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Perspectives of the Dry Fish Industry in Coastal Areas of West Bengal, India

Chanchal Samanta[1]*, Utpal Bhaumik[2] and Bidhan Chandra Patra[1]

[1]Department of Aquaculture Management and Technology, Vidyasagar University, Medinipore-721102, West Bengal, India

[2]Former Divisional Head, Central Inland Fisheries Research Institute, Barrackpore, Kolkata-700120, West Bengal, India

Corresponding author

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A B S T R A C T

To portray the present status of dry fish industry, a study was conducted in 7 different coastal fish landing centres as well as dry fish processing centres of two coastal districts of West Bengal namely South 24-parganas & Purba Medinipore. A total of 336 fish curers of 7 sample sites *viz.* Patharpratima Khuti, Baliara Khuti, Namkhana Khuti & Kakdwip Khuti under the district South 24-parganas and Junput Khuti, Haripur Khuti, Jaldha Khuti under the district Purba Medinipore, selected at random were personally interviewed through a structured schedule. All the 336 respondents of the 7 sample sites have been practicing the sun-drying of fishes in traditional manner exclusively. The peak season for fish drying was reported during November to March in the entire 7 sample sites. As many as 28% of the fish curers undertook fish drying activity procuring raw materials to the tune of 30,000kg/yr. The end product received after drying from these raw materials was estimated at 8000kg/yr. The traditional method of fish drying needs to be modernized for better return since it has promising export market.

Introduction

Fish has been a major source of food for human beings from time immemorial. Over the years it has become a resource of generating employment for a large section of the fishers, middlemen in fish trade, processors and exporters. Fish now plays a lead role in the export earnings of many Asian countries. Fisheries have also social, economic, nutritional and food security importance. It is roughly estimated that over 40 million people are today employed worldwide in the primary fish production activities (FAO, 2012). Fisheries are an important source of livelihood for over 14 million populations in the country. Fisheries have also contributed INR 30, 2130 million (983,000 tones) to Indian economy through export during 2013-14. India is the second

largest fish producing country with the contribution of 5.43% in global fish production and West Bengal has been able to ensure the second position among all the States of India (FAO, 2012). West Bengal has a coastline of 157.5 km and covers mainly the districts of South and North 24 Parganas and Purba Medinipore (Dan, 1985). Fish is an important part of the regular diet and is a cheap source of protein for the peoples of West Bengal. About 78% of total fish catch is consumed in fresh condition, 6% is used as dry fish and rest is used as frozen fish. Indian dry fish export contributes 8% of all form of fish exports and earned INR 7540 million during 2012-2013 (MPEDA, 2013). The nutritional quality of dried fish remains unchanged, sometimes retains higher quality standards compared to fresh fish (Faruque, *et al.*, 2012). A study was conducted with view to throwing some light on the present status of the dry fish industry and to identify the constraints *vis a vis* suggestions towards improvement of fish drying process and facilitation of profitable marketing.

Materials and Methods

A sizable section of the fish curers of the coastal belt, undertake fish drying as their profession. The location where fish landing as well as drying activity are undertaken, is known as Khuti. An investigation was carried out in such 3 Khuties of the district Purba Medinipore namely Junput, Haripur and Jaldha and in 4 Khuties namely Patharpratima Khuti, Baliara Khuti, Namkhana Khuti & Kakdwip Khuti of the district South-24 Parganas. List of the fish curers of two districts was prepared initially and 25 percent of them were selected at random finally which constituted the sample of the study. Thus, a total of 336 fish curers of the sample (Table 1) were personally interviewed with a pre-tested structured schedule development for this purpose. The Khuti wise respondents were distributed as; under the district South-24 Parganas collected sample are 81whereas the Khuti wise distribution in Patharpratima Block Khuti-50, Baliara Khuti-21, Durganagar/ Namkhana Khuti-05, Kakdwip Steamer Ghat Khuti-05 and under the district Purba Medinipore sample size was 255 where 145 fish curers were from Junput Khuti, 80 from Haripur Khuti and 30 from Jaldha Khuti. Women members of respective family of each respondent were also personally interviewed to know their involvement in the system. The perceived problems and suggestions were measured by a scale developed by Haque (1981), the respondents were asked to mention three most important problems and suggestions as perceived by them and ranked them according the majority. The ranked problems 1, 2, and 3 were given by the majority which outcome through the interview. Now the problems were arranged in descending order of importance on the basis of their majority and then finally ranked. Following the same method cause of spoilage of dry fish were also evaluated and ranked.

