A socio-ecological approach for managing a small-pelagic fishery: the case of sardine (*Pilchardus*) in France

MSEAS, Yokohama, June 2024

umr-amure.fr
@umramure

UBO
Université de Bretagne Occidentale

Ifremer

cnrs

DAURES Fabienne (fdaures@ifremer.fr)
ALBAN Frédérique
LE GRAND Christelle, MERZEREAUD Mathieu
HURET Martin, LEHUTA Sigrid
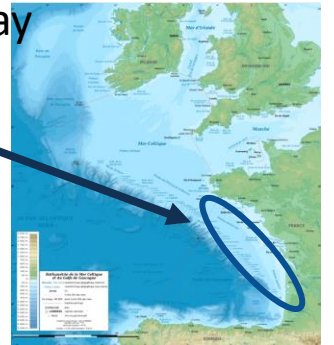**TRAORE Ahmadou, HERVE Hugo**

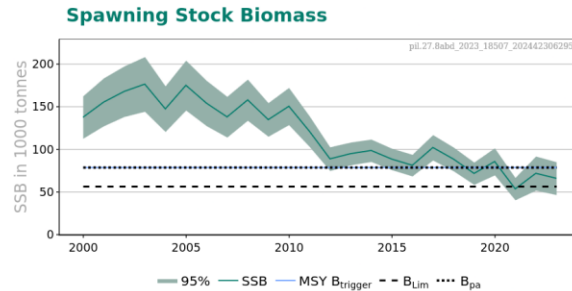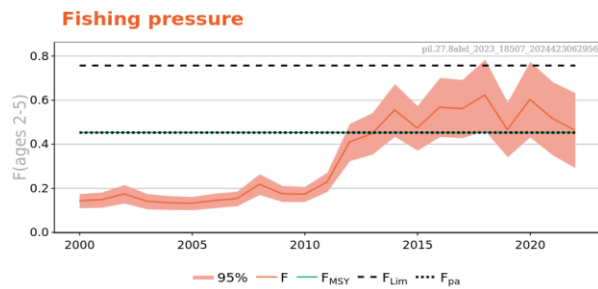# The context

- Top 10 of French catches (27kt per year, mainly from the BoB) – *SIH, 2021*
- Top 10 of fish consumed in France (3kt fresh and 16kt canned) – *FAM ,2021*

- Since 2019, BoB PIL assessed overfished and depleted (*ICES*)

Bay of Biscay (BoB)

Fishing pressure

Spawning Stock Biomass

No catches limitations, only recommendations!

Finistère – Departmental Archives

- A socio-ecological challenge
  - Strong historical presence of French canneries on the coast (Brittany, Vendée)
  - Diminishing trends in Sardine condition (size and fat) ← ? Climate change impacts ?

2

Objectives

- Implementation of a management system based on Ecosystem Approach Fisheries (EAF)
    - Taking account of the ecosystem dynamics AND human dimensions
    - Avoiding the "false success" of BoB Anchovy moratorium (2005)
    - Avoiding the collapse of fishery (e.g. Gulf of Lions Sardine in 2010)
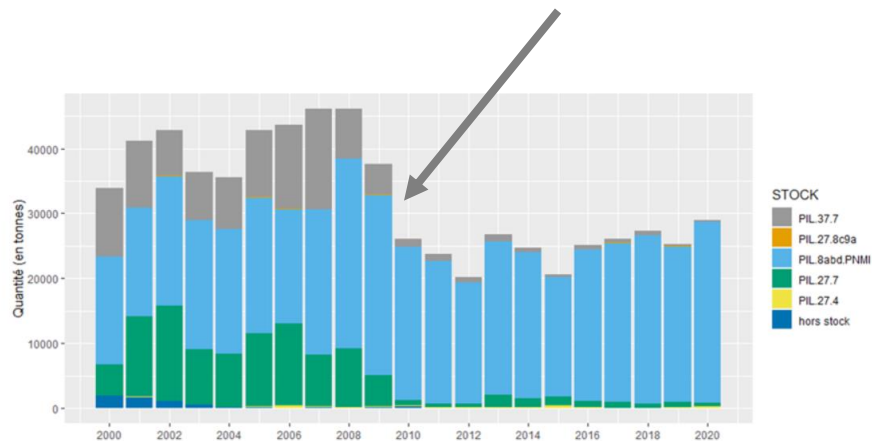
The DEFIPEL Project
Funded by "France Filière Pêche"
Involving 9 partners (including scientists and professionals)

What contribution can a Supply Chain (SC) approach make to fisheries management in the context of climate change? (Khan, 2012; Purcell, 2014; Thuy, 2019...)

