

# EVIDENCE ON THE CURRENT STATE OF THE SHRIMP INDUSTRY IN ECUADOR

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## ABSTRACT

*This article presents evidence regarding the current state of the shrimp industry in the Republic of Ecuador. The paper conducts a survey that highlights existing problems the industry faces. The author proposes several solutions for the short and long-term correction and elimination of such problems. The Ecuadorian economy consists of three major sectors: (1) The Primary Sector includes agriculture, aquaculture, livestock, and mining; (2) The Secondary Sector consists of industrial production; and (3) The Tertiary Sector includes all types of services. The shrimp industry in Ecuador is in the first primary sector.*

**JEL:** M16, M20

**KEYWORDS:** Ecuador, Shrimp Industry, Product Diversification, El Nino, Decree #1391, Ministerio de Acuacultura, Camara Nacional de Acuacultura, Nicovita Exports, CJP International, City of Guayaquil

## INTRODUCTION

The purpose of this article is to present the status of the shrimp industry in Ecuador. The Ecuadorian shrimp industry plays an important role in the national economy and constitutes a large percentage of the production of non-petroleum products destined for exportation around the world. The shrimp industry in Ecuador is divided into production and exportation. The industry employs 5% of the labor force, and produces 20% of non-petroleum exports (Banco Central del Ecuador, Información Estadística Mensual, 2017). The data included in this article adds additional information to the relatively limited availability of academic literature on the shrimp industry in Ecuador. It also provides information on the current status of the shrimp industry.

The Ecuadorian economy has three major sectors: (1) The Primary Sector includes agriculture, aquaculture, livestock, and mining; (2) the Secondary Sector consists of industrial production; and (3) the Tertiary Sector which includes all types of services (Quintana, Mendoza & Quezada, 2014). The economy of Ecuador is based on the United States currency (Higgins de Ginnata, 2007) and highly depends on revenues received from petroleum production, the exportation of non-industrial products including shrimp, and from revenues generated in the public sector (Theodore, 2010). The economy of Ecuador is not competitive and operates under diseconomies of scale due to under-utilization of the factors of production (Acosta, 2012). The European Union is the largest export market of non-petroleum products while most imports to Ecuador come from the United States (Vasquez & Saltos, 2008).

Ecuador has adopted the strategy of product diversification for its economic and social development (Larrea, 2017). Several legislative enactments have led to structural changes in government and non-governmental institutions as well as agencies for the purpose of supporting the desired diversification (Theodore, 2011). Constitutional amendments specify the government may participate in all strategic sectors of the economy including the sectors of imports and exports. There are government controls on foreign investments in telecommunications and in air and sea transportation (Vallejo, 2010). Economic

development in Ecuador is highly influenced by global cyclical fluctuations. It is, therefore, highly important that the strength of internal economic controls be increased through development in all sectors of the economy, and there be less government control of private enterprises (Theodore, 2010).

The literature commensurate to the topic of this article is based on academic articles, academic books, publications of government and private institutions and agencies in Ecuador. In addition, I conducted personal interviews with managers of private business organizations and top officials and consultants of government agencies in Guayaquil, Ecuador, in October 2017.

There is a 25% shortage of 25 shrimp supply globally due to substantial reduction in the production of shrimp in South-East Asia caused by diseases that affect crustaceans. For this reason, Ecuador has been making every effort to increase its production and exportation of shrimp. Ecuador produces the highest quality shrimp globally. Existing problems in the shrimp industry and efforts to correct them and further develop the industry have been exposed, analyzed, and evaluated. This article provides information pertinent to the current status of the shrimp industry in Ecuador. In the section that follows, the author provides a review of the relevant literature. The data and Methodology section discusses both primary and secondary data. Results and Discussion that indicate the research findings and provide a discussion. Next, the author provides some comments about how the industry might move forward in a positive way. The paper closes with some concluding Comments.

