Ladprao (Moderator: Bage; Co-moderator: Vivekanandan)

The workgroup on "How to promote appropriate and energy-saving technologies and practices in support of sustainable and equitable fisheries" energy efficiency comprised of people from South Asia, Southeast Asia, and Europe and such diverse areas as academics, development, government and intergovernmental organizations.

The moderator introduced the topic by highlighting a study on increased fuel prices. The study contains 3 case studies from Finland, Ireland and UK. In the **Finnish** case the hypotethical price increased by 34 %, the result were that Trawlers no longer make profits whereas the the other categories (small scale) are unaffected (Gillnets and Traps). Second case (**Ireland**) trawlers consume 90 %. When the price of fuel increase the crew salaries are decreased by up to 12 % in the trawler category whereas it is less affected in the other categories (~ 5%). The interventions suggested from the industry were: subsidize fuel; minimum prices and reduce import. The fishers view was that they had a reduction in earnings, no increase in fish price, crew in short supply. They suggested that better planning is required, have a more conservative price and so forth. In the **UK case**, fuel prices increase by 100%. The most common changes for trawlers were: changing towing patterns; modifying gear; reduce speed; change fishing methods and in general the changes reduce speed, closest landing port, replacing engine and not go

Destructive fishing techniques again become a viable option as fuel prices rise (Indonesia).
You can never get fisherman to agree on closed season

These studies on large scale fisheries are important is a comparisons and can serve as a starting point for the discussion.

Energy is not only on fuel but also on

Two issues to consider: 1) Behavior at sea 2) Technologies.

Moderator suggested focusing the discussion on:

1) Increase of fuel efficiency of boats and gear
2) Changing to less consuming fishing methods (practices)
3) (Fuel subsidies) – not a sustainable option

And then opened up to the floor: The floor identified the following key points as important areas where energy savings could be done/ considered.

4) Renewable/ alternative resources
5) Mauritian (closed season), not to fish a certain season of the year to save fuel. If you stop fishing for a period of the year you can catch more during the time you are fishing (more than if fishing continusly throughout the year).
6) Carrier boats to bring catch to shore.
7) Optimizing catch-effort: other types are to identify were fish stocks are (in space and time)
8) Efficient fishing (improve selectively of gear) if you reduce by catch (i.e. you don't have to transport catch that you don't want).
9) SSF they do not now fishing zone, wandering around and searching. Reduce search for fish through better info on fishery ground.

10) Timely maintenance and replacement, using the same engine for years, changing engine every other year – the older the engine the more the fuel it consumes. Operation of cost. Voila.
11) Proper equipment – navigation – GPS. (However most fishers know where fish are – generally).
12) Most saving energy – don't eat fish anymore (solution)
13) A world without fuel, sailing, rowing, manual labour, our options are:
    a. solar power, wind turbine, wave power
    b. alternative fuels (coal, steam, hydrogen
14) Less engine power (smaller motors) better suited motors.
15) Less fish available close to shore, fishing fleet need to travel further and hence also the local knowledge and traditional fishing grounds are lost.
16) For SSF Southeast Asia to save energy, develop fishing grounds (enhance fisheries). No need to go further: artificial reefs and so fort enhancing and rehabilitate habitats.
17) There is much less fish at the beach – need to go further. Reduce pollution to enhance near shore fishing
18) Data needed for policy making
19) Active gear with towing - bigger engine, more fuel. Passive gear manually hauling – smaller engine lower fuel
20) GPS with fishing ground marked will help save fuel
21) OBM Longtail to inboard
22) Gas as fuel
23) Training and info on technology options and better practices

Studies> economy of fishing, does fisher themselves study these studies.
The fishermen change their behavior.

Bigger engine size - towing gear. Fuel economies focusing on stationary (passive) gear and manually haul the gear.
Traditional knowledge – buy GPS with fishing grounds already on your GPS maps (waypoints).

*Q*Studies from developed countries, how can you compare developed and developing countries? *A*These are the studies on fuel consumption that exist within FAO.

Longtail boats – change from outboard to inboard motor reduced fuel consumption. The Longtail is probably the most fuel consuming types of engine setups.

Post harvest – sun drying fish. Post harvest – women

Training

High price for energy is good luck for everybody. It is good luck for the fish (less catches, long distance fleet). We have to think about what energy to use and for what. Have to care about the fish stocks; this could be a good opportunity when we can expect the stocks to increase slightly due to the reduced fishing effort (higher fuel price).

Materials in boats and fishing gear (less plastic which is oil based)