# The 3ʳᵈ Meeting of the Regional Scientific and Technical Committee

**5ᵗʰ - 7ᵗʰ February 2020**
Classic Hoang Long Hotel, Hai Phong City, Viet Nam

**SEAFDEC/UNEP/GEF Project on Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand**

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# AGENDA 8.2

# REGIONAL GUIDELINES ON INDICATORS FOR MANAGEMENT OF FISHERIES REFUGIA

- ✓ The draft Indicators for Management of Fisheries Refugia was developed at the 1st Regional Meeting on Indicators for Fisheries Refugia Management held on 9-11 September 2019 at A-One the Royal Cruise Hotel, Pattaya City, Chonburi Province, Thailand.
- ✓ The guidelines are aimed to support participating countries on the effective management of fisheries refugia established during the project implementation and to ensure that after project-end, country will continue and increase number of fisheries refugia in their country, besides monitoring the existed refugia using the agreed indicators as enclosed herewith..
- ✓ However, the agreed indicators require the appropriate methodology and references in which the PCU takes this opportunity to continue discuss with the Regional Scientific and Technical Committee as well as the regional experts who join this RTSC3.

# 1) ECOSYATEM DIMENSION

| SUB-DIMENSIONS | CRITERIA | INDICATORS | METHODS/REFERENCES |
|---|---|---|---|
| **Fisheries Resources** | Abundance stock / Distribution / Fishing Effort | ☐ Biomass Estimation (ton) | |
| | | ☐ Level of MSY (ton) | |
| | | ☐ Level of MEY (ton) | |
| | | ☐ Level of CPUE (Kg/…) | |
| | | ☐ CPUA (Kg/Area) | |
| | | ☐ Catch landing (ton or Kg) | |
| | Biological Parameter | ☐ Length at first capture (Lc) | |
| | | ☐ Length at first mature (Lm) | |
| | | ☐ Sex ratio | |
| | | ☐ Spawning Potential Ratio | |
| | | ☐ Length frequency | |
| | | ☐ Exploitation rate | |
| | | ☐ GSI (Gonadosomatic Index) | |
| | Species composition / Catch structure | ☐ Percentage of dominance species | |
| | | ☐ Number of species | |
| | | ☐ % Main economic/commercial species | |
| | | ☐ Percentage of Bycatch | |
| **Habitat (mangrove, coral, seagrass, and other critical habitats)** | Healthy/condition/Area | ☐ Size Coverage (Percent) | |
| | | ☐ Healthy Index | |
| | | ☐ Target habitat density (IUCN reference) | |
| **Environment (Impact from human act.)** | Pollution | ☐ Standard Water Quality (e.g. COD, BOD) | |
| | Eutrophication | ☐ Phytoplankton Abundance | |
| | | ☐ Phosphate, Nitrate Concentration (Nutrient loading) | |
| | Anthropogenic (Human activity) | ☐ Coastal reclamation area | |
| | | ☐ Level of maritime activity (If appropriated) | |
| | Erosion | ☐ Level and distribution of sedimentation | |
| | | ☐ Loss of area/habitat | |

## 2) ESOCIAL DIMENSION

| SUB-DIMENSIONS | CRITERIA | INDICATORS | METHODS/REFERENCES |
|---|---|---|---|
| **Livelihoods** | Choice of Occupation | ☐ Number of option/ Occupation/ work (Alternative, Permanent work, Subsistence work) | |
| | Fish consumption | ☐ Fish consumption per capita per year | |
| | Nutrition | ☐ % animal protein (if appropriate) | |
| **Stakeholder Participation (Indigenous People, Gender, etc.)** | Participation | ☐ Ratio of Number of participations (gender and IP) | |
| | Local Organization | ☐ Number of organizations, | |
| | | ☐ Number of Best practices applied | |
| | Networking | ☐ Number of networking | |
| | | ☐ Type /way of direct or indirect communication | |
| | | ☐ Number of agreements | |
| **Education (Local knowledge, Local wisdom)** | Awareness program (e.g. information center, information education campaign (IEC)) | ☐ Number of information center or similar. | |
| | | ☐ Number of consultations | |
| | | ☐ Number of best practices | |
| | | ☐ Number of awareness program | |
| | | ☐ Number of understanding by stakeholder | |
| | Capacity building | ☐ Number of training/Extension | |

