

Assessment of comparative advantage in aquaculture

Framework and application on selected species in developing countries



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Cover photographs:

Background: A commercial aquaculture farm in Kigembe, Rwanda; courtesy of Nathanael Hishamunda.

Inset bottom left: Shrimp being cleaned for freezing in Manila, The Philippines; © FAO/Freeby Maimone.

Inset bottom right: Commercial aquaculture can help poor fishers increase food security;
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by

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Preparation of this document

Within the framework of its continued efforts to alleviate poverty and enhance food security, the Fisheries and Aquaculture Department of the Food and Agriculture Organization of the United Nations (FAO) has initiated a number of studies to improve decision-making in both private and public sectors. This study provides two methodologies to estimate comparative advantage that can assist entrepreneurs and government policy-makers in developing countries in deciding which species and which export markets offer the most potential for commercial aquaculture.

While the methodologies can be applied anywhere, the focus of this report is on two case studies: the shrimp export market and farmed production of freshwater finfish. The studies were conducted within the Fisheries and Aquaculture Economics and Policy Division at FAO.

Abstract

International trade in fishery products has increased, together with the absolute and relative importance of aquaculture, as a source of fish production. Shrimp and salmon are two examples of species grown in developing countries that are traded internationally. How successful a country is in competing against other producers depends in part on transport and on satisfying food standards, but also on its costs of production. Comparative advantage is a means of comparing relative costs and indicating the species and markets where there is the greatest likelihood of success. There are problems with estimating comparative advantage: the method can be static rather than dynamic and may not indicate long-run opportunities. However, it is a useful tool for planners who devise aquaculture strategies and for individual fish farmers.

Two methods exist for estimating comparative advantage – both have been applied to aquaculture. The domestic resource cost (DRC) method relies on production cost data to compare efficiency. Distortions may require the estimation of shadow prices to reflect true social opportunity costs but, when adjusted, the country that has the lowest DRC has a comparative advantage. The DRC method is dynamic, providing useful information to decision-makers; however, cost data may be difficult to obtain and shadow pricing is problematic. The second method is revealed comparative advantage (RCA) whereby comparative advantage is inferred from an *ex post* assessment of actual trade and specialization. From trade statistics, estimates are obtained to examine whether a country exports a species to a particular country more than to the rest of the world; if so, it is judged to have a comparative advantage in that particular market. The RCA method is more descriptive and has less predictive potential than the DRC approach but it has the advantage of data availability.

This paper illustrates the concept of comparative advantage and some of its policy implications by presenting two case studies: the first one focuses on shrimp exporting countries while the second one is based on freshwater aquaculture production of carp, catfish and tilapia. The RCA method is used in both cases.

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Foreword

This report aims at assisting countries determine in which species and in which export markets they should specialize. Comparative advantage is a concept almost two-hundred years old suggesting that countries can trade and benefit from trade even if they have no absolute advantage. Thus even a country with limited resources and cost disadvantages can specialize and gain from trade just as the most efficient producer. For decision-makers, comparative advantage provides insights if they want to “pick winners” among the sectors of an economy.

The conclusions and methodologies in this report are not specific to any particular country and while data limitations may preclude the use of one method, both should apply consistently to all sectors. This report concentrates on the aquaculture sector with data coming from more than 100 countries. Case studies indicate which countries have a comparative advantage in shrimp production (for the export market) and freshwater production of fish.

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