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The food supply chain in Tuscany. An input-output approach

Sara Turchetti

sara.turchetti@irpet.it

Aims of the study and motivations

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- This study concerns the organization of the supply chain in **Tuscany**.
- Why?
  - **Food value chain disruption** is one of the consequences of the health crises due to the SARS-COV-2 pandemic. According to FAO (2021), the goal of zero hunger by 2030 will be missed by a margin of nearly 660 million;
  - Many institutions urged for a **transformation of the the global food systems**, even beyond the phase of emergency (IFPRI, 2021; Webb et al., 2021; Global Alliance for the Future of Food, 2021; FAO, 2021; FAO, 2020);
  - **UN World Food Summit** in September;
  - **"Farm to Fork"** and **"biodiversity"** strategy.

Aim of the study and motivations

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- As a paradox, the knowledge about :
  - The **structure of the food supply chain** (local and non-local firms involeved, inter-linkages among them, distribution of the value added)
  - Its **resilience**;
  - Its **environmental sustainability**; and
  - The relative relevance of the **alternative agri-food networks and short supply chains** (eg. Networks of consumers directly purchading from producers (so-called GAS), open markets, e-commerce)

…Is still very limited

Some definitions

- **Food system**: range of actors and their interlinked value-adding activities involved in the **production, aggregation, processing, distribution, consumption, and disposal** (loss or waste) of food products that originate from **agriculture (incl. livestock), forestry, fisheries, and food industries**, and the broader economic, societal, and natural environment in which they are embedded.
- A food system is **sustainable** when it "contributs to food security and nutrition for all in a such a way that the economic, social, cultural, and environmental bases to generate food security and nutrition for **future generations** are safeguarded"

(von Braun et al., 2021)

Some definitions

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- The **value/supply chain** "describes the full range of activities that firms and workers perform to bring a product from its conception to end use and beyond. This includes activities such as research and development (R&D), design, production, marketing, distribution and support to the final consumer" (Gereffi and Fernandez-Stark, 2016)
- No official definition of food supply chain but we can consider all the industries involved in supplying food for **human nutrition**;

