



SHORT COMMUNICATION

The Fish at the Table: Reflections on Fish Consumption Across two Coastal States in India

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Abstract Environmental impact literature needs to include changing food consumption behaviour in the era of conscious consumption especially in the post COVID period. The observations on fish consumption from two coastal states in India – Kerala and Gujarat offers interesting insights into how there has been change in consumers' tastes and preferences and further how it can be integrated to create a sustainable fisheries value chain. However, there is a need to develop a strong statistical base on consumption studies with respect to food items such as fish given its importance as a source of affordable nutrition and the international trade aspects associated with it. In the post covid scenario, we argue that there is a need that within the broader ambit of the Pradhan Mantri Matsya Sampada Yojana, we need to augment the existing momentum of augmenting awareness and advocating sustainable consumption to devise a stronger statistical base with informed policy.

Keywords: Marine fisheries sector, Fish consumption, Covid pandemic and Indian consumers

1. Introduction

The covid pandemic has been a time of and for unprecedented changes. While the literature on environmental impact has been critical of consumption, the focus on food consumption behaviour has been

relatively less. For a country as diverse as India, the rebuilding following the pandemic—presents a unique challenge given the multiple ethnicities that result in diverse behaviour including diversity in food consumption behaviour.

While there has been focus on the changing consumption pattern in India, the focus has been two fold—the food consumption expenditure of the average household and to provide an overarching view of the dietary/nutrition intake of the country. In our study spanning 900 fish consumers over the 9 coastal states in the country, we find that fish consumption patterns had registered a paradigm shift. Whether this would be a temporary phenomenon requires a longer time series study. However, for the purposes of the paper, we look at three time periods—pre covid/ during covid and post covid. We offer preliminary analysis based on case studies from two coastal states—Kerala and Gujarat. The reason on choosing the two studies is explored in the following section.

2. Data and Methodology

The paper is based on survey of 14 coastal districts across 9 states in the country. At each of the sample district, 240 sample households across seven stakeholders were identified viz, boat owner (45), labourer (60), marketing functionaries (20), women (30), traders (20), exporters (5) as well as fish consumers (60). Additionally, 60 fish consumers were surveyed online using Google form to

capture a wider geographic spread across the study region. Interviews were done using a structured questionnaire. For the paper, the focus has been on fish consumers in Gujarat and Kerala because the states offer interesting insights regarding fish production and fish consumption with the former being the highest fish producing state and the latter being the highest fish consuming state in the country. Within the two states, data was collected from 180 consumers across both rural and urban areas and the same has been used for analysis in the paper.

3. India: An 'atlas of food'

The Food Trends Report 2023 surveying over 1500 food industry professionals, states that in the recent years, the country has earned the reputation of being an '*atlas of food*' owing the diversity of cuisines available as well as widening palate of the Indian consumer (Food Trends report 2023). Over the years the country has undertaken nationwide household consumption surveys undertaken by National Statistical Organisation and National Family Health survey to gauge the food consumption habits of Indian households. In addition, there are also state specific studies by the Indian Council of Agricultural Research-Central Marine Fisheries Research Institute to understand the consumption habits of the Indian population—particularly fish consumption. However, there are still lacunae in terms of the specific food items being consumed by the average household—both at the global and national levels. Keeping in mind that the Global Hunger Index points to the worrying statistic of an increase in the prevalence of the undernourishment from 7.6 per cent in 2017 to 9.8 per cent in 2021, there is a need to focus on consumption. However, to begin addressing the issue of hunger, we need to go back to the table to understand what is being eaten in an average household?

