

FOOD MILEAGE OF SHRIMP FARMING IN COASTAL BELT OF SAURASHTRA REGION

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ABSTRACT

The spatial patterns of the conventional food supply chain have played a significant role in increasing the amount of miles food travels before being consumed. As a result, this has increased the amount of energy that is required to transport food from the farm to the table. This study is a place-based approach that compares the food-miles of shrimp exported from Saurashtra region. India ranks second in terms of aquaculture production. A Weighted Average Source Distance (WASD) was used to calculate food miles by combining information on the distances from production to point of sale and the amount of food product transported. Twenty six shrimp farmers and three major exporters from Gir Somnath and Amreli districts were surveyed by using purposive sampling technique. In this study, food mileage is varied from 4535 Nm to 9498 Nm with 8 to 15 travelling days. The major quantity of frozen shrimp was export to France with 7177.70 Nm distance because of good price of frozen shrimp. The frozen shrimp spread in long mileage of 9021 Nm. Higher food mileage leads to high food transport emissions, but it need consider its economic impact too.

KEY WORDS: Food mileage, Export, Shrimp, WASD

INTRODUCTION

Aquaculture has been defined by FAO as “The farming of aquatic organisms including fish, mollusks, crustaceans and aquatic plants. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. Farming also implies individual or corporate ownership of the stock being cultivated” (Anon., 2019b).

Asia continues to dominate the world aquaculture market where in nearly 90 per cent of the world’s aquaculture production

comes from Asia. India currently ranks second in the world in terms of aquaculture production, only next to China. However, relatively India produces only about 1/20th of what China produces annually. The industry is also one of the substantial foreign exchange earners and accounted for 2 per cent of the total export earnings of India in the last four years (FY 14 – FY 17; refers to the period April 1 to March 31). In the marine export basket, frozen shrimps export has the lion’s share, contributing 65 per cent of the total value of marine export in FY 17. The cultured shrimps contribute about 50

per cent of the total shrimp exports from India (Anon., 2019b).

Among the Indian states, Gujarat has been a major producer of fishery products, both marine and aquaculture. Gujarat state rank second in shrimp production next to West Bengal in India.

Gujarat state possesses rich and diversified fisheries resources. A long coastal-line of 1600 km, which is broken by several bays, inlets, estuaries and marshy lands, widest continental shelf with an area of 1.64 lakh sq.km, brackish water area of 3.67 lakh ha., are some of the unique features of Gujarat's marine topography. Gujarat contributes approx. 1.80 per cent of national shrimp production and stands second in brackish water area after West Bengal. State has 12 coastal districts and a union territory of Diu but only four of the districts viz., Valsad, Navsari, Surat and Bharuch are the major contributors for state shrimp production (Patel, 2014).

In recent years, the expansion of international food trade has significantly increased the transportation of food products around the world with negative impacts on the environment. Transportation of food products and the highly publicized food contamination accidents have prompted consumers to question the safety standards in the global food system, as well as their actual environmental and social sustainability. Food transportation, especially by air and road, consumes large quantities of fossil fuel releasing greenhouse gases that contribute to global climate change. Food that is sourced by major retailers from global supply chains often travels for thousands of miles before consumption. The globalization of food supply chains has exacerbated the problem. It has led to lower visibility to consumers of information on food origin and miles travelled, which may be used as proxies for

the social and environmental impacts of food production and transportation.

'Food miles' is a term coined in a 1994 report (Paxton, 1994) by the Sustainable Agriculture Food and Environment (SAFE) Alliance, to signal the distance food travels from the place of production to that of consumption. Although there has generally been no public regulations related to food miles yet, recent labeling initiatives are emerging in several countries from the private sector. However, lower food miles do not necessarily guarantee either lower environmental degradation, fresher food or a small ecological footprint of the production system. Therefore, the question surrounding the adequacy of food miles as a generic label indicator of sustainability, freshness and as a proxy for the economic stimulus to the local economy is still under debate, especially because the scientific evidence as to whether domestic or imported food products generate the strongest environmental impact is inconclusive (Caputo *et al.*, 2013).