Food system vs. food supply chain

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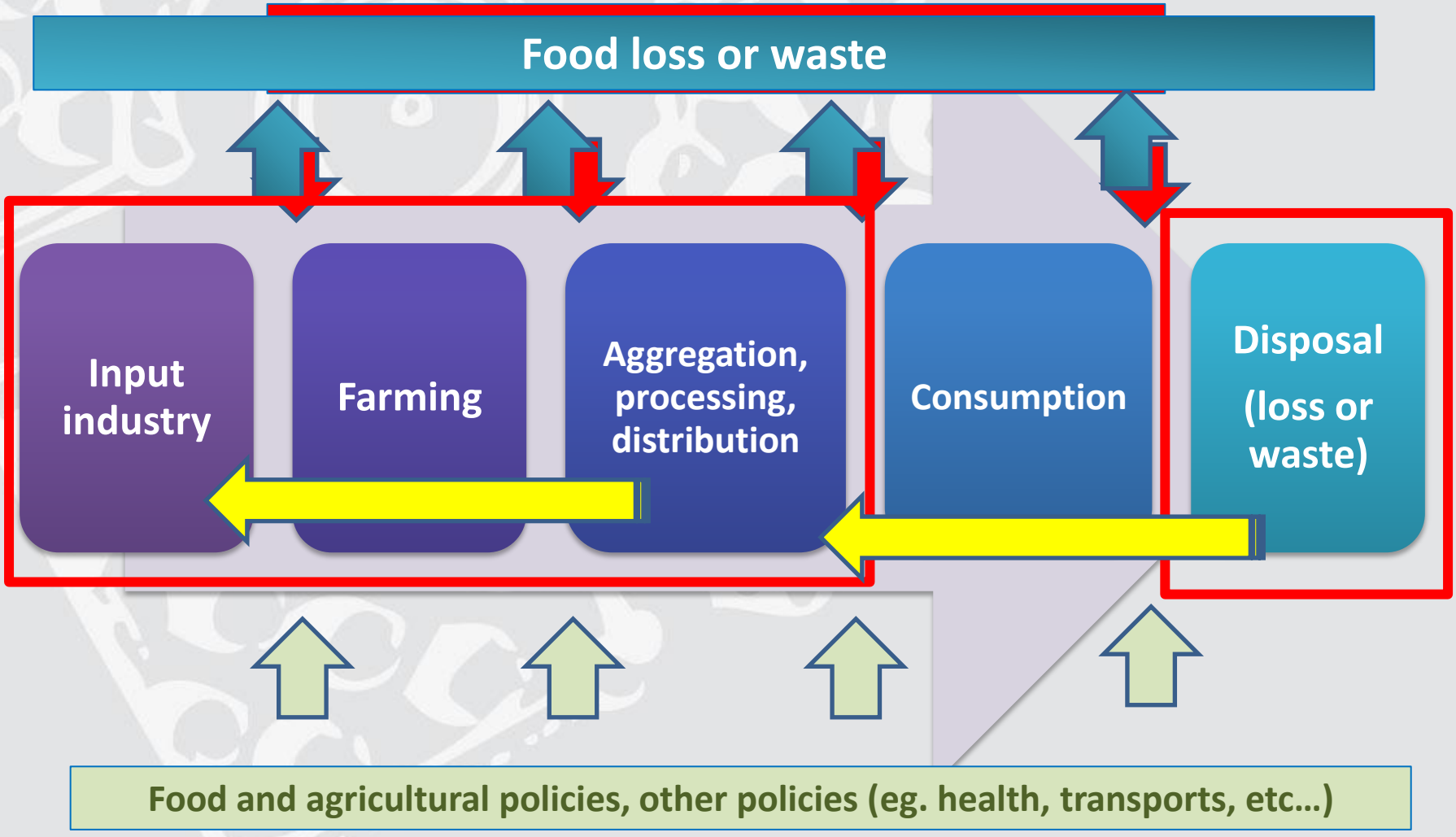
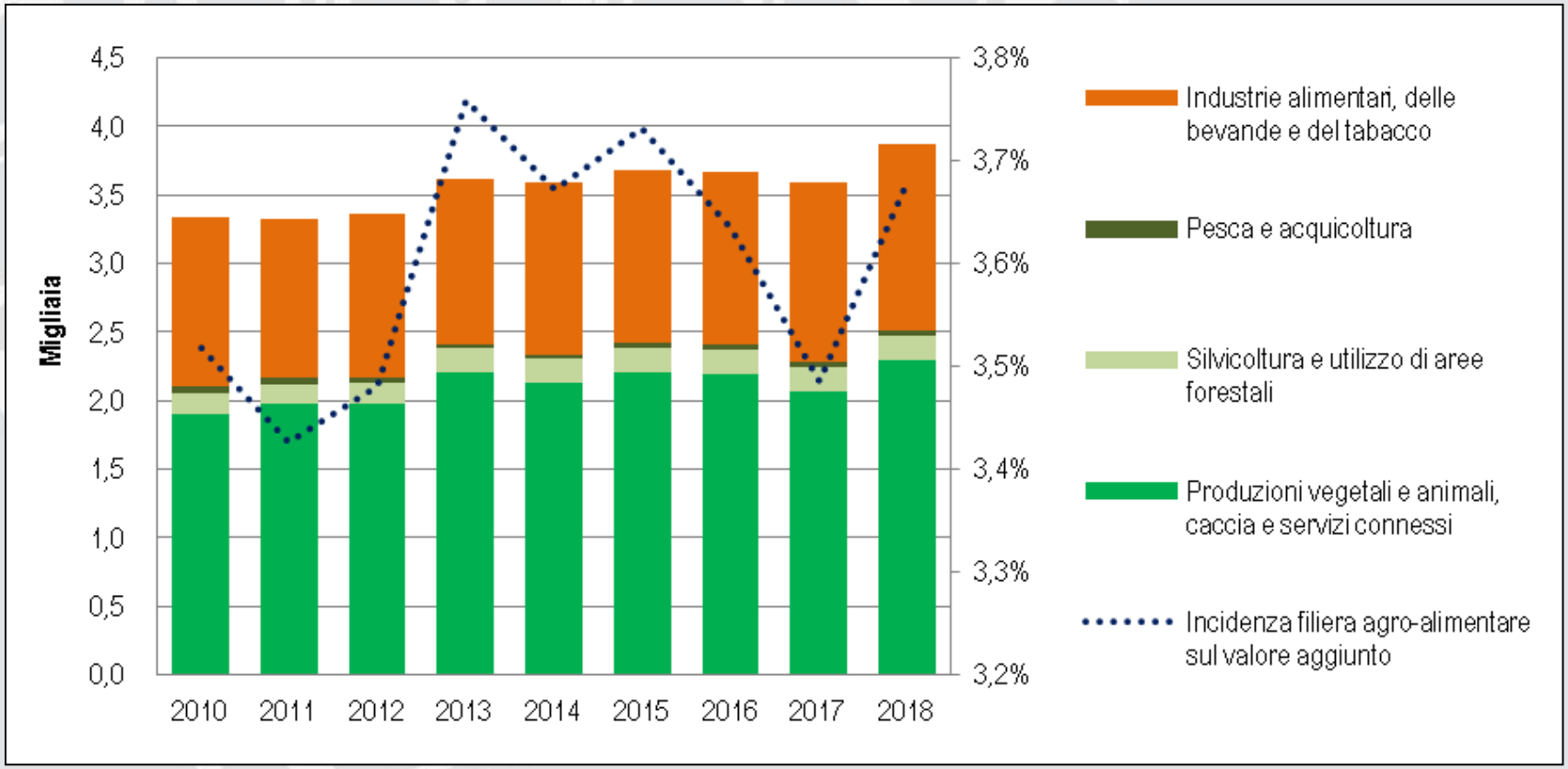