## **LITERATURE REVIEW**

### The Role of the Shrimp Industry in Ecuador

The shrimp industry is a part of aquaculture that mainly includes crustaceans (shrimp), mollusks, and fish. Currently, there is a high global demand for Ecuadorian shrimp due to the disease, which has substantially reduced the production of South-Asian shrimp. In other parts of the world, such as Mexico, there have been large economic losses during the cultivation process of shrimp. These losses occur due to diseases, coupled with intensive intervention generated by culture practices which degrade the environment (Plascencia & Bermudez, 2012).

Expansion of the shrimp industry depends on scientific advances related to the understanding of reproductive endocrinology that allows the development of aquaculture programs based on biotechnology (Sancho-Blanco, Castro & Montoya, 2018). There is continuous demand upon the Ecuadorian shrimp industry to increase both its production and exportation. Currently, there is a 25% shortage of shrimp production globally (Camara Nacional de Acuicultura. Comercio Exterior Información, 2017). At present, 58% of the exports go to Asia, 24% to Europe, 16% to the United States, and 2% to Latin America. In 2017 the percentages of Ecuadorian shrimp for exportation were: Frozen shrimp 80.5%, frozen shrimp from cold water (harvested) 18.8%, and preserved shrimp in jars and cans 0.7% (Camara Nacional de Acuicultura. Estadísticas, 2018).

Asian shrimp producers have been making strong efforts to revive the disease afflicted shrimp industry. Efficiency estimates indicate substantial potential for improving the level of shrimp production using existing inputs and available technology (Devi & Prasad, 2007). In North America, Canada has increased its shrimp production to an appreciable degree. Canada's cold-water shrimp had an export value of \$345 million in 2013. It represents Canada's fourth-largest seafood export, behind lobster, Atlantic salmon, and snow crab (Beswick, 2017). Similar efforts have appeared in the United States. Efficiency estimates indicate substantial potential for improving the level of shrimp production using existing inputs and available technology in both the systems (Grimes & Yow, 2009).

The shrimp industry in Ecuador is divided into production and exportation. The industry employs 5% of the labor force, and represents 20% of non-petroleum exports (Banco Central del Ecuador, Información Estadística Mensual, 2017). The shrimp industry does not receive government financial assistance but is subject to necessary government controls. Production and exportation take place during the entire year (A. Arauz Paladine, General Manager and Consultant, Nicovita Exports, personal communication, October 20, 2017). The shrimp industry has 175,000 hectares dedicated to the cultivation of shrimp and 277 shrimp boats (Banco Central del Ecuador, 2017). Both harvesting of shrimp by the shrimp fleet and cultivation of such crustaceans are included in the production phase of the industry. Harvesting shrimp in the coastal waters of Ecuador takes place between 98 to 120 days when the shrimp reaches the appropriate size. On the other hand, the cultivation of shrimp in farms takes place continuously throughout the year.

#### Current Problems in the Shrimp Industry in Ecuador

The geography of Ecuador affects the production of shrimp, especially when the climatic phenomenon of El Niño causes changes in water temperature with detrimental effects upon the availability of shrimp. The two main diseases that affected shrimp farming in Ecuador are the Taura Syndrome Virus and the White-Spot Virus. Prior to the arrival of the White-Spot Virus in 1999, the Taura Syndrome Virus was the biggest killer of shrimp. Shortly after stocking, it can kill from 40% to 90% of the post-larvae in a pond (Veuthey & Gerber, 2012). In Asia, consumed shrimp infected by disease has caused food poisoning. Asian governments have been making every effort to protect their citizens from having food poisoning caused by the consumption of infected shrimp. According to published information, HACCP systems are being put into practice in aquaculture at various levels (Okocha, Plukfemi & Adedeji, 2018).

Traditionally, Ecuadorian producers have been receiving delayed payments for the sale of their products. This delay impedes such producers from timely reinvesting in breeding, feeding, providing medical controls against disease, renovating/upgrading machinery, and implementing new technologies (B. Nunez, Undersecretary, Ministerio de Acuacultura, personal communication, October 19, 2017). In addition, there have been logistic problems in the channel of distribution whereby intermediaries have been causing unnecessary increases in the price of the product. The channel of distribution from production to exportation has been lacking in effectiveness, efficiency, and timely movement. Finally, there has been slow technical assistance and slow transfer of technology (Armijos-Suárez et al, 2015).