MATERIALS AND METHODS

Gujarat state has 3.76 lakh hector of coastal area, providing immense potential for coastal aquaculture. This study is confined to Gir Somnath and Amreli districts, because these both districts are mesmerizing on coastal belt of Saurashtra region and compare to other districts, these districts having high potential in shrimp production in this region. It is located on the southern corner of the Kathiawar peninsula with its headquarters at the town of Patan-Veraval, Talala, Sutrapada, Kodinar, Una and Gir-Gadhada in Gir-Somnath district and Rajula, Jafrabad, Khambha, Dhari, Lathi, Bagsara and Savarkundla in Amreli district. The study carried out during 2019. Purposive sampling technique was used for the sample selection. At the first stage, Gir-Somnath and Amreli districts were selected. At the second stage, six talukas (Kodinar,

Una, Sutrapada, Veraval, Rajula, Mahuva and Jafrabad) were selected. At the third stage, 19 shrimp farmers were surveyed from selected talukas of Gir-Somnath and 7 shrimp farmers were surveyed from Amreli districts. The three major exporters of shrimp were selected for the study (Figure 1). This way, total 26 shrimp farmers and 3 exporters were surveyed. Primary data was collected by using structured questionnaires. Secondary data was collected from company's database and internet source. According to requirement of the specific

objectives of the study and based on nature and extent of availability of data, Weighted Average Source Distance was used.

To obtain the average export miles a certain food item travels from all sources to reach a certain city or community, it is necessary to calculate a Weighted Average Source Distance (WASD). The WASD from production source to consumption end point is a single distance figure that combines information on distances from producers to consumers and the amount of food product transported (Pirog and Benjamin, 2005).

The formula for the WASD is:

$$\text{WASD} = \frac{\sum \{(\text{Crop weight in kg} * \text{Distance travelled in km})\}}{\sum (\text{Crop weight in kg})}$$

RESULTS AND DISCUSSION

Export mileage

Farmers sell raw shrimp directly to exporters and exporters export the frozen shrimp to the other countries by different ports of India. There were mainly three exporters who export major quantity of shrimp from this region. The data pertaining to it was accessed from the primary source for the year of 2018-19 and are presented in Table 1. Distance has been expressed in Nautical miles.

The results presented in Table 1 and Figure 2 indicated that export mileage and major quantity of frozen shrimp export from Saurashtra region to major 7 foreign countries. The long export mileage of frozen shrimp was from Saurashtra region to New York port of U.S.A with 9499.42 Nm distance travelled even though about 14 per cent quantity of total quantity was export to this country. The second longest export mileage of frozen shrimp was from Saurashtra region to Le Havre of France with 7177.70 Nm distance travelled even though about 36.38 per cent quantity of total quantity was export to this country because

of good price of frozen shrimp, while short export mileage of frozen shrimp (142 tons) was from Saurashtra region to Haiphong port of Vietnam with 4537.34 Nm distance travelled in 11 days. The another short export mileage of frozen shrimp is 4867.06 Nm to reach to Zhanjiang port of China, this ship took 8 days for travelled the distance and only 12 per cent quantity of total quantity was export to this country because the annual production of shrimp is twenty times high in China compare to India.

CONCLUSION

The study concluded that aquaculture is considered to be a high risk high return sector. On one hand, where it has a potential to generate huge returns, it also demands high risk taking ability as an aquaculture farmer. It can be concluded from this study that food mileage was beneficial to exporters way to understand the original food miles idea and calculate the distance that farm produce had travelled before consumption. Export mileage is a factor to understand the inefficiency of shrimp supply chain. Food miles are a growing cause of concern due to the greenhouse gas emissions released

through the transportation of food. In this study, food mileage is varied from 4535 Nm to 9498 Nm with 8 to 15 travelling days. The major quantity of frozen shrimp was export to France with 7177.70 Nm distance because of good price of frozen shrimp. The frozen shrimp spread in long mileage of 9498 Nm.