Tuscany supply chain

Composition of the Tuscany food supply chain (left) and contribution to the total value added (right)



Source: Own elaboration based on ISTAT data

Tuscany food system and the crises

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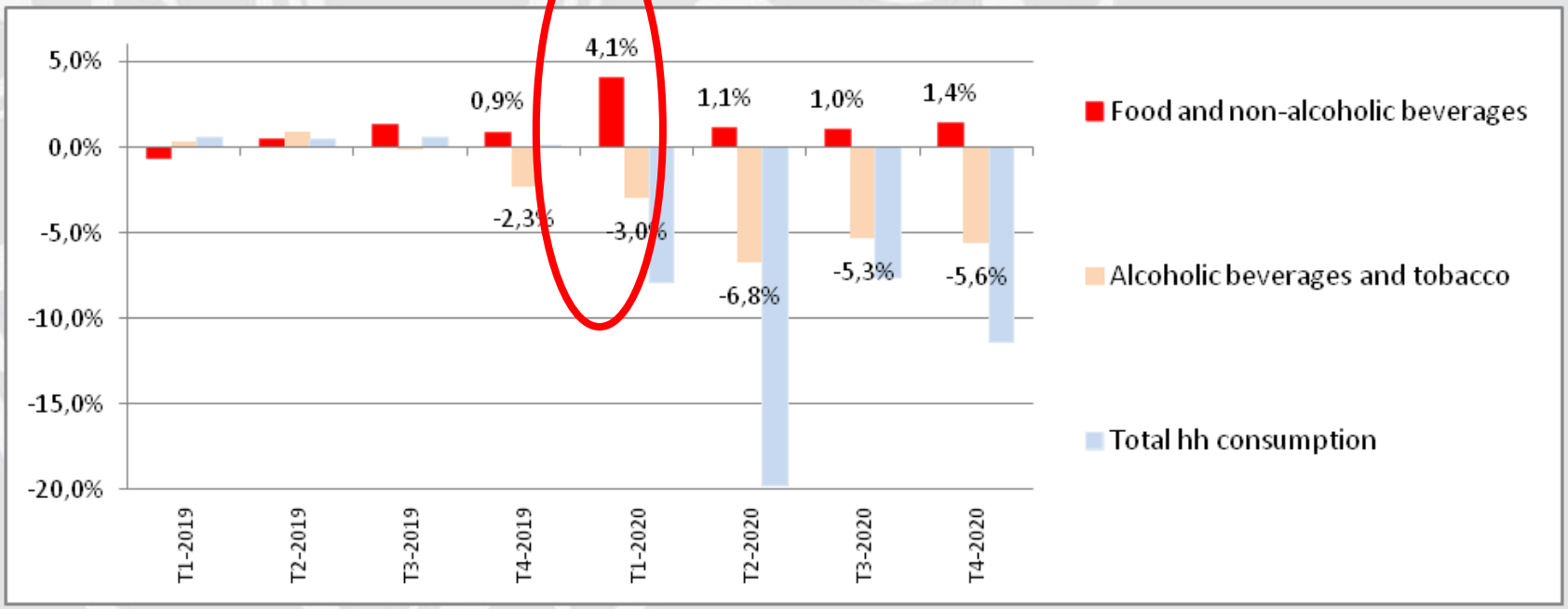
Quarterly variations in household consumption expenditure