# 3) ECONOMIC DIMENSION

| SUB-DIMENSIONS | CRITERIA | INDICATORS | METHODS/REFERENCES |
|---|---|---|---|
| Economic Condition (to community) | Poverty incident | ☐ Poverty Index | |
| | Capital accessibility | ☐ Number of financial accessible | |
| | Income | ☐ Income per household | |
| Fisheries Production, Fishing Efforts | Contribution of target species / Availability | ☐ Value of contribution/production | |
| Innovative Fisheries Technology | Effectiveness fishing gear | ☐ level of CPUE | |
| | Cost effectiveness | ☐ Cost reduction, time, human power | |
| | Environment friendly (Green technology)DIMEN | ☐ Reduce of fuel consumption | |
| | | ☐ Reduce bycatch | |
| | Investment | ☐ Number of investment (for e.g. fishing fleet, processing, ship builder, management tools/software, etc.) | |
| | | ☐ New domestic product | |

## 4) GOVERNMENT DIMENSSION

| SUB-DIMENSIONS | CRITERIA | INDICATORS | METHODS/REFERENCES |
|---|---|---|---|
| Fisheries management policy (Fishing/User Right, Precautionary approaches/Science-based management, and Synergistic Way/Strategy) | Legal framework | ☐ Number of law and regulation | |
| | Harvest strategy/ Limit of fishing effort | ☐ Fishing close, (area and seasonal closure, Zoning | |
| | | ☐ Number of Input control (Number, mesh size, length of fishing gear, Licensing control, Capacity (e.g. Gross tonnage, horsepower, etc.) | |
| | | ☐ Number of output control (TAC, Quota, Target species) | |
| | Fisheries management plan/ strategy/ framework | ☐ Available/not available | |
| | | ☐ Management plan of Fisheries refugia in place, | |
| | | ☐ Habitat rehabilitation, protection and stock enhancement. | |
| | Efficiency fishing gear | ☐ Length limit (e.g. crab fishery) | |
| Stakeholder Cooperation/Coordination (Regional / national levels) | Management mechanism | ☐ Management board/ committee, transboundary committee, RPOA for refugia in place | |
| | | ☐ Linkage to the existing management/conservation framework (e.g. MPAs) | |
| Enforcement | Coordination mechanism | ☐ Inter-agency coordination in place, Number of joint operations | |
| | Fishery Law enforcement | ☐ Level of enforcement | |
| | | ☐ Frequency of regular patrol | |
| | | ☐ Number of violation prosecution | |
| Capacity Building | Best Practice | ☐ Adoption of best practice in place | |
| | Maritime policy and regulation/ International policy | ☐ Number of training/workshops | |
| Funding (Infrastructure, Enforcement, etc.) | Sustainability | ☐ Long term commitment of Government on finance | |
| | Source of funding (incentive, soft loan, donation/CSR) | ☐ Number of donors | |
| | | ☐ Type of funds | |
| | incentive | ☐ Type of incentive | |
| | | ☐ Number of activities | |
| | | ☐ Number of best practices | |

## 5) CLIMATE CHANGE AND DISASTER CROSS-CUTTING ISSUES

| SUB-DIMENSIONS | CRITERIA | INDICATORS | METHODS/REFERENCES |
|---|---|---|---|
| Fish Stock | Impact to Fish Stock | ☐ Availability/levels of knowledge abundance, distribution, genetic diversity, recruitment | |
| | | ☐ Update information impact to fish stock | |
| Impact to Habitat | Coral bleaching | ☐ Area | |
| | | ☐ Incident/ frequency | |
| | | ☐ Recovery Rate | |
| | Destruction of mangrove | ☐ Area coverage | |
| | | ☐ Recovery Rate | |
| | Destruction of sea grass | ☐ Area coverage | |
| | | ☐ Recovery Rate | |
| Impact to Environment | Sea level rise | ☐ Saline intrusion | |
| | | ☐ Mean sea level annual | |
| | | ☐ Coastal Erosion (Area) | |
| | Physical/chemical parameters (T, Salinity, PH, DO) | ☐ Level of physical and chemical parameters | |
| | Precipitation (rainfall) | ☐ Level of Precipitation | |
| | Ocean acidification | ☐ PH level | |