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Commentary

China's aquatic product processing industry: Policy evolution and economic performance

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ABSTRACT

Background: Aquatic products processing industry (APPI) in China has been developing for several decades and is becoming a pillar sector in China's fisheries industry. There are some problems in the development of this industry, such as significantly lower-than-world-average APP ratio, improper regional structures, weakly development in freshwater products processing, and lower profit margin from processing.

Scope and approach: This study aims to provide a whole picture of China's aquatic products processing (APP) Industry. It also describes an overview of the development of aquatic product industry and evolutions of policies and regulation in China.

Key findings and conclusions: The findings indicated China's Aquatic product industry has progressed significantly in the past decades. The total products of the APPI gradually increased from 0.6 million tons in 1978 to 20 million tons in 2014. The ratio between aquatic products processing output and aquatic products output rose from 0.13 in 1996 to 0.32 in 2014, and the number of processing firms substantially increased during this period. Since 2004, the quality of the APPI gradually improved, and the APPI value-added rate increased from 29.76% in 2004 to 37.28% in 2014.

Some remarkable issues still exist in the process of APPI. Further policies need to focus on better industrial development planning, favorable tax for intensive processing sectors, as well as reinforced R&D and policy supports.

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1. Introduction

During the last two decades, China has ranked first according to the total products of fisheries and aquaculture in the world. The aquatic products processing industry (APPI) has not been fully developed. The yields of aquatic products were 64.62 million tons in 2014 (with 160 million in world yields, FAO, 2014, pp. 41–46), but only 33.9% (54% in the developed country, FAO, 2014, pp. 41–46) of this total products were used in the APPI.

Aquatic products (AP) are typically perishable, with the rate of deterioration accelerating as temperature increases (Xiao, He, Fu, Xu, & Zhang, 2016; Li, Yang, Nadolnyak, Zhang, & Luo, 2014). To prevent these valuable products from perishing and being wasted,

processing methods were adopted, and an advanced APPI has been established in developed countries (Calanche et al., 2013; Chouhan, Kaur, & Rao, 2015; FAO, 2014, pp. 41–46; Li, Lu, Zhu, Wang, & Li, 2009; Gao, Tong, & Wu, 2011). The development of China's APPI has been widely discussed by scholars (Xu, 2006; Fu et al., 2009; Li et al. 2009; Ni, Hu, & Wang, 2010). In the mid-1990s, several researchers suggested that China's APPI should focus on strengthening the R&D of freshwater processing technology, carrying out complete processing and utilizing marine fishes, and promoting the construction of APP circulation and market systems (Li & Liu, 1995). Some studies build efficient models to establish the changes and trends of aquatic products in the domestic market and international trade (Liu, 2013). The competitiveness of China's APPI was investigated, and some empirical studies indicated that its global competitiveness was relatively lower. The major issues are concentrated in capital intensity, cluster industry level, monitoring level and firm sizes (Qu, 2013, pp. 38–46; Zhang, 2008). Cen, Li, Yang, Chen, and Hao (2008) suggested China's APPI faced various challenges including, weak basic research, relatively lower

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processing rate, rarely processed product species, lower added value, inadequate equipment, imperfect standard systems, and low product quality. Some of the literature also focused on the role of technological innovation in how to upgrade the APPI, the regional distribution of the APPI, and low-carbon economy (Cui, Lin, & Wang, 2012; Li et al., 2011; Xu & Ning, 2011).

The development of the APPI in China will improve domestic consumers' food security, reduce the waste ratio as well as help the development of her fisheries and aquaculture. More importantly, it will also profoundly promote the efficient utilization of global fishery resources through international trade. Most of the previous studies introduced models and structures from the natural science perspectives (Chouhan et al. 2015), some of the economic studies usually focus on the aquatic products in the international trade markets (Koopman, Wang, & Wei, 2008; Liu, 2013; Venugopal, 2005), and few of them were explored from the economic point of view. It is important to improve the analysis of the industry's policy evolution and to expand the study in the spatial-temporal span of the sector's development. In this study, main point will be focused on the evolution of China's APPI policies and evaluate the economics performance of APPI development given the observed data over the past 30 years, discussing the achievements and problems of this industry. Overall picture as to relate to the developing trends in China's APPI will be clarified. Policy implementation is pointed out to promote the development of this industry in China.