Results and Discussion

The coastal waters of the Bay of Bengal appear to be potentially very rich fishing grounds with a variety of species diversity. The processing of fish other than by freezing is done by the artisanal in this region, essentially in small scale in scattered manner and in remote areas of the fishing villages. Salting and drying have been too age-old methods of preserving surplus fish practiced by the fishermen. Unfortunately in many countries of Asia including India, fish curing and drying has been reported to be declining. The predominance of a species varies from coast to coast and is greatly influenced by the fishing method and

operation used and consumer acceptances and preferences, as well as by the social attitudes by fish and availability of easy commercial outlets. Although in West Bengal the consumer preference goes towards consumption of fresh fish but cured products mostly dry fish also have been gaining priority since it has got export market. The improvement of fishery product as in the case of dry fish is an essential requirement if better use is to be made of marine resources. Preference for wet fish, effective use of ice and chilling techniques, growing nutritional awareness, and vast improvement in transport facilities have all contributed to this phenomenon. However, dried salted fish still continues to enjoy a steady market, particularly among the low-income group on account of its low cost of production, extended shelf life at ambient temperatures, and convenience of packing and transport. In West Bengal, fish curers collect the trash fishes and simply dry in beaches either spreading those in sand itself or placing those over polyethylene sheets. For Bombay ducks they hang those in scaffolds in beach. Thus, the dry fish sector has been playing an important role in the State economy through employment generation, enhanced income *vis-a-vis* socio-economic conditions of the fishermen and earning valuable foreign exchange. In order to achieve such improvement for obtaining quality dry fish, a number of factors have to be taken into consideration

Varieties of Fish Utilized for Fish Drying

Species used

It has been observed from the study (Table 2) that a large variety of fish species have been exploited by the fishers in the coastal region of South 24-parganas as well as Purba Medinipore districts. The exploited fishes used for drying by the fish curers mostly for making fish meal/consumption, are *Harpodon nehereus, Trichiurus savala, Sardinella fimbriata, Cynoglossus semifasciatus, Sardinella longiceps, Pampus argentius, Chirocentrus dorab, Polynemus indicus, Tenualosa ilisha, Rastraliger kanagurta, Thunnus albacores, Euthynnus affinis, Pama pama, Leognathus* sp., *Setipina phasa, Setipina taty, Scoliodon* sp., *Barelius bhola* and *Polynemus paradiseus*. Similar observations have been reported by Das *et al.* (2013), Ghorai *et al.* (2014) and Saha (1970).

According to the priority, *Harpodon nehereus* is the first choice of the respondents for the drying activity, followed by *Trichiurus savala*, Prawns & crabs, *Sardinella fimbriata, Cynoglossus semifasciatus, Sardinella longiceps, Pampus argentius, Chirocentrus dorab, Polynemus indicus, Tenualosa ilisha, Rastraliger kanagurta, Thunnus albacores, Euthynnus affinis, Pama pama, Leognathus* sp., *Setipina phasa, Setipina taty, Scoliodon* sp., *Barelius bhola* and *Polynemus paradiseus*.

Quantity of Raw fish Utilized *vis a vis* Quantity of end Product

The study (Table.3) narrates that for undertaking fish drying activity, the fish curers procure raw materials varying between 10,000 and 70,000kg/annum. The quantity of procurement of raw material depends mainly upon socio-economic conditions of the fish curers *vis-a-vis* infrastructure and man power availability. Generally the procurement starts from 30,000 kg onwards per year. Paul *et al.* (1997) reported that in the Hooghly estuary, in absolute terms, total quantity of 35,844 tones of fishes was netted out at 282 fishing centres and those were converted to dry fish for sale.

It has been observed that end product (dry fish) turns approximately to 1/3 to 1/4 from the raw material (fresh fish) as is evident from the present study. The end product exhibited approximately 3,000 kg against 10,000 kg of raw materials at minimal level and 18,000 kg against 70,000 kg of raw materials. Paul *et al.,* 1997, reported that 6939.2 tones dry fish was produced during 1996-97, from 35,143.3 tons of raw fish which is in very much conformity with the present study.

