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# DRIED FISH MATTERS – SRI LANKA (DFMSL)

## KEY ZONE IDENTIFICATION

*A study to identify the key dry fish producing zones in Sri Lanka*

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*Prepared by*

**Oscar Amarasinghe (Ph.D)**

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## INTRODUCTION

Fish processing, especially the process of drying fish, has been an important component of the fish value chain, dominating all fish processing activities undertaken by the people of Sri Lanka. Dried fish making (both dried fish and *maldive*<sup>1</sup> fish) has been traditionally undertaken by women, providing fishing families with an important source of supplementary income. Its contribution towards food security, nutrition, sustainable livelihoods and poverty alleviation has been considerable. Moreover, fish processing has also provided women fisher folk with avenues of employment and empowerment. As mentioned above, the major fish processing activities carried out in Sri Lanka, are making *maldive* fish (*umbalakada* as called locally) and dried fish. A major portion of the fresh fish used for processing comes from low quality and damaged fish landed by crafts. Although the target is to catch fish for export, Sri Lanka's multiday boats land a fair quantity of poor quality fish; those which are found at the bottom of the stack of trays in the cold room of the boats (fish caught earlier in the fishing trip). Part of such low quality fish may not even be sold locally as fresh fish and, they find their way to dried fish processing. The rest of the supplies comes from the coastal fishery, when huge surpluses are found (when landings are heavy). Even though the industry has advanced significantly, the processors (often women in fishing families), still use the age-old, conventional processing techniques, which have not changed throughout the history of fish processing in the country. The exact technique employed depends on the type of product being processed. For the traditional drying style, this involves a meticulous routine of cleaning, gutting, boiling, salting, and laying out the fish to dry. For the Maldivian style, the fish are also smoked.

It is well known that fish stored in the ice compartment of the multi-day crafts, especially those at the bottom trays of the cold room, are of poor quality. This quality deterioration of the fish at the bottom trays is higher, the higher the duration of the fishing trip. Often the first-caught fish are dried on the deck of the craft during the voyage and such dried fish is called "Boat-Dry Fish" (*boattu karawala*). There is belief that *boattu karawala* are clean, contain less moisture and are of better quality and, thus command a higher demand than other dry fish types. They fetch higher prices compared to fish dried on land. Yet, the volumes available are limited.

Once the catches are landed by the multiday crafts, the fish stored in top trays of the cold room go for export while those at the bottom are sold for fish drying. Fish stored in the middle go to the local market. It is generally known that, fish that go for dry fish production are inferior in quality, although not decomposed.

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<sup>1</sup> *Maldive* fish is a certain type of dried fish, which follows a path of processing different from that of dry fish. During the very early days, this product was imported from Maldives, which explains why this fish product is called *maldive* fish.

## **Dried Fish making**

Poor quality fish landed by multiday crafts and used for dry fish making often consist of large pelagic species such as Tuna or *Kelawalla* (*Thunnus albacares*), skipjack or *Balaya* (*Kastuwouns pelagis*), *Kattawa* (*Chrinemus* sp.), *Wannawa* (*Caryphaens hippurus*), *Para*, (*Caranx sp*) etc. Generally, purchasing of fish is done by males in the family. The drying process involves, cleaning, washing, cutting, salting, which are done by the women fisher folk. Traditionally this existed for centuries as a household activity. Women say that this activity is profitable because only lower quality (and thus cheap) fish is used for fish drying.

Smaller pelagic fish species such as sprats, *salaya* (*Sardinella melanura*), *linna* (*Decapterus* sp.), *kumbala* (*Rastrelliger Kanagurta*), *hurulla* (*Amybligaster* sp.), etc. are also used for dried fish making, for which supplies come from both small and large scale boats. No selective buying is practiced and prices are quoted for whole mounds.

Prices of dried fish depend to a great extent, on the inputs that go into the process. Sun drying is most common method, where cleaned and salted fish are sun-dried on coir mats lying on beaches or on specially prepared drying racks kept above the ground.

## **Maldive fish making**

In general, large pelagic fish species are used as raw material for maldive fish, which is prepared through a steamed and dried process. This process is quite popular among small-scale fish processors, mainly females, settled along the coastal belt of Matara and Hambantota. However, the type of processing technique used by them is said to be quite inefficient leading to high wastage and poor quality product

Both dry fish and maldive fish processors confront difficulties of waste disposal. The usual method of throwing into the sea or burning have already reached alarming levels and public protests have threatened the industry's existence, if such practices are continued. There are of course good practices (which are being practiced in certain areas to a lesser extent) such as producing fish meal, poultry feed (as ingredient), slurry for pigs and bio-fertilizer. By product user are facing difficulties in drying the raw material and storing the semi-finish products at village level.

## **Spatial distribution of dried fish processing zones**

Processing of fish into dried fish and maldive fish is not evenly distributed in the country, in terms of quantities produced, scale of production, involvement of men and women, organization of production, etc. Commercial scale processing is often found in the western and northern parts of the country and household production is generally practiced in the southern regions, especially in Buddhist communities. Due to this diversity, and the dearth of information on dried fish and maldive fish, it was decided to carry out a Key Zone identification study, which forms the objective of the current study.

## **METHODOLOGY EMPLOYED IN THE STUDY**

Identification of Key Zones was done with the assistance of Assistant Directors (ADs) of Fisheries, who are the representatives of the Department of Fisheries and Aquatic Resources Development for each Fisheries district of the country (There are fifteen Fisheries districts in Sri Lanka: Colombo, Kalutara, Galle, Matara, Tangalle, Kalmunai, Batticaloa, Trincomalee, Mullaithivu, Kilinochchi, Jaffna, Mannar, Puttalam, Chilaw and Negombo). Each Assistant Director has a group of Fisheries Inspectors serving all fishing villages (FI divisions). Thus the Assistant Directors has first-hand knowledge of the area, and in the present context, they form the best sources of information on the following, for each coastal district

A structured questionnaire was prepared, which included questions on the following

- *Major fish production areas*
- *Major dried fish producing sites*
- *Volume of Production of dry fish by type*
- *Number of households involved in dried fish production*
- *Distribution of employment in dried fish production (disaggregated by gender and work category)*
- *Fish marketing channels and the type and number of traders serving each location*
- *Location and number of wholesale centers*
- *Type and number of state and non-state institutions (civil society organisations, community organisations, women's organisations) engaged in the sector*
- *Key issues faced by the dried fish producers of the district*
- *Changes over the last 10 years, in respect of volumes of production, locations, technology, marketing, etc.*

The questionnaire, which was prepared in English, was translated to local languages; Sinhala and Tamil (see annexes 1, 2 & 3).

