POLICY BRIEF

Pacific Community
Communauté du Pacifique

No. 30| 2017

The use of economic analysis in fisheries policy making and project management

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Purpose

The purpose of this policy brief is to inform policy makers and project managers of the range of uses of economic analysis in fisheries policy development and project management, from design to evaluation.

Key Messages

- An economic analysis is not just a financial appraisal. Rather, it takes a whole-society perspective to understand the full range of impacts of a given policy or project.
- The use of economics in policy development and project management can contribute to policies and projects achieving their aims without adverse impacts.
- There are many economic analysis techniques available to assist in the design and implementation of a policy or project.

Taking a holistic approach

As fisheries resources get depleted, the pressure to extract greater value from them increases. Economic analysis can play a significant role in making more evidence-based decisions and in identifying the most efficient options for intervention in the fisheries sector.

Economic analysis is often mistaken for financial appraisal, which concerns only money and the cash flows of private companies or public institutions. However, there are many forms of economic analysis that go beyond financial appraisal. Economic cost-benefit analysis, for example, tries to determine whether a policy or project is beneficial to the whole of society, rather than to individuals, companies or governments in isolation. This means the non-monetary costs and benefits, such as the social and environmental impacts, are also taken into consideration.

Adding value to policies and project

Economic analysis and advice can add value to policies and projects throughout their life cycle.

Design – Economic analysis contributes to the understanding of the policy and project context. It assists in understanding the root causes of a problem and potential solutions to address it. Economic analysis can be used to assess the value for money of a project and whether funding it is justified. It can also help project managers and policy makers define realistic outcomes and relevant indicators to be monitored.

Implementation – While monitoring these indicators, economic analysis can help to explain why a project may not be achieving its expected outcomes. Economics can then be used to design interventions that will enhance the project outcomes.

Evaluation – On completion of the project, an economic analysis will contribute to the evaluation of and learning from the project.

SPC has developed a range of economic tools to assist with fisheries project or policy development, such as methods for assessing aquaculture project feasibility or fishing business viability, as well as a range of record keeping frameworks in support of business and policy analysis. An example of how economics can help inform policy makers is the recent collaboration between Pacific Community (SPC) economists and scientists to understand the interactions between industrial fishing fleets and small-scale fishing activity, and to allow fisheries managers to trade off the impacts of different intervention options to support their policy objectives.

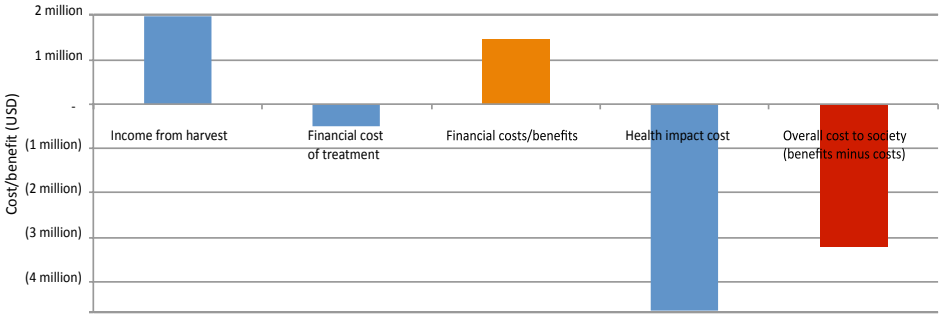
The most common economic techniques and their application to fisheries policy and projects are listed below.

Cost-benefit analysis

Cost-benefit analysis (CBA) is a structured evaluation technique that provides a quantification of all the costs and benefits (including non-monetary ones such as environmental or health effects) associated with projects or policies to establish their likely impact and whether or not they are worthwhile.

SPC has undertaken a number of fisheries CBAs for member countries. A recent CBA assessed the private and social costs and benefits of harvesting sea cucumber using SCUBA diving equipment. The analysis quantified the estimated cost of this practice to society in terms of the impacts of associated injuries and lost output. The resulting advice is that the practice of using SCUBA equipment for sea cucumber harvesting be banned due to the social costs associated with it.

Graph 1: Average cost/benefit per year of harvesting sea cucumber with scuba equipment*



* (Note: For confidentiality purposes data displayed is fictitious and does not represent advice to SPC members)

