

**Environmental Impact Assessment Ordinance, Cap.499  
Guidance Note**

**Methodologies for Fisheries Baseline Surveys**

*(Important Note :*

*The guidance note is intended for general reference only. You are advised to refer to and follow the requirements in the Environmental Impact Assessment Ordinance (Cap 499) and the Technical Memorandum on Environmental Impact Assessment (EIA) Process. Each case has to be considered on individual merits. This guidance note serves to provide some good practices on EIA and was developed in consultation with the EIA Ordinance Users Liaison Groups and the Advisory Council on the Environment. This guidance note may be subject to revision without prior notice. You are advised to make reference to the guidance note current to the date. Any enquiry on this guidance note should be directed to the EIA Ordinance Register Office of EPD on 27<sup>th</sup> Floor, Southorn Centre, 130 Hennessy Road, Wan Chai, Hong Kong. (Telephone: 2835-1835, Faxline: 2147-0894), or through the EIA Ordinance web site ([www.epd.gov.hk/eia](http://www.epd.gov.hk/eia))*

**1. Purpose**

- 1.1 As stipulated in Section 3.2 of Annex 17 of the Technical Memorandum on EIA Process (EIAO-TM) , the objective of the baseline study of fisheries assessment is to provide adequate and accurate fisheries baseline information of the study area for accurate prediction and evaluation of fisheries impacts. The fisheries baseline survey forms an important part of the baseline study to:
  - (a) provide specific and updated fisheries information of a proposed project site and its vicinity;
  - (b) verify information obtained from the review of existing fisheries information; and
  - (c) fill existing information gaps.
- 1.2 This guidance note (GN) aims at providing general guidelines for conducting fisheries baseline survey so as to fulfil the requirements stipulated in the EIAO-TM in respect of fisheries impact assessment for a proposed project. For the purpose of these guidelines, “field survey”, “fisheries survey” or similar terms appeared in Annex 17 of the EIAO-TM and EIA study briefs for fisheries assessment would be collectively referred to as “fisheries baseline survey”.
- 1.3 Fisheries baseline surveys, where deemed necessary, may include sampling-based field surveys for obtaining information on fisheries resources as well as observation-based surveys and interview surveys for obtaining other fisheries-related information. Other surveys for collecting additional baseline information may also be required if the need is identified in the course of the EIA study. The project proponent, in consultation with environmental consultants where applicable, should determine the appropriate type of survey and methodology to be adopted in each case based on their professional judgement. The project proponent is also suggested to consult the fisheries communities at the early stage when formulating the survey methodologies. The methodology for fisheries baseline survey with justification should be appropriately presented in the EIA report for audit purpose.

**2. Fisheries Resources Survey**

Survey Programme

- 2.1 Baseline survey on fisheries resources can be conducted by collecting data through field sampling. The survey requirements in respect of type and duration of survey, frequency of sampling and number of replicates would generally depend on factors such as the nature of the proposed project, size of the project site and the broader study area, presence of sites of fisheries

importance, seasonal variation of the fisheries resources under study, valid concerns of the public and availability of existing fisheries baseline information. It should be noted that a survey conducted over only a short period of time within the year may not be able to show representative seasonal conditions, whereas an unnecessarily long fisheries baseline survey may extend the EIA study period without yielding additional information essential to the assessment.

- 2.2 Hong Kong has typically a wet season and a dry season with seasonal changes in the physicochemical and biological parameters of the marine environment. Fisheries baseline survey should take into account the seasonality and cover the wet and dry seasons as well as the transitional periods where necessary to capture the main characteristics and seasonal variations of the fisheries resources of interest.
- 2.3 The project proponent, in consultation with environmental consultants where applicable, should consider the factors mentioned above as well as other factors deemed relevant to devise an appropriate survey programme for each case based on their professional judgement. In all cases, there should be adequate survey effort to ensure that the data obtained are scientifically robust and representative to address spatial and seasonal differences.

#### Survey Period

- 2.4 Baseline survey for fisheries resources should be carried out for an appropriate duration of at least 6 months and up to 12-month to cover the dry and wet seasons as well as the transitional periods where necessary taking into consideration of factors such as the nature of the project and the fisheries resources of interest. Sampling should be conducted for a minimum of 3 replicates per season/period and evenly arranged (e.g. monthly) over each season/period.

#### Survey Method

- 2.5 For the purpose of obtaining sampling-based baseline information on fisheries resources, suitable field survey methods should be used to collect representative samples of pelagic and demersal fisheries resources at the project site and in its vicinity. The surveys should be carried out by personnel with adequate knowledge of marine science and fisheries and experience in field survey. A variety of methods are available for the study of commercial fisheries resources including fish, crustacean and cephalopod. The general methods described under paragraph 2.6 below are commonly applied in fisheries resources studies and are by no means exhaustive. The project proponent should adopt suitable methods based on professional judgement. Consideration should also be given to the compatibility of the planned survey methods with those of any relevant surveys conducted by other parties that may provide reference data for supporting the impact assessment. Reference may be made to the relevant fisheries surveys or monitoring programmes implemented by the Agriculture, Fisheries and Conservation Department (AFCD) if found suitable.
- 2.6 For each survey method described below, specification of the sampling gear (such as length, height and mesh size) should be appropriate for the target fisheries resources and habitats. The conditions of the specific site (e.g. substrate type, depth, wave exposure, accessibility) for deploying a sampling gear should be suitable for the operation of that gear.