Specific objectives   and Methods

❖ Understanding the current organisation and structure of the French sardine supply chain (components, activities, interactions, product flows, prices…) including global trade

❖ Analysing 20 years trends in the French sardine market and supply chain (2001-2021)

❖ Forecasting trends in recent years (alarms)

❖ Exploring the potential impact of different management measures

Mixed method approach for data collection

- Quantitative data (landings, 1st sales, trade, home consumption)

- Qualitative data (semi-structured interviews)

Trend analysis

- Regression models to characterize the dynamics of indicators (linear, segmented linear, GAMs)

- STARS method for detecting regime changes, tipping years and raising alarms for recent years

The French Sardine supply chain in 2021
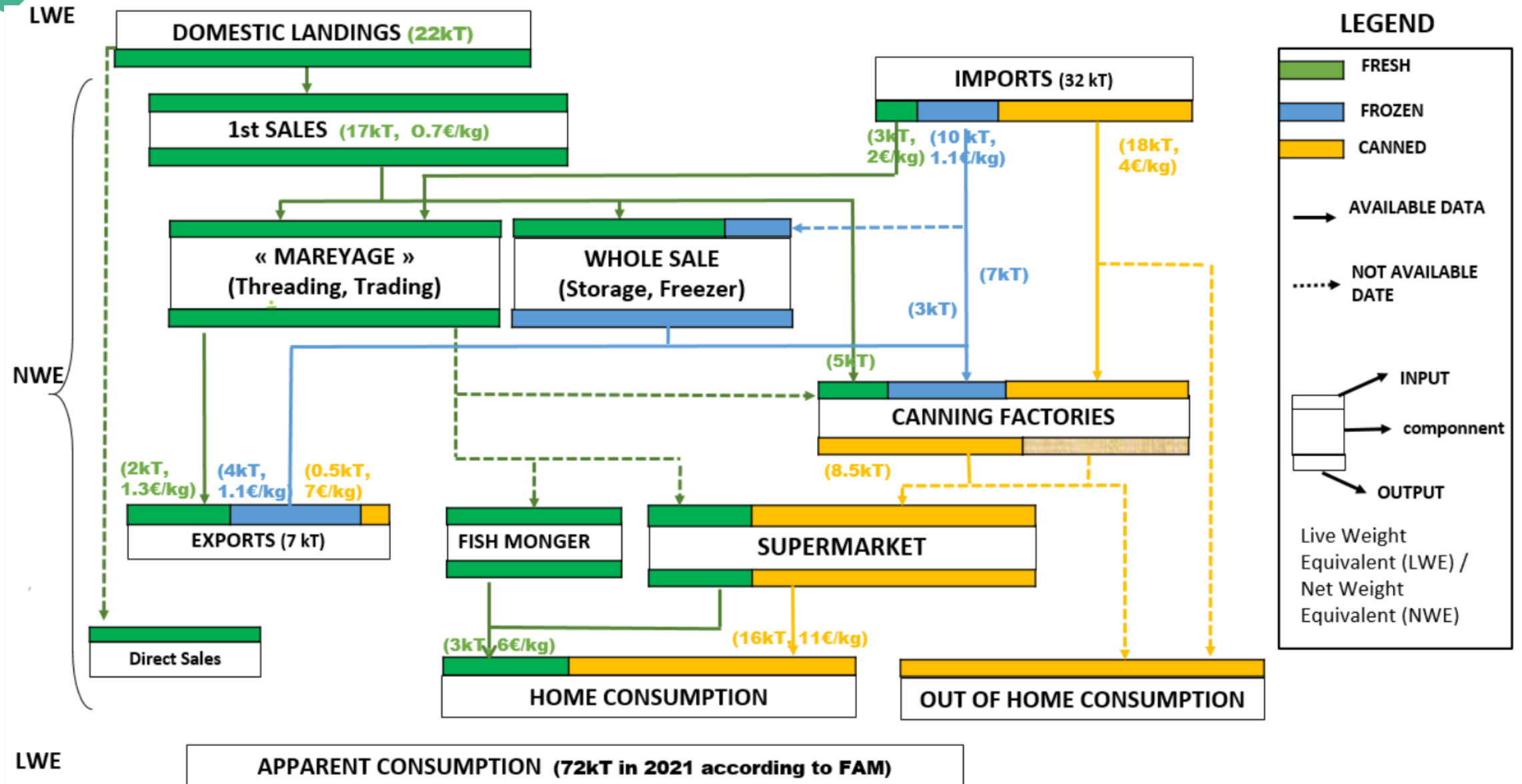
The French Sardine supply chain in 2021