The perusal of the Table 3, reveals that as many as 94 fish curers (28%) of the sample undertake drying activity procuring raw materials worth 30,000 kg/yr which turns to 8000kg/yr of dry fish, followed by 40,000kg/yr turns to 10,000kg/yr of dry fish (25%), 20,000kg/yr turns to 5000kg/yr of dry fish (15%), 50,000kg/yr turns to 13,000kg/yr of dry fish (11%), 60,000kg/yr turns to 15,000kg/yr of dry fish (08%), 70,000kr/yr turns to 18,000kg/yr of dry fish (05%), 10,000kg/yr turns to 3000kg/yr of dry fish (03%), 25,000kg/yr turns to 6000kg/yr of dry fish (03%), 15,000kg/yr converted to 4000kg/yr of dry fish (0.66%), 35,000kg/yr converted to 10,000kg/yr of dry fish (0.66%) and 45,000kg/yr converted to 12,000kg/yr of dry fish (0.66%).

Season for Processing or Drying

The study reveals (Table.4) that for fish drying operation take place generally November to March in the 6 sample site out of 7 study sites except Junput Khuti where November to March is generally considered as peak period for fish drying whereas April to July is considered as lean period for fish drying activity of Purba Medinipore district.

The study further reveals that quality dry fish could be processed only with maximum exposure of sun light and minimum moisture content in the atmosphere. All the fish curers excepting Junput Khuti, availed the same opportunity to get quality dry fish. They undertake the operation of fish drying during November to March. Saha (1970) also observed similar pattern in his study. On the other hand in Junput Khuti the entire dry season is divided into two periods as peak and lean. The peak and lean periods for undertaking the dry fish operation largely depends on fishing season only. The activity of drying commensurate with the exploitation of fish in the sea, nevertheless the drying operation culminates with the closing of fishing season by March. Paul *et. al.* (1997) observed the fish drying activities in the khuties of Jambudwip up to February which by and large is in agreement with the present observation.

Manpower Involvement in Fish Drying Operation

Man Power Involvement

It has been observed (Table-5) in the study that each fish curer involves 2-7 persons for undertaking fish drying activities. Maximum number of the fish curers (97 nos.- 29%) function with a group consisting of 3 persons as hired labors. Generally such numbers depend on the resource richness of the fish curers *vis-a-vis* quantity of raw materials handled for drying. Through in the study it is clear that the hired labors of Namkhana Khuti enjoy the maximum wages on daily basis. The male labors are paid @ Rs. 300/- per day and female labors @ Rs. 250/- per day as the wages for fish drying activity. On the other hand it is interesting to note that out of 336 fish curers of the sample, 221 respondents (66%) involved their family members for undertaking the fish drying job. Maximum number of the respondents (80 nos.- 36%) out of 221 fish

curers involved 3 family members as supporting hand in the fish drying activity.

The perusal of the Table-5, reveals that maximum number of the fish curers (97 nos-29%) function with a group consisting of 3 persons as hired labors followed with 2 persons by 77 respondents (22%), with 4 persons by 50 respondents (15%), 47 fish curers (14%) confessed that they do not hire any labor for fish drying which they manage with their family members, 5 persons are hired by 29 respondents (9%), 6 persons are hired by 22 respondents (7%) and maximum 7 persons as hired by 14 respondents (4%).

Daily Wages of Hired Labor

The data obtained (Fig.1) reveals that in all the 7 sample sites of two coastal districts, the daily wages of male are become higher than the female. The daily wages for male varies between Rs. 120/- to Rs. 300/-, whereas the daily wages of female varies between Rs. 100/- and Rs. 250/- in the 7 sites.

Involvement of Family Members

The study (Table 6) reveals that out of 336 fish curers of the 7 sample sites, 221 respondents (66%) involve their family members for undertaking the fish drying job. As many as 80 respondents (36%) involves 3 numbers of family members as supporting hand in the fish drying activity followed by 26% respondents (57 nos.) who involves 2 to 4 family members and 12% respondents (27 nos.) involves 5 family members.