*The ADs were asked to give data for the year 2018.*

A payment of Rs.5000 was made to each Assistant Director for responding to the questionnaire.

All Assistant Directors of Fisheries are co-opted members of the Sri Lanka Forum for Small Scale Fisheries and thus they had already been sensitized on the DFM project and its objectives, when they attended a meeting on the 28<sup>th</sup> of September at the National Science Foundation, Colombo, where a State Actor Sensitizing workshop on “Implementing FAO Voluntary Guidelines” was held. All of them expressed their willingness to assist the DFM project.

#### **Data collection:**

Mail Questionnaire method was used to reach all Assistant Directors of Fisheries). Some of the questionnaire were posted while others were sent by email.

### **THE IMPACT OF COVID PANDEMIC ON THE STUDY**

However, the study had serious negative consequences due to the Covid 19 pandemic, after the first Covid case was found on the 11<sup>th</sup> of March 2020. All Assistant Directors were involved in helping the fishing communities in selling their catches, making arrangements for transport, issuing curfew passes, transport arrangements for sending catches to remote areas under area lock-down conditions etc. The project activities came to a standstill during the months of March, April, May and June. Although fishing commenced fully by July 2020, project work continued at a slow pace because the Ads were too busy with the recovery process of the fisheries sector. However, most of the questionnaire were received from Ads in August and September. The last questionnaire (from Mullativu District was received in November, due to the absence of the AD who had met with an accident.

#### **Type of information furnished by Assistant Directors of Fisheries**

While information furnished by Ads included production of dried fish and maldivian fish by location, quantity, and employment (with gender disaggregated data), information on community institutions, wholesale and retail trade, etc. were absent. However, information that were received were sufficient enough to attain the objectives of the study.

Information on maldive fish production are scanty. It is not known whether data is not available for a particular district or whether there is no maldive fish production. Therefore, no attempt was made in this paper to analyse the available data on maldive fish production.

## RESULTS AND DISCUSSION

Due to the diversity in population characteristics, such as density, religion, ethnicity, etc. results will be discussed by province and district, while aggregate data will be used whenever necessary.


### 1. Dried fish and Maldive fish production

#### 1.1 Southern Province

Annual fish production and dry fish production, including maldive fish in the three districts of the Southern Province are given in tables 1, while the same data, by FI Division (Fisheries Inspector Division; the lowest fisheries administrative area) is presented in table 2.

**Table 1. Production of fresh fish and died fish in the Southern Province, by coastal District.**

Southern Province					
District	No. of FI divisions	No. of fishing households	Annual fish production (kg)	Annual dried fish production (kg)	Annual <i>maldive</i> fish production (Kg)
Galle	09	3452	49,976,205	77,685	3,659
Hambantota	12	8291	74,799,760	385,000	356,000
Matara	09	9109	25,465,027	1,572,914	139,850

 District with the highest dried fish and maldive fish production

As revealed by the results, Matara has recorded the highest quantity of annual dried fish production (1,573 MT of fish), while Hambantota has recorded the highest maldive fish production (356 MT).

Tables 2, 3 and 4 give dried fish and maldive fish production in the 3 districts of the Southern Province, by FI Division

**Table 2. Dried fish and *maldive* fish production in the Galle District, by FI Division**

<b>Galle</b>		
FI Division	Annual Dried fish production (kg)	Annual maldive fish production (kg)
Ambalangoda	7,050	610
Hikkaduwa- North	6,135	2,850
Hikkaduwa- South	32,550	DNA
Dodanduwa	4,300	DNA
Galle	27,650	199

*\* DNA : Data Not Available. Shaded in orange colour are the FI Divisions with highest dried fish and maldive fish production*

**Table 3. Dried fish and *maldive* fish production in the Hambantota District, by FI Division**

<b>Hambantota</b>		
FI Division	Annual Dried fish production (kg)	Annual maldive fish production (kg)
Kudawella	110,000	120,000
Mawanalla	20,000	25,000
Unakuruwa	10,000	15,000
Tangalle	25,000	40,000
Hambantota	40,000	20,000
Kirinda	80,000	40,000
Rekawa	5,000	23,000
Kahandhamodara	5,000	9,000
Kalamatiya	10,000	3,000
Welipatanvila	DNA	21,000
Sisilasagama	DNA	DNA
Pallewalala	80,000	40,000

*Shaded in orange colour are the FI Divisions with highest dried fish and maldive fish production*

**Table 4. Dried fish and *maldive* fish production in the Matara District, by FI Division**

FI Division	Annual Dried fish production (kg)	Annual maldive fish production (kg)
Gandara	27,443	
Weligama	72,000	11,000
Kapparithota	19,383	9,800
Dikwella	13,833	5,000
Gandara west	24,000	6,000
Dondra	1,110,600	105,050
Matara	655	
Mirissa	305,000	3,000
Kottegoda		

*Shaded in orange colour are the FI Divisions with highest dried fish and maldive fish production*

Evidently, the highest dried fish producing FI Divisions of the Southern province are, Dondra (1,110 MT) and Mirissa (305 MT) in the Matara District, Kudawella (110 MT), Kirinda (80 MT) & Pallewala (80 MT) in the Hambantota District. In respect of maldive fish production, the highest production is recorded in Dondra (105 MT) in the Matara District and Kudawella (120 MT), Kirinda (40 MT), Tangalle (40 MT) and Pallewala (40 MT) in the Hambantota District. The total annual malive fish production in the Matara District is 140 MT. Both in respect of dried fish and maldive fish the annual production in the above FI divisions are as follows (from high to low).

