# Ecological and Energy Foot Print of Fish Processing in the Southern Coast of Sri Lanka

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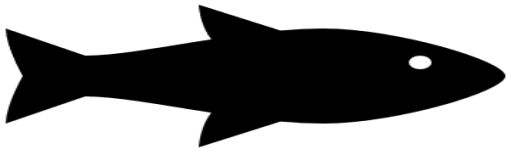


# Introduction

# Research Problem

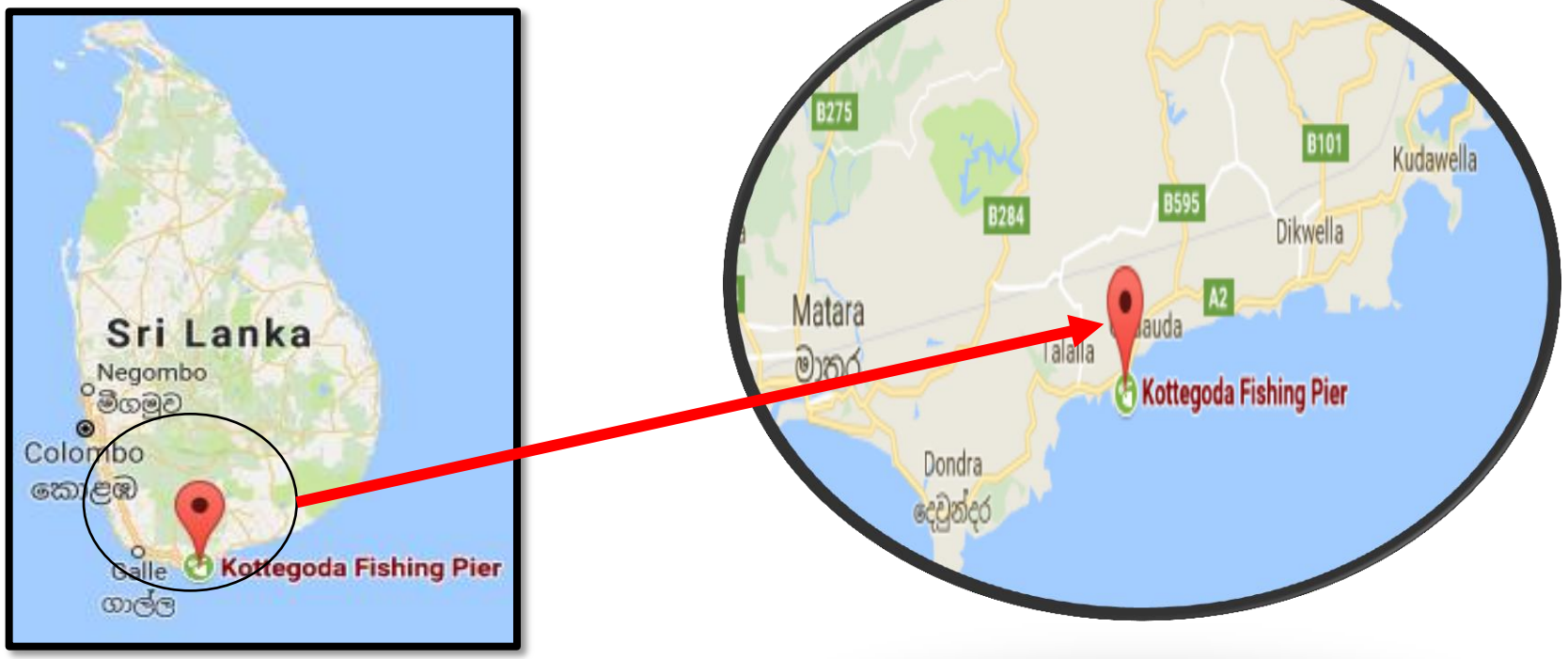
- The fisheries sector faces the challenge of determining effective management, in an ecosystem perspective in order to mitigate the Global Warming Potential (GWP).