In this manuscript, we look specifically at the fish consumption basket and the changes brought in the basket due to the pandemic. On an average the quantity of fish consumed is around 5-8 kg per capita with variations across states as well as within states with higher consumption levels in southern, eastern and north-eastern states and lower in western and northern states, the lowest being in the western states (Ravikanth and Kumar 2015; Shyam 2016; Shyam et al. 2021a; Shyam et al. 2021b). Further, studies based on National Statistical Organisation

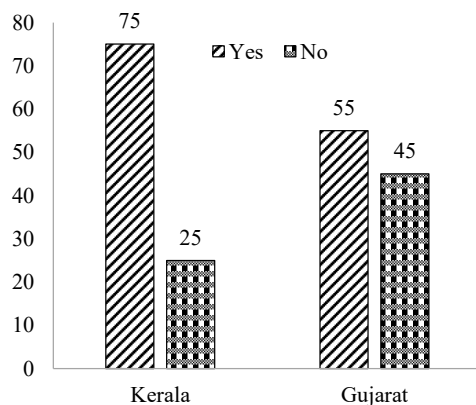
survey data point out that the fish consumption in India has depicted an increasing trend; showcasing, it increased from 6.97 kg/year/capita to 9.12 kg/capita in the rural areas and from 8.01 kg/year/capita to 11.05 kg/capita in the urban areas during the period 1983-2000. The various studies have been summarised in Table 1.

It has been observed that over the years there international trade is an important influencing factor with seafood. FAO estimates that 77% of world seafood production is exposed to trade competition showcasing how important it is to examine the global fish supply chain. While the seafood export sector remained resilient in the face of crises such as the global recession in 2007-8 as well as seems to be on the upswing in 2021 following a slump in 2020 due to covid pandemic, our survey of 60 exporters across the country informs us, that there are reasons to consider that domestic market needs to feature more exclusively as far as fish is concerned, particularly with smaller size export firms facing buyer rejections and sanctions. As this calls for more attention to the potential of the domestic market from a production and distribution point of view, we turn to two domestic markets within the country to explore the changes witnessed in fish consumption. In Gujarat, Panigrahy and Vahoniya (2018) point out in their study of inland fish consumers in Anand, that income and distance from market were important determinants impacting fish consumption; with an increase in income leading to greater per capita expenditure but lower income percentage being spent on fish. One can surmise that at the higher income levels, perhaps there is a switch occurring to high value species. However in high fish consuming states such as Kerala, it was seen that at demand and willingness to pay, for high value fish species was impacted by how much export occurred from the state (Salim 2020). Therefore, there is a need for further species level consumption studies to determine the factors influencing fish consumption in any regional context. Further as far as whole sale markets are concerned, Gadhia and Talsania (2013) observed that even major wholesale markets such as Surat reported issues pertaining to poor hygienic conditions and perhaps this played a role in fish consumption remaining low in the state.

Figure 1 show that the majority of the fish consumers across both Kerala (75) and Gujarat (55) report changes in fish consumption due to the pandemic. This is consistent

Table 1. Overview of the literature on fish consumption in India

Year	State	Methodology/ scope	Agency	Salient findings	Research gap
1983	All India	NSSO 38 th Round	MoSPI	Kerala and Goa top 2 states and Gujarat lowest in terms of per capita fish consumption. Inequality in the per capita quantity of fish consumption among the rural population was the highest in Maharashtra followed by Odisha and West Bengal, and inequality was the lowest in Goa	No distinction between marine and inland
1993-94	All India	NSSO 50 th round	MoSPI	Increasing inequality across states in food consumption expenditure and across rural/urban areas	
2009-10	All India	NSSO 66 th Round	MoSPI	Data pertaining to 2009-10- Increase in expenditure towards fish and per capita consumption across all states	No distinction between marine and inland
2013	All India	NSSO 68 th Round	MoSPI	Data pertaining to 2011-12 – Increase in marine fish production, fish consumption decline except Kerala and West Bengal	Species level Consumption basket
2014	All India	Sample System Registration Base Line	IIM	Non vegetarian consumers	No mention Specific to fish consumption
2018	All India	NA	FAO	Although per capita expenditure on fish increased with the rise in income but it was reverse in the case of percentage of income spent on fish The consumption of fish has grown faster than that of any other animal product During 1980 - 2000, the per capita consumption of milk increased from 43 kg to 63 kg, of fish from 3.5 kg to 5.8 kg, and of meat and poultry from 5-6.8 kg	No specifics output on species Aggregate data Regional dynamics not indicated
2019-21	All India	NFHS 5 th Round	IIPS MoH & FW	Fish consumption on the rise	Species level Consumption basket

