 4% annual return based on an optimistic forecast. In the event that the expected investment return is not achieved, any shortfall below the Annual Allocation as approved by the Steering Committee is proposed to be topped up by an additional top-up fund to ensure that resources to support FMP are not compromised.

On the basis of the above, AAHK proposes that a funding amount of HK\$100 million is to be put under an endowment arrangement targeted to generate an income of HK\$4 million to support FEF initiatives for long-term and sustainable fisheries conservation and enhancement efforts. This amount is proposed with consideration of the potential return that can be deemed adequate to fund projects of various scales and duration. In view of the possible fluctuation of investment





income and the need for stable funding support, in particular for the initial years of its implementation, it is proposed to establish an additional HK\$100 million top-up fund for both MEEF and FEF to meet any shortfall on investment income below the Annual Allocation for the FEF.

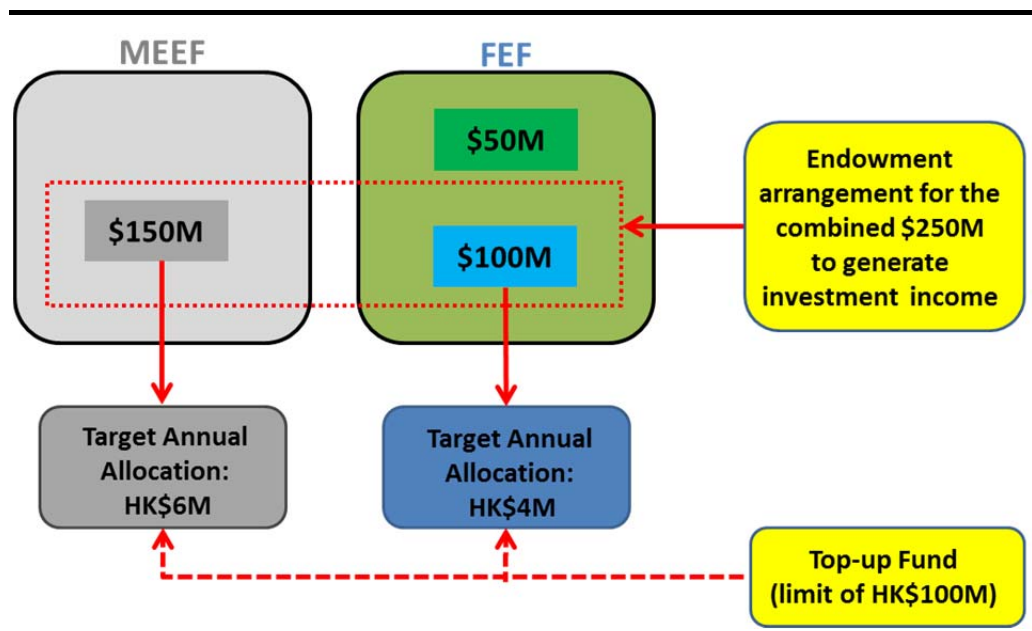
In addition, as the key objectives of FEF are to support the fishing industry and to enhance fisheries in western Hong Kong waters consequent to 3RS construction, it is expected a significant portion of the funding support would need to be deployed in the initial years, particularly during the marine construction stage of the project. It is therefore proposed to allocate HK\$50 million at the onset of FEF.

In summary, AAHK proposes the following arrangement for the FEF:

- A committed initial HK\$50 million allocation to jump start the implementation of the FMP in the initial years of establishment;
- A committed initial HK\$100 million allocation as an endowment fund. The HK\$100 million endowment arrangement is targeted to return around HK\$4 million per year, these funds to be used to implement the FMP; and
- Any shortfall below the Annual Allocation amount is proposed to be topped up by an additional top-up fund established for both the FEF and the MEEF, which has a cap of HK\$100 million in total.

The above fund arrangement is illustrated in *Figure 3.2*. The proposed arrangement provides an initial quantification of funds committed for implementing the FMP, representing AAHK’s commitment in contributing to enhancing fisheries resources and supporting the fishing industry in practical and effective ways in north and west Lantau waters.

Figure 3.2 Proposed Fund Arrangement for the Fisheries Enhancement Fund (FEF)



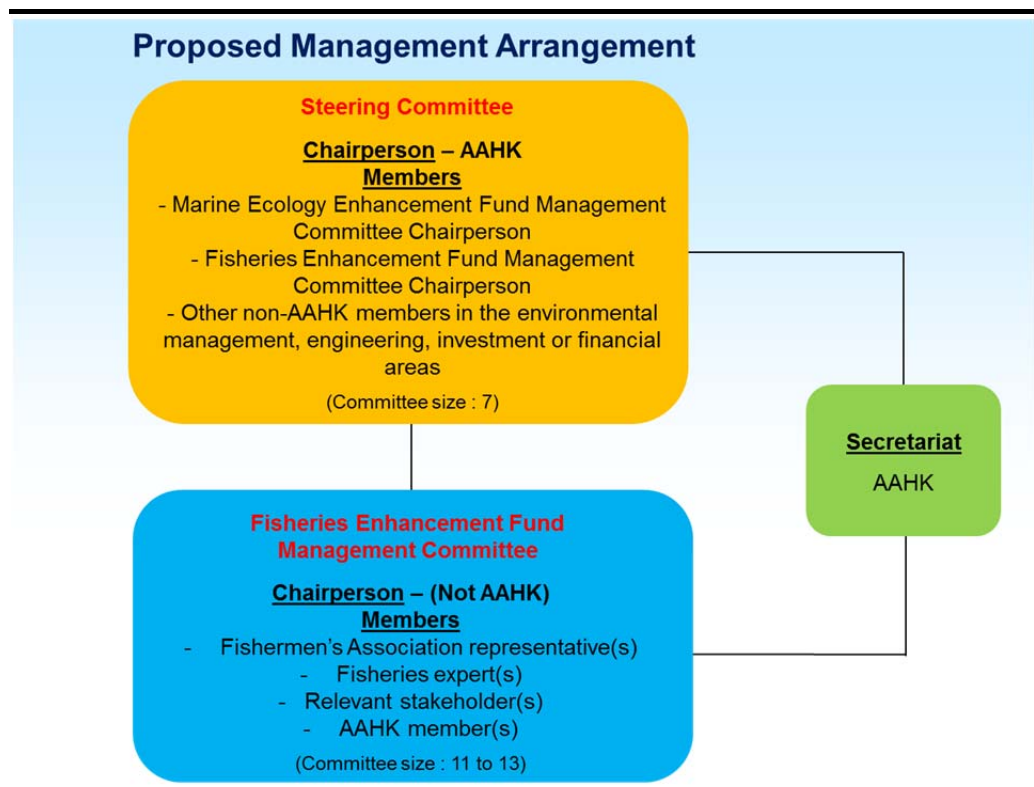


The proposed funding application, approval and allocation mechanism will be further developed and described in detail in the instrument constituting the fund, the guidance notes and application form for the fund.

3.5.2 Proposed Fund Management Structure

The FMP will be launched in consultation with relevant stakeholders, in particular the fishing industry. Consequently, in order to formalise the process and provide a platform for dialogue AAHK will establish a management committee (FEF-MC) to administer the FEF for the effective implementation of the FMP. In addition, a Steering Committee is proposed to be established to provide overall directional guidance / policies for the fund operation to enable sufficient resources will remain available for the fund to meet its objectives in a long-term and sustainable manner. The FEF-MC will approve recommended funding applications that are within the Annual Allocation. The Steering Committee will not override FEF-MC decisions on funding application approvals within the Annual Allocation and will not undermine the role of the FEF-MC. The management arrangement of the FEF is illustrated in Figure 3.3.

Figure 3.3 Proposed Management Arrangement for the Fisheries Enhancement Fund Management Committee (FEF-MC)



Fisheries Enhancement Fund Management Committee (FEF-MC)

It is envisaged that the FEF-MC will be composed of a membership including AAHK, Fishermen's Association representative(s) and fisheries expert(s). Relevant





stakeholders (including, but not limited to, community leaders, people having expertise/ experience in managing similar funds, academic(s) and green group representative(s)) would also be considered for appointment into the management committee. The exact membership will be determined subject to agreement from potential candidates. AAHK will serve (or will procure a third party to serve) as the Secretariat for the FEF-MC. The setup and operation of the FEF have made reference to the AFCD's Sustainable Fisheries Development Fund.

The remit of the FEF-MC will be to manage and operate the FEF so as to ensure that funds are granted to studies and projects relevant and appropriate to the key themes and initiatives of the FMP. Its primary role is to determine the criteria for the selection of initiatives to be funded by FEF, to make recommendations on funding applications that meet the fund objectives and approve the applications that are within the Annual Allocation approved by the Steering Committee. The FEF-MC will study the proposals and report the approved applications to the Steering Committee. If the recommended funding support exceeded the proposed Annual Allocation in any particular year, the FEF-MC will present the recommendations to the Steering Committee for consideration and approval of the shortfall from the HK\$50 million jump start amount and when the HK\$50 million jump start amount has been depleted, then from the top-up fund. For each approved application, appropriate reporting on progress is required and the FEF-MC will monitor and review the project outcomes, including the effectiveness of the approved applications in achieving the goals and objectives of the FEF, so as to make necessary refinement/ adjustment to future funding focuses. The draft terms of reference for the FEF-MC (which will be subject to review / revision by the committee members) has been prepared and is included in *Annex C*.

Steering Committee

AAHK proposes to establish a Steering Committee to provide overall directional guidance / policies for the operation of the FEF to enable sufficient resources will remain available for the fund to meet its objectives in a long-term and sustainable manner. Its functions will include:

- steering and reviewing the operations of FEF (but it will not have authority to override matters within the exclusive power of the FEF-MC);
- approving the funding budget to be allocated to the FEF-MC;
- overseeing the use, allocation, and investment performance of the FEF; and
- reviewing the overall funding situation including the sufficiency and sustainability of the top-up fund arrangement.

Besides, if the total funding amount of the applications recommended by the FEF-MC exceeds the Annual Allocation, the Steering Committee may exercise its discretion to approve the recommended application(s) for funding support by drawing the shortfall from the top-up fund.





It is envisaged that the Steering Committee will be chaired by the AAHK and composed of the chairperson of the FEF-MC, chairperson of the MEEF-MC and other non-AAHK members nominated by reputable organisation(s) in the environmental management, engineering, investment, or financial areas. For clarity, there does not need to be a member in each of the areas referred to above and the members may be nominated by one or more reputable organisations. The exact membership will be determined subject to agreement from potential candidates. AAHK will serve (or will procure a third party to serve) as the Secretariat for the Steering Committee. It should be noted that the Steering Committee is also proposed to provide oversight to the MEEF and MECP to be prepared under separate cover.

Appointment Procedure

The Secretariat will invite reputable organisations in the environmental management, engineering, investment, or financial areas to nominate person(s) having relevant professional expertise / experience to occupy the seats of 4 member(s) of the Steering Committee.

The Secretariat will:

- appoint the persons nominated by the organisation(s) as described above to be those 4 members above of the Steering Committee upon their acceptance; and
- appoint the person nominated by AAHK as described above to be the Chairperson of the Steering Committee upon their acceptance.

3.5.3

FEF-MC Membership

It is suggested that the membership reflects the four broad themes that will comprise the FMP. The FEF-MC will provide balanced views on on-going fisheries operation and sustainable management and enhancement of fisheries resources. It is proposed that the committee will comprise of 11 to 13 members (including the Chairperson), including Fishermen's Association representative(s), Fisheries Expert(s), Relevant Stakeholder(s) and up to 2 representatives nominated by AAHK. It is envisaged that AAHK will not chair the FEF-MC. The code of conduct will be agreed amongst the FEF-MC.

Fishermen's Association representative(s)

Fishermen's Association representative(s) will be engaged as the member(s) of the FEF-MC to oversee the need of the projects, especially in the Fisheries Industry theme and provide comments to enhance current fisheries operations to develop sustainable fisheries industry.

Fisheries Expert(s)

Fisheries expert(s) will be engaged as the member(s) of the FEF-MC to oversee the potential benefits of the projects in all themes to consider whether the projects could enhance fisheries resources to achieve sustainability. Fisheries expert(s)





will also review the proposed assessment for the measurement of project performance as well as provide comments to enhance the effectiveness of the projects.