#### Areas of Ongoing Improvements

In 2008, the Ecuadorian Government enacted Decree No.1391 which regulates the shrimp industry in the area of physical environment. Producers are obligated to contribute financially by complying with the above-cited decree (Luna Osorio, 2010) to assist in maintenance of the physical environment affecting the physical condition of the ponds where the shrimp grow.

Since the government does not provide financial assistance, the private sector is providing financial incentives on an increasing basis (B. Nunez, Undersecretary, Ministerio de Acuacultura, personal communication, October 20, 2017). Producers are now increasingly receiving their compensation faster and are rapidly reinvesting in breeding, feeding, providing medical controls against diseases that affect the crustaceans, and replacing/innovating machinery (O. Crespo, Secretary, Ministerio de Acuacultura, personal communication, October 19, 2017).

There have also been improvements in research for the nutrition/food for the shrimp (La Exportación Empuja al Sector Camaronero, 2017). The new method of feeding the shrimp, through multiple rations of high-quality food, has decreased the cycle of production and increased the total volume produced (Molina and Espinosa, 2017). Fish intestines are now being used to provide food for the shrimp; there are national

business organizations that process and prepare such food (Y. Piedrahita Falquez, Executive Director, Camara Nacional de Acuacultura, personal communication, October 20, 2017).

There are increases in synergy and coordination in the channels of distribution. These activities begin with the production phase in order to meet the quality demands of the international market and attain reasonable prices by reducing costs through the elimination of intermediaries (A. Arauz Paladines, General Manager of Nicovita Exports, personal communication, October 18, 2017). The implementation of new technology is increasing, among other things, the coordination among the associations of producers, exporters, government agencies, and foreign importers (Munos Suarez; Duran Ganchoza & Gonzalez Illescas, 2017). It is evident that all parts of the distribution channel continue to make every effort to attain economies of scale and provide competitive prices to foreign importers (C. Jurado, President, CJP International Business, personal communication, October 19, 2017). In 2016, for every US \$100.00 invested in the shrimp industry of Ecuador, the gains were US \$28.90 (Banco Central del Ecuador, Información Estadística Mensual, 2017).

## DATA METHODOLOGY

For the purpose of this article, the author collected secondary materials published by Ecuadorian and foreign authors on the shrimp industry in Ecuador. Primary data were collected through a number of lengthy personal interviews that took place in the port City of Guayaquil, the headquarters of the Ecuadorian shrimp industry. Interviews were conducted between the author and government agency officials, private organization officials, and consultants affiliated directly with the shrimp industry in the country.

Specifically, the author interviewed O. Crespo, Secretary, Ministry of Aquaculture in which the shrimp industry belongs, October 19, 2017; Y. Piedrahita Falquez, Executive Director, National Chamber of Aquaculture, October 20, 2017; C. Jurado, Economist and Management Consultant, President of CJP International, October 19, 2017; B. Nunez, Undersecretary, Ministry of Aquaculture, October 19, 2017; and A. Arauz Paladines, General Manager of Nicovita Exports, the organization that exports Ecuadorian shrimp around the world, October 18, 2017. Results of the interviewees are described in subsequent sections. The personal interviews took place in the offices of the persons interviewed and were based on three general open-ended discussions: (1) What are the current problems in the shrimp industry in Ecuador, (2) what is being done to correct such problems, and (3) what are the prognostications of the future of the shrimp industry in the country? All the responses were parallel and well-aligned although they came from experts who hold different and divergent positions in the shrimp industry.