# Research Objectives

- The main focus of the study was to analyze the **resource utilization** in the value chain of **Maldives fish processing** and the **environmental performances of the steps involved.**

# Research Method

- The sample composed of 30 Maldive fish processors of Kottegoda fishing community of the southern coast of Sri Lanka.



# Fishing to port

| Fishing Operations | |
|---|---|
| Boat Type | |
| According to the horse power of the engine | ➢Wallam boats(20 Hp)<br>➢Multi-days boats<br>➢Fisher-glass boats(25hp) |
| According to the length | ➢40 feet boats<br>➢45 feet boats<br>➢30 feet boats<br>➢38 feet boats<br>➢28 feet boats |
| Length of operation | 20 days(min 1 week to max 2 months) |
| Average crew size | 5-6 fishermen |

# Fishing to port

Amount of fish traded from one trip:
38'size boat:**12,000-14,000kg**
Small boat:**7000-8000kg**
Other large boats-Maximum upto **25,000kg**

Post Harvest Loss of Tuna Fish:
**1000kg** of raw fish leads for **300kg** of post harvest loss of fish due to inadequate amount of ice.

# Fishing to port

**Emission=$\Sigma_a[Fuel_a . EF_a]$**

**$Fuel_{a=}$Fuel sold(TJ)**

**$EF_a$=Emission Factor(74,100kg/TJ)**

- **1 litre of diesel emits 2.68kg of $CO_2$**
- **Volume of diesel for one trip of a multiday boat:6000 litres**
- **16.08MT $CO_2$ e/trip**

# Port to the processing units


$$\text{Emission} = \Sigma_a [\text{Fuel}_a . \text{EF}_a]$$

$\text{Fuel}_a$=Fuel sold(TJ)

$\text{EF}_a$=Emission Factor(74,100kg/TJ)

- 1 litre of diesel emits 2.68kg of $CO_2$
- To transport 1000kg of raw fish needed to process Maldives Fish from port to the processing unit(10.2 km):6.58 litres
- For a month there are 4 trips from port to the processing unit.
- 0.0705MT $CO_2$ e/Month

# Processing of Maldive Fish

Raw Fish

**5kg**

Firewood

**4kg**


Salt

**0.2 kg**

Water

**2.5-3 liters**

**1 Kg of Maldives Fish**

Other primary solid biomass: **11TJ/Gg**

**=4.4MT $CO_{2\,e}$ per MT of Maldive Fish**

# Conclusion

- The study revealed that **5 kg** of raw fish were required to produce **1 kg** of Maldives Fish out of which **3kg** is dumped as waste.
- The waste produced were dumped into the sea
- Energy source used for processing was combustion of coconut husks and the requirement per one kg of Maldives fish was **4kg of coconut husks**.
- **4.4MT $CO_{2\,e}$ per MT of Maldive Fish**.

# Conclusion

- The fishing operation at the sea estimated 6000 liters of diesel which thereby contributed for a value of **16.08MT $CO_2$ e/trip**
- The transportation of raw fish from offshores to the point of processing estimated a value of **0.0705MT $CO_2$ e/Month**
- The estimated water requirement of processing Maldive fish ranges from 2.5-3 litres/kg of Maldive fish.
- The study revealed that Diesel was one of the major contributor of Carbon-dioxide in the Maldive fish value chain.
- Proper Post Harvest Management practices will thereby help to mitigate the GWP.

# Recommendations

- Area based markets to minimize the transportation distance
- Use of fish waste in the production of animal feed and compost
- Introduce environmental friendly efficient processing and drying methods such as capitalizing the solar energy.

# References


- IPCC,2018,*Task force on National Greenhouse Gas Inventories :2006 IPCC Guidelines for National Greenhouse Gas Inventories,* IPCC , *viewed 15 January 2018,<* https://www.ipcc-nggip.iges. or.jp/public /2006gl/>