Relevant Stakeholder(s)

Relevant Stakeholder(s), such as members from fisheries trade business and aquaculture technology, will be engaged as the member(s) of the FEF-MC to oversee the potential benefits of the projects in all themes. They will justify the proposed assessment for the measurement of project performance as well as provide comments to enhance the effectiveness of the project. Community leader(s) as well as people having expertise / experience in managing similar funds will also be considered for appointment into the FEF-MC to provide advice on the fund administration and help streamline the implementation and management of the fund. In addition, academic(s) and green group representative(s) would also be invited to join the FEF-MC to provide balanced views on on-going fisheries operation and sustainable management and enhancement of fisheries resources.

AAHK Member(s)

As the core focus areas of the FEF-MC are sustainable fisheries industry and community benefits, it is suggested there will be up to 2 representatives nominated by AAHK on the Committee, which may include the associated specialist / environmental consultant(s).

Appointment Procedure

The Secretariat of the FEF-MC will compile a list of potential candidates including, but not limited to, any member of any consultative and advisory committee of the AFCD to be the Chairperson and members of the FEF-MC that satisfy the composition stated above.

The Secretariat will invite the potential candidate(s) to be Chairperson or member(s) of the FEF-MC.

The Secretariat will appoint the candidate(s) to be Chairperson or member(s) of the FEF-MC upon their acceptance. If potential candidate(s) declined the invitation, the Secretariat will propose alternative candidate(s) to ensure that the FEF-MC would meet the composition requirements stated above.

Each member of the FEF-MC will be appointed for a fixed term of 3 years, unless otherwise agreed with that member.





3.5.4 Secretariat Structure, Role & Responsibilities

AAHK will provide secretarial services (or will procure the provision of secretarial services by an external third party) to the FEF to facilitate the functions of the Steering Committee and the FEF-MC.

The secretariat will:

- be responsible for the preparation of meeting notices, agendas, meeting translation and minute taking;
- collate progress reports / final reports submitted by funded projects, as well as the summary of total applications received, successful applications, ongoing projects and completed projects in a year for review and reference by the Steering Committee and the FEF-MC; and
- work with the AAHK and the Chairperson of the FEF-MC to ensure proper expertise is present at relevant meetings.

3.6 PROPOSAL SELECTION

It is expected that criteria for the selection of successful initiatives for funding will be formulated and agreed by the FEF-MC. The Steering Committee will not override a decision of the FEF-MC and will not undermine the role of the FEF-MC. In general, it is anticipated proposals will be evaluated based on the strength of their contribution to MEFES objectives and the overarching aspects stated in Section 3.2 in terms of providing the outcomes that will clearly benefit habitats and species and stakeholders (public and fishers ⁽¹⁾) (*Figure 3.4*). It is expected that while proposals may focus on one theme, they may be able to contribute across other themes, which could be taken into account in evaluations.

3.7 IMPLEMENTATION PLAN

It is expected that the FMP will be implemented throughout the construction and operation phases of the 3RS Project. AAHK endeavours to implement the FMP and approve and allocate funding to studies and projects that meet the goal and objectives of the FMP as soon as practical subject to the timely establishment and recommendations from the FEF-MC. A tentative programme for the implementation of the FMP is presented in *Table 3.1*. The AAHK has been conducting consultations with relevant stakeholders and the AFCD to formulate the FMP. It is expected that the FMP will be submitted to ACE for comment in Q4 2015, followed by submission to the DEP in Q1 2016. The establishment of FEF and FEF-MC will commence after the final approval by the DEP and the fund is planned to be in place for application in Q3 2016.

⁽¹⁾ Fishers refer to fishermen and people related to fishing industry.



Figure 3.4
General Considerations for Selection of Proposals for Funding

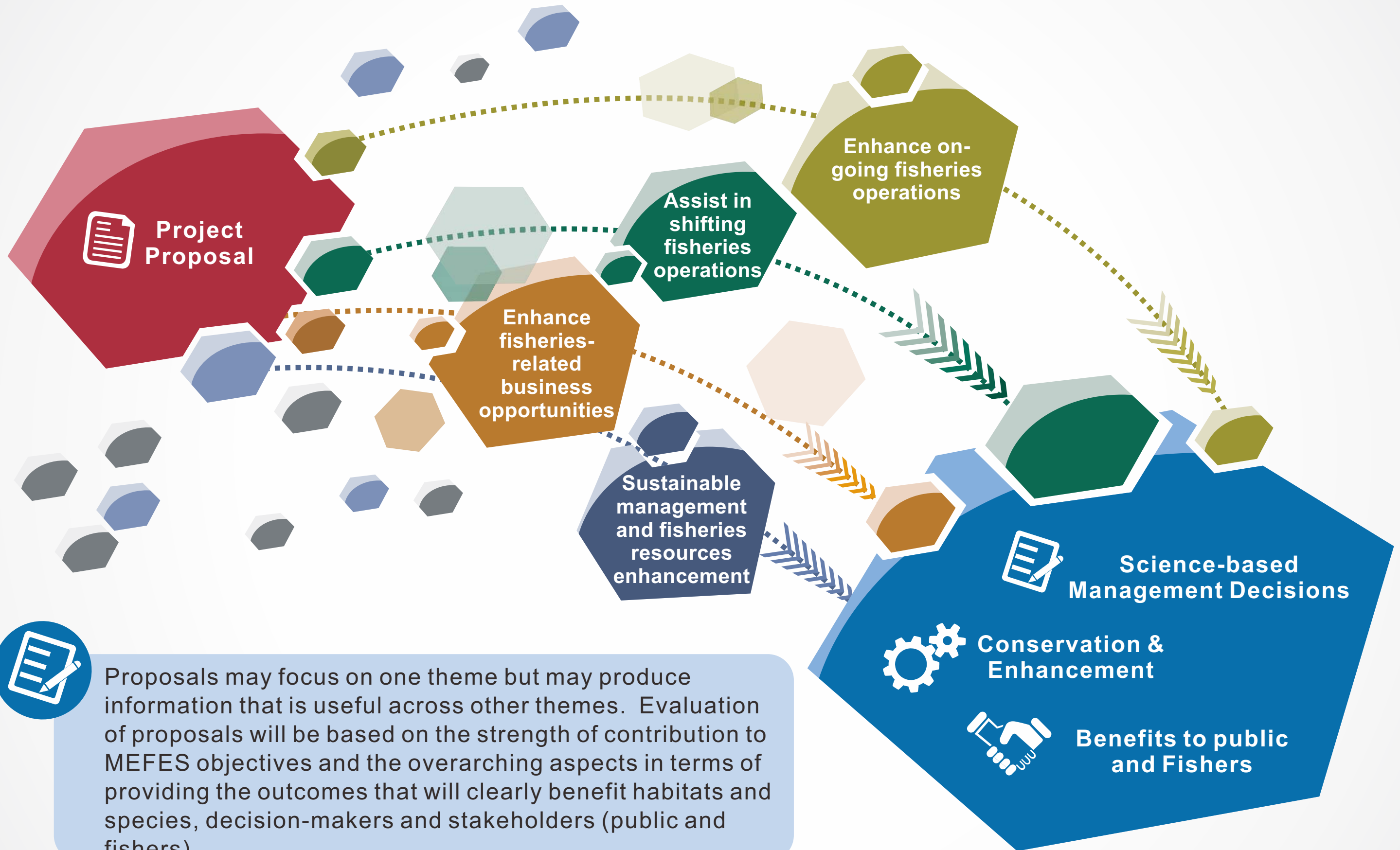




Table 3.1 *Tentative Programme for the Implementation of FMP*

Key Tasks	Time
Consultation with relevant stakeholders and the AFCD	2015 - Ongoing
Submission of FMP to ACE for comment	2015 Q4
Submission of FMP to the DEP for approval	2016 Q1
Establishment of the FEF and FEF-MC	2016 Q2 ⁽¹⁾
Call for funding applications	2016 Q3 ⁽¹⁾

Note:

(1) Subject to the final approval by the DEP.

3.8 *REVIEW AND EVALUATION OF THE FMP*

In order to determine whether the FMP is successful in achieving the goal presented in *Section 3.4* it is important to implement a mechanism for reviewing and evaluating the success of the Plan and supported initiatives. Review and evaluation mechanisms are proposed for each of the four themes in *Section 4*. The FEF-MC will monitor the performance of the funded applications so as to make necessary refinement/ adjustment to future funding focuses.





4 KEY THEMES OF THE FMP

4.1 BACKGROUND

The FMP aims to achieve its goals through the following key objectives:

- Support measures that help to achieve sustainable management and enhancement of fisheries resources;
- Support and enhance on-going fisheries operations in a sustainable manner;
- Support measures that assist in shifting fisheries operations; and
- Support the promotion and enhancement of fisheries-related business opportunities.

The FMP is therefore organized into four themes, each of which is developed further and discussed in detail below.

A key theme of the FMP is to support measures that help to achieve sustainable management and enhancement of fisheries resources, which further ensures sustainable fisheries resources rather than facilitating the fishing sector to increase their catch. It is important to note that the concept of sustainable fisheries is also embedded in the other three key themes of the FMP whereby sustainable modes of operation and alternative livelihood and business opportunities will be supported; consequently an enhancement of fisheries resources is expected when fishing effort is kept within sustainable levels.

4.1.1 ***Support Measures that Help to Achieve Sustainable Management and Enhancement of Fisheries Resources***

Certain management measures, controls and restrictions can be explored and undertaken to enhance fisheries resources. Examples include training to fishermen on the concept of sustainable fisheries in order to raise their awareness of the long-term ecological and economic importance of conserving and enhancing fisheries resources in Hong Kong.

4.1.2 ***Support and Enhance On-going Fisheries Operations in a Sustainable Manner***

Given the challenges facing the marine capture fishery industry (refer to *Annex B*), it is considered critical to propose initiatives under the FMP to support and enhance on-going fisheries operation in the north Lantau waters in a sustainable manner.

4.1.3 ***Support Measures that Assist in Shifting Fisheries Operations***

Although initiatives are provided to support the ongoing fisheries operations within the north Lantau waters as well as ensure operators explore new fishing grounds, it is considered possible that some operators may want to change their livelihood





considering the challenging operating environment. Alternative livelihoods may include aquaculture which is considered as a practical alternative for capture fishermen to make a living using their knowledge on fisheries operations in the marine environment.

4.1.4 *Support the Promotion and Enhancement of Fisheries-related Business Opportunities*

Certain business opportunities are noted to be fisheries-related and can thus be adopted by the fishery communities. Examples include fisheries-based eco-tourism where tourist can tour the Hong Kong fishing grounds and observe fishing operations onboard. Fishermen using their vessels may also be engaged in eco-tourism related to dolphin watching and recreational fishing.

4.2 GOALS AND OBJECTIVES

4.2.1 *Support Measures that Help to Achieve Sustainable Management and Enhancement of Fisheries Resources*

The goal of the current theme of “Support Measures that Help to Achieve Sustainable Management and Enhancement of Fisheries Resources” is to promote sustainable fisheries for the ultimate benefit of conserving and enhancing fisheries resources in a long term. Specific objectives under this theme are as follows:

- To explore and examine practicable management measures that could be implemented by the fishery sector to enhance the sustainable use of fisheries resources (eg reduce capture of non target fish and fry, identify seasonal fishing grounds, etc.); and
- To build and improve overall capacity of fishery operators to promote sustainable fisheries.

4.2.2 *Support and Enhance On-going Fisheries Operations in a Sustainable Manner*

The main goal of the Support and Enhance On-going Fisheries Operations in a Sustainable Manner Theme is to ensure that the affected fisheries operations in the north Lantau waters can be sustained and promoted to allow fishermen to address the challenges facing the industry which have culminated from a variety of circumstances in recent years. The specific objectives of this theme are as follows:

- Optimise the on-going fisheries operations to increase operational range to allow fishing activity to be conducted in alternative locations by affected fishermen;
- Through initiatives including technology, engine and equipment upgrades, improve efficiency and environmental performance of operations to allow for improvement of cost-effectiveness and competitiveness to enable the feasibility of fishing in alternative locations; and





- To build and improve overall capacity of fishery operators to adapt to improved technology.

4.2.3 Support Measures that Assist in Shifting Fisheries Operations

The goal of the Support Measures that Assist in Shifting Fisheries Operations Theme is to assist fishermen in developing alternative livelihoods related to aquaculture. Specific objectives of this theme are:

- To allow fishermen to build their capacity in order to enhance their employment / development opportunities in aquaculture; and
- To assist fishermen in developing aquaculture practices by providing ongoing support on technology development, equipment purchase / upgrades, product marketing and knowledge transfer.