Source: Own elaboration based on ISTAT data

Tuscany food system and the crises

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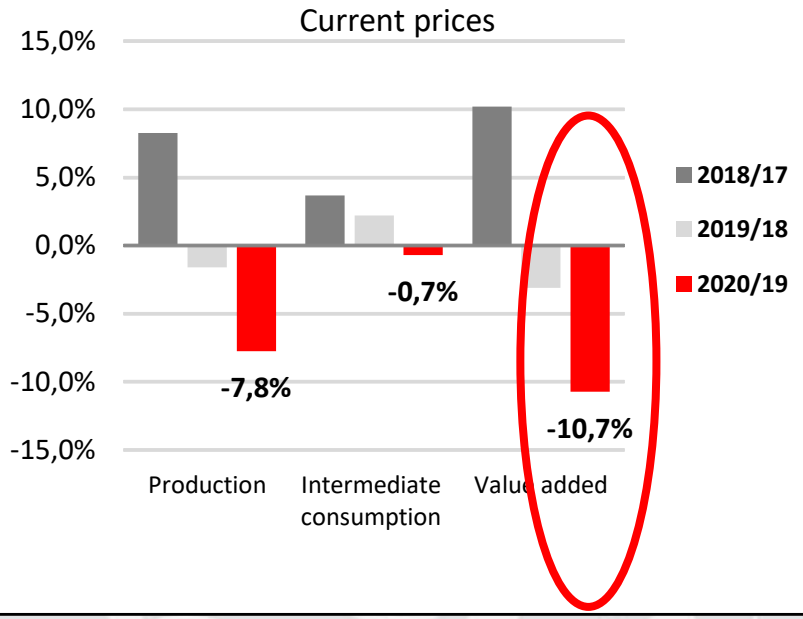
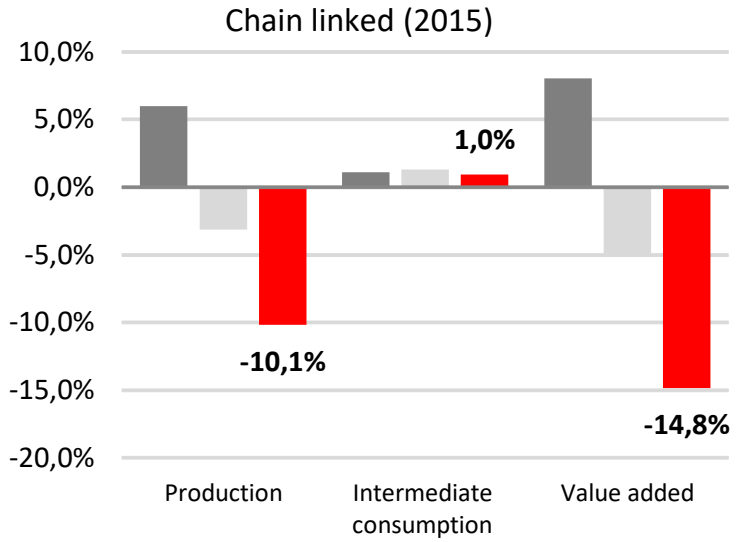
Annual variations in agricultural production, intermediate consumption and value added