Dondra	1,215 MT
Mirissa	308 MT
Kudawella	230 MT
Pallewalala	120 MT
Kirinda	120 MT

## **1.2 Northern Province**

Tale 5 gives the annual dried fish production in the Northern Province. No data is available for maldive fish production in the Northern Province.



**Table 5. Annual dried fish production in the Northern Province**

Northern Province					
District	No. of FI divisions	No. of fishing households	Annual fish production (kg)	Annual dried fish production (kg)	Annual <i>maldive</i> fish production (Kg)
Kilinochchi	04	3877	6,676,550	582,760	DNA
Mannar	06	9759	23,048,762	819,280	DNA
Jaffna	14	21593	48,835,012	2,996,009	DNA
Mullaitivu	04	3410	12,500,000	3,350,000	DNA
All	28	38639	91,060,324	7,748,049	DNA

Among the four districts of the Northern Province, the highest annual dried fish production is found in the Mullaitivu District, which is 3,350 MT, followed by Jaffna, with a production of 2,996 MT. The other two districts have recorded very small quantity of dried fish production. The district total of dried fish production amounts to 7,748 MT annually.

Tables 6 - 9 show the breakdown of the district-wise production into respective Fisheries Inspector Divisions of then Jaffna, Kilinochchi, Mannar and Mullaitivu Districts.

**Table 6. Annual dried fish production in the Jaffna District, by FI Division**

Jaffna		
FI Division	Annual Dried fish production (kg)	Annual maldive fish production (kg)
Jaffna West	776,030	DNA
Aliyawalai	391,220	DNA
Thalaiyady	33,680	DNA
Point Pedro East	341,950	DNA
Kankasanthurei East	155,850	DNA
Kankasanthurei West	213,250	DNA
Sandilipay	90,700	DNA
Chulipuram	2,350	DNA
Kayts	00	DNA
Velanai	250,700	DNA
Delff	50,160	DNA
Jaffna East	152,250	DNA
Chavakachcheri	00	DNA

Point Pedro West	537,869	DNA
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The highest annual dried fish production in the Jaffna district are, Jaffna West (776 MT), Point Pedro West (538 MT), Alliyawalai (391 MT), Point Pedro East (342 MT), Velanai (251 MT) and Kankasanthurai West 213 MT).

**Table 7. Annual dried fish production in the Mannar District, by FI Division**

<b>Mannar</b>		
FI Division	Annual Dried fish production (kg)	Annual maldive fish production (kg)
Pesalei	202,698	DNA
Erikkalampididi	107,321	DNA
Mannar Town	181,339	DNA
Nanattaan	116,230	DNA
Silawathurei	132,928	DNA
Widaththaltheu	78,764	DNA

Only two FI divisions in Mannar have recorded annual dried fish production above 150 MT; Pesalai with 203 MT and Mannar Town with 181 MT), while lesser amounts are produced in Silawathurei (133 MT) and Nanattaan (116 MT).

**Table 8. Annual dried fish production in the Kilinochchi District, by FI Division**

<b>Kilinochchi</b>		
FI Division	Annual Dried fish production (kg)	Annual maldive fish production (kg)
Nachchikuda	546,000	DNA
Poonagary	36,000	DNA
Kandavadani	DNA	DNA
Palai	760,000	DNA

Two FI Divisions in the Kilinochchi District have recorded considerably high annual dried fish production; Palai (760 MT) and Nachchikua (546 MT).

**Table 9. Annual dried fish production in the Jaffna District, by FI Division**

<b>Mullaitivu ++</b>		
FI Division	Annual Dried fish production (kg)	Annual maldive fish production (kg)
Mullai North	395,000	DNA
Mullai Town	490,000	DNA
Naayaaru	715,000	DNA
Kokkilai	1,950,000	DNA

The Mullaitivu District, which has produced the highest quantity of dried fish, has two FI divisions annually producing dried fish in excess of 700 MT; Kokkilai (1,950 MT) and Naayaaru (715 MT). Lesser amounts are recorded by the other two FI divisions: Mullai Town (490 MT) and Mullai North (395 MT). Evidently, all FI Divisions in the Mullaitivu district are good dried fish producing areas, producing more than 395 MT per year.

### 1.3 Western Province

There are only two coastal districts in the Western Province; Kalutara and Negombo. The total annual dried fish production in the district is 2,000 MT, the two districts reporting quite similar quantities of production; Kalutara 1,023 and Negombo 977 MT. Information on maldive fish production is only available for Kalutara, which is 25 MT annually.

**Table 10. Production of fresh fish and dried fish in the Western Province, by coastal District**

<b>Western Province</b>					
District	No. of FI divisions	No. of fishing households	Annual fish production (kg)	Annual dried fish production (kg)	Annual <i>maldive</i> fish production (Kg)
Kalutara	09	79	2,740,200	1,023,200	25,100
Negombo	13	7490	33,909,527	976,520	DNA
All	22	7569	36,649,727	1,999,720	DNA

Tables 11 and 12 gives the annual dried fish production in Kalutara and Negombo districts, by FI Division

**Table 11. Annual dried fish production in the Kalutara District, by FI Division**

<b>Kalutara</b>		
FI Division	Annual Dried fish production (kg)	Annual maldive fish production (kg)
Aluthgama	50,000	DNA
Beruwala south	100,000	DNA
Beruwala north	36,200	22,400
<b>Maggona</b>	<b>568,000</b>	<b>1,200</b>
<b>Payagala</b>	<b>120,000</b>	<b>DNA</b>
Kalutara south	22,000	DNA
<b>Kalutara north</b>	<b>122,000</b>	<b>DNA</b>
Wadduwa	5,000	1,500
Panadura	DNA	DNA

A sizeable amount of dried fish is only produced in the Maggona FI division (568 MT), followed by Kalutara North (122 MT) and Beruwala South (100 MT). Beruwala North has also recorded a production of 22.4 MT of maldive fish annually.