4.2.4 Support the Promotion and Enhancement of Fisheries-related Business Opportunities

The goal of the current theme of “Support the Promotion and Enhancement of Fisheries-related Business Opportunities” is to assist fishermen in developing fisheries-related business opportunities. Specific objectives under this theme are as follows:

- To enable fishermen achieving self-reliance, maintaining their own livelihoods and coping with the changing operating environment of the fisheries related business;
- To explore and enhance the feasibility of developing fisheries-based eco-tourism; and
- To diversify the skills of fishermen to other fisheries-related business by provision of appropriate training.

4.3 POTENTIAL INITIATIVES

Indicative example initiatives under each of the four themes are provided in *Annex D*. The initiatives are not considered to be definitive, but demonstrate some possible opportunities under the MEFES for developing sustainable fishing industry and fishery resource enhancement in western Hong Kong waters. It should be noted that the actual initiatives to be undertaken under each theme will be proposed by third-party applicants for consideration by the FEF-MC.

4.4 IMPLEMENTATION AND FUNDING

The initiatives of the four themes involve substantial activities that need to be conducted during the construction and operational phases of the 3RS development. It should be noted that as the funding applications for each initiative will depend on





interest of applicants, it is not possible to estimate funding allocation for individual initiatives at this stage. Funding for initiatives will be as per funding agreements between third-party applicants and the FEF-MC and are also not included in this FMP.

It is expected that initiatives submitted by third-parties will have focused implementation/work plans yet to be discussed with AAHK and FEF-MC and that these would be separate activity driven documents and not included within this FMP.

4.5 ROLES AND RESPONSIBILITY

Several entities are identified who will be integral to achieving the overall goal of the four key themes. These entities and their roles and responsibilities of these entities are presented below.

AAHK The main role of the AAHK will be to ensure the FMP is implemented in compliance with the requirements of Condition 2.13 of EP No. EP-489/2014. AAHK will also provide assistance to applicants, on administrative support as well as technical support if needed, e.g. review and comment on the proposed activities under individual initiatives.

FEF-MC The main role of the FEF-MC will be to oversee the management and implementation of the activities under individual initiatives.

4.6 REVIEW AND EVALUATION

In order to evaluate the effectiveness and efficiency of supported initiatives under the four themes, a process of ongoing performance evaluation is proposed. It is suggested that performance evaluation shall be arranged around groups of specific high level performance indicators. The example performance indicators envisaged at this early stage are detailed in *Annex D*. The FEF-MC will monitor the performance of the funded applications so as to make necessary refinement/adjustment to future funding focuses.

It should be noted that the performance indicators will be set and agreed between the third-party applicants and the FEF-MC for the actual initiatives to be undertaken under each theme.





This document presents details on the proposed mechanism for the implementation, the funding arrangement, and the setting up of a management committee for the FEF to manage and administer the FMP. It aims to support the fishing industry and enhance fisheries resources in the western Hong Kong waters especially the Lantau waters during the construction and the operation of the Project. In addition, the document contains information on the goal, management and administration of the FMP and introduces the four themes that when implemented are expected to achieve the stated goal. These themes are:

- Support measures that help to achieve sustainable management and enhancement of fisheries resources;
- Support and enhance on-going fisheries operations in a sustainable manner;
- Support measures that assist in shifting fisheries operations; and
- Support the promotion and enhancement of fisheries-related business opportunities.

To support the initiatives with the stated goals and objectives in a long-term and sustainable manner, it is considered that an endowment fund arrangement whereby seed money is invested to generate an annual investment return that is able to support the FMP in a long term. In the event that the targeted investment return is not achieved, any shortfall below the Annual Allocation is proposed to be topped up by an additional top-up fund to ensure that resources to support FMP are not compromised. A significant initial allocation outside of the endowment arrangement is also proposed to jump start the implementation of the FMP in the initial years of establishment. It is important to note that the endowment fund with top-up fund arrangement would allow funds to be available sustainably and AAHK will ensure the FMP is implemented in compliance with the requirements of Condition 2.13 of EP No. EP-489/2014 and have oversight of the implementation of studies and projects under the key aspects and initiatives of the plan.

AAHK will establish a FEF-MC, composing of members from AAHK, fishermen's association representatives, fisheries experts and relevant stakeholders (including, but not limited to, community leaders, people having expertise/ experience in managing similar funds, academic(s) and green group representative(s)) to administer the FEF for the effective implementation of the FMP and approve the applications that are within the Annual Allocation. In addition, a Steering Committee is proposed to be established to provide overall directional guidance / policies for the fund operation to enable sufficient resources will remain available for the fund to meet its objectives in a long-term and sustainable manner. It is planned to establish the FEF and FEF-MC in Q2 2016 and initiate fund application in Q3 2016, subject to the final approval by DEP.



ANNEX A

Overview of Marine Ecology and Fisheries Enhancement Strategy (MEFES)





A1 OVERVIEW OF THE MARINE ECOLOGY AND FISHERIES ENHANCEMENT STRATEGY (MEFES)

The *Marine Ecology and Fisheries Enhancement Strategy (MEFES)* of the 3RS Project has been set up for the purpose of enhancing the marine environment for the benefit of marine ecology (including Chinese White Dolphins (CWD)) and fisheries resources in the vicinity of the project area, in Hong Kong western waters and further afield into the Pearl River Estuary (PRE). It is also for the purpose of providing support and assistance to affected fishers to achieve more sustainable fishing operations.

It is important to note that the MEFES and associated enhancement and assistance initiatives are not intended to address or directly mitigate impacts identified in the environmental impact assessment (EIA) study as these are already addressed by the specific construction practices, mitigation measures and monitoring programs that will already be implemented for the project. These include the establishment of a new Marine Park, associated management plan and marine ecological and fisheries enhancement measures, and an Environmental Monitoring and Audit (EM&A) programme, which includes extensive CWD monitoring, water quality monitoring and coral translocation efforts at the HKIA seawall.

The main geographical focus of initiatives and measures under the strategy is on North Lantau and Hong Kong western waters but will extend to other Hong Kong waters and PRE.

Initiatives under the MEFES can be grouped into three main categories:

- EIA committed enhancement measures;
- Marine Ecological Conservation Plan (MECP); and,
- Fisheries Management Plan (FMP).

EIA committed enhancement measures are those initiatives which AAHK has committed to progressing and directly funding such as eco-enhancement of seawall design, deployment of artificial reefs and re-stocking of fish fry. Through a different funding mechanism, AAHK will also fund initiatives proposed by third-parties (eg Non-Governmental organisations (NGOs) and researchers) which will form and be under the MECP and the FMP. Further details are provided in the remainder of this Annex.

A1.1 EIA COMMITTED ENHANCEMENT MEASURES

An overview summary of initiatives in the MEFES to be progressed and directly funded by AAHK are as follows:

- ***Implementation of early enhancement measures within the preliminary boundary of the future marine park area and/or near to the future 3RS works***





area. AAHK will define habitat enhancement areas near the project area where enhancement measures are expected to be implemented during the construction phase of the project and these will be the responsibility of AAHK. These may include:

- Restricting SkyPier High Speed Ferries (HSFs) and construction vessels from entering into defined high value habitat enhancement areas / dolphin protection areas under normal circumstances ⁽¹⁾;
 - Development and deployment of artificial reefs ⁽²⁾;
 - Conducting restocking of fish fry and shrimp seedling ⁽²⁾; and,
 - Eco-enhancement design of seawall.
- **Enhancement Studies in Hong Kong Territorial Waters.** AAHK will support enhancement initiatives through:
 - Support for Feasibility Study for Artificial Reef deployment ⁽²⁾
 - Feasibility Study for fish fry stocking ⁽²⁾
 - **Conduct additional voluntary surveillance in Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP).** AAHK will liaise with AFCD and Country and Marine Parks Board to decide the feasibility of supporting reporting of incidents of apparent non-compliance with Marine Park Regulations by other marine users.

A1.2

MARINE ECOLOGY CONSERVATION PLAN (MECP)

AAHK will fund initiatives that support the objectives of the MEFES. The MECP and its funding through the Marine Ecology Enhancement Fund (MEEF) will be administered by a Management Committee set up by the AAHK. Applicants will be able to apply for funding for their initiatives with proposals invited under three overall themes:

- Enhancement of habitats for marine ecology and fishery resources;
- Encouragement of scientific research and studies; and,
- Promotion of environmental education and eco-tourism.

(1) The planned high value habitat enhancement areas / dolphin protection areas were identified during the 3RS EIA approval process and are located to the east of the existing Sha Chau Lung Kwu Chau marine park and in the area to the west of HKIA. Further details on these areas are provided in the Marine Travel and Routes Management Plan for High Speed Ferries of SkyPier and the Marine Travel and Routes Management Plan for Construction and Associated Vessels.

(2) Implementation would be subject to the outcome of feasibility studies.





Should the enhancement studies for Hong Kong Territorial waters identify values for implementing enhancement measures in other Hong Kong Territorial waters, their implementation and future management would also be addressed under the MECP.

A1.3

FISHERIES MANAGEMENT PLAN (FMP)

AAHK will fund initiatives that promote sustainable fisheries for affected fisheries in North Lantau waters. The FMP and its funding through a Fisheries Enhancement Fund (FEF) will be administered by a Management Committee set up by the AAHK. Fishers will be able to apply for funding for their initiatives with proposals invited to:

- Support and enhance on-going fisheries operations;
- Support measures that assist in shifting fisheries operations; and,
- Support the promotion and enhancement of fisheries-related business opportunities.



ANNEX B

Physical Description and Fisheries Setting





B1 PHYSICAL DESCRIPTION AND FISHERIES SETTING

B1.1 INTRODUCTION

This *Annex* provides background information on the Hong Kong fishing and aquaculture industry as well as a high-level description of the physical and fisheries characters of western Hong Kong waters, in particular north and west Lantau waters. This review provides the basis for identifying key habitats, species, fisheries resources or fishermen that may warrant focused effort in enhancement and support under the Fisheries Management Plan (FMP). A description on the current planning of the 3RS Project is also presented.

B1.2 PHYSICAL SETTING

The 3RS project area mainly comprises approximately 650 ha of land formation in marine open waters and seawall development of approximately 5.9 km immediately north of the HKIA existing platform in the northern Lantau waters. The resulting loss of seabed comprises of marine sediment and debris formed from natural sedimentation with the influence of flows from the Pearl River Estuary (PRE). The existing seawall is largely constructed of sloping armour rock with the berthing point being constructed of vertical concrete.

The hydrodynamic regime in the western Hong Kong waters is complex and varies with a number of factors including the lunar cycle (spring and neap tides), the season and the rate of flow of the Pearl River. In general, the main ebb tide currents flow south along the Urmston Road, with a subsidiary flow bifurcating northwest of Chek Lap Kok to flow south down the west coast of Lantau, and southeast around the east of Chek Lap Kok Island. Flood tides show the reverse pattern.

The Pearl River, situated in a sub-tropical climate, brings along with heavy loads of suspended sediment and nitrates during summer (wet) season and as a consequence concentrations of these parameters within western waters are variable but generally far higher than in the more oceanic influenced waters to the south and east of Hong Kong. As a result of the influence of the Pearl River, water quality of the western waters is characterized by a relatively higher background level of nitrogenous nutrients (in particular Total Inorganic Nitrogen); the water quality is otherwise acceptable with a fair rate of compliance with the Water Quality Objectives.

During the winter (dry) season the influence of the Pearl River is at its least because of reduced flows, resulting in typically well-mixed coastal waters. In contrast during the summer (wet) season, the flow of the Pearl River increases and the coastal waters become highly stratified as the large influx of brackish water overlies the denser, more saline oceanic waters near the seabed.

There are two main channels in the area. One channel extends from the Ma Wan Channel to the Urmston Road with a deepest depth of 22 m near Tap Shek Kok. The other one which stays south of The Brothers is generally of water depth of 10 m.





Other areas in the North Lantau waters are quite shallow and the average water depth is 5 to 6 m. The water depths of west Lantau range from 0 to 22 m

A number of infrastructure developments are planned or underway in western Hong Kong waters with multiple marine users operating. These include the HKIA, Hong Kong Boundary Crossing Facilities (HKBCF), Tuen Mun – Chek Lap Kok Link (TM-CLKL), Hong Kong Link Road (HKLR), contaminated sediment disposal facilities, shipping fairways and vessel traffic routes, anchorage areas, and submarine utilities such as cables, pipelines, seawater intake and effluent outfalls. Marine traffic level is high with high speed ferries, licensed ferry, tankers, bulk carriers, cargo vessels, container vessels, passenger ships, construction vessels (e.g. pilot, tug and tow, barges), government fast launches, fishing vessels and other small craft commonly seen in these waters.

