PRODUCTION OF ICE AND IT'S EXTENT OF UTILISATION BY FISHERY INDUSTRY OF RATNAGIRI

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Abstract

This paper attempts to explore the production of ice and it's extent of utilization in fishery industry of Ratnagiri. It was observed that the all categories of fishing vessels and marketing personnel were using ice regularly for preservation of fish by procuring ice from 19 ice plants situated in Ratnagiri block. The total production capacity of all the ice plants was 2,01,491 tonnes, but the total ice utilization by the fishery industry of Ratnagiri block during the year 2007-08 was 97,046 tonnes which indicated under-utilisation (48%) of the present production capacity of ice plants. The expected ice requirement for the fisheries industry of Ratnagiri block is estimated at 1,57,377 tonnes. The existing ice plants are with appropriate production capacity to suffice the present requirement of the fishery industry of Ratnagiri block.

(Key words: *Ice Plants, Fishery industry, Purse-seiners, Trawlers, Gill-netters, Auctioneers, Wholesalers, Commission agents, Retailers and Vendors****)***

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Introduction

Fish is a highly perishable food commodity, it's spoilage begins as soon as the fish is dead after catching. Various biochemical and microbiological changes (Gopakumar, 2002) takes place in fish after death, which leads to spoilage and unaccepted for human consumption. These processes are reduced by using ice to lower the temperature of fish. India being a developing country, cold chain is not well established and ice is commonly used as the cheapest source for preservation of fish while marketing.

Marine fishing industry in Maharashtra has witnessed rapid development due to intensive mechanization programme, which have led to the rise in seafood production. Ratnagiri block is one of the major contributors in total catches of Ratnagiri district, having Mirkarwada as a minor fishing harbour and other 18 fish landing centres. There are 344 trawlers, 161 purse-seiners and 570 gill-netters (Anon, 2008) operated along the coast of Ratnagiri block. Marine fish landed in Ratnagiri block is either processed for export or sold in fresh condition in local markets through various marketing personnel. Totally 19 ice plants are fulfilling the requirement of ice for the fishery industry of Ratnagiri block. Earlier, Indian Institute of Management, Ahmedabad carried out study on capacity utilization of ice plants in Gujarat, Maharashtra and Kerala (Gupta *et al.*, 1984) and another study by Unnithan *et al.* (1998) in Kerala. However, the present production and utilization pattern of ice is unknown. Considering the importance of Ratnagiri in the total marine fish trade of Maharashtra, the present study was undertaken to understand the production and utilisation pattern of ice in Ratnagiri block.

Materials and Methods

The study was conducted in the year 2007-08 in Ratnagiri block. The production capacity as well as actual production of ice by ice factories and utilization of ice by fishers, auctioneers, wholesalers, commission agents, retailers and vendors in Ratnagiri block was studied. Interview schedules were constructed for collection of required information from ice plant owners, fishing vessel owners, auctioneers, wholesalers, commission agents, retailers and vendors were formulated (McGoodwin, 2001).

Required data on the production and sale of ice were collected from all the 19 ice plants functioning in Ratnagiri block. The data on daily production and sale of ice were collected on monthly basis from all the ice plants. The data on utilization of ice on weekly basis were collected using interview schedules from 32, 19, 19, 10, 15, 11, 41, 24 and 19 numbers of purse-

seiner owners, trawler owners gill-netter owners, auctioneers, wholesalers, commission agents, retailers, vendors and ice plant owners respectively. On an average, 54 numbers of purse-seiners were observed in a month out of 161 operational purse-seiners, while on an average 42 and 44 numbers of trawlers and gill-netters were observed in a month out of 344 and 570 numbers of operational trawlers and gill-netters. In a month, on an average 29, 54, 49, 114 and 24 numbers of auctioneers, commission agents, wholesalers, retailers and vendors were interviewed to collect information about ice utilization.