**Figure 1.** Changes in fish consumption across the Covid period across Gujarat and Kerala

with the overall trends observed globally (Eftimov et al. 2020 and Geng et al. 2022). But even as we learn the drivers and impediments influencing consumption, there is a need to examine the composition of the consumption basket in itself. This is shown in Figures 2 and 3. We can see that in Kerala the change has been in taste and preferences of the consumers while in Gujarat the reason driving change has been quantity of fish consumed. Shyam (2020) has shown that in case of Kerala, the fish consumption seems to shift in favour of more inland species vis a viz marine species. While this could be on account of easier availability during the pandemic period, one can also view this in the growing global movement

Table 2. Compilation of per capita fish consumption data for Indian states

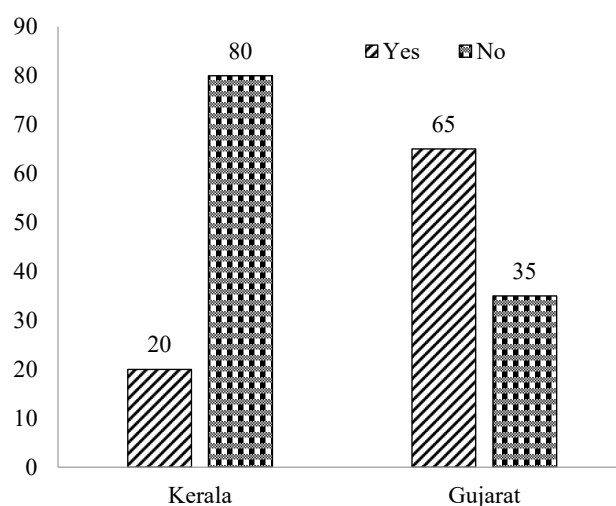
District	Location		Per capita Annualfish consumption (kg)
West Bengal	Purba Medinapur	Rural coastal	21.84
Andhra Pradesh	Ananthpur	Rural non-coastal	5.8
	Visakhapatnam	Urban coastal	10.98
	Vizianagaram	Rural coastal	9.52
	Kurnool	Urban non-coastal	7.96
	Somnath Gir	Rural coastal	16.08
Gujarat	Puri	Urban coastal	10.97
Odisha	Balasore	Rural coastal	6.78
	Cuttack	Urban non-coastal	8.52
	Mayurbhanj	Rural non-coastal	5.15
	Palakkad	Rural non-coastal	20.63
	Alappuzha	Rural coastal	31.94
Kerala	Trivandrum	Urban coastal	34.83
	Kottayam	Urban non-coastal	23.96
	Mangalore	Urban coastal	9.5
Karnataka	Mumbai	Urban coastal	9.43
Maharashtra	Chennai	Urban coastal	9.47
Tamil Nadu	Medachal, Mehaboobnagar, Medak, Medwal	Rural non-coastal	3.53
Telengana	Hyderabad, Warangal, Rangareddy, Vikrabad	I Urban non-coastal	5.85
Bihar	Patna	Urban non-coastal	7.76
	Samasthipur	Rural non-coastal	8.17

Source: Compilation of studies done as part of the ICAR-CMFRI project: Marine Fish distribution and Consumption Demand in India: A policy outlook'

Changing fish baskets: Observations from Kerala and Gujarat

that is driven by conscious consumption (Hüttel and Balderjahn 2022; Kim et al. 2021; Severo et al. 2022). Therefore, there is need for greater investment in smaller retail outlets who may be able source locally and whose products are of assured quality to find markets. Whether there can be economies of scale in this endeavour is a question that requires further deliberation (Figure 2 & 3).

In another instance, we could also see that there are seldom substitutes that satisfy the consumer in the absence of fish being available (Shyam 2020). With growing value-added production in fish products, there is an important segment that can be catered to whose strong preference for fish would lead them to consume products such as chutneys, pickles and powders. Our survey points towards the incidence of increasing reliance on value added products during covid in the state of Kerala. Given that

**Figure 2.** Change in quantity of consumption across Gujarat and Kerala

there are state driven initiatives such as the Kudumbashree (in the south western Indian state of Kerala) operating in this area, there is much to be gained in terms of generating employment (specifically for women) in this aspect.