B1.3 HONG KONG FISHING INDUSTRY & RECENT CHANGES

B1.3.1 Marine Capture Fisheries

Post-war fisheries development efforts allowed vessels to mechanize and be equipped with increasingly powerful engines to extend operational range to the South China Sea and Hong Kong's fishing industry underwent rapid expansion with annual production and production per vessel, especially by trawlers, experiencing an upward trend throughout the 1970s and 1980s. At its peak in 1989, annual production by the Hong Kong capture fisheries industry was 230,000 tonnes per annum.

After this time, annual production and production value of the local fishing fleet levelled off and then saw a downward trend. After 1989, the industry saw a decline in catch per unit effort, reflecting a reduction in fishing efficiency. After 2000, the industry saw a decrease in the number of vessels (mainly among smaller, low power vessels) as well as a continual increase in overall engine power of the fleet. Despite these changes, no corresponding increase in fishing efficiency of the Hong Kong fleet was recorded.

In a recent review, the Government's Committee on Sustainable Fisheries attributed the reduction in annual catch and production value to a declining quality of catch and the continued decrease in fisheries resources in traditional fishing grounds of Hong Kong and the South China Sea due to overfishing and competition from Mainland fishermen from provinces adjoining the South China Sea. The poor status of Hong Kong's fisheries resources was first described in detail in the late 1990s as well as later studies⁽¹⁾⁽²⁾⁽³⁾. In Hong Kong waters, catch composition changed from mainly large, slow-growing, high-value species to small, fast-growing, low-value species. Other factors contributing to the decline included changes in water quality and

(1) ERM 1999. Artificial Reef Deployment Study. Final report for AFD.

(2) ERM 1998. Fisheries Resources and Fishing Operations in Hong Kong Waters. Final report for AFD.

(3) Sumaila, U.R, Cheung, W. and L.Teh 2007. Rebuilding Hong Kong's Marine Fishery. An evaluation of Management Options. WWF-HK commissioned report produced by the Fisheries Centre, University of British Columbia





coastal / marine development projects. In addition, rising operating costs (due to inefficiency associated with fishing technologies not being advanced enough and higher fuels costs), competition from imported fisheries products, the annual summer closure of fishing grounds in the South China Sea (effective since 1999 and extended to two and a half month duration since 2009), the introduction of a permanent trawling ban in Hong Kong waters (effective from 31 December 2012) and introduction of other fisheries management measures has made the operating environment increasingly difficult for Hong Kong fishermen in recent years. Other restrictions on fishing activities in Mainland waters include a total ban on hang trawlers and a ban on bottom trawling in waters less than 40m depth (since 1979).

The business model of operations is also identified as contributing challenges to development of the industry. Capture fisheries operate mainly on a family basis, with crews comprising family members as well as local or Mainland deckhands. The fishing population is ageing with more than half aged over 50 years old and labour shortage and lack of new entrants are acknowledged issues for the industry.

The challenges facing the industry are therefore many and have culminated over many years. Consequently, there has been recognition by government and fishermen and other stakeholders, that the Hong Kong fishing industry must move towards a more sustainable future, allowing fishing communities across Hong Kong to achieve self-reliance, maintain livelihoods and cope with changing business environment. To assist fishers, the government has implemented a number of schemes and financial relief measures over the years whilst at the same time strengthening fisheries management measures in Hong Kong waters including implementation of a fishing licensing system, limiting the entry of new fishing vessels, and implementing measures to enhance fisheries resources. As well as general marine pollution control measures, measures to improve fishing resources have included Artificial Reef deployment programmes, fish restocking programmes, designation of fisheries protection zones, designation of Marine Parks and Marine Reserves (and restrictions on fishing therein) and introduction of the Hong Kong-wide trawling ban. Introduction of fisheries resources enhancement measures started in the mid-1990s when the government's objective for Hong Kong fisheries was to prioritize the sustainable use of fisheries resources rather than pursuing continual increased production. Recently, financial assistance from the government includes a HK\$500 million lump sum Sustainable Fisheries Development Fund to fund projects to facilitate the sustainable development of the Hong Kong fishing industry.

In the latest publically-released data ⁽¹⁾, AFCD reported fishing activities in 2014 by the Hong Kong capture fisheries industry are mainly conducted in the waters of the adjacent continental shelf in the South China Sea. AFCD reported there were about 4,500 fishing vessels in the Hong Kong fleet and estimated the Hong Kong capture fishery annual production was 160,789 tonnes in 2014. AFCD does not publish a more detailed breakdown of data by different home ports across Hong Kong.

(1) AFCD (2015) Capture Fisheries: Latest status
<http://www.afcd.gov.hk/english/fisheries/fish_cap/fish_cap_latest/fish_cap_latest.html>





In 2014, main fishing methods of the Hong Kong fleet include pair trawling, long-lining, gill-netting and purse-seining. Of these methods, pair trawlers have the greatest operational range with traditional fishing grounds for Hong Kong vessels spanning the entire continental shelf of the South China Sea and were responsible for producing the majority of the Hong Kong fishing fleet's annual production. Similarly, fishing grounds for purse-seining also extend to the offshore continental shelf. Vessels conducting long-lining, which targets demersal species has traditionally mainly been conducted around the Pearl River Estuary, reflecting the distribution of target species. Gill-netting is typically employed by local, small scale fishers with effort typically concentrated in Hong Kong waters. Hand-lining involves targeting live catches with traditional frequent fishing grounds including reefs and shoals at Pratas, Paracels, Macclesfield Bank and Spratly Islands.

As mentioned previously, the Hong Kong fleet competes with Mainland fishers in the South China Sea (as well as others such as from Vietnam and Taiwan), though the distribution of fishing effort and degree of overlap of operations cannot be elucidated given there is limited monitoring and publically available information. Based on 2011 data ⁽¹⁾, it can be seen the Hong Kong fleet is small compared to the number of Mainland fishing vessels operating in the South China Sea (Guangdong: 54,300 vessels; Guangxi: 10,300 vessels; Hainan: 26,000 vessels; Fujian: 59,000 vessels). Similarly, based on 2011 data, in comparison annual production by the Hong Kong represents a sizeable fraction of production by fleets in other Mainland provinces bordering the South China Sea (Guangdong: 1,452,000 tonnes per annum; Guangxi: 665,000 tonnes per annum; Hainan: 1,050,000 tonnes per annum; Fujian: 1,916,000 tonnes per annum). Similar to the Hong Kong situation, trawlers are reported to account for most of the production by the Mainland fleet.

B1.3.2

Aquaculture Fisheries

Marine Fish Culture

Hong Kong aquaculture fisheries include marine fish culture and pond culture. Prior to 1980, marine fish culture operations were haphazardly distributed and unregulated. Following enactment of the Marine Fish Culture Ordinance (Cap. 353) in 1980, all fish culture activities were required to operate under licence and in designated fish culture zones. To date, the government has designated 26 fish culture zones (FCZs) located in sheltered coastal areas across Hong Kong, occupying a total sea area of 209 ha (*Figure B1*). The government commissioned a feasibility study to examine the potential for increasing the number and size of fish culture zones as well as the potential for issuing new licences to assist development of the industry. As at 2015, this study is ongoing.

Marine fish culture involves rearing marine fish from fry or fingerlings to marketable size in cages suspended by floating rafts. The species under culture depends on availability of imported fry. Fry are mostly imported from the Mainland, Taiwan,

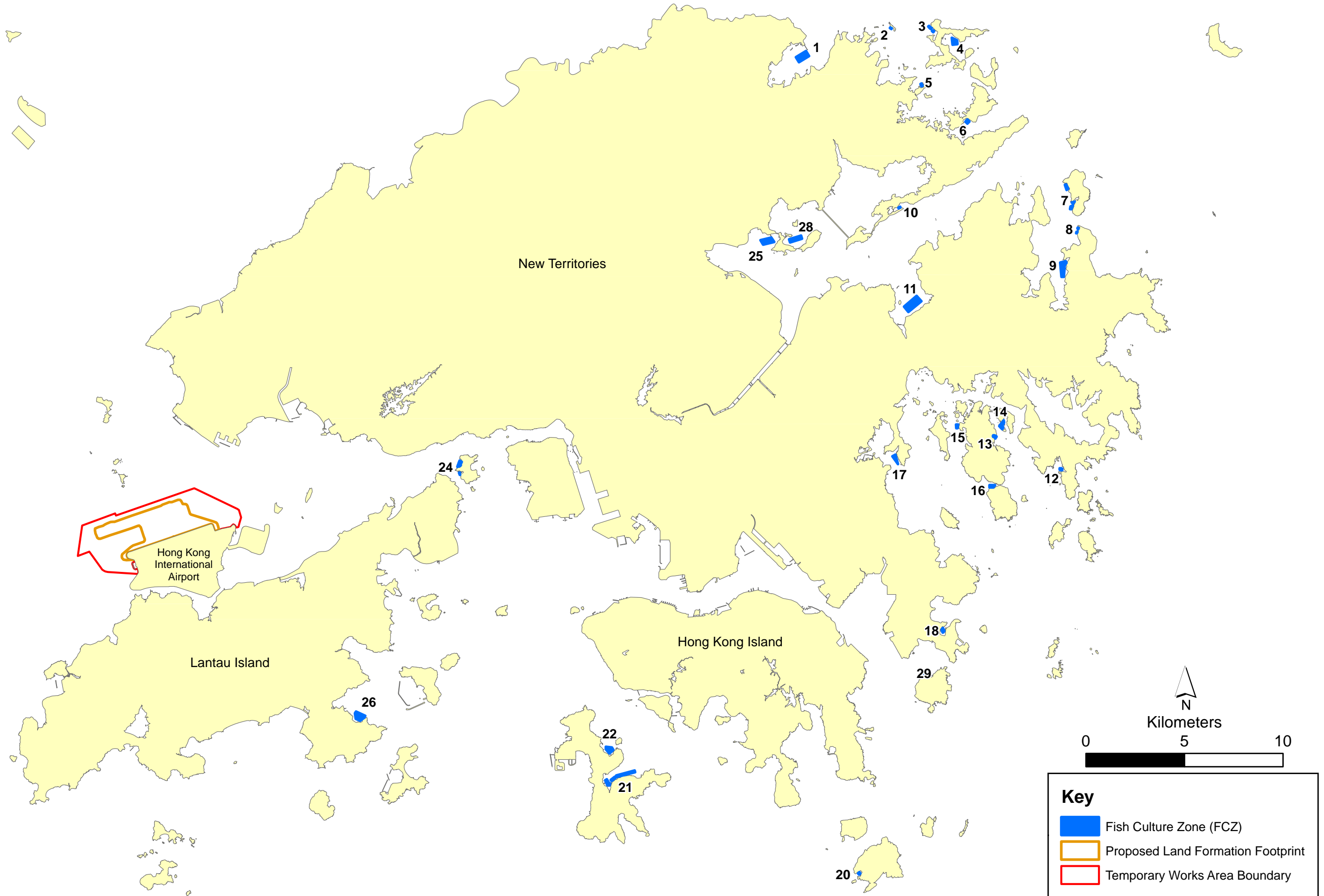
(1) Chinese Academy of Fisheries Science, 2012, The 2011 National Fisheries Statistics (in Chinese)
<http://www.cafs.ac.cn/english/index.html>



Figure B1

Marine Fish Culture Zones in Hong Kong

ID	Fish Culture Zone
1	Sha Tau Kok
2	Ap Chau
3	Kat O
4	O Pui Tong
5	Sai Lau Kong
6	Wong Wan
7	Tap Mun
8	Kau Lau Wan
9	Sham Wan
10	Lo Fu Wat
11	Yung Shue Au
12	Leung Shuen Wan
13	Tiu Cham Wan
14	Tai Tau Chau
15	Kai Lung Wan
16	Kau Sai
17	Ma Nam Wat
18	Po Toi O
20	Po Toi
21	Sok Kwu Wan
22	Lo Tik Wan
24	Ma Wan
25	Yim Tin Tsai
26	Cheung Sha Wan
28	Yim Tin Tsai (East)
29	Tung Lung Chau





Thailand, Philippines or Indonesia. Species being cultured have gradually changed over the recent years. Currently, common species under culture include green grouper, brown-spotted grouper, giant grouper, Russell's snapper, mangrove snapper, goldlined seabream and star snapper.