Product Utilization

The present study reveals that (Table 7) out of 336 fish curers of the sample (more than one options expressed), 312 of the respondents (93%) expressed that dry fish was traded to the poultry and cattle feed manufacturers, 270 of the respondents (80%) expressed that dry fish was traded towards human consumption and 201 of the respondents (60%) expressed that end product was purchased by fish meal manufactures.

The dry fish produced in the area are graded according to quality. The best quality of the product, suitable for human, consumption are graded for export purpose whereas low quality of dry fish like broken, putrefied, containing sands are generally graded for using in the fish meal industry for making poultry/fish feed. Majority of the (80%) fish curers of the area have been making quality dry fish, which are suitable for human consumption. Saha (1970), mentioned the sun dried fish prepared by the artisanal fish curers in the West Bengal and it is mostly consumed by the people outside the state. The present study also indicates that the trade is mainly organized for exporting the dry fishes for human consumption to various states of India which is in agreement of the observation made by Saha (1970).

Export Status of Dry Fish

The study (Fig.2) reveals that out of 336 fish curers of the sample, most of the respondents (173 nos./51%) sell their good quality dry fish to the big traders who in turn export their end product outside the districts as well as to other states and the rest (163 nos./49%) of the respondents sell their end products in the local markets of the respective districts.

Generally, the quality end product suitable for human consumption is exported to several states of India and as well as in abroad. In India the end product is exported to the states like Assam, Bihar, Uttar Pradesh, Odisha, Tripura, Manipur and North-Eastern states. It is also exported to foreign countries namely Bangladesh,

Myanmar, Nepal, China and Pakistan. As such 51% of the fish curers undertake export of dry fish mostly to Bangladesh through middlemen/traders and fetch good return. Saha (1970) stated that the people of the districts of Chittagong, Barishal, Khulna, Mymensing of Bangladesh, prefer dry fish.

Causes for Spoilage

Due to various reasons namely poor quality raw fish, environmental conditions, mishandling and pests, spoilage of fishes are reported many a times by the fish curers resulting in deteriorated quality end products. To identify causes for spoiling the perusal of the Table 8 indicates (respondents expressed more than one reasons) that "*Due to heavy rain during off-season*" has been perceived by 285 fish curers (85%) as first and foremost cause, second cause for spoiling has been identified by 247 respondents (73.5%) as "*Due to heavy moisture in air*", third cause for spoiling has been termed by 199 respondents (59%) as "*Due to storm*" and "*Due to infestation of pests (rats, insects etc.)*" huge quantity of stored dry fish are spoiled which has been regarded as the fourth cause by 151 respondents (45%). The fifth cause has been perceived by them (35%) is "*Due to cloudy weather drying does not take place properly*".

Utilization of Spoiled End Product

The study (Table-9) reveals while expressing (more than one reasons) the utilization of spoiled end product out of 336 fish curers of the sample 258 (77%) respondents expressed that foremost utilization of the end product has been towards manufacturing of the "Poultry feed" followed by utilization of dry fish as "Fish feed" by 216 respondents (64%) and utilization as "Cattle feed" has been expressed by 166 respondents (49%).

Cost of Average Raw Material

The study indicates (Fig.3) that the cost of the raw material on an average Rs. 30/- to Rs. 35/- per kg has been stated by 135 of the respondents (40%), followed by Rs. 35/- to Rs. 40/- per kg by 64 respondents (19%), Rs. 25/- to Rs. 30/- per kg by 58 respondents (17%) whereas maximum cost at the rate of Rs. 40/- to Rs. 50/- per kg of raw fish has been paid by 45 respondents (13%) and minimum cost at Rs. 20/- to Rs. 25/- per kg of raw fish has been paid by 34 respondents (11%).

Cost of Average Selling Price of End Product

After studying the cost of selling price of end product (Fig.4), it has been observed that as many as 42% fish curers (141) sold the end product @ Rs. 80/- to Rs. 90/- per kg, followed by Rs. 70/- to Rs. 80/- per kg of 68 fish curers (20%), Rs. 90/- to Rs. 100/- per kg of 49 fish curers (15%), in minimum price Rs. 60/- to Rs. 70/- per kg sold by 40 fish curers (12%) and in maximum price Rs. 100/- to Rs. 120/- per kg sold by 38 fish curers (11%).

It has been observed from the study that most of the fish curers (40%) procured fish at a purchase rate Rs. 30/- to Rs. 35/- per kg. whereas most of them (42%) sold the end products at Rs.80/- to Rs. 90/- per kg. keeping the margin of good profit.

