

Management of Trawl Fisheries in Southeast Asia and Coral Triangle Region: the REBYC-II CTI Project

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The Coral Triangle and Southeast Asia are the world's most biologically diverse and economically productive regions. Of the regions' about 600 million people representing nearly 9% of the world's total population, at least 120 million are directly dependent upon marine resources for livelihoods and food security. In 2009, the regions' production from marine capture fisheries was reported to be approximately 12 million metric tons (mt) or 18.1% of world's marine fisheries production (FAO, 2011). Specifically, the Coral Triangle region which embraces Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands, and Timor-Leste, has the most diverse coral species (605 species) accounting for 76% of the world's coral species (798 species). It is therefore very obvious that these regions are also among the most potentially vulnerable marine zones of the world.

As a result of increasing population and exploitation pressures, growing threats from pollution and major ecosystem changes are particularly the most crucial concerns in the Coral Triangle (CT) region and in Southeast Asia. As with the global context, issues related to the capture of untargeted fish species and non-fish species also commonly known as by-catch and discards are on the rise. Specifically, problems associated with by-catch include the capture of juveniles of ecologically-important and economically-valuable species, non-reporting of retained catches and discarded catches (**Box 1**). Trawl and longline fisheries have the tendency to retain by-catch not only for human consumption but also for utilization as aquafeeds and fertilizers. In an effort to sustain the pelagic fisheries resources especially for tuna long-line fisheries, the use of circle hooks instead of J-hooks had been advocated to commercial and artisanal fisheries, and proved effective. However, the design and scale of multi-species diverse trawl net used in trawl fisheries remains a complex issue that requires integrated policies and involves technical and community support measures.

By-catch Management in Trawl Fisheries

SEAFDEC had successfully implemented Phase I of the FAO/UNEP/GEF Project on *Reduction of Environmental Impact from Tropical Shrimp Trawling through the*

Introduction of By-catch Reduction Technologies and Change of Management (REBYC) in 2002-2008, which had relatively strong focus on technology and development of selective gear. While Phase I generated significant results, but experience showed that more effort is needed to successfully address the complex issues related to by-catch reduction in trawl fishing operations. This is particularly the case in multi-species trawl fisheries of the type found in Southeast Asia and the Pacific region where trawler fleets are diverse in terms of type and scale. In addition, since the overall management seems rather weak, by-catch is largely utilized and considered part of the total catch. Solutions that include gear modification should be supported by appropriate legal and incentive frameworks to become effective. Although gear modifications are important but these are not always the most appropriate tools as such approach should be combined with other management measures.

Moreover, the socio-economic drivers behind by-catch and livelihoods in the context of poverty alleviation need to be understood and considered. While initially this holistic approach may be more costly and require more efforts, it is cost-effective in the longer-term because of

Box 1. Regional definitions of some terminologies (SEAFDEC, 1999)

- By-catch:** A general term for the component of the catch anticipated to be caught during industrial fishing operations, in addition to the target catch
- Incidental Catch:** A general term for the catch not anticipated to be caught during fishing operations but are incidentally caught
- Retained Catch:** Portion of the catch landed at fishing bases or distributed to the markets
- Total Catch:** Catch on board fishing vessels, which is synonymous with "Retained Catch in the Fishing Gear"
- Discarded Catch or Waste:** Portion of the catch returned to the sea (or otherwise thrown away) due to economic considerations - deemed to have none or even negative value to the catchers
- Selective Fishing Gear:** Fishing gear designed to exclude/ reduce the capture of unwanted sizes and species of fish as well as incidental catch, and released from fishing gear with high survival rate
- Destructive Fishing Gear and Practices:** Fishing gear and practices that have destructive effect on ecosystems including the environment and fishery resources

sustainability of the results. Thus, the follow up three-year project on *Strategies for trawl fisheries by-catch management* (REBYC-II CTI) which took off in late 2012, is generally aimed at mitigating the problems associated with by-catch in fisheries within the Coral Triangle region of Southeast Asia. The project will focus on multi-species trawling, where by-catch issues are among the most serious, with potentially significant effects on the ecosystems and livelihoods. Specifically, the project will address these challenges by promoting sustainable fishing and the adoption of best fishing practices, and providing a rational approach to delivering benefits from landed by-catch. Appropriate technological practices will be identified and management plans developed in partnership with the private sector at both national and regional levels, and the “guidelines for best practice in fishing operations” will be crafted. In order to attain sustainability of fisheries resources and healthier marine ecosystems in the project area, it is necessary to: minimize the catch of juveniles, minimize the risk of species from trawling, minimize discards where such catch takes place, avoid negative impacts on the habitats, improve utilization of catch by value-adding, and increase resilience of coastal livelihoods. In this regard, the project aims to champion the necessary changes by seeking a balance between environmental and human well-being (**Box 2**).