To manage the effects on water quality of marine fish culture on the marine environment, in 1987, the government introduced a moratorium on the issue of new licences, which is still in effect to the present day. In June 2002, the government allowed marine fish culture licences to be transferable to facilitate competitiveness of operations.

The marine fish culture sector in Hong Kong has seen a decline in annual production since peak levels in the early 1990s. Since that time, production has decreased from nearly 4,000 tonnes per annum to under 1,500 tonnes per annum in the intervening years. The decline may be linked to a number of challenges that the industry faces over the years, such as strong competition from imported aquatic products; inadequate aquaculture technologies; limited choices and supply of fry; uncompetitive production costs; the moratorium on the issue of new marine fish culture licence; and idling marine fish culture rafts⁽¹⁾.

Pond Culture

Pond culture, on the other hand, does not require a licence from the government. Fish pond operations are mainly concentrated in the northwest New Territories. Pond culture involves raising fry or fingerlings to marketable size in ponds. Polyculture of various carp in combination with tilapia or grey mullet is practiced in freshwater inland ponds. Monoculture of carnivorous species such as giant grouper, seabream and spotted scat are practiced in brackish ponds nearer to the coast. Fry are imported from the Mainland and Taiwan and some mullet fry are sourced from local coastal waters. In 2014, there were 1,140 ha of fish ponds in Hong Kong which produced 2,001 tonnes of freshwater fish.

The industry saw a development phase in the post war years to the 1960s and then rapid expansion phase up til the mid 1980's. Improvements in management techniques and mechanization led to reduced operation and maintenance costs and so in the 1970s and 1980s, it had grown to be a highly profitable industry aided by strong demand of a growing population. In the late 1980s, annual production peaked at 6,600 tonnes. Following the late 1980's, the industry saw a decline. Production levels reduced as a result of loss of pond area due to urban development. In the 1990s, the wholesale price of fish decreased in the face of competition from imports. In 2002 the central government removed export quota on freshwater fish to Hong Kong resulting in greater imports and a sharp drop in local prices, affecting incomes. This manifested as a decline in profits and incomes for aquaculturists.

Challenges Facing the Aquaculture Industry

(1) Legislative Council Secretariat (2012) *FACT SHEET: Review of the moratorium on the issue of marine fish culture licence.* FS30/11-12





It has been recognized the aquaculture fisheries sector in Hong Kong faces a number of challenges to its development. In 2006, the Government's Committee on Sustainable Fisheries identified the challenges as including low market share, strong competition from large volume of imported aquaculture products, inadequate aquaculture technologies, limited choices and supply of fry, uncompetitive production costs, moratorium on issue of new licences and idling marine culture fish rafts, unclear land status concerning fishponds and decrease in fish pond area due to urban development. In addition, the aquaculture industry was reported to face problems associated with ageing population (more than half are over 50 years old), labour shortage and inability to attract new entrants to the industry. To assist in addressing the challenges, the government has implemented a number of schemes and relief measures as well as provision of technical support and technical development studies and education on good management practices. The Government's HK\$500 million Sustainable Fisheries Development Fund was set up to fund projects that would facilitate the sustainable development of the Hong Kong fishing industry including aquaculture.

B1.4 FISHERIES PROFILE OF HONG KONG WESTERN WATERS

In order to understand better the fisheries setting of the area where the 3RS Project may have interactions with, a series of fisheries surveys were conducted between 2012 and 2013 as part of the EIA study. This included fish trawl, purse seine, gill net, hand line, artificial reefs, ichthyoplankton and fish post-larvae surveys, as well as fisheries interview survey at the homeports potentially affected by the Project. Survey results were supplemented with data from the literature to provide an update of the status of fisheries resources and fishing activities within and in the vicinity of the 3RS project site.

The findings of the 3RS EIA Study represent the most recent publically available published information on the fisheries resources and operations for Hong Kong western waters. Based on the fisheries interview survey conducted in 2013, it was concluded that information presented in 2006 Port Survey, which is the latest published information on operations and production in Hong Kong waters, was still applicable. However it was noted that since the trawl ban came into effect on 31 December 2012, fishermen using trawlers have moved to outside Hong Kong, while some trawlers have transformed their operation to purse-seining, gill netting and hand-lining.

B1.4.1 Fishing Operations

There are no aquaculture activities within the land formation footprint of the 3RS Project. In western Hong Kong waters, the level of overall fishing operations varied in different places, ranging from very low to moderate (approx. 1-400 vessels) (*Figure B2*). Locations with relatively higher level fishing operations included northern Chek Lap Kok waters, within the SCLKCMP, near The Brothers, Tai O and Fan Lau. The types of fishing vessels operating in the area included stern trawler, shrimp trawler, hang trawler, gill netter, long liner, purse seiner and sampan. It should be noted

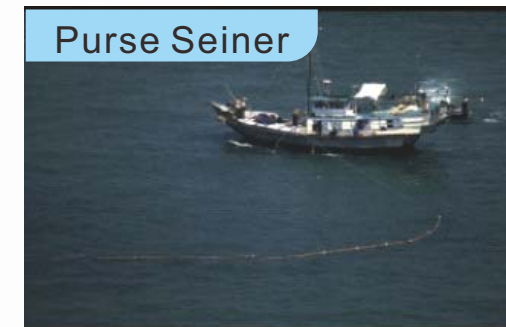
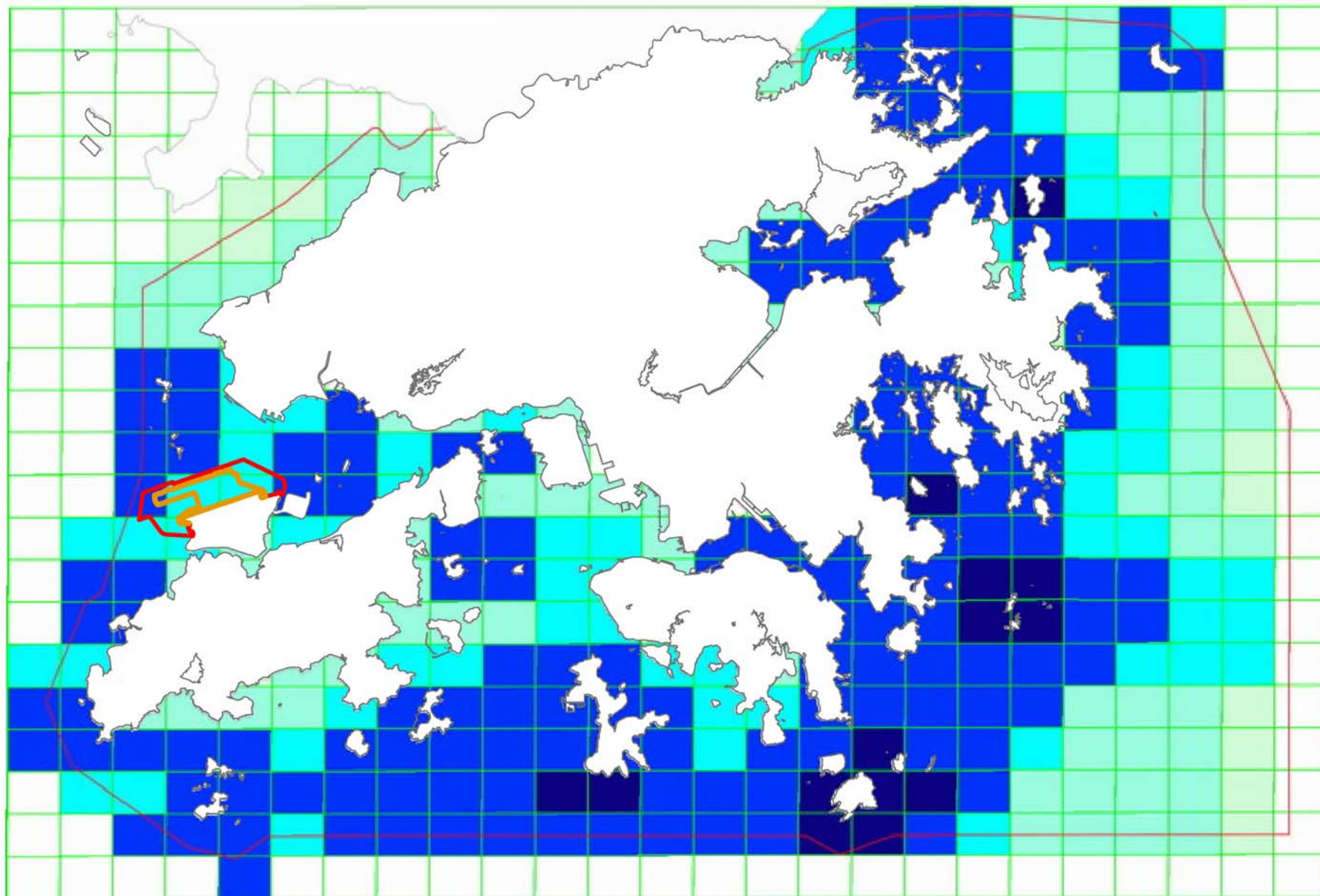


Figure B2 Distribution of Fishing Operations (All Vessels) in Hong Kong Waters as recorded by Agriculture, Fisheries and Conservation Department in Port Survey 2006

Port Survey 2006
Distribution of fishing operations
Overall

捕魚作業及生產訪問調查 2006
捕魚作業分布
總計





捕鱼作业及生产访问调查 2006
捕鱼作业分布
总计



Key

-  Proposed Land Formation Footprint
-  Temporary Works Area Boundary

Number of vessels

- 漁船數目
漁船數目
-  >0 & ≤ 10
 -  10 - 50
 -  50 - 100
 -  100 - 400
 -  400 - 700
 -  700 - 1000



that these observations represented data before the territory-wide trawl ban that came into effect on 31 December 2012.

B1.4.2 Fisheries Production

There was no reported fish fry fisheries production, and the Tai O area is the place with reported high adult fish production in terms of weight (400 – 600 kg/ha). In comparison to recent catch levels across Hong Kong waters, moderate to moderate high levels of fisheries productions, in terms of abundance and yield, were recorded in northern Chek Lap Kok waters, western Chek Lap Kok waters, within SCLKCMP, near The Brothers, Tai O and Fan Lau.

B1.4.3 Fisheries Resources

Fisheries surveys of the EIA study recorded moderate yield, in northern and western Chek Lap Kok waters, and high yield in SCLKCMP and The Brothers in comparison to recent catch levels across Hong Kong waters. The most dominant species were generally of low or no commercial value. The ichthyoplankton and fish post-larvae densities and family richness were low.

Northern Lantau waters had been identified as spawning grounds of commercial fisheries resources such as *Leiognathus brevisrostris* (shortnose ponyfish), *Lateolabrax japonicas* (Japanese seabass), *Konosirus punctatus* (dotted gizzard shad), *Solenocera crassicornis* (coastal mud shrimp), *Metapenaeus affinis* (jinga shrimp) and *Oratosquilla oratoria* (mantis shrimp). The highest number of reproductive individuals was observed during May to August, while other months with increased spawning activities included March to April, and December to January.

B1.4.4 Sites of Fisheries Importance

Based on the literature review and latest fisheries survey findings, the sites of fisheries importance were identified and these include spawning grounds of commercial fisheries resources in northern Lantau waters; SCLKCMP; artificial reefs at SCLKCMP and proposed artificial reefs deployment at the planned The Brothers Marine Park (BMP); Ma Wan FCZ; the area of high production of capture fisheries at Tai O; the area around The Brothers which has been proposed to be designated as a marine park arising from the HKBCF project; and the oyster production area at the Deep Bay mudflat (*Figure 3.1*).

Ultimately, the designation of a new 2,400 ha marine park for the 3RS Project, some areas serving as no-take zones, will span a large portion of these waters and will connect to the existing SCLKCMP to the north, the planned BMP to the east and the marine mammals conservation area at the Mainland waters to the west. The designation of the new marine park was proposed to mitigate the moderate impacts associated with loss of 768 ha of fishing ground. The EIA Study indicated expected benefits to fisheries from the new marine park are expected to occur through the net emigration of juvenile and adult fish (termed “spillover effect”), and/or export of pelagic eggs and larvae from the restored spawning stocks fishery.