**Table 12. Annual dried fish production in the Negombo District, by FI Division**

<b>Negombo</b>		
FI Division	Annual Dried fish production (kg)	Annual maldive fish production (kg)
Kammalkuraya	DNA	DNA
Ethukala	25,000	DNA
<b>Kudapaduwa</b>	<b>513,600</b>	<b>DNA</b>
<b>Town 1</b>	<b>141,500</b>	<b>DNA</b>
Town 2	8,020	DNA
Town 3	37,700	DNA
Duuwa	21,500	DNA
Pitipana	24,200	DNA
<b>Aluthkuruwa</b>	<b>137,000</b>	<b>DNA</b>
Kapungoda	DNA	DNA
Ja Ela	DNA	DNA
Uswatakeiyawa	DNA	DNA
Wattala	68,000	DNA

In the Negombo coastal district, only three FI Divisions have recorded an annual production of dried fish in excess of 100 MT; Kudapaduwa (513 MT), Town 1 (142 MT) and Aluthkuruwa (137 MT). No information is available for maldive fish production in the district.

#### 1.4 North Western Province

The North Western Province consists of two coastal districts; Puttalam and Chilaw. Annual dried Fish production for the two districts and maldive fish production for Puttalam are given in table 13.

**Table 13. Production of fresh fish and died fish in the North Western Province, by coastal District**

North Western Province					
District	No. of FI divisions	No. of fishing households	Annual fish production (kg)	Annual dried fish production (kg)	Annual <i>maldive</i> fish production (Kg)
Puttalam	08	9701	64,820,206	2,381,919	2,400
Chilaw	11	7089	21,900,993	2,201,000	DNA
All	19	16790	86,721,199	4,582,919	DNA

The two districts of the North Western province together produce 4,583 MT of dried fish annually, each district producing similar quantities; Puttalam 2,382 MT and Chilaw 2,201 MT. Puttalam has recorded a very small amount of maldive fish production (1.2 MT annually).

The FI Division wise bread down of dried fish production is given in tables 14 and 15.

**Table 14. Annual dried fish production in the Puttalam District, by FI Division**

Puttalam		
FI Division	Annual Dried fish production (kg)	Annual maldive fish production (kg)
Baththuluoya	209,263	DNA
Mangalaa-eliya	256,756	DNA
Palakuda	126,415	DNA
Kalpitiya-Land	781,020	1,200
Kalpitiya- Island	634,750	DNA
Kandakuliya	94,650	1,200
Puththalam	183,000	DNA
Wanathawilluwa	96,065	DNA

Kalpitiya is the major dried fish producing area in the Puttalam District (781 MT by Kalpitiya Land and, 635 MT by Kalpitiya Island), followed by Mangala Eliya (257 MT), Baththuluoya (209 MT), Puththalam (183 MT) and Palakuda (126 MT). Very little maldive fish production is reported in the district.

**Table 15. Annual dried fish production in the Chilaw District, by FI Division**

<b>Chilaw</b>		
FI Division	Annual Dried fish production (kg)	Annual maldive fish production (kg)
Wennappuwa South	264,000	DNA
Wennappuwa North	336,000	DNA
Naththandiya	DNA	DNA
Maha wewa West	45,000	DNA
Maha wewa South	DNA	DNA
Maha wewa Center	95,000	DNA
Maha wewa North	51,000	DNA
Chilaw South	240,000	DNA
Chilaw Town	180,000	DNA
Chilaw North	300,000	DNA
Arachchikattuwa	690,000	DNA

Arachchikattua is the major dried fish producing area in the Chilaw District (690 MT), followed by Wennappuwa North (336 MT), Wennappuwa South (264 MT), Chilaw South 240 MT) and Chilaw Town (180 MP). No production of maldive has been reported in the district.

### **1.5 Eastern Province**

Annual production of dried fish and maldive fish in the 3 districts of the Eastern Province are given in table 16.

**Table 16. Production of fresh fish and died fish in the Eastern Province, by coastal District**

Eastern Province					
District	No. of FI divisions	No. of fishing households	Annual fish production (kg)	Annual dried fish production (kg)	Annual <i>maldive</i> fish production (Kg)
Trincomalee	13	23,277	42,980,771	2,207,474	10,000
Batticaloa	03	3959	3,502,970	150,000	2700
Kalmunai	11	7600	5,112,500	59,100	14,400
All	27	34,836	53,406,297	7,692,552	117,100

Of the three districts, Trincomalee produces the highest quantity of dried fish (2,207 MT), which is in fact, the highest reported quantity among all the coastal districts in the country. Kalmunai reports the highest maldive fish production of 14 MT per year, while Trincomalee has reported 10 MT and Batticaloa 2.7 MT of maldive fish production.

Tables 17, 18 and 19 give dried fish and maldive fish production by FI division in all 3 districts of the Eastern Province.

**Table 17. Annual dried fish production in the Trincomalee District, by FI Division: North Western Province**

Trincomalee		
FI Division	Annual Dried fish production (kg)	Annual maldive fish production (kg)
Trincomalee- North-01	99,452	DNA
Trincomalee- North-02	10,000	DNA
Kuchchaweli- North	800,000	DNA
Kuchchaweli-South	50,000	DNA
Trincomalee Town- 01	5,000	DNA
Trincomalee Town- 02	5,000	DNA
Trincomalee West	4,000	DNA
Kinniya	724,022	10,000
Muthur	500,000	DNA
Echchlampaththu	10,000	DNA
Seruwila	DNA	DNA

Two FI Divisions of the Trincomalee District, namely Kuchchaweli North and Kinniya produce the highest number of dried fish annually; Kuchchaweli 800 MT and Kinniya

724 MT. This is followed by Trincomalee North (99 MT) and Muthur (50 MT). Kinniya also reports an annual maldive fish production of 10 MT.