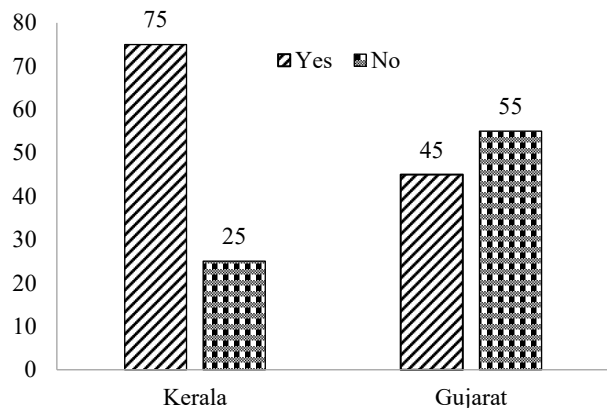


Figure 3. Change in preferences across Gujarat and Kerala

4. Source of purchase

Next, we examine the issue of accessibility of fish through the sources of purchase the consumers rely on and the reasons for the same. In both the states, it can be seen that the sources of purchases have been landing centers, vendors, stalls and online modes through apps. The change has been in terms of the composition of these three sources over the three periods- pre covid (2019), during covid (2020) and post covid (2021) (Figure 4 and Figure 4a & 4b).

In Kerala, the reliance has been on vendors referring to fish sellers who directly deliver to houses. This has been followed by landing centers and purchase from stalls. However, during the pandemic, the reliance was on those sellers who showed an online presence. The increase was fivefold during covid in Kerala from 5% to 26% as shown in Figure 4a. This showed a decline to 15% post covid.

Figure 4. Source of Purchase- Kerala and Gujarat

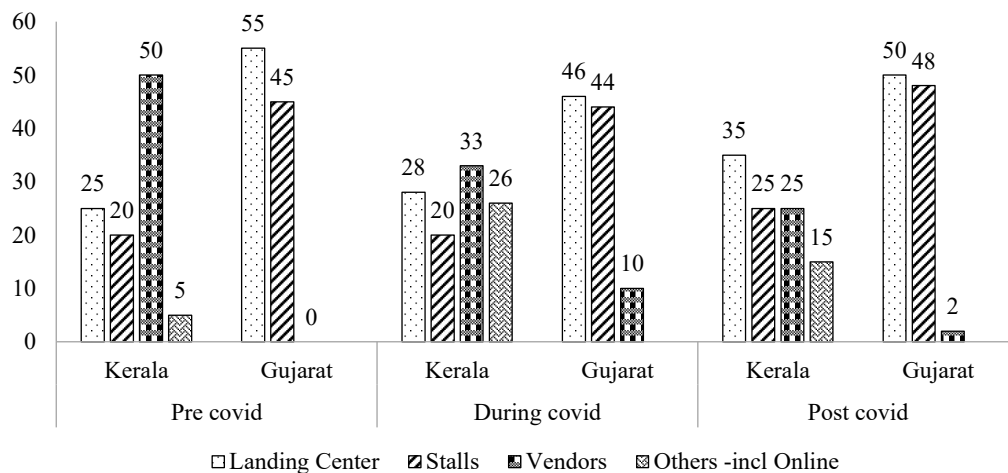
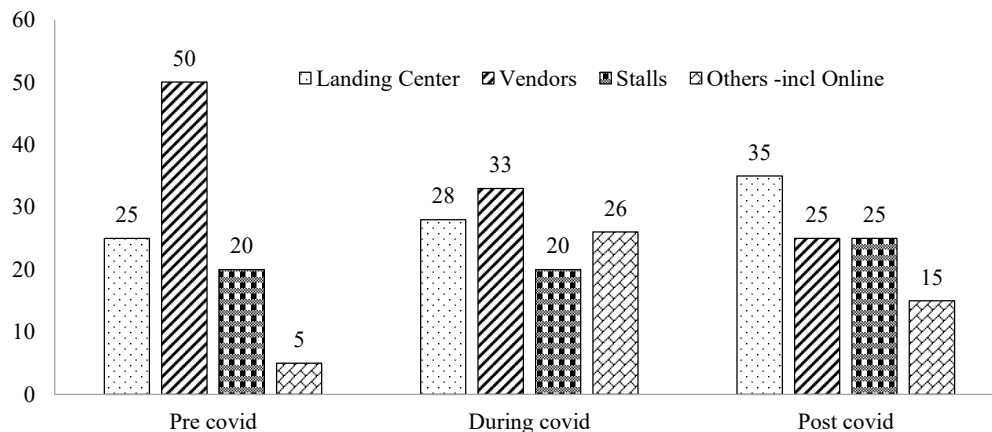