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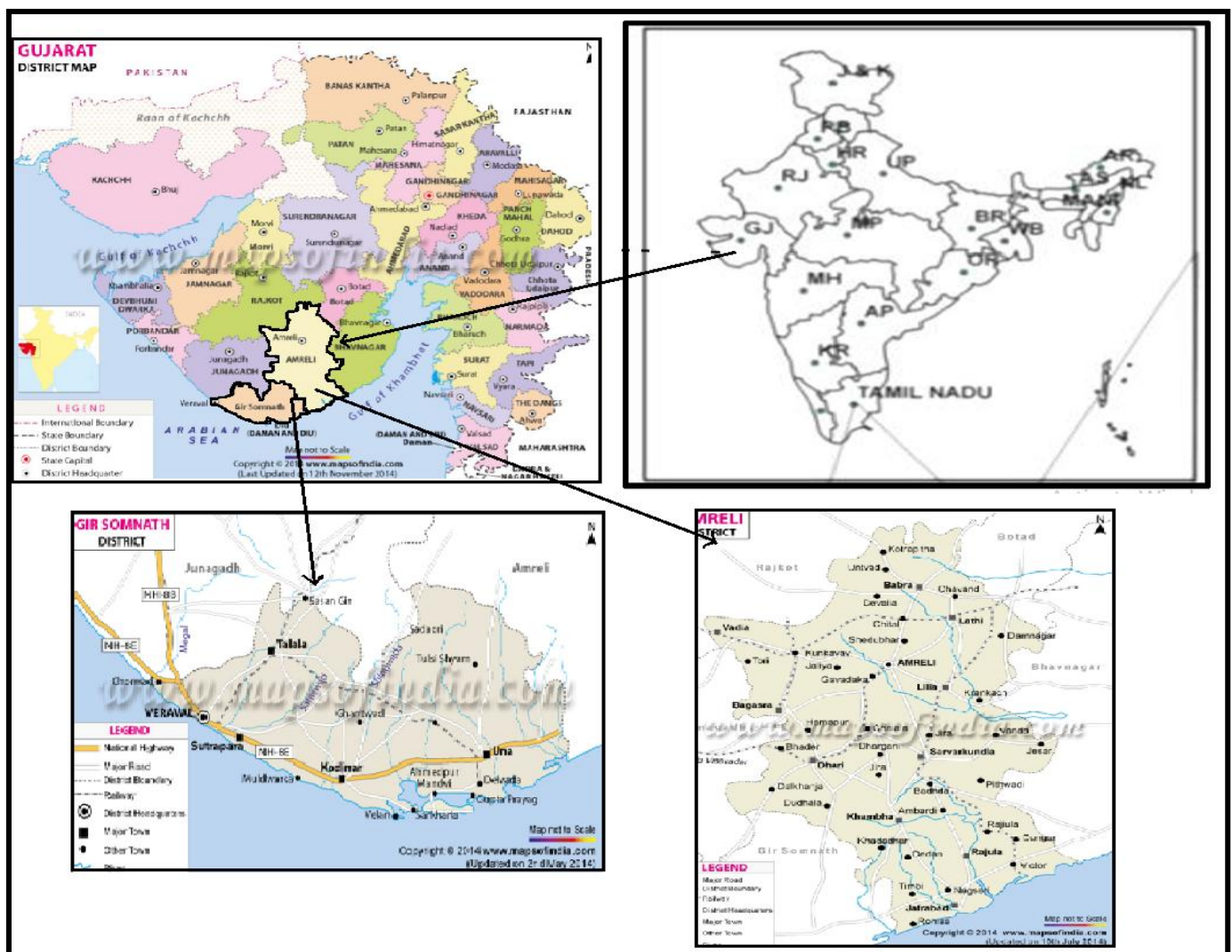
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Table 1: Food mileage of frozen shrimp from Saurashtra region to different foreign Countries

Sr. No.	Foreign countries	Quantity (Tons)	Distance (Nm)	Time in Days	WASD (Nm)
1	Japan	63	6492.35	11	6493.44
2	U.S.A	172	9498.35	15	9499.42
3	France	457	7177.13	13	7177.70
4	U.K	93	7655.35	12	7656.42
5	China	168	5065.46	8	4867.06
6	Vietnam	142	4535.45	11	4537.34
7	Italy	161	5209.02	9	5206.42