- 3 products circulating within the SC (fresh, frozen and canned sardine)
    → Potentially in competition

- Multiplicity of components grouping together a variety of activities
    → Not only fishers and the "black box" of buyers

- Multiplicity of flows (volumes and prices)
    → Relevance of price transmission and market power analysis
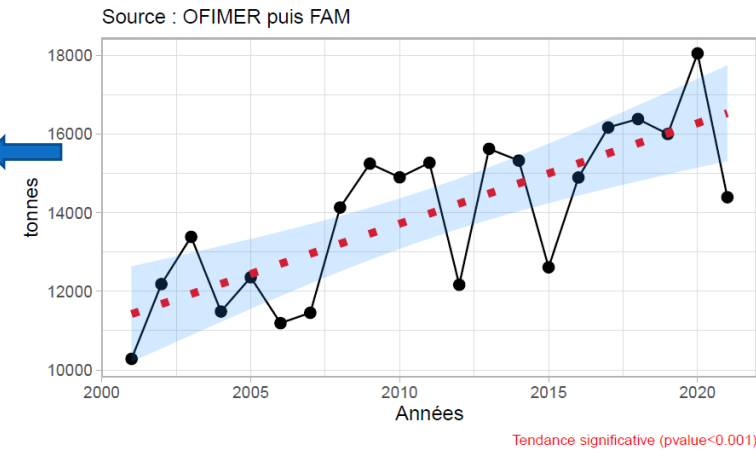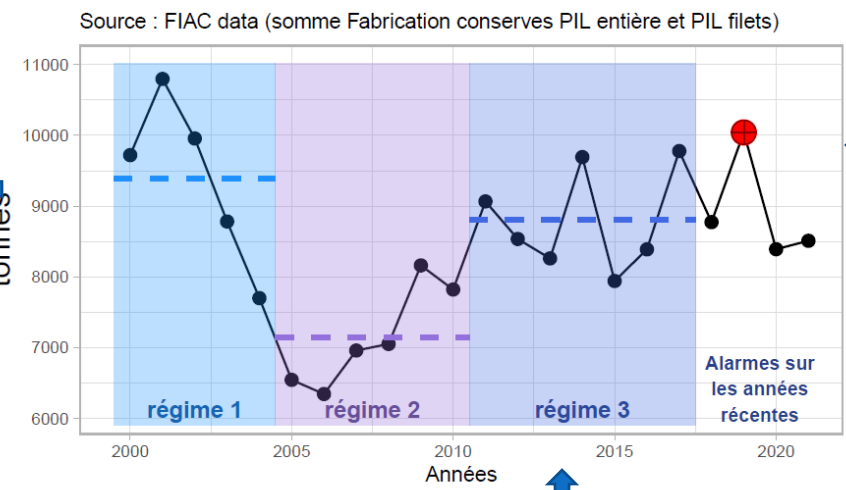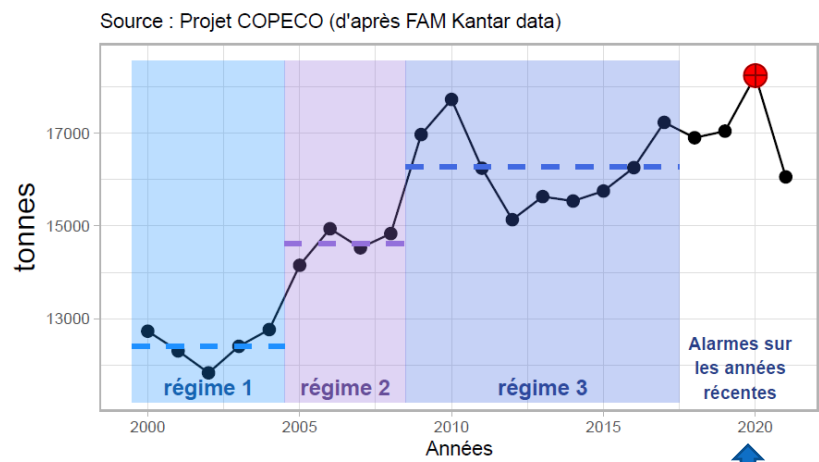
- Issue of data availability
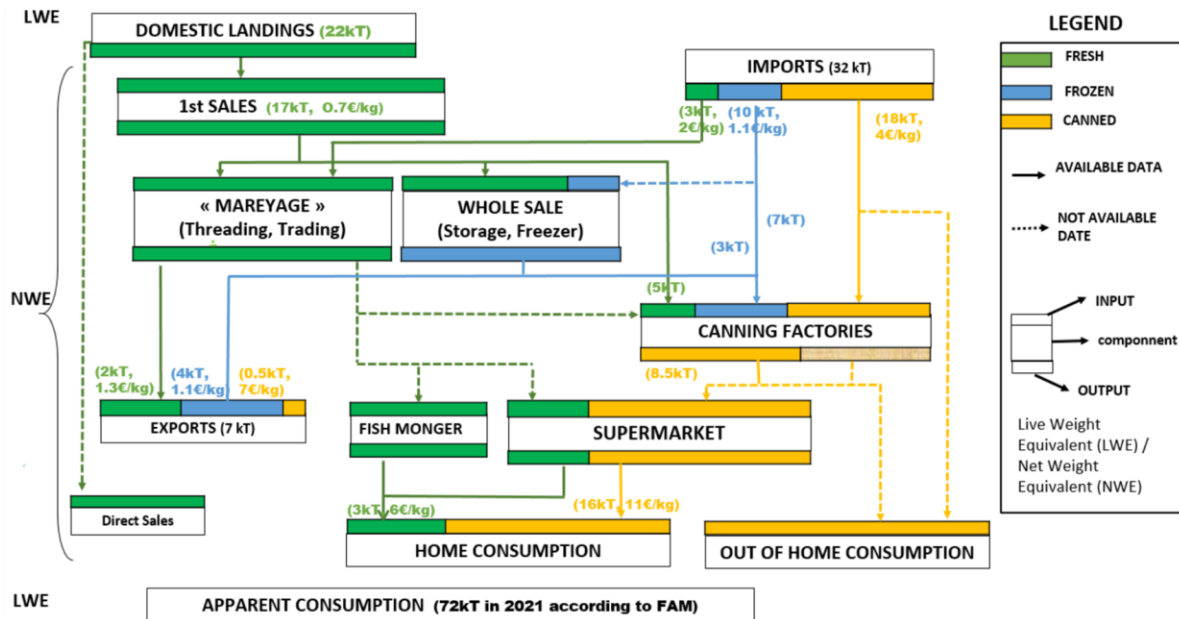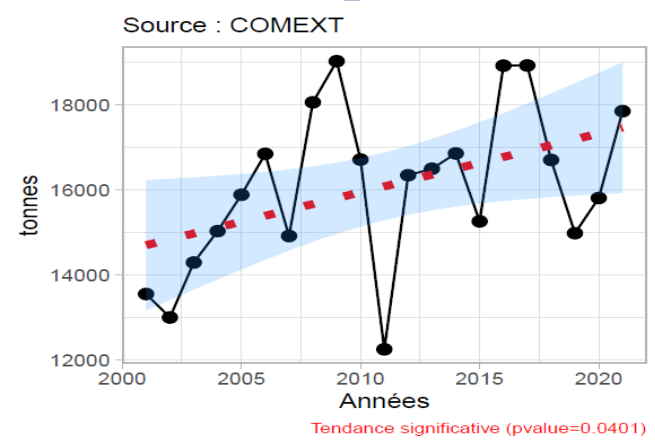
Home consumption is a major driver of the PIL supply chain

Increasing trend of home consumption of canned PIL…

… and domestic production of canned PIL since 2005

… and domestic landings of fresh PIL since 2000

Source : Projet COPECO (d'après FAM Kantar data)

régime 1 | régime 2 | régime 3 | Alarmes sur les années récentes

Source : FIAC data (somme Fabrication conserves PIL entière et PIL filets)

régime 1 | régime 2 | régime 3 | Alarmes sur les années récentes

Source : OFIMER puis FAM

Tendance significative (pvalue<0.001)