## RESULTS AND DISCUSSIONS

The primary findings indicate there have been several problems in the shrimp industry of Ecuador (such as the nutrition of the shrimp) which are now being corrected. Ecuador is making every effort to increase its production and exportation of shrimp, which is of the highest quality globally. Existing problems in the shrimp industry and efforts to correct them and further develop the industry have been exposed, analyzed, and evaluated.

There is continuous demand upon the Ecuadorian shrimp industry to drastically increase both its production and exportation. As noted earlier, there is a 25% shortage of shrimp production globally. The shrimp industry is a part of aquaculture that mainly includes crustaceans (shrimp), mollusks, and fish. Production and exportation take place during the entire year. The shrimp industry does not receive government financial assistance, but it is subject to necessary government controls. The industry is divided into production and exportation segments. The industry employs 5% of the labor force and includes 20% of the non-petroleum exports.

Diseases have affected Ecuadorian shrimp in the past, two of which were the Taura Syndrome Virus and the White-spot Virus. The geography of Ecuador affects the production of shrimp, especially when the climatic phenomenon of El Nino causes changes in the water temperature of the sea and the ponds where the shrimp are produced. These changes have detrimental effects on the health of the crustaceans. Another problem has been that, until recently, producers of shrimp did not receive immediate payments for the sale of their products. They had to wait for several weeks until they get paid. This delay impeded producers from immediately reinvesting, inbreeding, feeding, and providing medical care for the shrimp.

There have been logistic problems in the channel of distribution where intermediaries have been causing unnecessary increases in the price of the product. The entire process from production to exportation has lacked effectiveness, efficiency, and timely movement. Finally, there has been slow use of technical assistance and the implementation of technology.

All the persons interviewed by the author of this work believe that the government needs to control the industry, but the private sector has to provide more financial incentives in the entire channel of distribution. There is mechanization in the channel of distribution which is regularly upgraded and/or renovated. Research centered on the nutrition/food of shrimp has been increasing with good results. These research projects include issues such as using fish intestines for nutrition/food produced by national firms located close to the production ponds. In 2008, the Ecuadorian Government enacted Decree No.1391 which regulates the shrimp industry in the area of the physical environment. This regulation affects the physical condition of the ponds where the crustaceans are born and raised. A majority of shrimp producers are obligated to pay additional funds to comply with the above-cited decree.

The industry has been constantly developing during the last 10 years. It is evident that all parts of the channel of distribution continue to make every effort to attain economies of scale and provide competitive prices to foreign importers. Coordination is now taking place among the producer associations, exporters, government agencies, and foreign importers to reduce unnecessary costs within the channel of distribution and to reach synergy and coordination to meet the quality demands of the international market and attain reasonable prices by reducing costs through the elimination of intermediaries to attain economies of scale.

The primary data collected by the author resulted from a number of lengthy personal discussions with top officials of government offices and agencies, top officials of private organizations, and top officials of consulting organizations. Each of these individuals are directly related to the shrimp industry and are located in the Port City of Guayaquil on the Pacific Ocean where the headquarters of the Ecuadorian shrimp industry is located. B. Nunez, Undersecretary of the Ministry of Aquaculture, indicated that producers are now paid faster after the sale of their products and the producers immediately reinvest in the breeding, feeding, and medical care of the shrimp. Further, the private sector shrimp industry is contributing more in the entire channel of distribution while the government retains the right to control and monitor said industry.

O. Crespo, Secretary of the Ministry of Aquaculture, denoted that his organization is constantly advising producers to renovate and upgrade the mechanization element through the entire channel of distribution. Y. Piedrahita Falquez, Executive Director, National Aquaculture Chamber of Commerce, stated that research in the nutrition/food of the shrimp is increasing with good results. As noted earlier, fish intestines are being used to provide food for the shrimp and there are commercial organizations close to the shrimp ponds of production that process and prepare such food.

C. Jurado, President, CJP International Business, a consulting organization that specializes in micro and macro-economic areas of Ecuador, including the shrimp industry, presented positive development of the shrimp industry during the last 10 years, making positive projections for its future developmental process. A. Arauz Paladine, Commercial Manager of Nicovita Exports and consultant to the shrimp industry, stated the industry does not receive government financial assistance, but it is subject to necessary government

controls. The private sector is increasing its financial contributions for the sustenance and development of said industry and that production and exportation take place during the entire year.