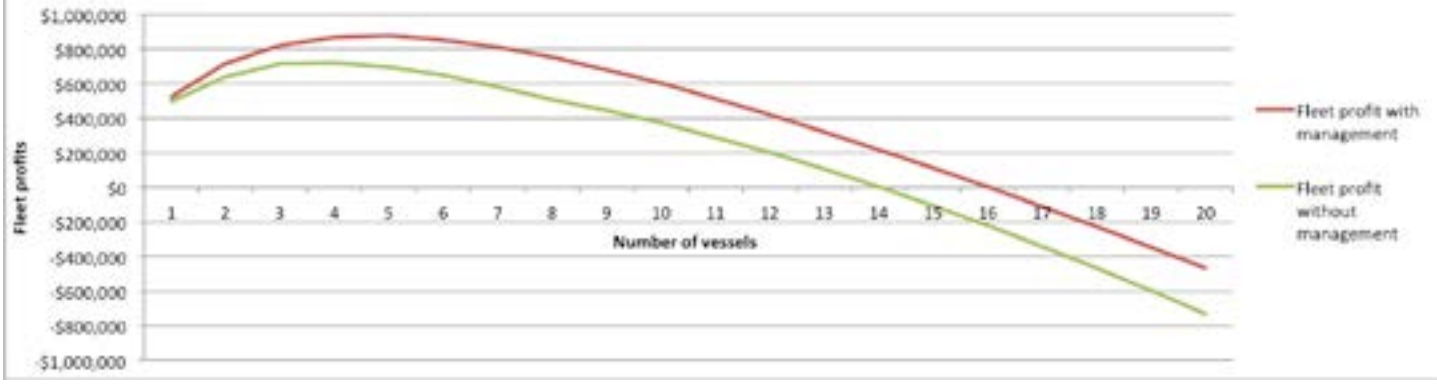
Graph 1 shows the results from a cost-benefit analysis of the use of SCUBA equipment to harvest sea cucumber. The graph shows that the small direct financial cost of treating the injured divers is outweighed by the benefits from the income from harvesting sea cucumber. However, when the social implications (the flow-on costs of injuries) are included, the overall impact on society is extremely negative.

Bio-economic modelling

Bio-economic modelling is a tool that can be used to inform fisheries management decisions. A bio-economic model combines fisheries science and fisheries economics to develop a detailed understanding of how fish stocks, fishing fleets, people and profits may react to changes in the fisheries management regime. It allows governments to identify the fishing conditions that maximise or increase revenue and profits from fisheries, while safe-guarding long term sustainability.

SPC modellers have developed a region-wide bio-economic model for the tuna industry, which allows the member countries of the Western and Central Pacific Fisheries Commission (WCPFC) to understand the impact of different management scenarios on fleet profits, licence revenues and tuna catch. National analyses have also helped SPC members to identify more profitable longline licensing levels. SPC economists have developed a bio-economic model for the deep-water snapper fishery to advise both government and industry about the long-term impacts of alternative fisheries management approaches.

Graph 2: Impact of fisheries management measures on fleet profits and vessel numbers*



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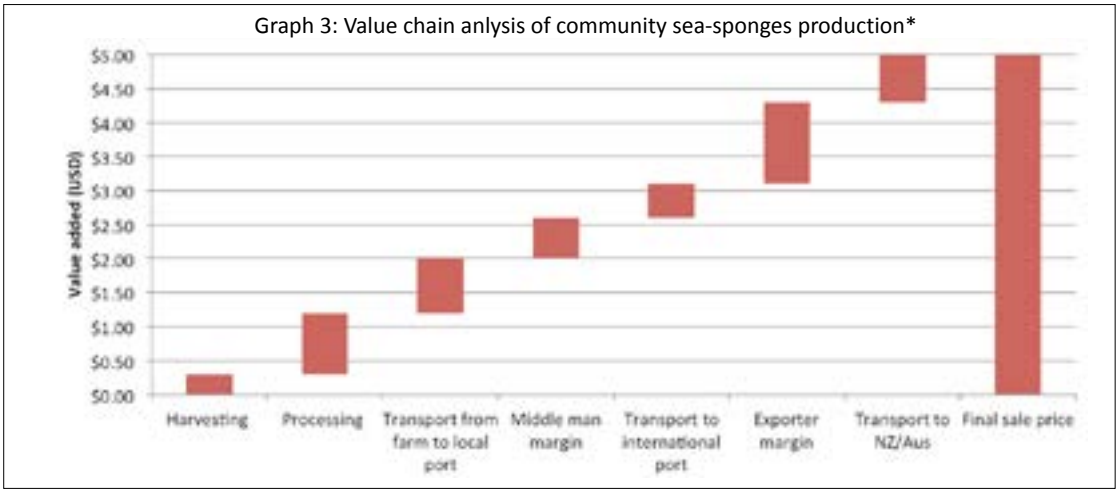
Graph 2 shows the impact of management of the deep water fishery. The analysis showed that, over 10 years, management increases the total income from the fishery compared to no management. It also showed that with management the fishery can support more profitable vessels (the point where the lines cross the horizontal axis) and that the optimum number of vessels in the fleet (where the peak of the lines are) increases from four vessels to five vessels.

Value chain analysis

A value chain analysis (VCA) is a description and quantification of all activities that are required to bring a product to market. It can be used to understand where most profit is being extracted and where the main bottlenecks are within the distribution and production system. This understanding can thus be used to identify development opportunities within a product supply chain.

VCA has been used by SPC economists and SPC's Fisheries and Marine Ecosystems (FAME) aquaculture team to look at the opportunities for sea-sponge farming in member countries. This analysis suggests that it is likely to be a viable industry, provided that the sponges are large enough, a cooperative sale system is set up and middle sellers are not part of the supply chain.

Graph 3: Value chain anlysis of community sea-sponges production*



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Graph 3 shows an analysis of the value chain of sponges from a Pacific Island to New Zealand or Australia. The analysis looks at opportunities during the transport of the sponges to understand how farmers may be able to extract more value from their sponges. Analysis showed that the exporter margin was extremely significant and those who harvest and process the sponges are likely to capture only 24% of the final price paid by the importer.

