

4.6 Optimizing Energy Use in Fisheries

Considering the large number of powered fishing boats in the Southeast Asian region, it has become imperative to reduce fuel consumption in order to contribute to savings on operations costs as well as reduce CO₂ emission to the environment. In the capture fishery sector, introduction of good engine maintenance including the use of alternative energy source for example the use of sails for small fishing vessels, natural gas such as the liquefied petroleum gas (LPG) or compressed natural gas (CNG) or the liquefied natural gas (LNG) commonly used in natural gas vehicle (NGV) has been promoted to reduce pollution and CO₂ emission from boats' engine. Modification of fishing gear construction and design should be pursued to reduce resistance during fishing operations or reduce travel time from shore to fishing grounds.

Furthermore, it is also vital for the Southeast Asian countries to advance the production of fish and fishery products in terms of safe and good quality standards in order to promote the region's fish and fishery products in the world market, and eventually boost the flow of foreign currency into the region's economies, as well as increasing the availability of fish and fish products for human consumption. Therefore, sustainable development in fisheries post-harvest technology could also be enhanced by minimizing the fuel consumption for refrigeration or that of the boat's auxiliary engine through good fish handling processes and preservation onboard, and proper local knowledge practices. The use of ice and chilled sea water, practicing traditional method of fish processing such as the use of solar energy, should also be advanced to reduce the use of charcoal and fuel in processing.

4.7 Safety at Sea and Standards for Fishers in Southeast Asia

The global Code of Conduct for Responsible Fisheries has prescribed in 8.1.5 that: "States should ensure that health and safety standards are adopted for everyone employed in fishing operations. Such standards should not be less than the minimum requirements of relevant international agreements on conditions of work and services". Taking into consideration the situation in the Southeast Asian countries, the Regional Guidelines for Responsible Fishing Operations in Southeast Asia (SEAFDEC, 2000) specifically stipulated in (8.1.5 (1)) that: "*Since the minimum requirement in relevant international agreements including SOLAS and IMO is only applicable to vessels larger than 24 m LOA, and considering that majority of fishing boats in the region is smaller than this size, States should be encouraged to elaborate special safety standards and policies with emphasis on smaller boats*".

Taking into consideration the small-sized fishing boats in the Southeast Asian region, the Regional Workshop on Safety at Sea for Small Scale Fishing Boats in Southeast Asia held in 2003 and 2010 (SEAFDEC, 2010c), recommended that "*Since safety at sea is a serious problem in developing countries, the initiatives of respective Southeast Asian countries in improving safety at sea for small fishing boats should be reviewed taking into account the international and regional initiatives on safety at sea*". The 2010 Workshop also made special focus on the establishment of a mechanism for recording the accidents at sea for fishing boats, and on the need to improve the fishers living conditions onboard fishing boats (**Box 3**).

Moreover, even if the Southeast Asian countries have been implementing measures to improve safety of fishing boats and fishers, there is still a need to generate political will in order that such efforts could be further enhanced. Thus, the 2010 Workshop called upon the governments to mainstream the safety issues into national policies in order that safety at sea could be integrated in the overall fisheries management with the recommendations during the 2010 Workshop (SEAFDEC, 2010c) as the overall framework, and that appropriate programs on Safety at Sea should also be pursued by the Southeast Asian countries.

Note should also be taken that in order to promote and address safety at sea including working condition onboard fishing boats to ensure that the consideration that appeared in **Box 3** are addressed, a series of activities have been initiated and implemented in the region. These include, among others, development of regionally harmonized format for recording accident at sea of small fishing boats; production of awareness building materials for promoting safety at sea of small fishing boats; development of the regional guidelines on safety at sea and working standard for small fishing boats; establishment of the regional network to strengthen inter-agency coordination on safety at sea and working standard of fishing boats in the Southeast Asia.

5. AQUACULTURE

Aquaculture contributed 38% to the world's total fisheries production of 145 million MT in 2009, and has become the fastest growing food producing activity in the world with an average annual growth rate of more than 8% from 1970 to 2008 (FAO, 2010). Aquaculture has also grown to be a robust and vital industry providing about 46% of the fish consumed globally, and with its ancillary industries, engaging about 11 million people and spurring global trade of fish and fishery products.

While global accounts show remarkable milestones for aquaculture, the scenario in Southeast Asia suggests a