The average per day ice requirement for the fishing vessels was estimated by dividing the total ice used in a fishing trip with days of fishing trip. Further, month-wise utilization of ice by purse-seiners, trawlers and gill-netters was calculated by multiplying the number of purse-seiners, trawlers and gill-netters operated in Ratnagiri block with the average per day ice used by these categories of fishing vessels and number of fishing days in a particular month. Average numbers of fishing days for different type of fishing vessels were varied and the average of fishing days observed for purse-seiners, trawlers and gill-netters were 21, 19 and 20 respectively. Similarly, month-wise ice utilization by auctioneers, wholesalers, commission agents, retailers and vendors was also calculated. Monthly ice utilized in fish processing industries was estimated by summing the per day utilization of ice. In this way, total ice utilization in fishery industry of Ratnagiri block was estimated by adding all the three factors such as utilization of ice by fishing vessels, marketing personnel and fish processing plants. Similarly, expected ice utilization was estimated by considering all possible number of fishing vessels operated in Ratnagiri block, marketing personnel and all possible number of fishing days in a particular month. The results were analysed and tested for the significance by applying 't' test (Zar, 2004).

Results and Discussion

The study indicated that the maximum ice production capacity of existing ice plants of Ratnagiri block in any given month was 23,141.50 tonnes (Fig. 1). The production capacity of ice plants in different month varied because of variation in the total number of effective production days in different month (e.g. Jan. 31 days, Feb. 29 days, March 31 days, April 30 days etc) and effective number of ice plant producing ice varied, as certain ice plants started ice production in the month of September or October after over hauling and yearly maintenance of the ice plants. Annual cumulative ice production capacity and actual production recorded by the ice plants of Ratnagiri block in a fishing season was 2,01,491 and 97,830 tonnes respectively. An

earlier study indicated that the total estimated annual ice production in Kerala was at 2,41,265 tonnes (Unnithan *et al.*, 1998). The annual capacity utilization of ice plants in Gujarat ranged from 56 to 80 per cent, while it was reported at 81.65 per cent in Maharashtra (Gupta *et al.*, 1984) and 36.70% in Kerala (Unnithan *et al.*, 1998). This indicates that the ice production is lesser than the actual production capacity. The annual capacity utilization of ice plants of Ratnagiri block was 48.55%. The annual fish production of Ratnagiri block decreased by 6.98% and 23.71% in 2006-07 and 2007-08 respectively as compared to previous year. Therefore, this factor has played a key role in the under capacity utilization of ice plants during the year 2007-08.

The fishers have very well understood the importance of fish preservation and ice is being commonly used for preservation of fish (Kunjir, 2004; Markad, 2004; Salam, 2005; Chandrakumar, 2006; Ghatage, 2006; Shanta, 2006; Shinde, 2006; Patel, 2007; Ponkshe, 2007). The present fishing scenario is changing and fishers are preferred to undertake stay-over fishing (Thakare, 2007). This factor has forced the fishers to carry ice on-board to maintain the quality of fish and is commonly practiced by the fishers of Ratnagiri block. The month-wise average utilization of ice by purse-seiners, trawlers and gill-netters is presented in Table 1. The average minimum (1,083 tonnes) and average maximum (1,771 tonnes) ice utilization by gill-netters of Ratnagiri block was recorded in the month of September and March respectively. The average utilization of ice by purse-seiners ranged from 1,752 tonnes in the month of February to 5,331 tonnes in the month of October. The least quantity of average ice requirement of the trawlers was recorded in the month of February (572 tonnes), while the highest quantity of average ice utilization by trawler was in the month of May (4,770 tonnes). The estimated quantity of ice carried on-board by the gill-netters was less due to the less storage facilities available, compared to the trawlers and purse-seiners. Therefore, it can be concluded that the quantity of ice carried on-board varied depending on the fishing methods as well as fishing season.