**Table 18. Annual dried fish production in the Kalmunai District, by FI Division**

<b>Kalmunai</b>		
FI Division	Annual Dried fish production (kg)	Annual maldive fish production (kg)
Kalmunai tamil	2,000	1,000
Kalmunai Muslim	10,000	150
Sainthamardhu	20,000	100
Karativu	9,000	150
Ninthawur	4,100	DNA
Addalaichennai	3,400	4,000
Akkarepattu	500	DNA
Alayandiwanda	DNA	DNA
Thirukkivil	3,000	DNA
Pottuvil 1	4,900	DNA
Pottuvil 2	2,200	9,000

Only 3 FI Divisions of the Kalmunai district produce more than 9 Mt of dried fish annually; Sainthamardhu (:20 MT), Kalmunai Muslim (10 MT) and Karativu (9 MT). Maldive fish production is reported by Kalmunai Tamil (1 MT), Addalaichchenai (4 MT) & Pottuvil (:9 MT) FI Divisions.

**Table 19. Annual dried fish production in the Batticaloa District, by FI Division**

<b>Batticaloa</b>		
FI Division	Annual Dried fish production (kg)	Annual maldive fish production (kg)
Valaichenai West	112,000	2,700
Valaichenai East	35,000	DNA
Vaharai South	30,000	DNA

In the Batticaloa district, only Valachchenai produces a considerable quantity of dried fish (112 MT), revealing the less popularity of dried fish production in the Batticaloa district. Vlachchenai also produces 2.7 MT of maldive fish.



### 1.6 Comparison of dried Fish production among coastal districts

Annual dried fish production in Sri Lanka by coastal district is shown in figure 1. Except for Matara, no coastal district in both Southern and Western provinces produce more than 1,000 MT of dried fish. In the Northern Province only Jaffna produces more than 1,000 MT, while both coastal districts, both Puttalam and Chialw produce more than 2,000 MT annually. The highest annual production of dried fish is reported by the Trincomalee district, which is in excess of 7,000 MT per year,

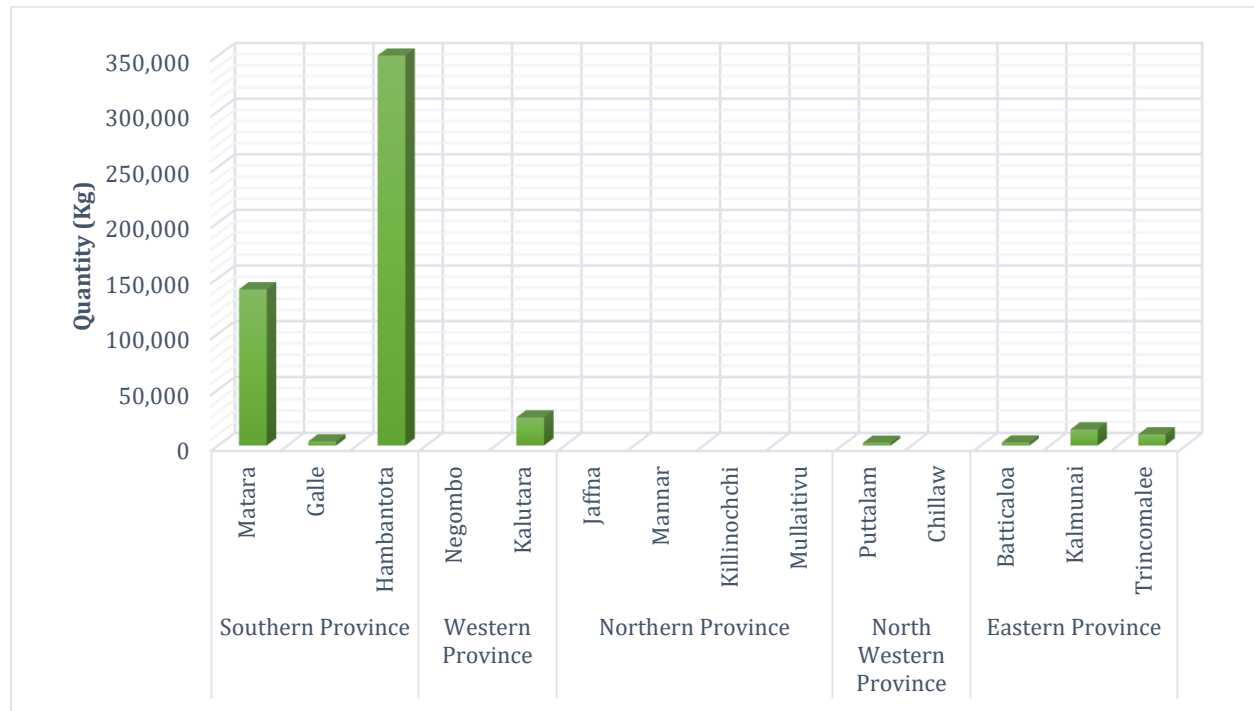


**Figure 1: District-wise annual dried fish production (Kg)**

### 1.7 Comparison of maldive Fish production among coastal districts

Unlike dried fish, maldive fish production is recorded only by few districts and FI Divisions in the country. In contrast to dried fish, maldive fish is not produced in all districts of the country. Information furnished by the ADs reveal that maldive fish is produced only in 8 of the 15 coastal districts of the country; Matara, Galle, Hambantota, Kalutara, Puttalam, Batticalo, Kalmunai, Trincomalee, which belong to only 4 provinces of the country; Southern,

Western, North Western and Eastern. Maldive fish production is generally practiced in the Southern province, especially in the Hambantota and Matara districts and very little production is reported from the Northern and Eastern provinces. It is worthy of note that Northern and Eastern Provinces are the traditional homeland for the Tamil people in the country!