Constraints

The perusal of the Table 10 reveals while performing the professional job of fish drying the fish curers of the sample have been facing various constraints. According to the order of priority, majority the constraints (more than one reasons) are enlisted. The respondents perceived *"Lack of capital"* as their main constraint (280) as

83.33%, "*Lack of proper infrastructure"* for fish sun drying has been perceived as their second constraint (241) as 71.72%. The fish curers have expressed third important constraint as *"Crisis of raw material"* (193) as 57.44%. After drying the fish the fish curers do not get proper return from their sale hence *"Low market price"* has been identified as the fourth constraint (135) as 40%. Since fish curers undertake their activities under developed rural coastal areas *"Transport problem"* has been preside as the fifth important constraint (79) as 23.51%. The fish curers in the profession are generally poor, for which they used to take the services of middlemen, thus *"Middleman's interference"* becomes imperative and it has been considered as their sixth important constraint (48) as 14.28% in all the sample sites.

Table.1 Distribution of Sample (Khuti Wise)

Name of District	Laying Block	Name of the Khuti	Sample (nos)	Male (nos)	Female(nos)
South-24 Parganas	Pathar Pratima	I.Pathar Pratima Khuti	50	47	03
South-24 Parganas	Namkhana	II. Baliara Khuti	21	21	00
South-24 Parganas	Namkhana	III. Namkhana Khuti	05	05	00
South-24 Parganas	Kakdwip	IV. Kakdwip Khuti	05	05	00
Purba Medinipore	Contai-I	V. Junput Khuti	145	138	07
Purba Medinipore	Contai-I	VI. Haripur Khuti	80	80	00
Purba Medinipore	Ramnagar-I	VII. Jaldha Khuti	30	29	01

Table.2 Species Used for Drying (Khuti Wise)

Sl. No.	Dimension *Name of the fish species used for drying*	Percentage (%) of fish species used for drying						
		Site-I	Site-II	Site-III	Site-IV	Site-V	Site-VI	Site-VII
i.	*Harpodon nehereus*	15	12	20	18	18	20	15
ii.	*Trichiurus savala*	18	15	15	12	14	12	14
iii.	*Sardinella fimbriata*	10	10	10	10	12	10	11
iv.	*Sardinella longiceps*	3	5	6	6	3	3	5
v.	*Cynoglossus semifasciatus*	12	8	14	12	4	4	4
vi.	*Pampus argentius*	0	3	2	2	4	4	4
vii.	*Chirocentrus dorab*	0	0	0	0	2	2	2
viii.	*Polynemus indicus*	2	3	2	2	3	3	3
ix.	*Tenualosa ilisha*	1	3	3	3	8	6	6
x.	*Rastraliger kanagurta*	8	8	3	3	5	5	5
xi.	*Thunnus albacores*	0	0	0	0	2	3	3
xii.	*Euthynnus affinis*	0	0	0	0	2	2	2
xiii.	*Pama pama*	0	0	0	0	2	2	2
xiv.	*Leognathus sp.*	0	0	0	0	4	4	4
xv.	Prawns & Crabs	15	10	14	18	7	8	8
xvi.	*Setipina phasa*	2	5	4	4	2	2	3
xvii.	*Setipina taty*	2	3	3	3	1	2	2
xviii.	*Scoliodon sp.*	12	2	1	1	1	1	1
xix.	*Barelius bhola*	0	11	2	4	5	6	5
xx.	*Polynemus paradiseus*	0	2	1	2	1	1	1

Table.3 Quantity of Raw Fish Utilized Vis A Vis Quantity of End Product

Dimension *Raw fish to End product (Kg/Yr)*	No. of Fish-Curers in the sample Khuti wise						
	Site-I	Site-II	Site-III	Site-IV	Site-V	Site-VI	Site-VII
10,000 – 3000	4	0	1	0	0	6	0
15,000 – 4000	0	0	2	0	0	0	0
20,000 - 5000	9	6	2	0	22	11	0
25,000 - 6000	0	11	0	0	0	0	0
30,000 - 8000	37	4	0	0	29	22	2
35,000 - 10,000	0	0	0	2	0	0	0
40,000 - 10,000	0	0	0	1	41	34	7
45,000 - 12,000	0	0	0	2	0	0	0
50,000 - 13,000	0	0	0	0	24	7	5
60,000 - 15,000	0	0	0	0	17	0	11
70,000 - 18,000	0	0	0	0	12	0	5

