FAO's role in current and emerging issues on energy, fuel use, GHGs and atmospheric pollution in the fisheries sector.

Background

The Committee may recall that the need to address issues related to energy optimization and atmospheric pollution generated within the fisheries and aquaculture sectors is set out in the Code of Conduct for Responsible Fisheries. Concerns for related issues of energy costs and climate change impact have also been described in SOFIA 2008 and 2010. In this regard, the Twenty-ninth Session of COFI recommended that FAO should provide Members with information on possible fishing industry contributions to climate change and on technologies and ways to reduce the sector's reliance on, and consumption of, fossil fuels, respecting the principles embodied within the United Nations Framework Convention on Climate Change (UNFCCC)[1]. This matter is directly addressed in document COFI/2012/Inf.5. An important related issue has been the growing concern for atmospheric pollution associated with vessel operations, and the implications for fishing activities[2].

This briefing note sets out more information on current work by the Fisheries and Aquaculture Department in addressing the increasingly important and closely interlinked issues of fuel and energy use, greenhouse gas mitigation and atmospheric pollution. Amidst longer term trends of rising energy prices and considerable volatility, together with reducing levels of catch per effort, greater intensification of aquaculture and more global markets and distribution systems, the sector's dependence on fuel and other forms of energy is an increasingly important strategic theme. Close connections between energy use, greenhouse gas (GHG) emissions, and other aspects of atmospheric pollution have given further impetus to the need to rationalise energy use, reduce emissions and ensure that the fisheries sector becomes more efficient and environmentally responsible. The product of FAO's continuing engagement with resource use efficiency in fisheries and aquaculture, and in climate change adaptation and mitigation, two major initiatives have been under way over the recent biennium, whose key findings and recommendations are reported here.

Review of fuel and energy use in the fisheries sector

Developed from FAO's long engagement in fuel use for fishing vessels, FI/FIRO has now compiled the first globally-based review of the use of fuel and energy across the sector, to be published shortly as an FAO Fisheries Circular[3]. It provides a comprehensive perspective on the nature, quantities and costs of fuel and energy use, from capture and culture to post-harvest transformation, markets, distribution and consumption. Where specific figures for usage and costs are not readily available, it sets out methodologies for estimating these, from enterprise level to national and global sectoral assessments. It also provides outlines for the means by which fuel and energy use could be reduced, and makes recommendations for future work. Key points include:

- The high degree of dependence on diesel fuel by fishing vessels, increasing costs, with growing risk of cessation of some forms of fishing, and potential economic multiplier effects; widespread fuel subsidy issues; options to reduce fuel use are available but not widely taken up
- Much less direct use of fuel and energy in aquaculture, but high levels of embedded energy in feeds; wider range of energy sources; further intensification will increase external energy inputs;
- A wide range of energy use in post-harvest handling, processing and distribution; key benefits in waste reduction and value addition; links with global food markets and widening range of aquatic products; scope for considerable energy savings at most levels through practice or

1 FAO. 2011. Report of the Twenty-ninth Session of the Committee on Fisheries. FAO Fisheries and Aquaculture Report No 973. FAO. Rome. 64p. (paragraph 40(d)).

[2] See Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL) concerning quality of fuel oils and limits of CO_2, SO_x, NO_x into the atmosphere or sea in general and for SO_x within emission control areas.

[3] Fuel and energy use in the fisheries sector: approaches, inventories and strategic implications. FA Fisheries and Aquaculture Circular No xxxxx FAO Rome, 2012

investment in improved systems;

- Wide variations in energy use by consumers – transport, storage, cooking, disposal - can exceed use in primary production; wastes also critical; considerable savings potential;
- Important interconnecting areas of resource policy, sector investment, livelihoods and food security; fuel and energy use needs to be accounted more specifically within overall strategies;
- Better and more geographically comprehensive information is required, together with practical guidance on options, further interactions with food, trade, energy and climate change policy, and framework analysis of mechanisms and incentives which can effect change.

Workshop on greenhouse gas emissions strategies and methods in seafood

This workshop follows the recommendation of the 29th session of COFI as noted above, in this case concerning contribution to greenhouse gases (GHGs), their measurement, and possible implications for mitigation. Specific focus was placed on LCA (lifecycle assessment) and related methodologies, with inputs from industry, policy agents and researchers. Support was provided by the Government of Norway, the FAO Regular Programme, UK Seafish, Dalhousie University and other contributing participants. The workshop report is currently being published[4]. Key points include:

- LCA-based information on GHG outputs from the sector is so far limited, with a strong geographical, species and system weighting (N America/Europe, pelagic/whitefish, salmon/ mussel aquaculture). Needs to be extended, though many basic principles can be identified.
- GHG values can vary substantially in similar systems; key issues are LCA scope, allocation for multiple products; in most cases based primarily on CO_2 outputs.
- Capture fishing GHG emission is primarily based on fuel use, though particulate carbon from combustion not so far included; aquaculture GHGs primarily feed related, but ecosystem related aspects of N_2O and CH_4 need to be better understood;
- Other parts of fisheries supply chain primarily based on fuel or energy consumption; source of energy (oil, coal, solar, etc) also affects GHG outputs.
- Sectoral GHG estimates can be made based on fuel/energy and feed data, but only rough approximations; more data is needed, particularly from developing countries;
- The role of the fisheries sector needs to be raised more clearly with the IPCC, UNFCCC[5] and others, particularly for longer-term negotiation for GHG reductions and related carbon trade.

This initiative is planned to feed into a further workshop on GHG mitigation options (October 2012), which will examine further the practical options available and their consequences. Estimates of GHG outputs at fleet levels, and different footprints associated with aquaculture feed choice, are also being prepared, and will draw on data developed in the review of fuel and energy use.

The broad aim of this theme is for FI to take up the task of developing a strong and coherent global strategy for fuel and energy use, GHG mitigation and atmospheric pollution management, with specific goals, clear methodologies, practical guidelines and targeted capacity building. FAO and FI are uniquely placed to develop this, potentially a core element in their emerging programme of work, with immediate relevance for the CCRF and significant future impact for the sector.

[4] Report on the Expert Workshop on greenhouse gas emissions strategies & methods in seafood, FAO *Fisheries and Aquaculture Report*. No. R1011 FAO Rome, 23-25 January 2012

[5] IPCC - Intergovernmental Panel on Climate Change; UNFCCC – UN Framework Convention on Climate Change