The 3RS Project will be located on a new land formation immediately north of HKIA in North Lantau. The key project components include:

- Land formation comprising ground improvement, seawall construction and modification (including sea rescue boat points), filling and surcharge activities;
- Construction of new airfield facilities including the third runway, taxiways, aprons, aviation fuel supply network and other airfield infrastructure, aircraft navigational aids, approach lighting system and new Hong Kong International Airport Approach Area (HKIAAA) marker beacons;
- Modification of existing airfield facilities, including the existing North Runway, taxiways and aprons in the Midfield area;
- Construction of new passenger facilities including the Third Runway Concourse (TRC) and expansion of T2, the automated people mover system and associated depot and maintenance / stabling areas, and the baggage handling system;
- Construction of new ancillary facilities to support the operational needs of the expanded airport, including utility buildings, airport support developments, air cargo staging, catering, aircraft maintenance, aircraft engine run-up (engine testing) facilities, ground service equipment area, early bag storage facility, fire station, fire training facility, petrol fuelling station, new air traffic control towers, Hong Kong Observatory facility, mobile phone system antenna towers, stores, security gate houses, etc.;
- Construction of new and expanded infrastructure and utilities, including road networks, seawater cooling and flushing system, stormwater drainage system, greywater system, sewerage network and potable water supply, Towngas supply, 132 kV / 11 kV and other power supply networks, communication networks, etc.; and
- Diversion of existing submarine infrastructure, including the submarine aviation fuel pipelines and submarine 11 kV cables.


Land formation work is planned to commence in 2016. The tentative programme for the Project is for the 3RS to be operational in 2023. Given the scale and complexity of the project, the construction and concurrent runway operational configuration will be implemented in phases. Some components, such as the TRC, may be constructed in phases based on the level of demand. Due to such phasing arrangement, the three-runway airfield system will be in operation before the full completion of all infrastructure associated with the project.



ANNEX C

Draft Terms of Reference for Fisheries
Enhancement Fund Management Committee





Draft Terms of Reference
Fisheries Enhancement Fund Management Committee
Pursuant to Condition 2.13 in EIAO Permit Number EP (EP-489/2014)
21 March 2016

Preamble

1. The Committee shall be known as the Fisheries Enhancement Fund Management Committee (FEF-MC).
2. The FEF-MC is established by the Airport Authority Hong Kong (AAHK) in accordance with Condition 2.13 of Environmental Permit No. EP-489/2014 issued to AAHK on 7th November 2014.
3. The approved EIA for the Project is Register Number AEIAR-185/2014 entitled: Expansion of Hong Kong International Airport into a Three-Runway System.

The outline for the Terms of Reference of the FEF-MC is as follows:

FEF-MC Mission

The mission clarifies the overarching FEF-MC long term goal(s) and duration/life span and is as follows:

The mission of the FEF-MC is to administer the Fisheries Enhancement Fund during the Construction and Operation Phases of the 3RS for the successful implementation of the Fisheries Management Plan (FMP) to promote fisheries industry in a long-term and sustainable manner.

FEF-MC Objectives

- To advise on and monitor the effectiveness of the proposed enhancement measures of the Project according to the approved Fisheries Management Plan (FMP) and EIA report; and
- To make recommendations on funding applications that meet the fund objectives and approve the applications that are within the budgeted Annual Allocation.

FEF-MC Organizational Structure

The FEF-MC is required to provide oversight of the implementation of FMP and its components, namely:

- Support measures that help to achieve sustainable management and enhancement of fisheries resources;

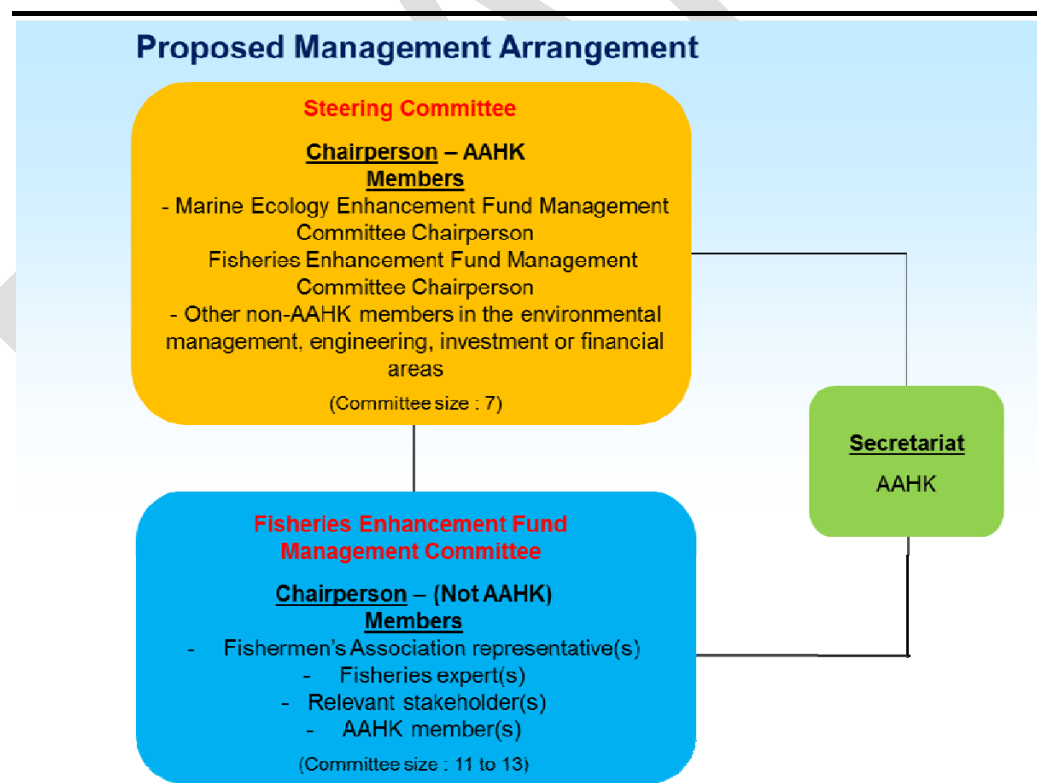


- Support and enhance on-going fisheries operations in a sustainable manner;
- Support measures that assist in shifting fisheries operations; and
- Support the promotion and enhancement of fisheries related business opportunities.

The suggested organization is presented in *Figure C1*.

It is important to note that the Steering Committee will provide overall directional guidance / policies for the fund operation to enable sufficient resources will remain available for the fund to meet its objectives in a long-term and sustainable manner covering the FEF-MC, as well as that of the Marine Ecology Enhancement Fund Management Committee (MEEF-MC) (discussed in a separate submission). The Steering Committee will not override a decision of the FEF-MC and will not undermine the role of the FEF-MC.


Figure C1 *Proposed Structure of the FEF-MC*



FEF-MC Membership

It is suggested that the membership reflects the four broad themes that will comprise the FMP. The FEF-MC will provide balanced views on on-going fisheries operation and sustainable management and enhancement of fisheries





resources. The committee will comprise of 11 to 13 members (including the Chairperson), including Fishermen's Association representative(s), Fisheries Expert(s), Relevant Stakeholder(s) (including, but not limited to, community leaders, people having expertise/ experience in managing similar funds, academic(s) and green group representative(s)) and up to 2 representatives nominated by AAHK.

Appointment Procedure

The Secretariat of the FEF-MC will compile a list of potential candidates including, but not limited to, any member of any consultative and advisory committee of the AFCD to be the Chairperson and members of the FEF-MC that satisfy the composition stated above.

The Secretariat will invite the potential candidate(s) to be Chairperson or member(s) of the FEF-MC.

The Secretariat will appoint the candidate(s) to be Chairperson or member(s) of the FEF-MC upon their acceptance. If potential candidate(s) declined the invitation, the Secretariat will propose alternative candidate(s) to ensure that the FEF-MC would meet the composition requirements stated above.

Each member of the FEF-MC will be appointed for a fixed term of 3 years, unless otherwise agreed with that member.

The AAHK Role

Whilst it is envisaged that AAHK will not Chair the FEF-MC, it will provide membership. As the core focus areas of the FEF-MC are sustainable fisheries industry and community benefits, it is suggested that there will be up to 2 representatives nominated by AAHK on the Committee, which may include the associated specialist / environmental consultant(s).

FEF-MC Operating Mandate


The operational procedures for the effective functioning of the FEF-MC include confirming the following:

Frequency of review submissions and meetings

The FEF-MC will review and advise on submissions related specifically to the FMP. Although there is expected to be one broad plan to kick-off the FMP implementation it is expected that the FMP will in reality consist of a series of submissions under each of the four themes.

The appropriate frequency of meetings will be based on projected submissions that relate to the FMP. The initial suggestion is for half-yearly meetings.





Secretariat Structure, Role & Responsibilities

AAHK will provide secretarial services (or will procure the provision of secretarial services by an external third party) to the FEF to facilitate the functions of the Steering Committee and the FEF-MC.

The Secretariat will:

- be responsible for the preparation of meeting notices, agendas, meeting translation and minute taking;
- collate progress reports / final reports submitted by funded projects, as well as the summary of total applications received, successful applications, ongoing projects and completed projects in a year for review and reference by the Steering Committee and the FEF-MC; and
- work with the AAHK and the Chairperson of the FEF-MC to ensure proper expertise is present at relevant meetings.

Deliverables of the FEF-MC

The Secretariat (AAHK or third party consultant appointed by AAHK) will be responsible for the outputs of the committee which will be scheduled on an 'as needed basis' depending on the workload of the committee and these are provisionally identified as follows:

- Briefing papers
- Agendas
- Presentations
- Meeting minutes – list of actions, review outputs
- Comments on submissions
- Materials for upload to dedicated website, if any

Initial half-yearly progress reports matching with the schedule of the FEF-MC meetings will be prepared by the Secretariat for consideration of the committee. The reports will include updates of the implementation and management of the FMP, monitoring and audit of the FMP and findings of any studies carried out under the FMP.

FEF-MC Implementation / Operation guidelines





To maintain the effective functioning of the committee, guidance notes will be produced for the committee's reference (*Annex 1*).

DRAFT





Annex 1
Guidance Notes for the Functioning of the Fisheries Enhancement Fund
Management Committee

Introduction

- Mission
- Objectives
- Membership

Make reference to the Terms of Reference for the committee.

Committee Procedure

In order to advise on the effectiveness of enhancement measures contained in the EIA and the FMP, the FEF-MC will need to be fully informed of what measures are contained within the EIA and related documentation. Upon joining the FEF-MC each member shall receive soft copies of the following documentation:

- The approved EIA Report for the Project;
- The approved EM&A Manual for the Project;
- The Fisheries Management Plan;
- Further information submitted under section 8(1) of the EIA Ordinance consisting of Responses to EIASC Members Questions, Supplementary Information in response to 11th August 2014 EIASC Meeting, Supplementary Information in response to 13th August 2014 EIASC Meeting, Supplementary Information in response to 18th August 2014 EIASC Meeting, Supplementary Information submitted before 15th September 2014 ACE Meeting and Presentation material presented at the 15th September 2014 ACE Meeting;
- The 7th November 2014 letter (with attachments) to AAHK from the EPD (Ref No: (1) in EP2/G/B/162 Pt 15) known as “the Director’s Letter” approving the project EIA; and
- The 7th November 2014 Environmental Permit No. EP-489/2014 for the Project.

Committee Members Code of Conduct





A code of conduct guideline will be prepared and agreed on by the FEF-MC covering:

- Status of membership – voluntary with reimbursement of incidental costs;
- Role and function – review and comment obligations;
- Duration of membership;
- Obligations - internal and external, e.g., confidentiality, media relations etc.;
- Lines of communication; and
- Resignation procedure (notice etc.).

Inaugural meeting to establish the FEF-MC

The FEF-MC will be established by holding an inaugural meeting with the following carried out:

- The Terms of Reference will be reviewed and agreed;
- Frequency of Committee meetings and dates discussed;
- The Guidance Notes for the functioning of the committee will be reviewed and agreed and include:
 - Procedures for providing comment on submissions will be discussed; and
 - The overall project scope and programme will be reviewed and Project knowledge and expectations leveled through the Secretariat.



ANNEX D

Potential Initiatives and Performance
Indicators under the Four Key Themes





D1 POTENTIAL INITIATIVES AND PERFORMANCE INDICATORS UNDER THE FOUR KEY THEMES OF THE FMP

D1.1 POTENTIAL INITIATIVES

D1.1.1 Support Measures that Help to Achieve Sustainable Management and Enhancement of Fisheries Resources

Development of Sustainable Fisheries

Under this initiative, funding will be provided to support studies that explore and examine practicable management measures that could be implemented by the fishery sector to enhance the sustainable use of fisheries resources. These may include studies that look at fishing gear and method modification to reduce capture of non target species and fish fry, the identification of seasonal fishing grounds which may be species-specific and warrants control and management, measures to support the management of catch of particular locally endangered/ vulnerable species, etc.. Overall this facilitates the development of more targeted fisheries for the protection of juveniles and vulnerable species, enabling the conservation and enhancement of fisheries resources in a long term. It is expected that findings of this initiative can contribute to making an informed decision by regulators and the industry with regards to the enhancement of fisheries resources in a long term.