… and canned PIL imports

Source : COMEXT

Tendance significative (pvalue=0.0401)

… and frozen PIL imports still high

Source : COMEXT

Tendance Non−significative : pas de modèle retenu pour décrire l'indicateur (pvalue=0.196)
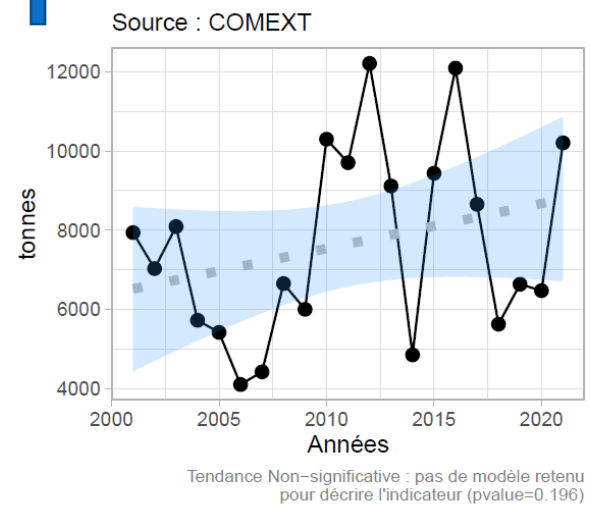
Opposite strategies within the SC

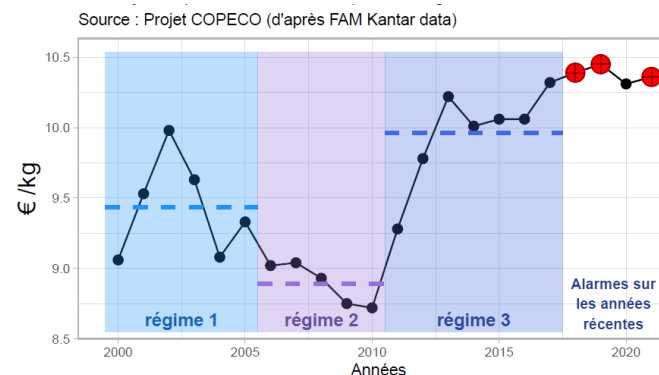- **Diversification of the canning component**
  - Domestic landings : main source for domestic manufactured canned PIL
    - Fresh PIL landings
    - Frozen PIL (Purchase of freezing companies)
  - Frozen imports : back-up
  - Imported canned PIL
    - Development of trading activity
    - International Investment in producing countries (Morocco, Croatia)

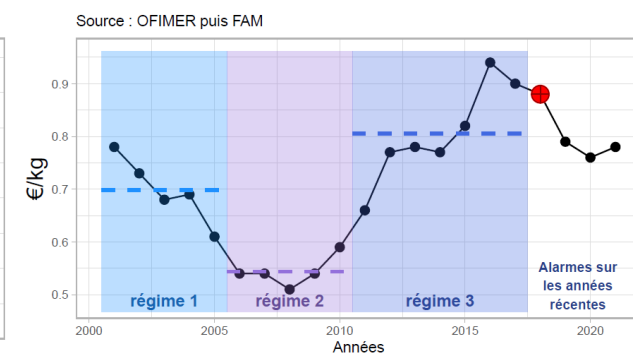- **Specialisation of fishers**

NB : Focus on Brittany Purse seiners (16meters, 70% landings)