Figure 4a. Changes in source of purchase- Kerala



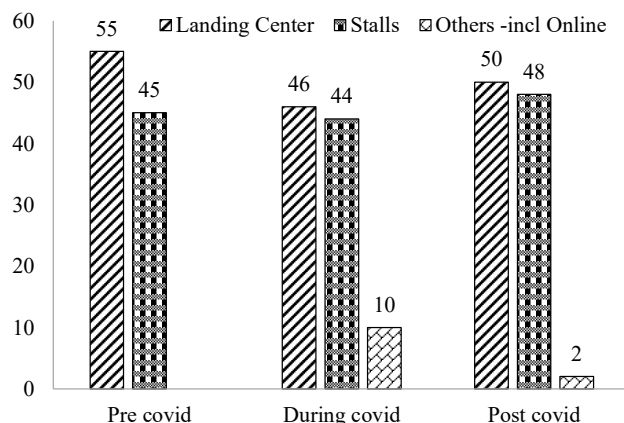


Figure 4b. Changes in source of purchase- Gujarat

However, in the case of Gujarat we see that the reliance on online sources were completely absent prior to the pandemic and showed 10 per cent during pandemic. Similar to Kerala, there has been a decline in the post pandemic period. Despite the decline, there are reasons to believe that the figures show the potential for such an avenue which can satisfy certain specific requirements of the fish consumer. For this, we turn to the reasons that drive the consumers to purchase from specific sources (Figure 5a and Figure 5b).

Purchases made offline (person – person) results in quality assurance, satisfying preferences for specific species and offers wider variety of choices for fish consumers in Kerala while in Gujarat, offline purchases are made due to better position for the fish consumers in bargaining, regular supply as well as social ties between the people/persons involved. Thus one can say that there are economic as well social considerations that drive offline

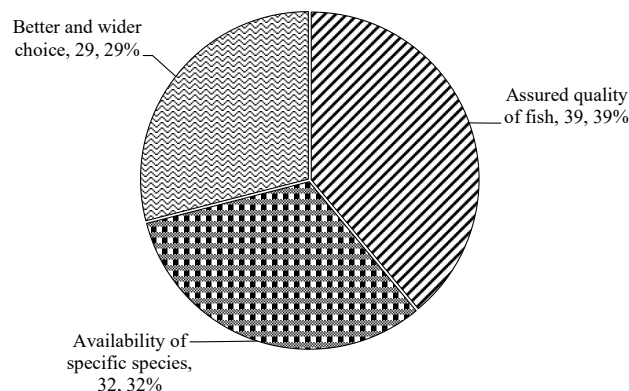


Figure 5a. Reasons for Offline Purchase- Kerala

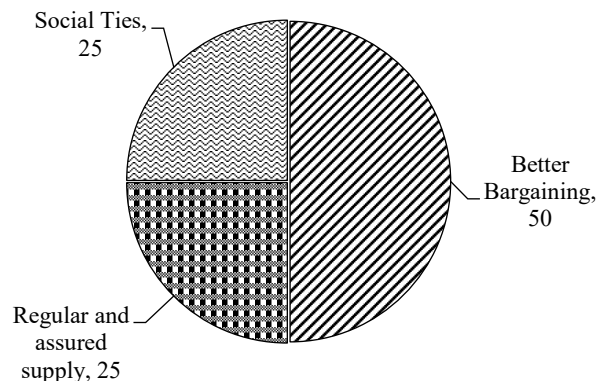


Figure 5b. Reasons for Offline Purchase- Gujarat

purchase. However as seen from Figure 4a and 4b, there are consumers who have relied upon online modes of purchase especially in 2020.