**Figure 2: District-wise annual maldive fish production (Kg)**

## 2. Labour use

Fisheries sector has long been considered a male domain, signifying a sense of adventure and risk valued by men but from which women are often excluded. Direct fishing by women is very rare in Sri Lanka. However, fishing related roles played by women are not recognised and appreciated in the country, and they are supposed to take care of the children and shoulder household responsibilities. One of the traditional household activities of women fisher folk in Sri Lanka has been the processing of fish into dried fish, maldive fish and salted fish, of which the two former are practiced more commonly. Dried fish processing and small-scale trading, form the major employment activity in coastal villages for women fisher folk and other marginalized groups, which earn them supplementary incomes. In fact, for many fishing villages, where dried fish processing is widely practised, it has become a way of life for the women, indicating its high social value within the fishing communities

Today, both men and women are involved in dried fish and maldive fish making (table 20). In respect of labour use, it is to be noted that available information does not facilitate a clear

division of processing establishments into household, small scale and medium to large scale units. It can however be safely assumed that, the missing information belong to household production which generally evades processes of information collection. Thus, this study does not attempt at disaggregating data based on scale.

**Table 20. Labour involvement in dried fish and *maldive* fish production**

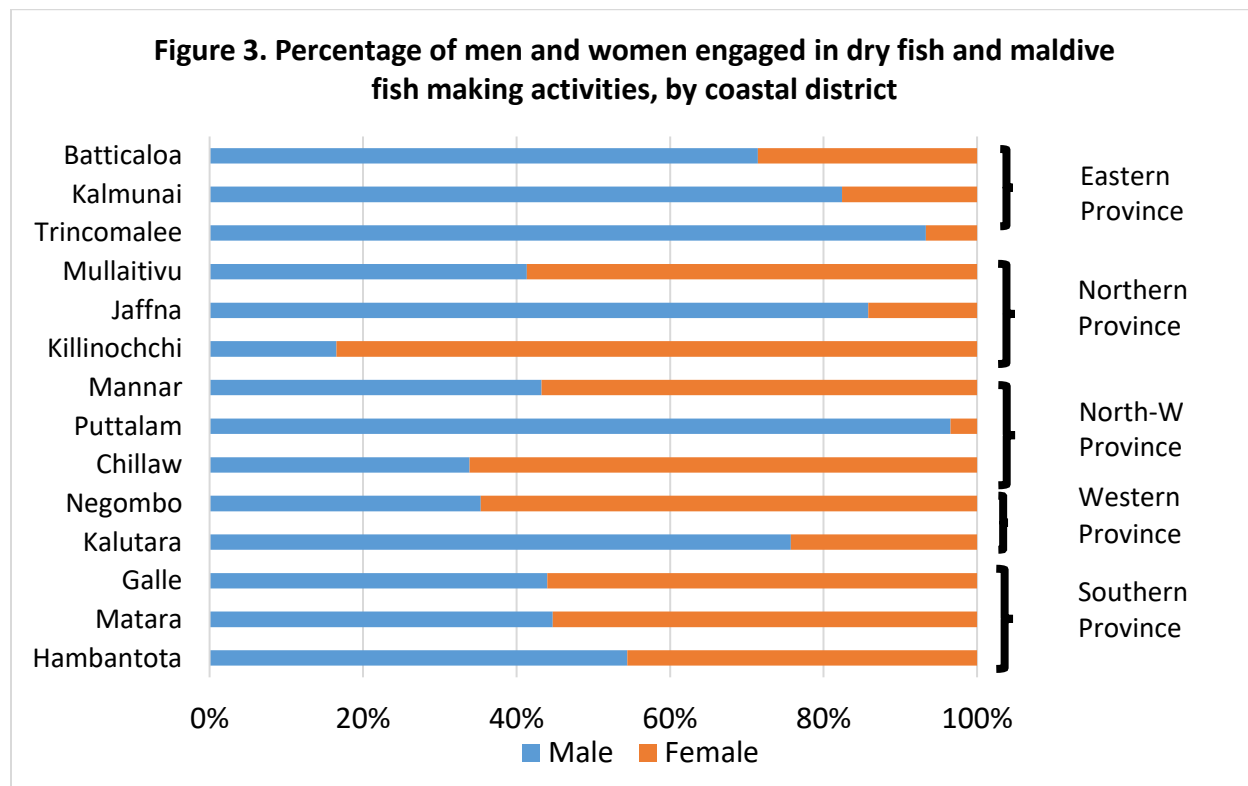
	District	Dried Fish Production			Maldive fish Production		
		No. of men involved	No. of women involved	Male: Female ratio	No. of men involved	No. of women involved	Male: Female ratio
<b>Southern Province</b>	Galle	22	28	1:1	7	13	1:2
	Matara	280	346	1:1	277	383	1:1
	Hambantota	490	410	1:1	433	433	1:1
<b>Western Province</b>	Negombo	1193	2182	1:2	DNA	DNA	
	Kalutara	78	25	3:1	6	12	1:2
<b>Northern Province</b>	Jaffna	8995	1486	6:1	DNA	DNA	
	Mannar	225	295	1:1	DNA	DNA	
	Killinochchi	38	192	1:5	DNA	DNA	
	Mullaitivu	1180	1675	1:1	DNA	DNA	
<b>North-Western Province</b>	Puttalam	12,256	437	28:1	4	18	1:4
	Chillaw	285	556	1:2	DNA	DNA	
<b>Eastern Province</b>	Batticaloa	100	40	2:1	25	10	2:1
	Kalmunai	117	25	5:1	11	3	4:1
	Trincomalee	280	20	14:1	4	DNA	

With the entry of business interests into fish processing, dried fish and maldive fish making, which remained a domestic activity is now gradually getting concentrated in the hands of an investing class. Small and medium scale industries are now found in many parts of the country. This does not mean that there were no commercial ventures earlier. For example, in Kalpitiya of Puttalam District and Kiniya of Puttalam District, commercial production of dried fish has a long history. But, such ventures in the southern province (ex. Kudawella of Hambantota District) are quite recent. Along with the entry of business ventures a shift from labour use, from female to male labour is evident.