  - Increase Economic dependency ~80%
    - All along the year, incl. off-season
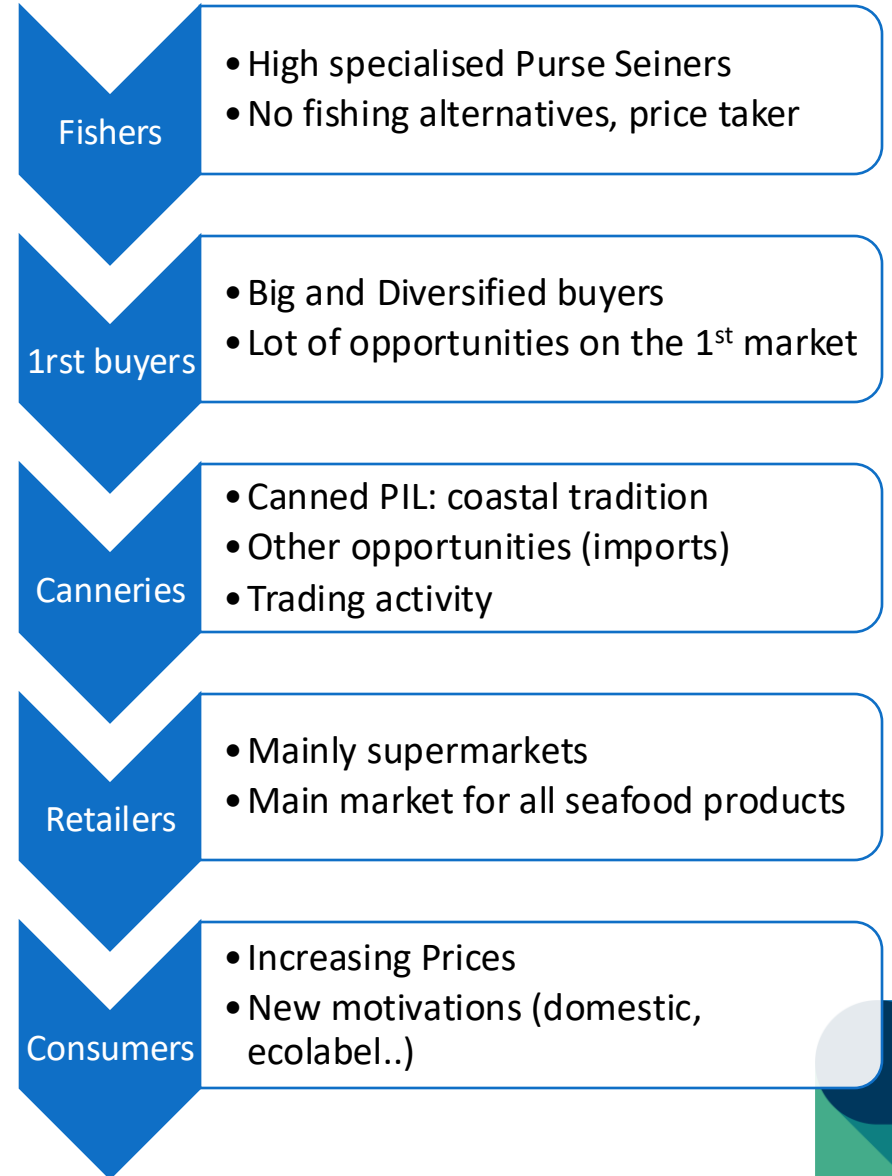   - Degradation of economic performances
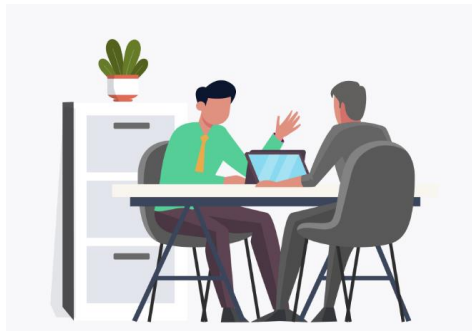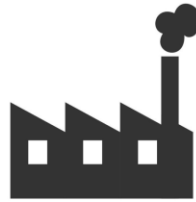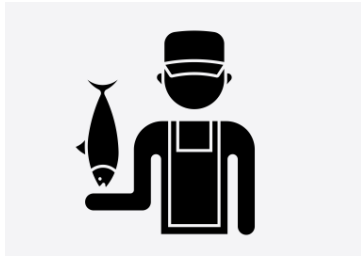
Price of canned PIL (home cons.)

