

Development of methods and information to support the assessment of economic performance in Commonwealth fisheries

From ABARE research report 09.5

abare.gov.au

- For a fishery to be economically efficient, it is necessary correct management targets be established and enforced effectively. These targets should also be delivered in a least cost and incentive compatible manner so that the cost of fishing at a given harvest level is minimised. An efficient outcome is important because it protects fish stocks and guarantees sustainability, and ensures resources will be correctly allocated to the fishery. Inefficient fisheries suffer low profits and excessive boat capital or fishing capacity, with the outcome of 'too many boats chasing too few fish'.
- Maximising economic efficiency requires catch and effort levels to be set appropriately and industry to have an effective property right to the harvest which removes the incentive for a wasteful and inefficient 'race to fish'.
- The principle underlying the definition of economic efficiency used in this project is maximum economic yield (MEY). MEY is an effort or catch level which maximises the present value of current and future profits in the fishery. This target changes with changes in the price of fish and the cost of fishing but, if appropriately set, will always imply that fishery profits are maximised. MEY generally involves fish stocks which are larger than stocks at maximum sustainable yield (MSY). In this sense, MEY is more conservationist than MSY.
- This report is part of a Fisheries Research Development Corporation (FRDC) project on the development of methods and information to support the assessment of economic performance in Commonwealth fisheries. This project has supported the specific implementation of efficiency measures in the northern prawn fishery, south-east trawl fishery (SETF) and the eastern tuna and billfish fishery. The northern prawn fishery has subsequently adopted maximum economic yield (MEY) as its target, and AFMA has now moved to provide economic efficiency measures, including MEY and other productivity indicators, for all of its fisheries where possible.
- For MEY to hold, vessel efficiency must be maximised. In other words, vessels must use the right amount and combination of inputs, including vessel capital, to minimise the cost of harvest at the MEY catch level. This will generally require fishery control instruments to encourage autonomous adjustment and allow fishers to freely combine inputs such as gear, engine size, crew and bait in proportions to minimise costs.
- Along with MEY measures there are a number of other useful indicators, such as direct efficiency measures (eg, stochastic frontiers), productivity indicators and profit decompositions.
 - Stochastic frontiers measure vessel level efficiency to determine whether harvest is at its maximum level, given inputs, or whether the cost of fishing at a given harvest level is minimized.
 - Productivity measures are a basic indicator of the ratio of output to inputs. Often this measure is stock adjusted in a fishery to account for changes in abundance. Holding stock and inputs constant, an increase in output indicates an increase in productivity. If output falls under the same conditions, productivity falls.
 - Profit decompositions decompose profits into various components: for example, output, inputs and productivity. Profit decompositions allow the effects of changes in, for example, fuel prices, on profits to be determined. In this report, profit decompositions are applied to both the SETF and the eastern tuna and billfish fishery.
- The suite of performance indicators used in this project — MEY, vessel-level efficiency, productivity indexes and profit decompositions — provide AFMA with the required tools to measure and report fishery efficiency and economic performance. This report discusses these methods and illustrates those used in the assessment of fisheries and provides key case studies of how these methods were employed in specific Commonwealth fisheries.