## A PATH FORWARD

The shrimp industry in Ecuador needs to continue the synergy and coordination in the channel of distribution beginning with the production phase in order to meet the quality demands of the international market and attain reasonable prices. This can be done by reducing costs through the elimination of intermediaries. The Ecuadorian shrimp industry has been constantly developing during the last 10 years. It is evident that all the constituent parts of the channel of distribution make every effort to attain economies of scale and provide competitive prices to foreign importers. Unnecessary costs found in all parts of the channel of distribution are being eliminated. The author encourages additional coordination and synergy among the associations of the producers, exporters, government agencies, and foreign importers.

## CONCLUDING STATEMENTS

The purpose of this article was to present the status of the shrimp industry in Ecuador which plays a very important role in the Ecuadorian economy and constitutes a large percentage of the production of non-petroleum products destined for exportation around the world. The shrimp industry is divided into production and exportation. It employs 5% of the labor force and includes 20% of non-petroleum exports. The author collected secondary materials published by Ecuadorian and foreign authors about the shrimp industry in Ecuador. Primary data were collected through a number of lengthy personal interviews that took place in the port City of Guayaquil, the headquarters of the Ecuadorian shrimp industry. Interviews were conducted between the author and government agency officials, private organization officials, and consultants affiliated directly with the shrimp industry in the country.

The only limitation this article has is the limited number of peer-reviewed academic articles available on the same topic. The present author wishes to see additional academic work in general and specific areas of the shrimp industry. This research might address nutrition of the shrimp, maintenance of shrimp farms, and any other specific areas pivoting around the Ecuadorian shrimp industry. This academic work has provided enough new information to enhance the knowledge of the public on the shrimp industry in Ecuador and the supply of shrimp around the world. The data included in this academic article will add additional information to the relatively limited availability of commensurate and related academic literature on the shrimp industry in Ecuador and will also provide recent information on the topic.

## REFERENCES

- Acosta, A. (2012). Breve historia económica del Ecuador. *Corporación Editora Nacional, Quito, Ecuador*, 7(2), 10-25.
- Armijos-Suárez, M., Macuy-Calle, J., Mayorga-Quinteros, E, Rodríguez-Valencia, L., & Clavijo-Basantés, M. (2015). Analysis of the economic impact of the application of Decree No. 1391 on the regularization of Ecuador shrimp aquaculture industry,” *Revista Ciencia UNEMI*, 8(16), 11-20.
- Banco Central del Ecuador. (2017). *Información Estadística Mensual*. Retrieved July 15, 2019, from Ecuadorian Central Bank Web site: <http://contenido.bce.fin.ec/jsp>
- Banco Central del Ecuador (2017). *La Exportación Empuja al Sector Camaronero*. Retrieved August 10, 2019, from Ecuadorian Leaders Journal Web site: <http://www.revistalideres.ec/lideres/>
- Beswick, A. (2017). The cod came back; and they are eating into Canada’s shrimp industry.

*Edmonton Journal*, 8(2).

Camara Nacional de Acuicultura. (2017). *Comercio Exterior Información*. Retrieved April 5, 2019, from <https://www.cna-ecuador.com/comercio-exterior/>

Camara Nacional de Acuicultura. (2018). *Estadísticas*. Retrieved January 8, 2018, from <https://www.cna-ecuador.com/estadisticas>

Devi, K.U., & Prasad, Y.E. (2007). Productivity analysis of coastal Andhra shrimp industry. *ICFAI Journal of Agricultural Economics*, 0(4), 20-29.

Grimes, J. R., & Yow, D. (2009). Globalizing shrimp: Florida's wild & wonderful shrimp program," *North Carolina University Press*, 49(2), 200-220.