The market intermediaries involved in the marketing of seer fish, pomfret and ribbonfish in Ratnagiri block were studied by Salam (2005), Ponkshe (2006) and Shinde (2006) respectively. The month-wise average utilization of ice by various marketing personnel is presented in Table 1. The auctioneers procured the required ice from the fishermen and the actual quantity of ice required by them was less, as they handled the fish for a short period. On an

average, commission agents utilized maximum of 2,686 tonnes of ice in the month of October and minimum of 1,051 tonnes in the month of September. Wholesalers utilized on an average maximum of 2,236 tonnes of ice in the month of September and minimum utilization of ice was 801 tonnes in the month of February. The quantity of ice utilized by them was almost same as that of quantity utilized by the commission agents, only the months were different. The quantity of ice used by the retailers was more as compared to the quantity of ice used by vendors.

Seafood processing industry takes utmost care to maintain proper temperature of the fish, shrimp and mollusk to be exported. On an average, minimum quantity of ice utilized by the processing plant was 161 tonnes in the month of December, while the average maximum quantity of ice utilized by processing plant was 598 tonnes in the month of April (Table 1). This wide variation observed may be due to the variation in quantity of seafood processed in those months. The sector-wise ice utilization details are furnished in Table 2.

The total and expected utilization of ice by the fishery industry of Ratnagiri block presented in Fig. 3 and Table 3 indicated that the actual utilization of ice by fisheries industry of Ratnagiri block during the fishing season of 2007-08 was estimated at 97,046 tonnes, but the potential requirement of ice in fishing season was estimated at 1,57,377 tonnes. The actual ice utilized during 2007-08 was much less than that of the estimated requirement of the industry. This has happened because of the low marine fish production during the year 2007-08, due to more number of unproductive fishing days in the year as well as due to reduction in number of vessels actually engaged in fishing during the season.

Conclusion

It could be concluded from the present study that the importance of utilization of ice was well understood by most of the marketing intermediaries as well as producers and processing units. In all, 19 ice plants with production capacity of 2,01,491 tonnes were operating in the Ratnagiri block whereas, the expected requirement of ice for preservation of fish is 1,57,377 tonnes. Though the production capacities of ice plants were under-utilized in the year 2007-08 due to less marine fish production, the actual ice used by fishery industry during the year 2007-08 was 97,046 tonnes, which indicated under utilization (48%) of present production capacity of ice plants. The expected requirement of the ice for the fishery industry in Ratnagiri block is 1,57,377 tonnes and existing ice plants are with appropriate production capacity to suffice the present requirement and expected requirement of the fishery industry.