Box 2. Overall objectives of REBYC-II CTI

The global environment objective of the project is *to promote responsible trawl fisheries that will result in sustainable fisheries resources and healthy marine ecosystems in the Coral Triangle and Southeast Asian waters by reducing by-catch, discards and fishing impact on biodiversity and the environment.*

The project development objective is *to promote effective public and private sector partnership for improved trawl and by-catch management and practices that support fishery dependent incomes and sustainable livelihoods.*

The Project is executed by the governments of five participating countries (**Fig. 1**), namely: Indonesia, Papua New Guinea, Philippines, Thailand, and Vietnam. The Southeast Asian Fisheries Development Center (SEAFDEC) based in Samut Prakan, Thailand assumes the role as Regional Project Facilitator in partnership with the private sector and relevant national, regional and international organizations, e.g. Sida (now Sweden), IFFO, SPF, WWF. The Food and Agriculture Organization of the United Nations (FAO) is the Global Environment Facility (GEF) agency for the project which is being funded jointly by GEF and the implementing and executing partners.

Implementation of the Project is structured around four interrelated components (**Box 3**), namely: (1) Policy, Legal and Institutional Frameworks; (2) Resource Management

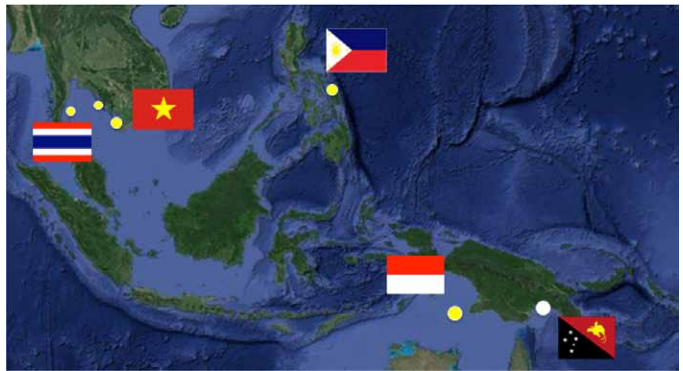


Fig. 1. Participating countries and corresponding project sites for the REBYC-II CTI Project

- **Indonesia:** Arafura Sea (Maluku-Papua)
- **Papua New Guinea (PNG):** Gulf of Papua
- **Philippines:** Samar Sea for small-scale trawlers; whole country large-scale trawlers
- **Thailand:** Gulf of Thailand (Chumporn-Trat Province)
- **Vietnam:** Southern part of Vietnam (Kien Giang Province)

and Fishing Operations; (3) Information Management and Communication; and (4) Awareness and Knowledge on trawl fisheries by-catch management. These were developed during the initial activities of the Project, such as: FAO/GEF Inception Workshop on By-catch Management and Reduction of Discards in Trawl Fisheries organized by FAO and SEAFDEC in Samut Prakan, Thailand, 3-6 November 2009; FAO/GEF Regional Workshop on Strategies for Fisheries By-catch Management REBYC-II CTI Project: CTI Log-frame/Project Planning Workshop, organized by FAO and SEAFDEC/TD in Samut Prakan, Thailand, 4–7 May 2010; Fishing Industry Round-Table Meeting in Bangkok, Thailand, 30 April 2012; the FAO/GEF Project Inception Workshop Organized by FAO and SEAFDEC in Bangkok, Thailand, 1-4 May 2012; and the FAO/GEF Regional Workshop for Work Planning-Year1 organized by FAO and SEAFDEC in Bangkok, Thailand, 6-9 November 2012.

The benefits of reduced catch of trash fish and juveniles could include improved productive potential of fish stocks, and lowered operational costs. This is considering that improved catch in the future from both commercial scale and small-scale sector and catch of larger size of economic fish would lead to increased economic gains/incomes, improved food security, and enhanced positive public attitude which consequently lead to new marketing opportunities. Moreover, reduced operational costs could be attained through improved catch quality and value, reduced fuel cost by trawl net fishing and sorting time of catch, reduced number of crew, and increased catch per unit of effort (CPUE). More specifically, the long-term outcomes and impact indicators of the Project are indicated in **Box 4**.

Box 3. Components of REBYC-II CTI Project

Policy, Legal and Institutional Frameworks: establishment of national or area specific trawl fisheries by-catch management plans and building institutional capacity for their implementation

Activities in Year 1

- Establish National Working Groups/Technical Support (Working) Group/Advisory Group, and organize relevant meetings/workshops (*all participating countries*)
- Review policy, legal, institutional frameworks and management plans of each project area (*all participating countries*)
- Establish Advisory Groups, National Working Group, and identify stakeholders to participate in the project (*all participating countries*)
- Develop monitoring and data collection mechanisms (additional, specific for *PNG*)
- Develop national circular for trawl fishery management and submit first drafted circular to relevant authorities, fishing industries, and local stakeholders for consultation, and convene national workshop to review and evaluate drafted circular (additional, specific for *Vietnam*)