Table.4 Season for Processing or Drying

Name of the Khuti	**Dry Season Period**
1. Pathar Pratima Block Khuti	November – March
2. Baliara Khuti	November – March
3.Namkhana Khuti	November – March
4. Kakdwip Steamer Ghat Khuti	November – March
5.Junput Khuti	November - July
6. Haripur Khuti	Novrmber-March
7. Jaldha Khuti	Novrmber-March

Table.5 Manpower Involvement

Dimension *(Hired labour involved in no.)*	No. of Manpower involvement in the sample Khuti wise						
	Site-I	Site-II	Site-III	Site-IV	Site-V	Site-VI	Site-VII
2	8	9	0	0	23	32	5
3	12	3	1	0	56	18	7
4	5	3	2	2	18	12	8
5	3	2	0	1	13	7	3
6	2	0	1	2	10	4	3
7	2	0	0	0	9	2	1
Not in hired	18	4	1	0	16	5	3

Table.6 Manpower Involvement (as Family Members)

Dimension *(Family members involved)*	No. of Manpower involvement in the sample Khuti site (as family members)						
	Site-I	Site-II	Site-III	Site-IV	Site-V	Site-VI	Site-VII
2	6	4	1	2	9	27	8
3	2	1	1	1	48	18	9
4	3	2	0	0	34	13	5
5	1	0	0	0	18	6	2

Table.7 Product Utilization

Dimension	Total no. of Fish-Curers studied in the sample Khuti site *(More than one item expressed)*						
	Site-I	Site-II	Site-III	Site-IV	Site-V	Site-VI	Site-VII
Human consumption	36	13	5	5	124	66	21
Fish meal	42	17	5	4	65	52	16
Poultry & cattle feed	47	20	4	4	137	73	27

Table.8 Causes for Spoilage

Dimension- Causes for Spoiling *(according to the majority)*	Causes for spoilage of dry fish in the sample Khuti site *(More than one item stated)*						
	Site-I	Site-II	Site-III	Site-IV	Site-V	Site-VI	Site-VII
Cause-I	45	18	4	5	115	73	25
Cause-II	38	14	3	4	105	62	21
Cause-III	30	10	2	2	90	48	17
Cause-IV	21	7	2	2	67	40	12
Cause-V	16	5	1	1	54	32	9

Table.9 Utilization of Spoiled End Product

Utilization	Utilization of spoiled end product by the fish curers in of the sample Khuti site *(More than one item stated)*						
	Site-I	Site-II	Site-III	Site-IV	Site-V	Site-VI	Site-VII
Poultry Feed	35	18	4	3	120	56	22
Fish Feed	28	14	5	5	98	48	18
Cattle Feed	20	10	2	3	76	40	15

Table.10 Constraints as Perceived by the Fish Curers

Dimension -Fish drying related problem *(according to the majority)*	Constraints in fish drying in the sample Khuti site *(More than one item stated)*						
	Site-I	Site-II	Site-III	Site-IV	Site-V	Site-VI	Site-VII
Lack of Capital	42	16	4	4	121	68	25
Lack of proper Infrastructure	36	14	3	4	110	55	19
Crisis of raw material	30	11	2	3	88	43	16
Low market price	24	8	2	2	58	31	10
Transport problem	16	4	1	2	32	20	4
Middlemen interference	10	2	1	1	20	12	2

Table.11 Suggestions Rendered by the Fish Curers

Dimension - Suggestions *(according to the majority)*	Suggestions of fish-curers in fish drying process in the sample Khuti *(More than one item stated)*						
	Site-I	Site-II	Site-III	Site-IV	Site-V	Site-VI	Site-VII
Suggestion-I	45	18	4	4	130	70	26
Suggestion-II	39	14	4	3	115	61	21
Suggestion-III	31	11	3	3	90	53	18
Suggestion-IV	23	8	2	2	64	42	14
Suggestion-V	15	5	1	2	43	30	11
Suggestion-VI	12	2	1	1	30	19	8