Figure 3 shows the proportion of male and female labour in dried fish production in all coastal districts.

Female labour is still dominant in the southern province due to the fact that the province's dominant mode production is household-based. This form of production is also dominant in Negombo of the Western Province, with female employment exceeding male employment. The same is true for both districts of the North Western Province and Killinochchi and Mullaitivu of the Northern Province. Fish processing is carried out at a commercial scale mainly in the Puttalam and Trincomalee Districts,

where employment is extremely biased towards male labour. The shift in gender in the processing industry has several implications for women empowerment and wellbeing of small scale fishing communities. The shift of dried fish making from a household activity carried out by women towards commercial enterprises aiming at profits, means a loss of female employment, especially in predominantly Buddhist communities where women do not get involved in fishing and beach based activities, and loss of supplementary incomes for low income families, threatening their wellbeing.



### 3. Fish drying technology

Only sun drying is practiced in all districts of the country, although the use of dryers by few individuals has been reported. This is quite surprising because dryers have been developed by various organisations and distributed among communities in the past. The reasons could be either the high initial cost of adoption, high cost of maintenance or just inefficiency of the drying technology.

As revealed by information furnished in table 21, none of the districts had reported that sun drying was 'bad'. As reported by many districts, sun drying was considered as a 'good' method of drying fish. However, it should be noted that these assessments are made from the point of view of Assistant Directors of Fisheries.

**Table 21. Assessment of Sun Drying as a method of drying fish**

	District	Method/s use for fish drying	Assessment on the efficiency of the method/s				
			Very good	Good	Neutral	Bad	Very bad
<b>Southern Province</b>	Galle	Sun drying					
	Matara	Sun drying					
	Hambantota	Sun drying					
<b>Western Province</b>	Negombo	DNA					
	Kalutara	DNA					
<b>Northern Province</b>	Jaffna	DNA					
	Mannar	Sun drying					
	Killinochchi	Sun drying					
	Mullaitivu	Sun drying					
<b>North-Western Province</b>	Puttalam	Sun drying					
	Chillaw	Sun drying					
<b>Eastern Province</b>	Batticaloa	Sun drying					
	Kalmunai	Sun drying					
		Smoking					
	Trincomalee	Sun drying					

#### 4. Marketing of dried fish

About 75 percent of the dried fish products are sold to wholesalers and the rest to retailers. In case of household production of dry fish the merchants visit the producing households. This is generally true with southern communities where the majority of dry fish production rests with women fisherfolk. The large scale producers have their own wholesale buyers with whom they have diverse arrangements. Marketing does not take the form of auctions. This is the case areas such as Negombo, Kalpitiya, Kniniya, etc. Due to the poor quality of products and the absence of competition among merchants, the bargaining power of small scale producers vis-à-vis merchants is rather weak, and they often complain that they do not receive a fair price. On the part of the merchants, who enjoy oligopsonistic buying powers, are able to collude and decide on buying prices more favourable to them (Amarasinghe 2020).

Information provided in table 22 show the movement of dried fish, from producing areas to the consumption areas of the country.

**Table 22. Marketing of dried fish (wholesaling)**

	<b>District</b>	<b>No. of wholesale centers</b>	<b>Major destinations of dried fish produced in the district</b>
<b>Southern Province</b>	Matara	DNA	Kandy, Colombo, Kurunegala, Hambantota, Ampara, Kalmunai, Trincomalee, Monaragala, Badulla
	Galle	DNA	DNA
	Hambantota	20	DNA
<b>Western Province</b>	Negombo	14	DNA
	Kalutara	06	DNA
<b>Northern Province</b>	Jaffna	DNA	<i>None*</i>
	Mannar	131	Kandy, Colombo, Kurunegala, Anuradhapura, Batticaloa, Killinochchi
	Killinochchi	23	
	Mullaitivu	DNA	Kandy, Puttalam, Negombo, Vavuniya, Anuradhapura
<b>North-Western Province</b>	Puttalam	39	Kandy, Colombo, Gampaha, Anuradhapura
	Chillaw	23	Kandy, Colombo, Kurunegala, Gampaha, Puttalam, Galle
<b>Eastern Province</b>	Batticaloa	18	Kandy, Colombo, Polonnaruwa, Ampara, Kinniya
	Kalmunai+	11	Kandy, Colombo, Kurunegala, Kalutara, Monaragala, Badulla
	Trincomalee	5	Kandy, Colombo, Kurunegala, Polonnaruwa, Nuwara-Eliya

*\* Production is insufficient for trade outside the district*

It is interesting note that almost all producing areas send dried fish to Colombo, Kandy and Kurunegala, and to Anuradhapura to a lesser extent, all of which appear to be the largest dried fish consuming areas.

It is also of interest to note that, some producing areas send dried fish to other producing areas, which could probably be attributed to differences in the type of dried fish produced or, the larger producers sending suppliers to smaller producers (see table 23).

**Table 23. Movement of dried fish, among producing areas**

<b>Province</b>	<b>District</b>	<b>Major destinations which are dried fish producing districts</b>
<b>Southern Province</b>	Matara	Hambantota, Kalmunai, Trincomalee,
	Galle	DNA
	Hambantota	DNA
<b>Western Province</b>	Negombo	DNA
	Kalutara	DNA
<b>Northern Province</b>	Jaffna	
	Mannar	Batticaloa, Killinochchi
	Killinoch+chi	
	Mullaitivu	Puttalam, Negombo,
<b>North-Western Province</b>	Puttalam	
	Chillaw	Puttalam, Galle
<b>Eastern Province</b>	Batticaloa	Trincomalee
	Kalmunai	
	Trincomalee	Negombo

#### **5. Status of dried fish market in the Districts**

In general, both the competition among middlemen and the producer prices are considered as either good or neutral (table 24). However, these results, reported by the ADs are highly subjective, and needless to say that the best assessment of both these variables can only be made by the dried fish producers. Yet, the assessment of both market competition and prices as 'neutral' also shows the imperfections in information available to the ADs to make such an assessment.