A potential enhancement initiative example is provided in more detail in *Figure D1*.

Capacity Building of Fishing Operators

This initiative will support the provision of capacity building to fishing operators to ensure that they possess up-to-date knowledge on fisheries management to sustain and enhance fisheries resources in a long term. Capacity building may be in the form of seminars, overseas study tours, training courses or education programmes.

It is suggested to enhance fishermen's understanding of sustainability under this initiative which would help to promote sustainable fisheries in Hong Kong in the long-term. Training can be provided to fishermen on the concept of sustainable fisheries in order to raise their awareness of the ecological and economic importance of conserving and enhancing fisheries resources in Hong Kong. The capacity building may cover modern and efficient fisheries, management practices, energy saving and environmental protection. With better understanding of the importance of a sustainable fishing industry it is hoped that the fishermen will be more proactively involved in managing, conserving and enhancing fisheries resources and that the fisheries industry would be properly managed and sustained for the long-term.



Figure D1 Development of Sustainable Fisheries (Example Initiative Case Study)

Rationale and Objectives

The Government pursues a number of fisheries management and conservation measures to conserve the fisheries resources in Hong Kong waters and promote the sustainable development of the Hong Kong fisheries industry. Since 31 December 2012, trawling is prohibited in Hong Kong to protect the marine resources and ecosystem. To further enhance sustainable fisheries, fishing gear and method modification to reduce capture of non target species and fish fry, the identification of seasonal fishing grounds which may be species-specific and warrants control and management, measures to support the management of catch of particular locally endangered/ vulnerable species, etc could be further investigated.

The overall aims of this Study are to:

- Facilitate the development of more targeted fisheries for the protection of juveniles and vulnerable species, enabling the conservation and enhancement of fisheries resources in a long term.
- Contribute to making an informed decision by regulators and the industry with regards to the enhancement of fisheries resources in a long term.



Scope and Methods

The scope of work will include:

- Review the current fishing operation status in Hong Kong.
- Conduct a feasibility study of developing fishing gear / modifying method to reduce capture of non target species and fish fry.
- Conduct surveys and stakeholder consultation to facilitate the identification of seasonal fishing grounds.
- Develop legislative measures and voluntary code of conduct to promote sustainable fisheries management.



Outputs

A variety of outputs could be generated by the Study including:

- Development of fishing gear to reduce capture of non target species and fish fry
- Identification of seasonal fishing grounds
- Measures to support the management of catch of particular locally endangered/ vulnerable species



Schedule and Cost

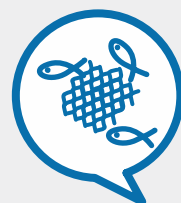
The Study is scheduled to last for **18 months**

The estimated cost is **HK\$ 2 million**

Funding Themes



Support Measures that Help to Achieve Sustainable Management and Enhancement of Fisheries Resources



Support and Enhance On-going Fisheries Operations



D1.1.2

Support and Enhance On-going Fisheries Operations in a Sustainable Manner

Optimisation of Mode of Fishing Operation

With the loss of fishing grounds in the coastal north Lantau waters due to the 3RS Project and new Marine Park establishment, it is considered that fishing grounds in marine environments (e.g. offshore waters, deep sea waters) that are relatively unexploited by local fishing fleet in north Lantau waters should potentially be explored to allow for continuity of the affected fishing operators. Such exploration of fisheries sources by the fishing operators in alternative marine environments would require the fishing operations / fleet to be optimised. The process of optimisation will require the following to be undertaken:

- Purchase of new fuel efficient design vessels ⁽¹⁾ with modern technology / facilities (i.e. including better navigation instrument, communication instrument, fishing handling equipment such as bailers and fish pumps, storage facilities, accommodations, waste treatment facilities, life-saving equipment etc) to allow for effectiveness, safe and sustainable operation in fishing grounds not targeted by the fishing operators before, such as the offshore and deepwater environments;
- Purchase of new engines with improved power to efficiency ratios to improve the ability of the fishing vessel to explore alternative areas of operation in an energy efficient and environmental friendly manner;
- Purchase of advanced fishing gear and equipment to allow for more efficient operation in the new environment. For example, advanced fish detection sonar for more reliable and accurate detection of fish aggregations; and
- Training of fishing operators to the use of advanced fishing instrument / equipment / technology as stated above.

This initiative supports funding for such optimisation to allow the fishing operators to develop their operations in new fishing areas of interest. The initiative will firstly support pilot studies to be implemented and trialled by a small number of operators. This would allow for more efficient use of the fund for targeting viable optimisation options. If results of the pilot studies are found encouraging, full-scale implementation and knowledge sharing to other interested operators will be supported at the subsequent stage.

Improvement in Operation Efficiency and Environmental Performance

Besides exploration of alternative areas of operation, improving the efficiency and cost-effectiveness of fishing operations is another initiative that can help the fishery sector to sustain their livelihood despite the loss of fishing grounds and other challenges in Hong Kong waters. It is noted that the technology currently employed

(1) Department of Fisheries and Aquaculture 2015. New Vessel Considerations. Energy Efficiency Fact Sheets. Available at:http://www.fishaq.gov.nl.ca/research_development/research/energyefficiencyfacts.html





by the local capture fisheries is outdated which results in high operating costs, low efficiency and consequently low competitiveness. For example, most of the large fishing vessels are still equipped with high-powered and high fuel-consuming engines which have increased their operating cost. As such, it is expected that operation efficiency can be enhanced through upgrading of vessels / equipment, for example using engines of lower horsepower / higher energy efficiency, nets with lower resistance, to help fishermen reducing their fuel and thus operating costs ⁽¹⁾⁽²⁾. It is expected that the environmental performance can also be improved under this initiative with the replacement of less energy efficient old equipment and potential use of green energy (e.g. wind or solar energy). In addition, energy audits / energy profiling to identify solutions for cutting fuel consumption on board fishing vessels during operations could also be undertaken ⁽³⁾⁽⁴⁾. The aspect of promotion of environmental performance will thus also be encouraged under this initiative through funding of vessel / equipment maintenance and installation of green energy technology on vessels (e.g. small wind turbine or solar panel) and energy audits.

Capacity Building of Fishing Operators

This initiative will support the provision of capacity building to fishing operators to ensure that they possess up-to-date knowledge on fishing technology to sustain and improve their operations. Capacity building may be in the form of seminars, overseas study tours, training courses or education programmes.

In addition, it is noted that the family mode of operation has restricted the development of the fisheries industry in Hong Kong. If fishermen need to develop new fisheries projects in future, more comprehensive knowledge and considerable financing will be required. It is therefore suggested that the initiative should also support the capacity building on formation of cooperative enterprises by fishermen organisations to improve their capacity in development of fisheries projects. The formation of cooperative enterprises may also offer more job opportunities to fishermen and attract interested parties to join the fishery sector.

D1.1.3

Support Measures that Assist in Shifting Fisheries Operations

Development of Aquaculture Technology / Techniques

The major mode of mariculture in Hong Kong is the culturing of marine fish species on simple, traditional mariculture rafts. There has been little technological advancement in aquaculture operations due to the lack of growth in mariculture due

- (1) CNR-ISMAR 2012. Effects of engine replacement on the fuel consumption reduction in fisheries. Information Collection in Energy Efficiency for Fisheries (ICEEF). Available at: <http://energyefficiency-fisheries.jrc.ec.europa.eu/reports>
- (2) Department of Fisheries and Aquaculture 2015. Fishing Gear Efficiency. Energy Efficiency Fact Sheets. Available at: http://www.fishaq.gov.nl.ca/research_development/research/energyefficiencyfacts.html
- (3) CNR/IMAR 2012. Energy audits on board fishing vessels: Energy profiling can lead to reduced fuel consumption. Available at: <http://energyefficiency-fisheries.jrc.ec.europa.eu/reports>
- (4) Danish Fishermen's Associations 2011. Energy Reduction in Fishing Vessels. <http://energyefficiency-fisheries.jrc.ec.europa.eu/reports>





to the government's moratorium on releasing more licences. Most culture operations remain small in scale.

With operational and technological advancement in fish culture, there are advanced management measures and technologies which could be considered for aquaculture in Hong Kong. For example, fallowing could be a management option to be considered for the operation of the fish farm to allow for carrying capacity recovery while the possibility of Integrated Multi-trophic Aquaculture could be explored for multi-species culture in a self-sustained manner. Also, there is the possibility of the adoption of recirculation aquaculture systems to reduce the amount of water and space required for fish culture and these can be explored. Under this initiative, it is proposed to fund projects to help fishermen who have changed their livelihood to aquaculture to develop such advanced aquaculture technologies.

In addition to the above, the development of hatcheries may also be encouraged. Hatcheries development can potentially help to secure the source of, and lower the cost of, fish fry supply to the industry. More choice of fry species may also be made available to the industry as a result. Activities that can be supported include pilot studies of hatchery trials as well as subsequent support on commercial scale implementation.

A potential enhancement initiative example is provided in more detail in *Figure D2*.

Development of New Cultured Species

Under this initiative, studies on the culture of new marine fish species with good market potential will be supported. Pilot studies may firstly be funded to look at the potential feasibility and market potential of the new species identified to be cultured. Following the successful completion of pilot studies, knowledge transfer will be undertaken to convey the skills and techniques to the fish farmers through training workshops. Funding may also be provided to help set up the culture system for the new cultured species.

Operation and Management Improvement

With increasing public concerns over food quality and safety and rising demands for quality fisheries products, the competitiveness of local aquaculture can be enhanced through improvement in the aquaculture management and culture techniques to produce high quality and safe aquaculture products.

Under this initiative, funding support will be provided to fish farms to implement good aquaculture practices for improving quality and safety of aquaculture products. Reference could be made, but not exclusive to the ten good mariculture practices developed by the AFCD which have summarised and briefly described as follows⁽¹⁾:

- 1) Maintaining appropriate stocking density

(1) AFCD. (2009) Environmental Management of Aquaculture. Good Aquaculture Practice Series 2. 32pp.



Figure D2 Advanced Aquaculture Technology Study (Example Initiative Case Study)

Rationale and Objectives

With operational and technological advancement in fish culture, there are advanced management measures and technologies which could be considered for aquaculture in Hong Kong. For example, fallowing could be a management option to be considered for the operation of the fish farm to allow for carrying capacity recovery while the possibility of Integrated Multi-trophic Aquaculture could be explored for multi-species culture in a self-sustained manner. Also, there is the possibility of the adoption of recirculation aquaculture systems to reduce the amount of water and space required for fish culture and these can be explored.

The Study aims to :

- Review available advanced aquaculture technology as well as best practices and experience in aquaculture operation worldwide.
- Develop a management plan to improve the current practice of the existing FCZs, including the use of advanced aquaculture technology.