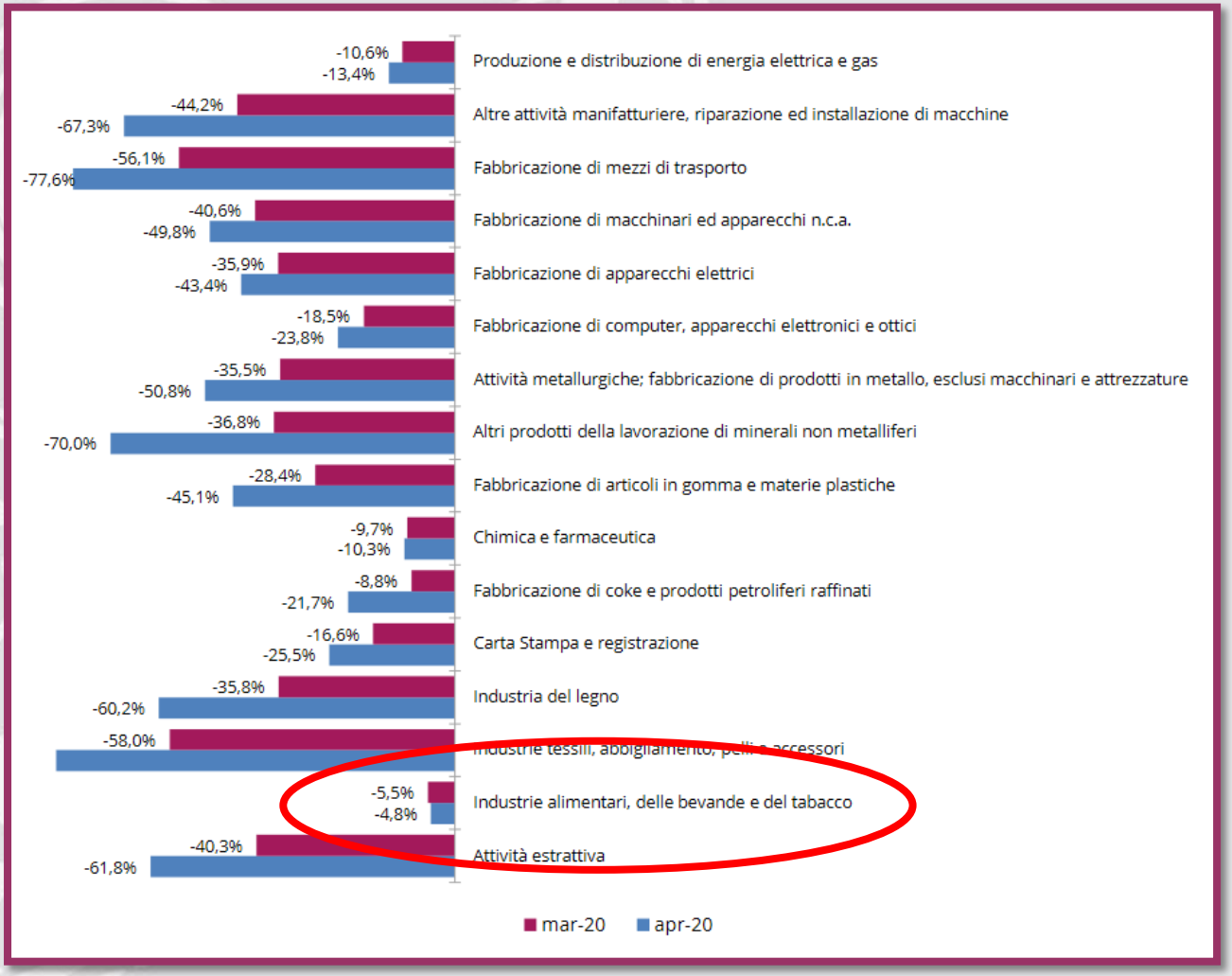




Source: Own elaboration based on ISTAT data

Tuscany food system and the crises

Industrial production index



Source: IRPET (2020). “L’industria toscana secondo l’IPIR”. Barometro del Covid-19. Numero 9/2020.

Farmers' associations driven responses

- According to **CIA (*Confederazione Italiana Agricoltori*)**, during the lockdown the number of farms directly trade their products to consumers increase by 5%;
- In Tuscany, in the Northern area of Firenze, Prato and Pistoia there are 10 open markets involving 100 farms. During the lockdown they have been closed but CIA created a **website for the e-commerce and home delivery**:

  http://www.laspesaincampagna.it/

Methodogy:
the input output approach

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- The main aim of the input-output approach (IOA) is to study the **interdependency of industries** in the economy so as to report the **flows of products from one sector to another**;
- Sectors can be either other industries (economic sectors) or consumers, like households and public administration (institutional sectors).
- We use the IOA in order to : i) explore the main characteristics of the Tuscany food system; ii) decompose the food production by industry; iii) decompose the final demand according to the origin of food; iv) distribution of value added between industries;
- This study uses a **inter-regional IO table (IRPET-ICIO)**, which shows in input (by column), the sector/region contributions of intermediate goods to the generation of production and, in output (by row), the sector/region destination of the obtained production (Ferraresi et al., 2021).