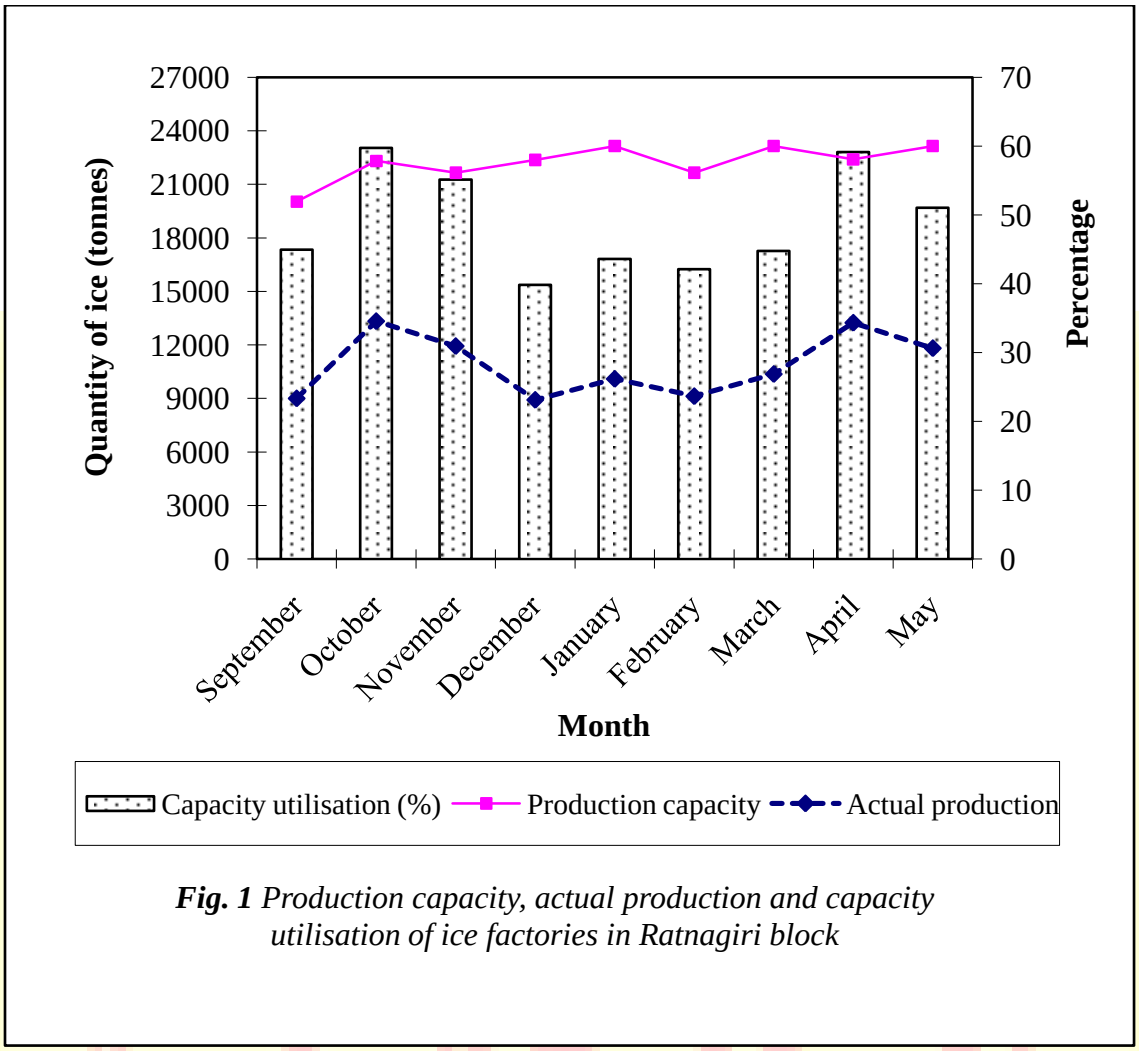

Fig. 1 *Production capacity, actual production and capacity utilisation of ice factories in Ratnagiri block*

Table 1. Month-wise average ice utilisation by on-board fishing vessels, various marketing agents and fish processing plants of Ratnagiri block

Sr. No.	Month	Utilisation of ice (tonnes)							
		Purse-seiners	Trawlers	Gill-netters	Wholesaler	Commission agent	Retailer	Vendor	Fish processing plants
1	September	4578	1069	1083	2236	1051	392	155	371
2	October	5331	2869	1506	2224	2686	323	147	477
3	November	2778	2048	1355	1831	1571	339	157	575
4	December	2357	959	1326	934	1398	300	168	161
5	January	2176	1044	1354	877	1308	304	176	367
6	February	1752	572	1379	801	1063	282	162	340
7	March	2362	4118	1771	966	1502	288	187	457
8	April	3101	4672	1210	1622	1670	281	171	598
9	May	2775	4770	1334	1650	1941	284	156	447
Total		**27210**	**22121**	**12318**	**13141**	**14190**	**2793**	**1479**	**3793**

Table 2. *Sector-wise utilization of ice during whole fishing season in Ratnagiri block*

(figures in tonne)

Particulars	Minimum	Maximum	Average
Fishing vessels	53776	69525	61649
Marketing agents	26970	36238	31603
Fish processing plants	-	-	3793

(Fig. in tonnes)