Economic impact analysis

Understanding how much benefit an industry or sector is bringing to an economy is critical in economic management and policy decision-making. Policy makers need to know the relative importance of an industry to decide whether or not that industry is worth supporting from the higher levels of government. Economic tools are available to assess the full economic contribution of activities.

For example, in the article, A preliminary economic valuation of the sports fishing industry in New Caledonia published in *SPC Fisheries Newsletter* #150, SPC economists used the data collected over a two year period to identify the potential economic contribution of sport fishing tourism to the New Caledonian economy. Without such analysis, secondary benefits such as the employment in support industries, would not have been identified and the impact of the sector on the economy underestimated.

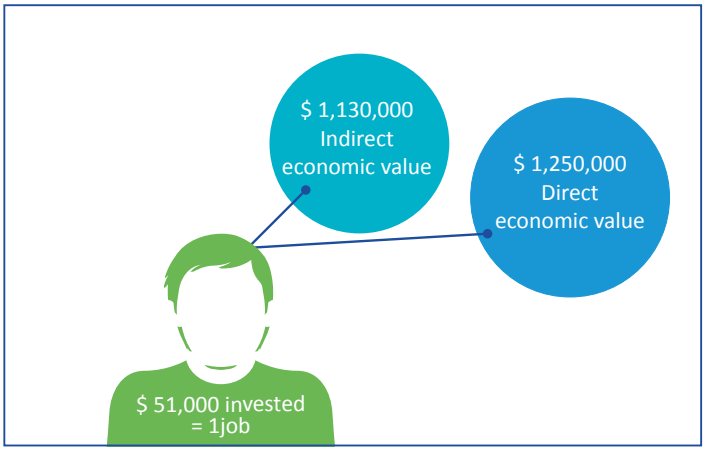

Figure 1: Total economic value generated from an activity

The total economic value generated from an activity is made up of the direct economic value[1] and indirect economic value[2].

The analysis (Figure 1) suggests that sport fishing tourism generates about the same amount of money in indirect economic value as it does in direct economic value. Without economic analysis, half of the value of this industry would go unrecognised, and therefore the benefits that this industry brings would be significantly underestimated.

[1] Direct economic value: clients directly contribute to the economy through their spending on activities directly related to sport fishing. For example, charter costs, accommodation, food and beverage, souvenirs and taxes.
[2] Indirect economic value: as a result of tourist spending, businesses and employees spend in other branches of the economy. For example, businesses will pay for goods or services to support their activities, such as suppliers, mechanics and accountants. Individuals who are employed in the businesses will also spend their income on items such as food, housing, transport, clothing and entertainment.

For further reading

James P. 2016. A preliminary economic valuation of the sports fishing industry in New Caledonia. *SPC Fisheries Newsletter* 150:14–18. [www.spc.int/DigitalLibrary/Doc/FAME/InfoBull/FishNews/150/FishNews150_14_James.pdf]

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Gillett R.E. 2016. *Fisheries in the economies of Pacific Island countries and territories*. Noumea, New Caledonia: Pacific Community. 684 p. [http://www.spc.int/fame/en/component/content/article/237]

Market analysis

Understanding market barriers and their root causes allows for well-designed interventions to be made. Market barriers may result from attitudes, incentives, functioning, structures, prices or governance systems. Economists have a range of tools at their disposal to help identify these market barriers, including theory, structured interviews and quantification techniques.

SPC economists have done an analysis of the market barriers that small-scale fishers face in Kiribati, and investigated how these barriers impact fishers' ability and willingness to supply export-quality tunas. This analysis has helped to explain why a project was underperforming, and this resulted in the formulation of possible interventions to improve performance (see the article, The economics of small-scale fishers supplying tuna to an industrial processing plant in Kiribati in *SPC Fisheries Newsletter* #149).

Demand and supply projections

Demand and supply projections are vital for long-term planning and policy making, particularly as demographic changes occur such as the rapid urbanisation of Pacific Island countries and territories (PICTs). Techniques for forecasting demand and supply can range from informed qualitative methods to quantitative modelling based on current and past trends.

SPC economists supported The Nature Conservary in Palau to predict future local demand for reef and oceanic fish. The projections helped to explain the potential future size of the domestic fishing industry, the number of jobs it could support and the economic impact of the maritime sanctuary.

Statistical trend analysis and forecasting

Statistical trend analysis is the analysis of available economic activity data to provide information to inform policy makers. For example, the economic data monitored and analysed can be in regard to contribution to the Gross Domestic Product (GDP), wealth creation, prices, production, tax and other government revenues, formal and informal employment and many other important economic indicators. Statistical analysis may be employed to forecast trends. Information on likely future developments allows pro-active policy development. For instance, a forecast decline in tuna stocks may impact decisions on current fishery quotas.

Summary economic analysis can be found in the 2016 edition of *Fisheries in the economies of Pacific Island Countries and Territories* by Robert Gillett.

For more information

For more information on economic tools and analysis, including training attachments to SPC, please contact:

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