Source : Projet COPECO (d'après FAM Kantar data)

PIL ex-vessel price

Source : OFIMER puis FAM

Sardine SC analysis per component

Fishers
- High specialised Purse Seiners
- No fishing alternatives, price taker

1rst buyers
- Big and Diversified buyers
- Lot of opportunities on the 1st market

Canneries
- Canned PIL: coastal tradition
- Other opportunities (imports)
- Trading activity

Retailers
- Mainly supermarkets
- Main market for all seafood products

Consumers
- Increasing Prices
- New motivations (domestic, ecolabel..)
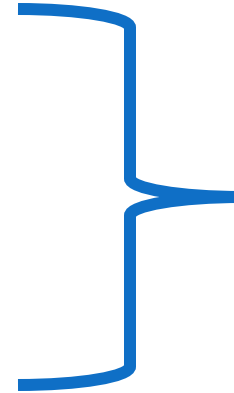
What if? Potential impact of management measures on the sardine SC

Management measures under discussion
- Quotas
- Seasonal closing
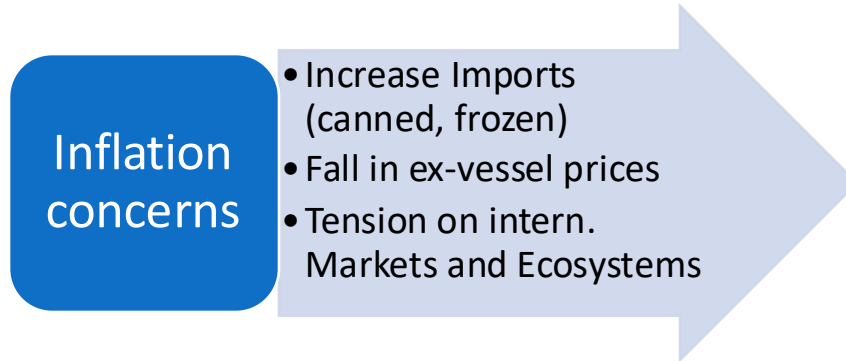- Selectivity
- Label (MSC certification)

Impact analysis

- Per component of the SC

- Based on 20 years trends, recent alarms and SC analysis

Considering

Consumer motivations, international markets and business climate

E.g. Impact Quotas under Consumption scenarios

Inflation concerns

- Increase Imports (canned, frozen)
- Fall in ex-vessel prices
- Tension on intern. Markets and Ecosystems

Fishers
1st buyers
Canning industry
Consumers

Outcomes and conclusion

Main (Economic) Findings

- Consumption is the main driver – However limited knowledge on consumers preferences and motivations

- Historical trajectories are heterogeneous (SC components, firms...)

  → The impact of the measures vary within the SC.

- In addition to conservation measures, common socio-economic objectives need to be defined for the SC as a whole (e.g. maintaining employment in a given area...)

  → Necessary to monitor the SC and to share knowledge acquired within the SC

  → A promising way to increase the SC resilience to Climate Change

| Habitats | Resources | Fisheries | S Chain |

+ PROFESIONNALS
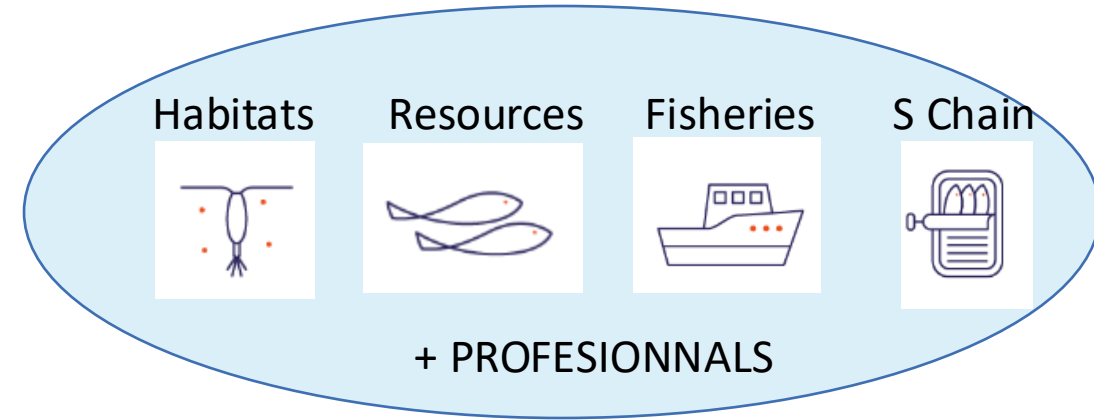
DEFIPEL Integrated Approach

Dashboard (46 indicators)

Dissemination Flyers

Narrative scenarios

Quantitative Simulations (ISIS model)

11

Thanks to

and for your attention

www.umr-amure.fr
@UmrAmure