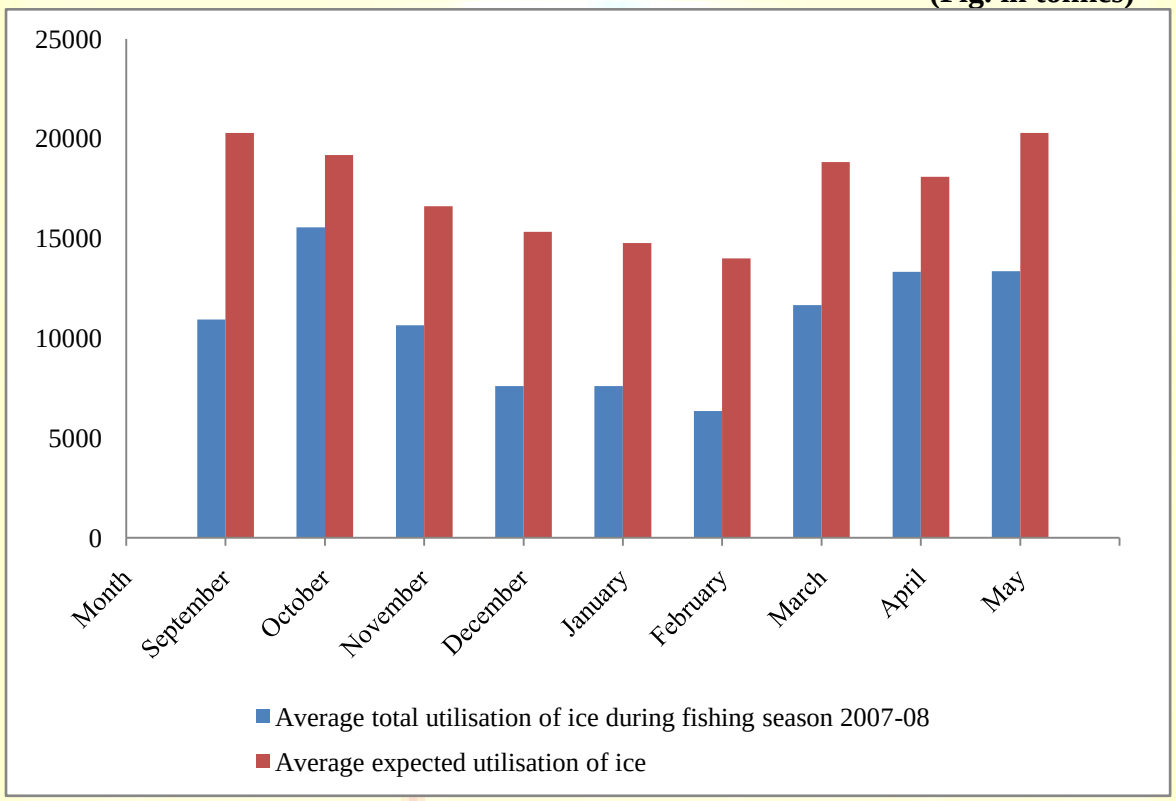

Fig 2. *Month-wise total and expected utilisation of ice in fishery industry of Ratnagiri block*

Table 3. Month-wise total and expected utilisation of ice in fishery industry of Ratnagiri block

Sr. No.	Month	Total utilisation of ice during the fishing season 2007-08 (tonnes)			Expected utilisation of ice (tonnes)		
		Minimum	Maximum	Average	Minimum	Maximum	Average
1	September	9111	12758	10935	16279	24293	20286
2	October	13873	17250	15562	17282	21085	19183
3	November	9315	11996	10654	14827	18387	16607
4	December	6505	8701	7603	13881	16768	15324
5	January	6587	8626	7606	13035	16518	14776
6	February	5281	7422	6351	11895	16091	13993
7	March	10255	13049	11652	17016	20644	18830
8	April	11933	14718	13326	16548	19636	18092
9	May	11679	15037	13357	18011	22558	20285
Total		**84539**	**109557**	**97046**	**138774**	**175981**	**157377**

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