Higgins de Ginatta, J. (2007). Dolarización: Un país blindado. *Editorial Edino*, 7(4), 191.

Larrea, R. (2017). Analisis de Emprendimiento y la Innovación en la Economía del Ecuador: Durante el Periodo 2010-2014. *Madrid. Editorial Academica Espanola*, 8(2), 130-150.

Luna Osorio, L. (2010). Ecuador: Proyección 2020. *Universidad Alfredo Perez Guerrero Press, Quito, Ecuador*, 2(1), p. 5-15.

Molina, C., & Espinosa, M. (2017). La alimentación en multiraciones incrementa el redimiento y reduce el ciclo de producción del camarón. *Aqua Cultura*, 119(September), 50-55.

Munos Suarez, M. A., Duran Ganchoza, F. V., & Gonzalez Illescas, M. (2017). Analisis Del Sector Camaronero Ecuatoriano Y Sus Ventajas Competitivas y Comparativas Para Encarar Un Mercado Internacional Competitivo. *Universidad Técnica de Machala Press, Machala, Ecuador*, 1(1), p. 3-7.

Okocha, R. C., Olukfemi, O. I., & Adedeji, O. B. (2018). Food safety impacts of antimicrobial use and their residues in aquaculture. *Public Health Reviews, Rennes, France*, 39(21), 15-25.

Plascencia, A.E., & Bermudez, M. C. (2012). La acuicultura y su impacto al medio ambiente. *Estudios Sociales: Revista de Investigación Científica, Ciudad de Mexico, Mexico*, 2(2), p. 221-232.

Quintana, L., Mendoza, M. A., & Quezada, R. C. (2014). Regiones Y Economía En El Ecuador: Crecimiento, Industrial, Migración Y Empleo. *Universidad Nacional Autónoma de Mexico, Ciudad de Mexico, Mexico*, 2(5), p. 100-135.

Sancho-Blanco, C., Castro, R., & Montoya, J. (2018). Isolation and characterization of partial insulin-like androgenic gland hormone gene from distal. *Latin American Journal of Aquatic Research. Pontificia Universidad Católica de Valparaiso, Chile*, 46(2), 461-468.

Theodore, J. (2010). Management education: A key element for the development of private enterprises in Latin America: The case of Ecuador. *International Business & Economics Research Journal*, 9(2), 69-75.

Theodore, J. (2011). Mergers of private enterprises: A powerful force for the development of private business organizations in Latin America: The case of Ecuador. *International Business & Economics Research Journal* 10(1), 9-13.

Vazquez, S., & Saltos, N. (2008). Ecuador: Su Realidad. *Educator Fundación Jose Peralta Press, Quito, Ecuador*, 11(1), 20-25.

Vallejo, M. C. (2010). Biophysical structure of the Ecuadorian economy, foreign trade, and policy implications. *Ecological Economics*, 70(2), 159-169.

Veuthey, S., & Gerber, J. (2012). Accumulation by dispossession in coastal Ecuador: Shrimp farming, local resistance and the gender structure of mobilizations. *Global Environmental Change*, 22(3), 611-622.

## **BIOGRAPHY**

John Theodore holds a Ph.D. degree in Administration and Latin American Studies from the University of Kansas; a Ph.D. in Management from the Aristotelian University in Greece, European Union; and a D.B.A. in International Business from the University of South Africa. He has been teaching and consulting for five decades, domestically and internationally. He is a visiting professor in various foreign universities and has consulted, taught, and lectured in a number of Latin American universities, colleges, and private organizations for several decades. He started his research on the economy and the private business organizations in El Salvador and the rest of Central American and South American states in the 1970s and has revisited Central and South America systematically to continue such studies to the present decade. John Theodore is the president of JDT Management Consultants in Clearwater, Florida, specializing in management, organization, strategy, international business, human resources, organizational development, and educational administration. He is a certified management consultant (CMC) certified by the Institute of Management Consultants in Washington, D.C. He has published three books and a large number of peer-reviewed articles in the areas of the organization, management, and international business.