2. Evolution of China's APPI policies

The design of policies to encourage the development of the APPI in China started in the 1980s (Bureau of Fisheries, 1990, 1999). In March 1985, the CPC Central Committee and the State Council of China jointly issued the "Instructions on Policy Liberalization to Accelerate the Development of Aquaculture" (the CPMCC General Office [1985] Document No. 5), as a guideline for fishery and aquaculture development to "prioritize aquaculture, simultaneously develop aquaculture, fisheries and aquatic product processing industry, and adjust development focus according to local conditions." The primary target of fisheries' development before the 1990s was to improve households' "Market Basket" and meet food demand.

Since the early 1990s, the government began to focus on developing processing industry, extending the industrial chain of aquaculture, and promoting the modernization of fisheries and aquaculture. In 1992, the State Council promulgated the "The Decision of the State Council on Developing High Quality and Efficient Agriculture (1992)" to encourage agricultural processing enterprises and help them to construct raw material bases or to establish a direct market linkage." The purpose was to simplify the process in intermediate steps and reduce costs. This policy also encouraged firms to develop modern agro-processing in some agricultural commodity productions. Subsidies and financial credits were provided to incentive upgrading technologies, ag-innovation, storage, preservation, distribution, and market extension. After 1992, the Ministry of Agriculture, the Ministry of Finance, the State Administration of Taxation, the People's Bank of China, and other departments issued a series of promotional and preferential policies like reducing tax, fiscal assistant and financial credit in the agricultural processing industry.

In 1997, the State Council endorsed the Ministry of Agriculture's "Opinions on Further Accelerating the Development of Fishery Industry," which particularly focused on promoting the development of the processing industry to keep the freshness and improve the quality of aquatic products. Related policies included the development of deep processing and comprehensive utilization of freshwater fishes, seawater pelagic, and bulk, and low-value products,

such as shellfish and marine algae; and to develop diversified, nutritious, healthy and convenient new aquatic product. Those policies incentivized the rapid development of China's APPI.

Since the 2000s, intensive processing of agro-products (including aquatic products), has attracted more political attention. For example, CPC Doc-No.1 in 2002 especially deployed measures to promote the development of the agro-processing industry. CPC Doc-No.1 of 2004 noted that central and local governments should make efforts to distribute the agro-processing industry rationally to support the development of the main food producing areas, with particular emphasis on the broad and intensive food processing industry. The CPC Doc-No.1 of 2005 required governments at different levels to raise the value-added tax (VAT) for the agro-processing industry to support its development. CPC Doc-No.1 of 2009 stressed the need to support the industrialized operation of agriculture and to encourage the development of agro-processing. CPC Doc-No.1 of 2015 highlighted the international cooperation in agro-processing industry and encouraged the stakeholders to develop international agricultural cooperation, primarily focusing on those fields of agro-processing, storage, transportation and international trade.

A series of special documents to develop the agro-processing industry have been issued since 2000. In November 2002, the State Council issued the "Notice of Opinions on the Promotion of Agro-processing Industry Development." This document indicated the importance of promoting the development of the agro-processing industry and decided to increase national investments and provide financial, tax and other support to this industry. Those supports included efforts to increase export tax rebates and decreasing corporate income taxes and tariffs on imported equipment and processing facilities. The deep and intensive processing of high-quality fish, shrimp, shellfish and rare seafood were also highlighted in this document as part of agro-processing industry development. In 2012, the State Council issued "Opinions of the State Council on Supporting the Development of Agricultural Industrialization Leading Enterprises" and re-emphasized the necessity of vigorously develop the agro-processing industry to promote industrial upgrading.

The recent National Five-year Plans (2006–2010 and 2011–2015) for fishery and aquaculture development enforced those State Council policies and stressed the development of this industry. In 2013, the "Several Opinions of the State Council on Promoting the Sustainable and Healthy Development of Marine Fisheries" (State Council [2013] No. 11) specially emphasized that the government would actively promote the development of deep and intensive processing of marine products and encourage stakeholders to invest more in the R&D of processing machinery, production lines, and waste disposal facilities comprehensively.

3. Economic performance of APPI development

To estimate the impacts of China's APPI policies on the development of the industry, the direct and indirect effects of technologies, capital, and labor were selected as measurements. Indicators included APP yield, APP rate, APP capacity and APP value-added rate. Technological advances in APP, APPI cluster level, and other aspects were also included as follows.

3.1. Substantial growth in APP output and gradual increase in product processing rate

The output of China's APPI rose from 0.6 million tons in 1978 to 20.5 million tons in 2014. The total production and processing output of aquatic products of 2014 were 13.88 times and 74.07 times as those of 1978. During 2004 and 2014, the ratio of aquatic

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