##### (a) Survey for general fisheries resources

Survey for general fisheries resources should be conducted to collect representative samples of pelagic and demersal fisheries resources with the following three methods.

### *Gillnetting*

Gillnets are long rectangular panels of netting with diamond-shaped mesh that are held vertically in the water column and often anchored to the sea floor at either end. Fish and crustaceans swim into the net and are entangled by the gill covers, fins and spines. This sampling gear is selected for its ability to capture pelagic or demersal fisheries resources of relatively high diversity depending on the size and depth of deployment of the nets.

### *Cage-trapping*

Cage traps are mainly in form of cages or baskets made with metal or plastic mesh and designed to have one or more openings for the entrance of catch. They are usually set on the bottom singly or in rows, connected by ropes or buoys on the surface. Baits can be used to lure marine organisms into the cage. This sampling gear is selected for its ability to capture demersal fisheries resources. Inlet shape and mesh size of the cage vary with target catch, hence different types of trap targeting fish and crustaceans (e.g. rabbitfish trap and crab trap) should be used.

### *Longlining*

The longline set up commonly consists of a single mainline with baited hooks attached at intervals to attract fish catch. Longlines can be set for pelagic or demersal fishing, depending on the objectives of the survey.

#### (b) Survey for zooplankton

Plankton towing with a plankton net is a standard method of zooplankton survey for assessing the distribution, abundance and diversity of zooplankton including eggs and larvae of commercial fish and crustaceans. A typical plankton net comprises a nylon-gauze cone attached to a metal frame, a mouth fitted with a collar or mouth-reducing cone, a cod-end with a sampling bucket, and a flow meter attached to measure the volume of water sampled. The mesh size of the net should be commensurate with the characteristics of the target plankton group. The net is usually deployed in a single oblique tow to a depth of several meters off the seabed and towed towards the water surface. During each sampling, replicate tows should be conducted.

#### (c) Survey for juvenile fisheries resources

Survey for juvenile fisheries resources should be conducted with appropriate methods such as purse seining, beaching seining and cage trapping taking into consideration of the condition of the survey sites (e.g. habitat type, water depth). Types of sampling gear and their specification (such as length, height and mesh size) should be suitable for the target groups of juveniles.

### Data Analysis

- 2.7 All samples collected from the surveys for general or juvenile fisheries resources should be analysed by season/period for species composition (including a complete species list), size (total length, standard length and fork length as appropriate), abundance, biomass in weight, yield per unit effort (YPUE), catch per unit effort (CPUE), species diversity and estimated commercial value of fisheries species where applicable.
- 2.8 All samples collected from the surveys for zooplankton should be analysed by season/period for species composition (including a complete species list), abundance in density, species diversity and estimated commercial value of fisheries species where applicable.

- 2.9 Additional parameters should also be analysed if considered appropriate to the proposed project and the fisheries resources of interest.

### **3. Observation-based survey**

- 3.1 Observation-based survey (usually on a boat) can gather specific information of the fishing operations in the study area. While reference can be made to the results of relevant fisheries surveys conducted by the AFCD in respect of the level and pattern of fishing activities in different parts of Hong Kong waters, an observation-based survey, if deemed necessary, can provide further details of fishing activities in the study area, such as vessel type, size, operating time and location of the fishing vessels. The data collected from the survey can reveal what, when and where fishing operations specifically take place in the study area as well as how fishing operations may be affected by the proposed project, thus offering insights on formulating effective measures to minimize impact on fishing activity especially for projects of larger scale or higher complexity.
- 3.2 To ensure that sufficient baseline information on fishing operation is available for performing a fisheries impact assessment, the project proponent should determine the appropriate survey effort (such as duration and frequency) for the observation-based survey in each case based on professional judgement, taking into account the nature of the proposed project, the actual site situation and any existing baseline information. For projects affecting water areas in large size or with significant fishing activities, monthly surveys for an appropriate duration up to 12 months should be conducted. Timing of survey should cover periods when fishing activities often take place taking into account the different modes of operation of fishing vessels.

### **4. Interview Survey**

- 4.1 Interview survey may be conducted to collect fisheries related information, such as fisheries production, fishing activities and aquaculture practices from local fishermen, fish farmers or other target study groups with a view to obtaining specific baseline information relevant to the fisheries assessment to be conducted.
- 4.2 The project proponent should determine the appropriate survey method, including but not limited to face-to-face interviews, phone interviews and mailed questionnaires, and deploy relevant questions that can achieve the objectives of the survey.

### **5. Other Surveys**

- 5.1 In addition to the types of surveys stipulated in paragraphs 2, 3 and 4 above, other surveys, including but not limited to site visit to fish ponds and fish culture zones as well as dive survey for habitats important to fisheries resources and artificial reefs, may be conducted for supporting the assessment of fisheries impacts where necessary. The project proponent should propose appropriate methodology for such surveys.

### **6. Fisheries Survey Results**

- 6.1 According to Section 3.2.1(ii) of Annex 17 of EIAO-TM, results of all relevant field surveys, the names and relevant experience of the competent personnel undertaking the surveys, shall be documented in field survey reports prepared, checked and signed by relevant professionals or experts.

Agriculture, Fisheries and Conservation Department  
in conjunction with Environmental Protection Department

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