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Comparative Analysis of Traditional and Scientific Fish Drying: A Study from Fishing Community of High Altitude Himalayan Wetland

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ABSTRACT

The study was conducted in district Bandipora, one of the major fish producing districts of Kashmir valley. Traditional fish drying is practiced by almost all the fishing villages of the district and contributes significantly to their income. The conventional method employed in drying of fishes is unscientific, can cause serious health hazards and fetches fishers much lower price than desired. Quality assurance of processed fish is therefore, of utmost concern. Data for the present study was collected through group discussion, observation and various participatory rural appraisal methods. Semi-structured interview schedule was also devised for extracting the information from the respondents. The results of the study indicated that technological interventions in the form of scientific fish drying can ensure i) good quality fish fit for consumption ii) which leads to higher economic returns than the indigenous fish drying. However, one of the important facts revealed during the study was that the introduction of scientific fish drying through Joint Liability Groups would make scientific fish drying a low cost technological intervention thereby making it affordable and beneficial for the downtrodden fishers.

Key words: *Traditional fish drying, Scientific fish drying, Joint Liability Groups.*

INTRODUCTION

Fish is one of the most important sources of animal protein and has been widely accepted as a good source of protein and other elements for the maintenance of healthy body[3]. It also a good source of vitamins and minerals. It is an extremely perishable commodity and quality losses can occur very rapidly after catch[2]. Drying is an ancient and simplest method to preserve fish. In India about 17% of the total catch is used for the production of dry fishes[4]. Sun drying is a simple and the oldest known method of fish preservation where fishes are dried under the sun. Drying method is considered as the least expensive method of fish preservation[1]. Fish production plays an important role in the economic development of Jammu & Kashmir State.

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Statistics indicates that the annual fish production in the state has touched to 19 tons, out of which 16 tons are produced in Kashmir valley. Fish and fish products are an important means of poverty and nutritional security for the people of state. During recent years fish consumption has significantly increased owing also to the realization that consumption of fish and products have health enhancing effects beyond simple nutrition. The methods employed for handling and processing of fish in Kashmir are still traditional and need lot of improvement. Dried fish forms an important place in the Kashmiri cuisine but the method used for drying fish is very much traditional that needs scientific intervention. In this backdrop the present study was conducted to make a cost-bnefit analysis of scientific and traditional fish drying to know the scope & feasibility of scientific fish drying.

MATERIAL AND METHODS

A list of licensed fishers and fishing villages was obtained from the J&K State Department of fisheries. As per data available, district Bandipora has 2008 licensed fishers which are spread in different fishing villages of the district. Four villages viz. Zurimanz, Kemha, Kolhama, Lankrishipora were selected randomly for the study. Data was collected through Group discussion, Observation and Participatory Rural Appraisal. A semi-structured interview-schedule was prepared wherein mostly open ended questions were asked from the respondents to extract the detailed information.

Benefit – Cost Ratio (B: C ratio) was calculated. Cost of various items (under fixed as well as the variable cost) was confirmed from different market sources and cross checked with the fishers. For calculating B/C ratio of Scientific fish drying through JLGs (comprising of 07 members), number of crafts and gears required for fish drying per group was worked out to calculate the cost incurred per season. Capacity of drier, fish caught per day, dried fish obtained was also calculated.

RESULTS AND DISCUSSION

The results of the study revealed that the fishers in district Bandipora were practicing traditional fish drying. Fish dried in traditional way was not only found un-hygienic but also un-fit for human consumption. This method of drying leads to quick spoilage of fish during summers. During summer season, fish catch is available in plenty, but indigenous method of fish drying spoils fish and spreads obnoxious smell resulting in poor quality fish. Indigenous fish drying is a time consuming process and involves lot of drudgery, therefore, an attempt was made to calculate the cost benefit ratio of traditional drying as well as the scientific fish drying to know the scope of technological intervention in the study area. Indigenous fish drying involved the following process. The catch from the traditional boats is graded as per the size at the landing centre.

- The segregated fish is then kept in plastic tubs.
- No washing or degutting is done.
- The fish is then spread on the ground for drying or tied in the knots in straw ropes which are hanged in open air for drying.
- Dried fish is removed from ropes, packed in gunny bags and stored in house and later sold in market directly or through middle men.
- On the other hand, the process of scientific fish drying involves the following steps
- The catch is graded as per the species and size
- The fish is degutted and washed.
- The processed fish is placed in the solar dryer.
- Depending on the type and capacity of the solar dryer, fish gets dried in 6-12 hours. BC ratio was calculated to know the scope of scientific fish drying using fish dryers.

S no.	Particulars	Fixed Cost (FC)	Fixed Cost
1.	Boat	18000	6000
2.	Net	15000	5000
3.	Tub	1500	500
4.	Fish Dryer	14285.71	0.00
5.	Packaging Machine	4285.71	0.00
6.	Labor/Man days	71100x 7= 497700	71100
	Fixed cost	**550771.42**	**83100**
	Particulars	**Variable cost(VC)**	**Variable Cost**
1.	Packaging Material	30000	500
2.	Electric Charges	6000	0.00
3.	Maintenance Charges	12000	0.00
	Variable cost	**48000**	**500**
	Total Cost FC +V C	598,771.42	83,600
1.	**Fish caught/day/head**	3kg	3Kg
2.	**Fish caught by 07 people /day**	7 x 3 = 21 Kgs	0.00
3.	**Dried fish obtained per day**	10.50 kgs (50%of fresh fish)	0.5Kg (As it takes 3days for 3 Kg fish to dry)
4.	**Dried fish obtained /fishing season**	237 x 10.50 = 2488.5Kg =24.885Quntl	237 x 0.5 = 118 .5 Kgs,
5.	**Selling Price of dried fish /season (@500/Kg)**	1244250	59250
	B/C ratio	**2.259**	**0.708**

Scientific fish drying is to be introduced through JLGs each comprising of 07 members. It was assumed that a JLG may require 03 boats each costing Rs 30000, 03 nets each worth Rs 5000, 03 tubs each costing Rs 500, one fish dryer (Rs. 100000), and packaging machine (Rs. 30000).Life expectancy of each item was calculated to know the cost incurred per year on all the items.