(Source: Anon., 2019a)

Fig. 1: Location of study area

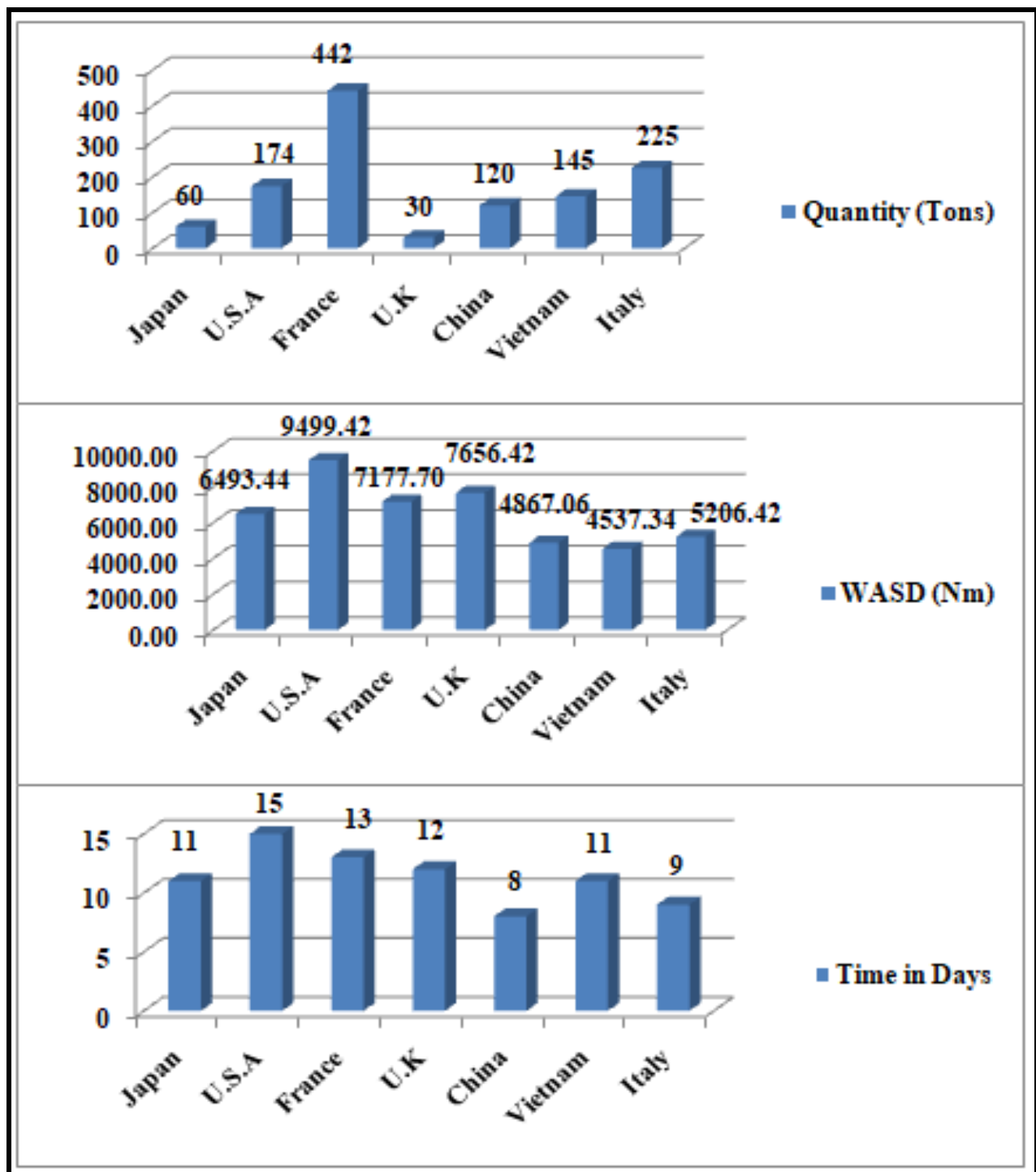


Fig. 2: Food mileage of frozen shrimp from Saurashtra port to major foreign countries

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