Fig.1 Daily Wages (INR) of Hired Labour

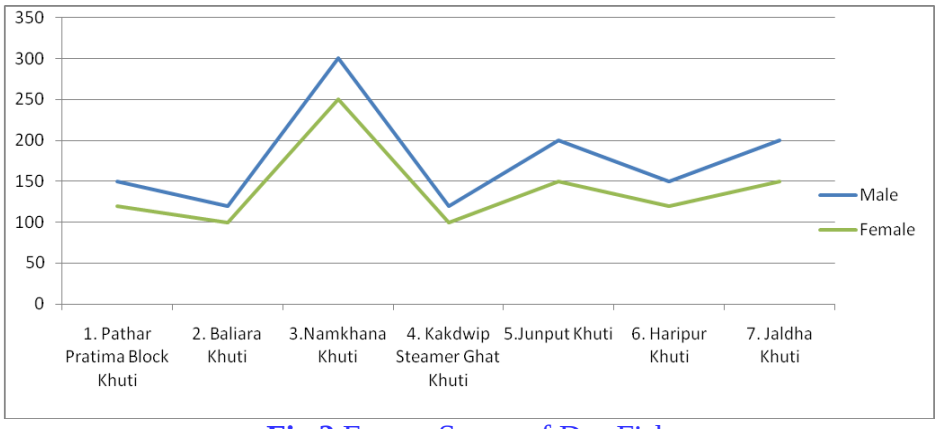


Fig.2 Export Status of Dry Fish

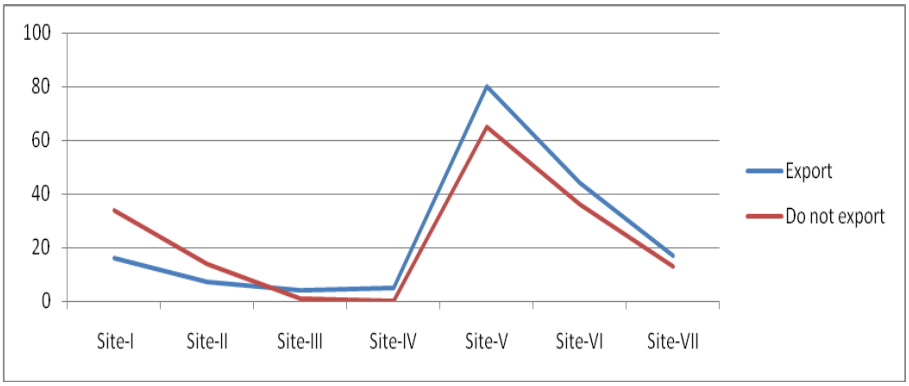


Fig.3 Cost of Average Raw Material

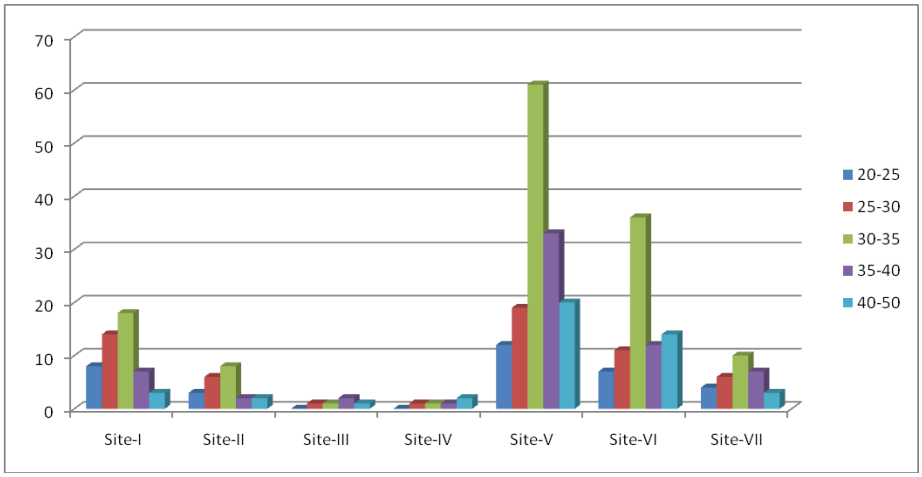
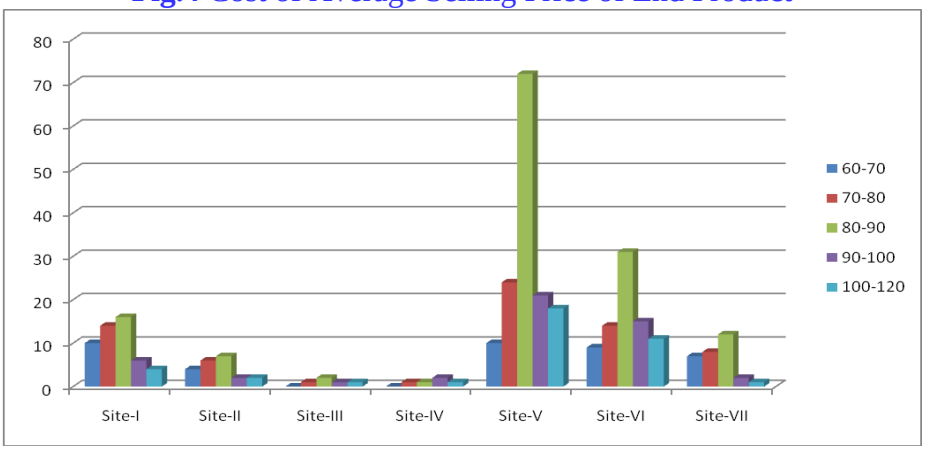