Benefit-Cost analysis of dried fish

Fixed variables

• Cost of dryer =Rs 1, 00000.00
• Cost of packaging machine= Rs 30,000.00
• Cost of boat (3No.)= Rs 90,000.00
• Cost of net (3 No.)= Rs 30,000.00
• Cost of tubs (3No.)= Rs 6, 0000
• Total Cost = Rs 2, 56000

To know the cost incurred per year, per JLG, cost of items was divided by their life expectancy.

Cost incurred per year / JLG = Cost of items / life expectancy of item

Dryer

Life expectancy of dryer = 7years

• Cost incurred for one year = 1, 00000.00/7 = Rs 14285.71

Packaging machine

Life expectancy of Packaging machine = 7years

• Cost incurred per year= Rs 30,000.00/7 = 4285.71

Boat

• Life expectancy of boat =5 years
• Cost incurred per boat per year = 30,000/5 = 6,000.00
• Cost incurred for 3 boats per year = 6,000 x 3 = 18,000.00

Net

Cost of Net (3 No.) =30,000.00

Cost of one net =10,000.00

Life expectancy of net = 2years

Cost incurred per year per net = Rs 10,000.00/2 =Rs 5000.00

Cost incurred 3 nets / per year =5000 x 3 = 15,000.00

Tub

Cost of tubs (3 No.) =6,000.00

Cost of one tub =2000.00

Life expectancy of tub = 4years

Cost incurred per year per tub = Rs 2000.00/2 =Rs 500.00

Cost incurred for 3tubs / per year =500 x 3 = 15, 00.00

Labour Cost:-71100 x 7 = 497700

Total cost incurred on fixed assets per year =

Rs 14285.71 + 4285.71 + 18,000.00 + 15,000.00 + 15, 00.00 + 497700= 550771.42

Variable cost

Packaging material = Rs 30,000

Maintenance cost = 6,000

Electricity charges = 12000.00

Total cost incurred on variable assets per year = Rs 30,000 + Rs 6,000.00 + 12,000.00 =48000

Fixed cost + variable cost per year = Rs 598,771.42

Total expenditure involved in fish drying activity per year will be = Rs 598,771.42

As there will be seven members in one JLG and the activity of fish drying will be a joint venture therefore cost will be shared by all the members equally.

Fish

• Capacity of dryer = 21 Kg

• Time taken for drying 21 kg fish = 24 hrs

• 21 Kgs fresh fish will fetch = 10.5 Kgs dried fish / day (50% 0f fresh fish)

Total number of fishing days is 237 so total dry fish obtained during fishing season will be = 10.5 x 237 =2488.5

• Selling price of 1 kg dry fish = Rs 500

• Selling Price of 2488.50 Kg dry fish = Rs 1,244,250

Total benefit earned per season = 1244250 – 598771.42 = 645,478.58

B/C= 1244250/598771.42 =2.07

Indigenous fish drying

Boat

• Life expectancy of boat =5 years

• Cost incurred per boat per year = 30,000/5 = 6,000.00

Net

Cost of one net =10,000.00

Life expectancy of net = 2years

Cost incurred per year = Rs 10,000.00/2 =Rs 5000.00

Tub

Cost of one tub =2000.00

Life expectancy of tub = 4years

Cost incurred per year per tub = Rs 2000.00/2 =Rs 500.00

Labour /man days = 71100

Total cost incurred on fixed assets per year = 83.100

Variable cost

Packaging material = Rs 500

Fixed cost + variable cost per year = Rs 83,600

Fish caught per day =3 kg

Dried fish obtained = 0.5 kgs

For 237 days fish obtained = 237 x 0.5 = 118.50

Selling price of fish = 118.50 x 500 = 59,250

B/C ratio= 59,250/83600 = 0.708

B/C ratio in case of scientific drying was found to be more than 1 whereas in indigenous drying it was found to be less than 01. Therefore, scientific drying was more beneficial than the indigenous drying and could be successfully popularized among the fishers to enhance their livelihood thereby promoting their growth and development.

CONCLUSION

The results of the study revealed that technological intervention in the form of scientific drying could play a pivotal role in socio-economic growth and development of the beneficiary fishers. The study deciphered the fact that scientific drying will enhance shelf life of fish, reduce drudgery and no. of man days involved in drying. It will enable fish drying in huge quantity and even in summer when the catch is available in bulk. Scientific drying will produce hygienic, quality fish resulting in higher economic returns and ultimately better life for fishers.

However, scientific drying needs to be introduced through Joint Liability Groups. Working in JLGs will make it a low cost intervention by distributing the cost incurred among the members thus reducing the cost of

inputs per head and thereby reaping more benefits. It will also result in sharing of risk and introduce the concept of cooperation among the fishers.

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