Methodogy:
the input output approach

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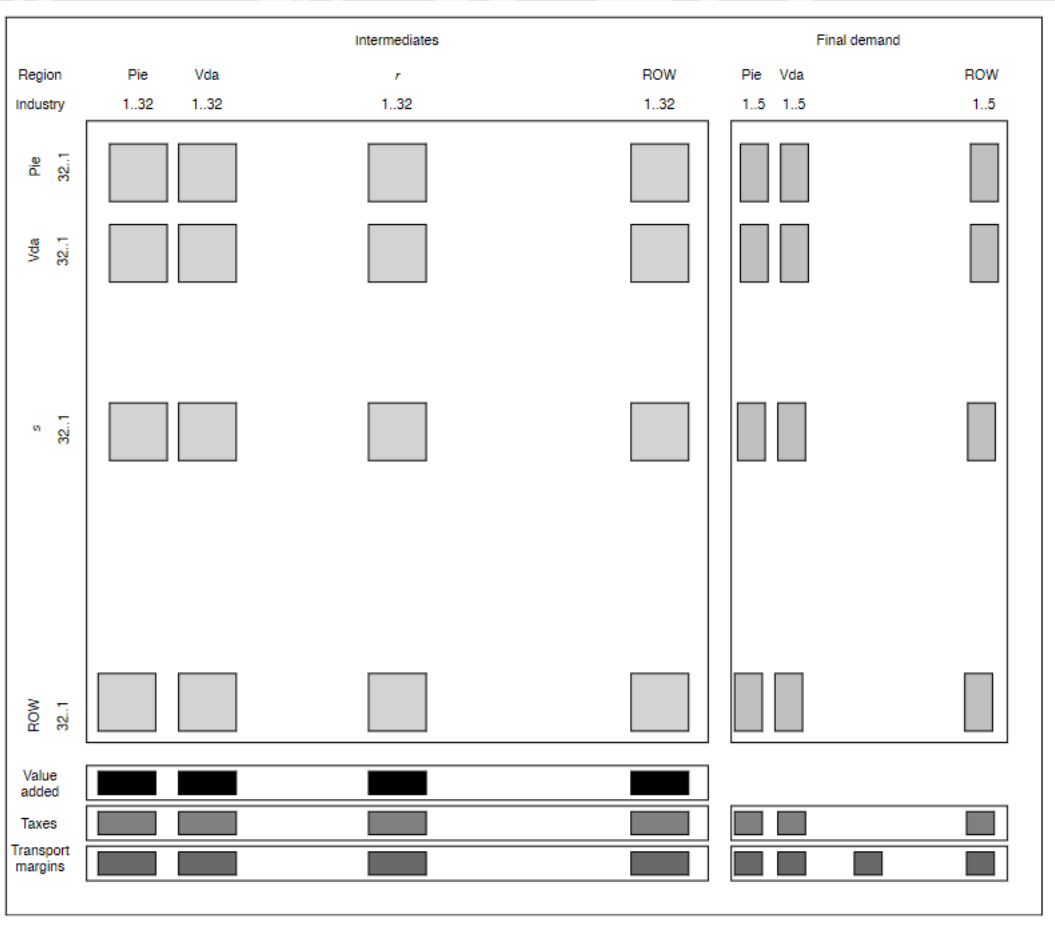
IRPET-ICIO table



Source: Ferraresi et al. (2021)