Figures 6a and b provide insights into the reasons for the online purchase of fish. Consumers in both states cited Hygiene (23% in Kerala and 30% in Gujarat) as reason influencing purchase of fish. In Kerala, regular supplies as well as brand loyalty were also found to be important while online purchase in Gujarat provided accessibility and ease of purchase to consumers online. It can be said that during the pandemic, hygiene became a common guiding factor deriving food consumption and fish consumption was not an exception to this trend. Therefore, within our existing policy framework there is a need to ensure that there are proper government approved safety measures for perishable food items such as fish. In the light of the sanctions borne by the exporters in the country, this has been re-inforced. We argue that, to begin

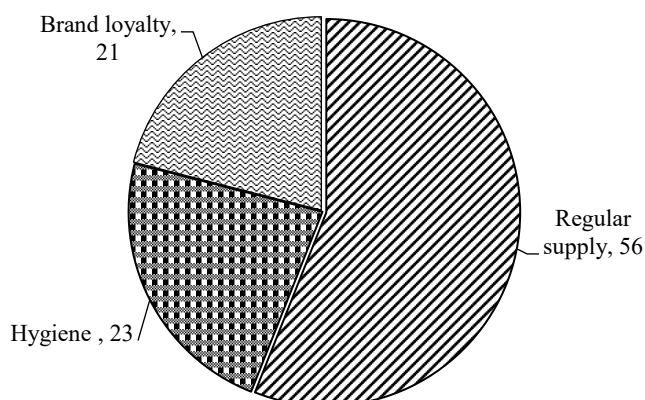


Figure 6a. Reasons for Online Purchase- Kerala

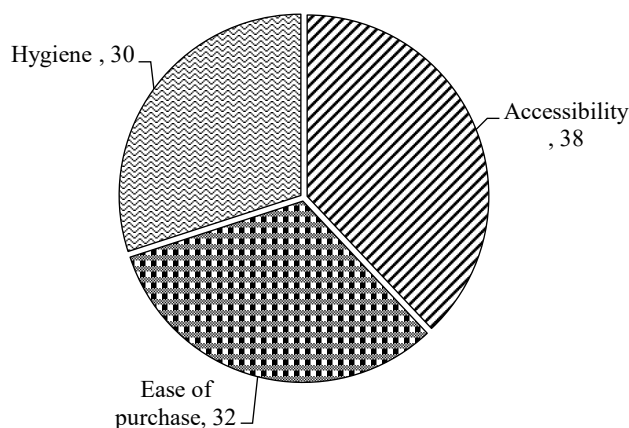


Figure 6b. Reasons for Online Purchase - Gujarat

such a process, we need to first need to focus on the right information regarding the fish consumption practices. While consumption studies have been undertaken before, by NSSO, NCAER and ICAR-CMFRI, we need regular and accurate information regarding availability and affordability of fish species for consumers. By strengthening our existing statistical base such as the Fish Marketing Price Information System therefore appear crucial.

5. Conclusion

There is no doubt that the consumers are aware more than ever on the environmental impact of consumption. Keeping the environmentally conscious consumer in mind, there is a need for studies to comprehend factors other than price such as the evolving taste and preferences of the consumer. In doing so, India being an atlas of food offers diverse canvas for researchers, we look into the case of two coastal states, Gujarat and Kerala and argue that in order to develop a strong effective demand that is climate friendly- we need region focussed studies. In Kerala, demand for fish seems driven by accessibility to a wider variety of fish species while Gujarat presents scope for expanding the fish consumer base. In addition to such differences that need to be explored further, there is further potential to integrate the existing marketing ecosystem to what the consumers' perceive to be important i.e., assured hygiene through online purchase. This calls for greater role for regulation and food safety standards. In building back better, we can begin from our oceans with the fish consumer leading the way.

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8. Declaration of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. The authors declare the following financial interests/personal relationships which may be considered as potential competing interests.

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