Resource Management and Fishing Operations: promotion of the adoption of more selective fishing gear and practices, as basis for implementing zoning of fishing areas and developing spatial-temporal closure management measures, and generation of better data on number of vessels and recommendations for fishing effort and capacity management

Activities in Year 1

- Identify, develop, test and assess the appropriate selective fishing gear/practices to reduce by-catch and juveniles in trawl fisheries (*all participating countries*)
- Investigate the priorities for fishing closed area/season (*all participating countries*)
- Identify and map critical areas; review existing vessel registry systems; and identify potential incentives packages (additional, specific for *Indonesia*)
- Review current VMS registry and license conditions of trawl fleets; and conduct research to assess the status of fisheries resources within 3-mile area (additional, specific for *PNG*)
- Conduct fish larval survey and map critical habitats; and train field officers on inventory procedures as well as on registration/licensing, registry/database systems (additional, specific for the *Philippines*)
- Allow consultancy work to validate existing data and inventory of trawl fishing fleets in the project areas (additional, specific for *Thailand*)
- Review the status of trawl fisheries and vessel registration system in Kien Giang (additional, specific for *Vietnam*)

Information Management and Communications: by-catch data collection, mapping of fishing grounds, establishment of socio-economic monitoring procedures, and development of means for communicating by-catch data and information, where the standardized methods for by-catch data collection will be promoted in the participating countries

Activities in Year 1

- Develop national project webpage (*all participating countries*)
- Standardize data collection; and train enumerators/observers to collect data both onboard and landing sites (additional, specific for *Indonesia*)
- Review/revise Observer Programs and develop protocols/forms for trawl fishery data collection; develop trawl fisheries database; and review and revise Logbooks, sampling forms/species guides (additional, specific for *PNG*)
- Strengthen coordination with collaborators in preparing for data collections; and train enumerators for trawl catch/by-catch landing surveys (additional, specific for the *Philippines*)
- Improve data collection, analysis, size composition, proportion of catch, by-catch from mesh size expansion and zonation (additional, specific for *Thailand*)
- Develop protocols/forms for trawl fishery data collection; and implement port sampling and trawl fishery logbook data collection program (additional, specific for *Vietnam*)

Awareness and Knowledge Issues: addressing the awareness of and knowledge on trawl fisheries by-catch management issues and on how these relate to sustainability, and development of measures that are available to make fishing more responsible, by allowing the private sector/fishers, policy makers, fisheries managers, officials, extension officers, and NGOs to conduct activities that would enhance their knowledge on best management practices and responsible fisheries

Activities in Year 1

- Build the awareness of project staff through their participation in regional workshops that aim to develop a regional guidelines on by-catch management and reduction of discards organized by REBYC-RFU and SEAFDEC/TD (*all participating countries*)
- Conduct consultative meetings/workshops for stakeholders, fishing communities and resource owners to introduce the project, and encourage their participation in order to promote responsible trawl fishing and practices (*all participating countries*)
- Carry out training needs assessment to enhance participation of fishers to project; and Identify national policy and decision makers for sensitization (additional, specific for *Indonesia*)
- Convene consultative workshops for stakeholders, fishing communities, and resource owners to introduce project's information and enhance awareness of relevant stakeholders in government fishery agencies (additional, specific for *PNG*)
- Conduct training/seminar on By-catch Reduction Devices (BRDs) and other similar management measures (additional, specific for the *Philippines*)
- Convene an inception workshop to introduce the project to local stakeholders in project areas (additional, specific for *Thailand*)
- Convene an inception workshop to introduce the project and enhance awareness of relevant stakeholders in project area of Kien Giang, this will be combined with activity to disseminate project information through mass media and brochures on by-catch management activities (additional, specific for *Vietnam*)

Box 4. Expected outcomes and impact indicators of the Project

- Agreed regional by-catch policy/strategy, which is in line with the forthcoming International Guidelines on By-catch Management and Reduction of Discards, is adopted by at least one relevant organization in the project region, and national or area specific trawl fisheries by-catch management plans are adopted covering at least a third of all trawlers in the participating countries
- Measures that manage by-catch and reduce discards that improve fisheries resources, are implemented by 25% of all trawlers in the participating countries, and in these fisheries (covered by improved by-catch management measures), by-catch has been reduced by 20% compared to the baseline data in Year 1 of the project
- Standardized data on at least 3 key by-catch and habitat indicators are available in the participating countries, and disseminated to trawl fisheries and by-catch management planning for implementation at national and regional levels
- Enhanced understanding of responsible fishing by private sector/fishers, fisheries managers and decision-makers are supporting participatory management arrangements in the participating countries
- Institutional arrangements and processes for public and private sector partnerships are in place, and supporting trawl fisheries by-catch management in the participating countries
- Role of by-catch in trawl profitability is understood and measures on how to ensure long-term economic sustainability of trawl fisheries are identified and incorporated into the trawl fisheries by-catch management plans in participating countries
- Incentives for trawl operators to reduce by-catch are defined and implemented in participating countries and best practices communicated within relevant regional frameworks

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