Primary results from the analysis

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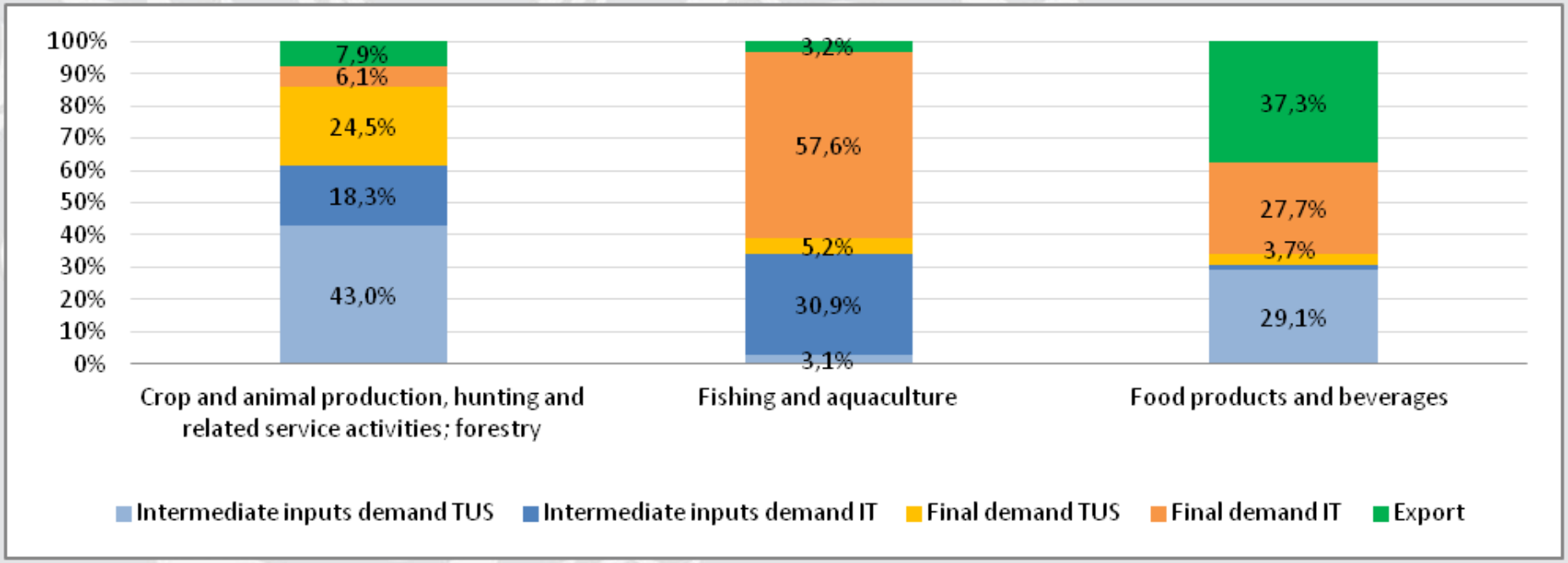
Composition of food production according to the type of industry



Source: Own elaboration based on IRPET-ICIO 2016

Primary results from the analysis

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Composition of final demand according to the origin of the products

	Share of the final demand satisfied by firms of Tuscany (local food system)	Share of the final demand satisfied by firms of other Italian regions	Share of the final demand satisfied by imports	Total
Crop and animal production, hunting and related service activities; forestry	15,1%	7,3%	2,6%	24,9%
Fishing and aquaculture	0,1%	1,0%	1,0%	2,1%
Food and beverage	3,6%	55,1%	14,3%	73,0%
Total	18,7%	63,4%	17,8%	100,0%

Source: Own elaboration based on IRPET-ICIO 2016

Conclusive remarks

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- During the 2020 health crises due to the SARS-COV-2 pandemic the Tuscany food system has been sufficiently resilient and households' consumptions expenditure have been steadily increasing;
- However, Tuscany is structurally much dependent on inflows and imports and its food self-sufficiency is still very limited;
- This is not so weird in a globalised world where no one can be completely food self-sufficient!

Conclusive remarks

- But….
  - Local agriculture is shrinking…..
  - Impact on the environment can be relevant in terms of i)biodiversity (and cultural diversity) loss; ii) emissions released;
  - The longer the supply chain:
    - The worse the position of farmers along the value chain (Pezzoli, 2011; Petriccione et al., 2011).
    - The more the food system is exposed to the risk of disruption and prices increases;
    - The poorer the capacity for local food policy to intervene;
    - eg. According to Rhiney et al. (2020), the pandemic is accentuating decades-old problems in coffee indutries and creating new ones, thus putting at risks exports

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Thank you!