



Public resources for private mariculture: Northeastern United States, Atlantic Canada and Scotland after NAFTA and GATT

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Abstract

During the past decade, mariculture development has increased rapidly in the north Atlantic Ocean. However, global developments in the market for farm-reared salmon have raised concern about government policy and intervention on behalf of mariculture sectors in closely competing countries and regions. This paper provides an analysis of public sector involvement in private sector mariculture innovation and investment in three regions: the New England states of the US, the Atlantic Provinces of Canada, and the Highlands and Islands region of Scotland. It illustrates temporal (1984–1997) and geographic differences in those mechanisms financing innovation and assisting private capital formation. As international trade rules eliminate tariff and other barriers supporting domestic industry, innovation assistance and capital market policies may become more prevalent. Recent support policy changes in Canada are illustrative. © 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Mariculture; Public support; Innovation; International trade

1. Introduction

Mariculture production¹ has increased rapidly in the northern Atlantic Ocean since 1984.² Because the Uruguay round of the General Agreement on Tariffs and Trade (GATT 1994) excluded fish and fish products from the ‘agricultural exemptions’ to its Agreement on Subsidies and Countervailing Measures (SCM), its provisions apply to public sector involvement in mariculture development.³ As the international community adopted new

and revised free trade agreements, wild stock declines in groundfish species forced marine fishing restrictions and fishing industry restructuring. Simultaneously, mariculture development has been promoted as a supplemental source of marine production and criticized for alleged environmental and aesthetic nuisance.

To date, mariculture development in the north Atlantic region has been dominated by salmonid rearing. Charges of farm-raised salmon dumping by Norway [5–7] and Chile [8] highlight concern regarding the nature of international markets for certain maricultured products. A related issue concerns the effect of differential public support for mariculture development on costs of production [9,10]. While product dumping is prohibited under the rules of international trade and subject to antidumping duties, differential public support continues to be allowed under many circumstances.⁴ This research delineates the extent of public involvement in private sector mariculture enterprises in three comparable regions: Atlantic Canada, the northeastern United States, and the Highlands and Islands of Scotland. The regions

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¹The BioTech Resources *Life Science Dictionary* defines mariculture as ‘the cultivation of marine plants or animals for food or for other purposes’ [1]. The *Merriam-Webster’s Collegiate Dictionary* defines mariculture as ‘the cultivation of marine organisms in their natural environment’ [2]. The National Research Council defines ‘marine aquaculture’ as ‘the farming of marine finfish, shellfish, crustaceans, and seaweed, as well as ocean ranching of anadromous fish’ [3, p. v]. In this paper, the term is used to describe any cultivation of marine or anadromous species in marine or marine/brackish environments. Aquaculture, the cultivation of all aquatic plants and animals, includes mariculture.

²Food and Agricultural Organization of the United Nations [4].

³In addition to extending its provisions to all signing nations, GATT 1994 clarified the Agreement on Subsidies and Countervailing Measures by delineating subsidies into three broad categories with respective courses of action.

⁴The GATT remedy for illegitimate subsidization is countervailing duty.

share common maricultured species as well as some geographical, historical, cultural and, therefore, gastronomic linkages.

In mariculture, as in other sectors, struggling domestic industries may justify increased domestic government action or support by appealing to the ‘unfair’ advantages or practices of their competitors. This paper describes elements of three systems of public support for innovation and input costs.⁵ These ‘product and export measures’ [11,12] were chosen, in part, because of their demonstrated existence and likely persistence under GATT 1994. A systematic inventory of such domestic mariculture industry support in three regions likely to compete in regional and global markets for certain maricultured species (see Table 1) precedes a discussion of some theoretical trade effects, whether ‘countervailable’ or not, associated with those differences.

2. Economic and geographic context

The included regions were chosen for their previously mentioned similarities *and* their status as smaller competing or emerging regions in markets where the output of others (i.e. Norway, Chile, Washington, and British Columbia, as appropriate) may dominate. In 1995, approximately \$2.3 billion worth of marine species were cultivated in northern Atlantic waters [4]. Almost half (44%) was grown in the marine waters of Norway. Combined north Atlantic mariculture production in France and Norway, the north Atlantic mariculture leaders, accounts for nearly two-thirds of total cultured product value in north Atlantic marine waters. Measured by weight, Norway produces more than 55% of world Atlantic salmon landings. France grows 91% of all oysters cultured in northern Atlantic waters and nearly 97% of the leading oyster species cultured in the north Atlantic, the pacific oyster, though a small percentage of pacific oysters harvested worldwide. But of the regional mariculture product value not originating in Norway or France, nearly half (43%) is grown by Canada, the United States and the United Kingdom. Over the time period reported in Table 1, north Atlantic mariculture in Canada and the United Kingdom experienced the majority of its rapid expansion during the 1980s, FAO recorded growth in the United States has been more concentrated in the 1990s.

⁵UNCTAD Nontariff Barrier Classification Codes 5.2.1 and 5.2.3. In this paper, labor subsidies (5.2.2) and tax concessions (5.2.4) are not included in the discussion.

3. Justifications for public intervention

Because of incomplete information or spillover effects, public benefit is sometimes suboptimal in the absence of public intervention. Innovation represents such a case. Companies rely on inputs derived, at least indirectly, from transferable scientific research. Such research is often financed by governments or other socially minded institutions because individual private companies are able to enforce intellectual property rights only imperfectly. Similarly, other types of projects are justified based on beneficiaries’ incentive to ‘free ride’ (i.e. marketing the idea of ‘aquaculture’ or origin as a product attribute). Finally, some public programs address distortions created by private or costly information.

Publicly funded actions may be less clearly justified than the previous descriptions suggest. Programs benefiting mariculture may address public good or market failure issues to some degree, but also may subsidize purely private aspects of mariculture. While many of the programs described in this paper do not target the mariculture industry exclusively, the actual benefits realized by mariculture enterprises across jurisdictions may translate into differential innovation and input costs. A legitimate question, beyond whether the supporting programs are consistent with GATT, is whether cross country public benefit differentials matter in fact [14]. Because benefits from publicly funded basic and very general technology research are difficult to limit within regional or national borders, programs providing direct access to public funding by private for-profit enterprises are more likely to convey domestic industry advantage.

Subcategories commonly used to classify and measure government subsidization to agricultural production, the producer subsidy equivalent or PSE [15–17], can be borrowed and used to categorize fish-related subsidy policy embodied in GATT 1994. PSEs represent generally comparable tabulations of public expenditures, at the national and subnational level, in support of agricultural production. Expenditure categories include infrastructure (i.e. research and development), marketing and technology transfer (i.e. extension programs), input price subsidy (i.e. investment cost sharing, below market leasing, predation and disease control, and subsidized lending), market price support (i.e. tariffs), and producer income support (i.e. emergency assistance and targeted income transfers). Though PSEs have not been calculated for mariculture, many existing programs would fall within ‘productive’ PSE component categories [18], be acceptable under GATT, and address more classically ‘public good’ problems (basic research, infrastructure, marketing and technology transfer). Research conducted on behalf of private sector enterprises (or industries) and input price subsidies represent more murky territory [18] though may be conditionally acceptable under the terms of GATT.

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