Fig.4 Cost of Average Selling Price of End Product



Suggestions Rendered by the Fish Curers

The study (Table-11) reveals that to overcome the constraints all the respondents have expressed some suggestions (more than one) of which "*Provision of loan facility*" has been put forward with top priority by 297 respondents (88.40%) whereas for better performance and for drying of quality end product "*Provision of proper infrastructure*" have been suggested as their second priority by 257 respondents (76.5%). The third important suggestion has been made by 209 fish curers (62.20%) is "*Supply of raw materials at reasonable price*". As they do not get proper selling price, 297 respondents (46.13%) have urged for "*Fixation of profitable market price*" which could be as their fourth important suggestion. To carry the raw material as well as transporting end products to the market they need the "*Provision for proper road & transport facility*" which has been expressed by 107 respondents (31.84%) as their fifth important suggestion. Sixth important suggestion as "*Elimination of middlemen through formation of the Co-operative Society*" has been expressed by 73 respondents (21.7%).

Marketing Channel

It has been observed that the marketing channel follows the similar pattern to that of

other fish products. In case of Kakdwip Steamer Ghat (West) Khuti, Vivekananda Gram Panchayat of South-24 Parganas district and Junput and Jaldha Khuti of Purba Medinipore district *Middlemen or Paikers* play pivotal role in the marketing channel between the Fish curers (who sun drying the raw materials) and wholesaler to sell the product. In general, the marketing channel is followed as- Fish curers (who catch the fish) Purchasing → Fish curers (who sun drying the raw materials)→ Wholesaler → Retailer → Consumer. It is confirmed with the study made by Saha (1970).

The dry fish markets of the 7 sampling sites are located at Patharpratima, Kakdwip, Raidighi where mostly retailers function whereas the whole-sale markets are located at Kakdwip, Raidighi, Kankandighi. of South-24 Parganas district. In case of Purba Medinipore district the popular retail and whole-sale markets are located at Junput, Aladarput, Dauki, Contai, Balisai, Deuli Bangla, Ramnagar and Balighai, Contai, Balisai, Ramnagar respectively. The same is in conformity with the study conducted by Ghorai *et. al.*(2014).

The study shows that cent percent of fishermen sell their end product through the following marketing channel "*Fisherman (who catch the fish) Fish curer (who sundry the raw material) End product Middleman Whole seller (Aratdar) Retailer Consumer* .

Conclusion

The fish curers still have been continuing their activities of fish drying by traditional method. The situation demands to educate them on modern lines of fish drying through organization of training courses to improve the in knowledge, skill and attitude of the fish curers. Since the fish curers undertake the drying operation in sandy beaches or in simple scaffolds, the cent percent of the respondents of the sample expressed that they adopted no quality control measure. They further revealed that regarding quality control measures no knowledge is also available to them. The cent percent of the respondents expressed that modern infrastructure were neither available nor were utilized for drying of fishes.

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