**Table 24. Middlemen competition and prices in the dried fish marketing**

Status of dried fish market in the Districts											
	District++	Competition in Fish Buying					Producer Price				
		Very Good	Good	Neutral	Bad	Very bad	Very Good	Good	Neutral	Bad	Very bad
<b>Southern Province</b>	Galle										
	Matara										
	Hambantota										9Ta
<b>Western Province</b>	Negombo										
	Kalutara										
<b>Northern Province</b>	Jaffna										
	Mannar										
	Killinochchi										
	Mullaitivu										
<b>North-Western Province</b>	Puttalam										
	Chillaw										
<b>Eastern Province</b>	Batticaloa										
	Kalmunai										
	Trincomalee										

## 6. Community organisations related to dried fish sector

Very little information is available with the Ads, in respect of the number of organisations that are operative in dried fish producing districts. Apart from Matara reporting 21 community organisations, Mannar 6, Mullaitivu 5, Puttalam 111, Batticaloa 2 and Trincomalee 5, no information has been reported from other districts. The total number of such organisations (reported) is around 150 with a membership of 8,464. DNA in table 25 could be a reflection of absence of data or absence of organisations.



**Table 25. Community organization related to dried fish, by coastal district**

	<b>District</b>	<b>Number of community organisations related to dried fish industry</b>	<b>Number of members</b>
<b>Southern Province</b>	Matara	21	503
	Galle	DNA	DNA
	Hambantota	DNA	DNA
<b>Western Province</b>	Negombo	DNA	DNA
	Kalutara	DNA	DNA
<b>Northern Province</b>	Jaffna	DNA	DNA
	Mannar	6	470
	Killinochchi	DNA	DNA
	Mullaitivu	5	2560
<b>North-Western Province</b>	Puttalam	111	4490
	Chillaw	DNA	DNA
<b>Eastern Province</b>	Batticaloa	2	65
	Kalmunai	DNA	DNA
	Trincomalee	5	376



## **7. Major issues related to dried fish industry**

The questionnaire sent to ADs also attempted at eliciting information on the various issues associated with the dried fish production. The answer given by ADs to this query is given in table 26.

**Table 26. Issues related to dried fish production**

Major issues	Southern Province			Western Province		Northern Province			North Western Province			Eastern Province		
	Matara	Galle	Hambantota	Negombo	Kalutara	Jaffna	Mannar	Killinochchi	Mullaitivu	Puttalam	Chillaw	Batticaloa	Kalmunai	Trincomalee
Lack of space for fish drying	√								√		√			√
Difficulty of sun drying during the rainy days	√	√					√		√				√	√
High cost of salt							√							√
Animal attacks (flies, insects, birds)							√							√
Lack of capital/financial facilities	√													√
Absence of specific place for waste disposal											√			√
Difficulty of getting clean water for processing activities							√							
Middleman/broker problem	√					√								
Lack of awareness on new technologies of fish processing		√						√	√			√	√	
Low consumer demand due to poor quality of the product		√				√		√						
Inability to get fish for processing throughout the year	√									√				
Lack of proper training facilities on processing	√													
Absence of modern equipment for processing activities	√							√					√	
Higher demand for fresh fish and difficulty to find fish for dried fish making								√		√			√	
Poor transport facilities	√													

Poor storage facilities	√													
Absence of stable market and a stable price for the products	√								√		√	√	√	
Poor government assistance												√		

	At least 4 districts reporting the issue
	At least 3 districts reporting the issue

Lack of space for fish drying, impossibility of drying fish during rainy season, lack of awareness of new technology for dried fish making and absence of a stable market with stable price, have been reported by 4 or more than 4 districts. About 3 districts have reported, low consumer demand due to poor quality of the product, absence of modern equipment for processing activities and Higher demand for fresh fish and difficulty to find fish for dried fish making as their major issues in the dried fish trade.

Suggestions proposed by ADs in resolving the above issues are given in table 27.

**Table 27. Solutions suggested by ADs to overcome issues related to dried fish production**

Solutions suggested	Southern Province			Western Province		Northern Province				North Western Province		Eastern Province		
	Matarā	Galle	Hambantota	Negombo	Kalutara	Jaffna	Mannar	Killinochchi	Mullaitivu	Puttalam	Chillaw	Batticaloa	Kalmunai	Trincomalee
Introduce new processing technologies instead of conventional methods	√						√	√	√	√		√	√	√
Conduct awareness building and capacity building programmes for processors	√	√						√			√	√	√	√
Provide training and practical knowledge on fish processing	√	√								√				



Ads of at least 3 districts were of the view that the following are important in resolving issues related to dried fish production.

- i. Provide training and practical knowledge on fish processing
- ii. Introduce suitable methods for waste disposal
- iii. Allocate suitable space for fish drying
- iv. Introduction of new methodologies/techniques to enhance the quality of the products
- v. Provide financial facilities to the processors

## **8. Summary - Key Zones of Dried Fish Production**

Map 1 gives the summary of findings of Key Dried Fish Zone identification exercise. The zones are divide into three, based on the quantity of dried fish production annually: 100 – 500 MT; 500 – 1000 MT and >1000 MT. Most of the producing zones are concentrated in the Northern and North-Western Provinces. While high production niches are found in the Trincomalle, Kalutara and Matara District.

The major deficiency in the study is lack of information on the scale of production, because household production of dried, which has a strong gender dimension, were not given in district reports. None of the districts of the Eastern Province has recorded a sizeable production of dried fish.

Map 1. Dried Fish Producing Zones in Sri Lanka