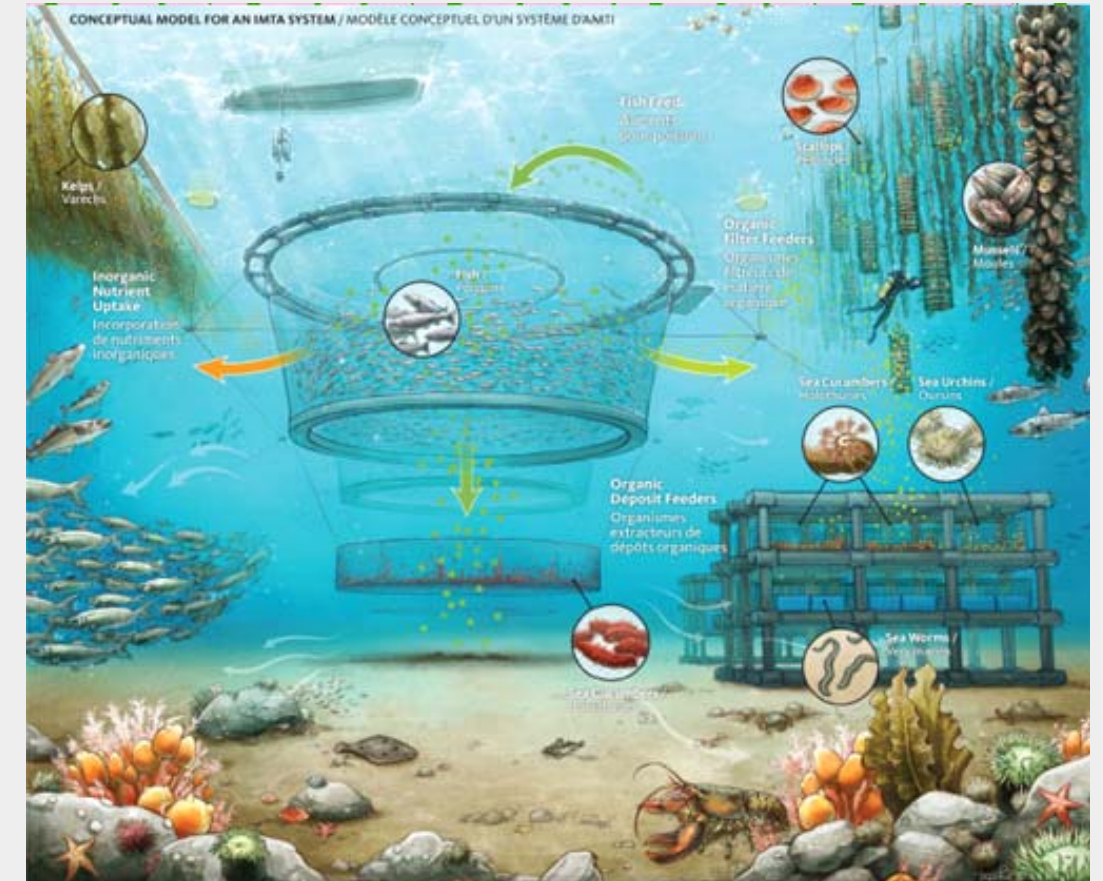
Source: <http://oceandocor.org/>

Scope and Methods

The scope of work will include:

Standardized methodology will be used.

- Collate, review and assess all information available worldwide relative to the best practices and experience in aquaculture operation and advanced aquaculture technology.
- Conduct stakeholder consultation with relevant stakeholders, including the academics, mariculturists, etc to understand the feasibility of developing advanced aquaculture technology in Hong Kong.
- To develop a management plan to recommend new management and enhancement measures aiming at environmental conservation and sustainable development.



Source: <http://www.dfo-mpo.gc.ca>

Schedule and Cost

The Study is scheduled to last for **10 months**

The estimated cost is **HK\$ 1 million**



Funding Themes



Support Measures that Assist in Shifting Fisheries Operations



Support the Promotion and Enhancement of Fisheries-related Business Opportunities



Outputs

A variety of outputs could be generated by the Study including:

- Case Studies of best aquaculture practices
- Options to enhance aquaculture activities in Hong Kong
- Management plan for enhancing the existing aquaculture operation





- Check the growth rate of fish and sort them into different cages according to their size to reduce stocking density.
 - Use the “Appropriate culture density chart” to estimate the appropriate density.
- 2) Remove fouling organisms on the fish cages regularly
- Clean fish nets regularly to prevent deposit of fouling organisms which will affect water current exchange.
 - Inspect fish nets regularly and repair any torn or damaged parts.
- 3) Good feeding management measures
- Use dry pellet feed instead of trash fish to reduce the content of organic matters in water.
 - Apply feed in phases and in appropriate quantities. Stop feeding if fish are not eating to avoid water pollution by residual fish feed.
- 4) Proper disposal of dead fish and garbage
- Remove all rubbish, residual feed and fish carcasses on and in the water and put them in a garbage bag in a rubbish bin with lid to avoid water contamination and spreading of germs. When the garbage bag is full, deliver it to the nearest refuse collection point.
 - Dead fish should be collected immediately and put in a garbage bag for delivery to the nearest refuse collection point.
 - In the event of extensive fish kill, seek assistance from the AFCD or the Marine Department.
- 5) Regular disinfection of culture gear
- Disinfect gear thoroughly and regularly by bleaching, streaming and drying them under strong sunlight.
- 6) Quarantine for newly stocked fish/fry
- New adult fish and fry should be isolated for a few days to observe their health condition. If abnormal behaviour or infection symptoms are detected, isolate and disinfect immediately.
- 7) Isolation/proper treatment of sick fish
- Any fish found infected must be isolated immediately for proper treatment or destroyed.





- Use fish drugs prescribed by the AFCD or a registered veterinarian.
- 8) Proper use of feed additives and drugs
- Apply feed additives and drugs as instructed by the registered veterinarian.
- 9) Regular monitoring of water quality and fish health
- Carry out a simple health check on the fish every day. See if the fish are reducing feed intake or showing abnormal swimming habits. Check the body surface, fins and gills for parasites or disease symptoms.
 - Measure water quality parameters across waters where marine fish culture zones are situated at specified times every day.
 - Appropriate feeding can prevent seawater from turning acidic.
 - When seawater pH value is low, stop feeding.
 - Monitor dissolved oxygen levels more closely if suspect any fish behavioural changes or when there are sudden weather changes or extended cloudy periods.
 - Refer to special markers on the mariculture calendar for anoxic days and keep close watch of fish stock during such periods. If necessary, stop feeding, reduce the stocking density and turn on an aerator or jet water along the borders of rafts with a blast pump to increase dissolved oxygen level.
 - Select species that can adapt to local climate.
 - Feed sparingly and add sun screens to reduce direct sunlight.
 - When water temperature is low, move the fish less frequently.
 - Depending on the temperature tolerance range of fish species under culture, harvest whenever possible before the onset of winter or before water temperature drops.
 - Stay alert to water temperature changes. If it falls below 18°C, monitor fish activities closely. If necessary, harvest and sell the fish stock.
 - Highly nutritious feed must be given to prepare fish for winter. Add vitamins C and E appropriately to boost immunity and cold tolerance.
- 10) Maintenance of farm management records





Brand Development and Marketing

Under this initiative, activities related to the brand development and marketing of aquaculture products will be funded. With the increasing public awareness on food safety and quality, it is expected that the brand development and marketing may be related to development, promotion and publicity activities of green or organic culture operations. For instance, applicants may be funded to upgrade their operations so that their products are able to be registered under the Accredited Fish Farm Scheme, which is a recognition of high quality and safe aquaculture products.

D1.1.4 Support the Promotion and Enhancement of Fisheries-related Business Opportunities

Development of Fisheries Based Eco-tourism

Although it is considered possible to develop fisheries based eco-tourism as an alternative livelihood for fishermen, during consultation with the fishery sector it is revealed that such development is still subjected to restriction imposed by the existing regulations and inadequate local experience. For example, while tourists can observe fishing operations and harvesting of fishery resources onboard, they will not be able to enjoy the experience of seafood banquet on the vessel since the operators are not licensed to provide food / beverages. The eco-tourism is thus limited to sight-seeing activities. Therefore, this initiative is proposed to support feasibility studies of fisheries based eco-tourism which would at least cover the following aspects:

- Legislation review to identify current restrictions on development of fisheries based eco-tourism;
- Review of overseas experiences of fisheries based eco-tourism to identify the contributing factors for the success or failure of this business;
- Evaluation of the feasibility and limitations on developing fisheries based eco-tourism in Hong Kong; and
- Recommendations of the way forward to develop fisheries based eco-tourism in Hong Kong.

In addition to the above, funding may be provided under this initiative to support measures recommended in the feasibility study or by the fishing community to develop the fisheries based eco-tourism locally. This may include engagement of a consultant to assist in further liaison with appropriate parties (e.g. government departments) on implementation of fisheries based eco-tourism, support to upgrade / purchase equipment for the business as well as capacity building activities.

A potential enhancement initiative example is provided in more detail in *Figure D3*.



Figure D3 Development of Fisheries Based Eco-tourism (Example Initiative Case Study)

Rationale and Objectives

During consultation with the fishery sector it is revealed that development of fisheries based eco-tourism is still subjected to restriction imposed by the existing regulations and inadequate local experience. In order to facilitate the fishing industry in their business opportunities in a sustainable manner, it is considered that a comprehensive package of fisheries based eco-tourism should be developed, including fishing culture interpretation, seafood banquet, souvenirs as well as sight-seeing activities.

The Study aims to :

- Promote fisheries-related business opportunities.
- Promote sustainable fisheries management.



Scope and Methods

The scope of work will include:

- Legislation review to identify current restrictions on development of fisheries based eco-tourism.
- Review of overseas experiences of fisheries based eco-tourism to identify the contributing factors for the success or failure of this business.
- Evaluation of the feasibility and limitations on developing fisheries based eco-tourism in Hong Kong.
- Recommendations of the way forward to develop fisheries based eco-tourism in Hong Kong.

Outputs

A variety of outputs could be generated by the Study including:

- Case studies of fisheries-based eco-tourism
- Training materials and code of conduct for fishermen to develop fisheries-based eco-tourism

Schedule and Cost

The Study is scheduled to last for
12 months

The estimated cost is
HK\$ 1.5 million

Funding Themes



Support the Promotion and Enhancement of Fisheries-related Business Opportunities



Support Measures that Help to Achieve Sustainable Management and Enhancement of Fisheries Resources





Development of Recreational Fishing and Eco-tourism for Dolphin Watching

Some fishermen in Hong Kong are already involved in recreational fishing business through renting of their boats to, and taking recreational fishers, out for fishing. In addition, given their familiarity with the CWD habitats in the western Hong Kong waters, it is also possible for fishermen to engage in dolphin watching business. Considering that a relatively low level of technical skills and capital input is required, these businesses should be suitable for fishermen to operate in general. Under this initiative, support will be provided to fishermen to help them develop their business in recreational fishing and dolphin watching eco-tourism. This will include potential funding support to:

- Upgrade of fishing vessels to be used for recreational fishing / dolphin watching;
- Purchase of pleasure crafts or passenger-carrying boats; and
- Identify and upgrade scenic spots and routing design for recreational fishing and dolphin watching as well as strengthen publicity to attract more tourists.

Provision of Training to Diversify Skills of Fishermen

Since fishermen related businesses are identified, it is possible to provide training to fishermen to diversify their skills so that they will not be solely dependent on fishing operations to earn their living. It is expected the training may include “Code of Conduct for Dolphin Watching Activities”, CWD ecology, boat operations, marine safety and knowledge on touring techniques. Overseas trips to study and exchange experience on recreational fishing and fisheries-based ecotourism may also be funded under this initiative.

D1.2 POTENTIAL PERFORMANCE INDICATORS

D1.2.1 Support Measures that Help to Achieve Sustainable Management and Enhancement of Fisheries Resources

Some potential performance indicators envisaged at this early stage could include the following:

- Completion of feasibility study on fisheries management and sharing of findings;
- Number of training offered to fishermen and number of participants;
- Number of seminars, overseas study tours, training courses or educational programmes organized for capacity building and number of participants; and
- Modes of fisheries operations used.





D1.2.2 Support and Enhance On-going Fisheries Operations in a Sustainable Manner

Some potential performance indicators envisaged at this early stage could include the following:

- Number of pilot studies completed for optimisation of modes of fishing operations, and the outcomes of these pilot studies, eg whether the expected outcomes and milestones have been achieved, continuity to full-scale implementation, etc;
- Number of operators participating in full-scale implementation of optimisation of modes of fishing operations;
- Number of participants involved in Improvement of Operation Efficiency and Environmental Performance initiatives; and
- Number of seminars, overseas study tours, training courses or educational programmes organized for capacity building and number of participants.

D1.2.3 Support Measures that Assist in Shifting Fisheries Operations

Some potential performance indicators envisaged at this early stage could include the following:

- Number of trainings offered to fishermen and number of participants;
- Number of new aquaculture technologies adopted;
- Number of new cultured species developed;
- Number of fish farms participating in operation and management improvement initiatives; and
- Number of fish farms participating in the brand development and marketing initiative.

D1.2.4 Support the Promotion and Enhancement of Fisheries-related Business Opportunities

Some potential performance indicators envisaged at this early stage could include the following:

- Number of training offered to fishermen and number of participants;
- Number of overseas trips organized for knowledge sharing and number of participants;
- Completion of feasibility study on fisheries-related eco-tourism and sharing of findings;





- Implementation of fisheries-related eco-tourism;
- Number of fishing vessels upgraded for recreational fishing / dolphin watching;
- Number of pleasure crafts or passenger-carrying boats purchased for recreational fishing / dolphin watching ; and
- Completion of routing design for recreational fishing and dolphin watching.

