Roles played by services and knowledge’s networks in practices evolutions of dairy supply chain’s stakeholders in Egypt; proposal for a methodological extension of social life cycle assessment framework.

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Plan

1. General Context
2. Egyptian case study
3. Objectives, problematic and hypothesis
4. Material and Methods
5. Results
6. Conclusion and perspectives
Millennium goals set in 2000 to fight poverty and hunger remain incompletely achieved. (UN, 2014)

The ultimate goal for sustainable development is human well-being, contributing to the needs of current and future generations.” (UNEP-SETAC guideline, 2009)

Social dimension remain until now less explored

Need for tools and data taking into account social dimension for decision making!
1. General context: Sustainability in food supply chain

**INCREASING OFFER**

- **Family farming system**
  90% of farming systems in the world; important precarious condition

- Expansion of **agribusiness** companies and corporate agriculture model

- Increasing pressure on natural resources

**INCREASING DEMAND**

- **Food supply chain mutation**

- **World explosion food demand**

- Challenge to supply cities

- Quality concern

- International market

**Adaptation and Innovation mechanisms** in the centre of family farming system ability to sustain in the coming highly pressured context.
2. Egyptian case study: Why Egyptian dairy supply chain as a case study?

**Limited agricultural resources**
Arable land = 40,000 km² (7 times less than France) <4% total country area, No rain → Irrigated agriculture (Nile water)

**Population**
84 millions inhabitants (UN-ESA) (2015)
57% rural population
33% of rural population under poverty level

**Urbanization**
Urban population: 43% of total population
Giant cities
Arable land conversion
National strategy of desert land conversion into agricultural land: 10 000 km² converted in New Reclaimed land

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2012 Revision
2. Egyptian case study: Rapidly evolving Egypt dairy supply chain in 2015

Demographic growth → Consumers

Consumers

Dairy products demand growth and shift

Industrial sector

Dairy agribusiness national and international

Standardized dairy products

Cow milk

Artisanal sector

(Dairy intermediaries, family enterprises...)

Traditional dairy products

Buffalo or cow milk

Family farming system

integrating crops and livestock production

Urbanization

Milk powder import

Corporate dairy farms

Dairy agribusinesses development and marketing

Urbanization

Urbanization

2. Egyptian case study: Rapidly evolving Egypt dairy supply chain in 2015

How to facilitate connection between family farming systems with urban demand moving forward sustainability?
3. Objectives, problematic and hypothesis

Objectives:

1. Describing and understanding artisanal dairy supply chain in a low data availability context.

2. Enhancing the roles artisanal dairy supply chain network as a dense, efficient and dynamic net able to drive significant innovations at local level.

3. Identify the strengths and weaknesses of the artisanal dairy supply chain from a social point of view using social life cycle analysis (S-LCA).

Tools and data taking into account social dimension for decision making!
3. Objectives, problematic and hypothesis

**Problematic**
What roles are played by services and knowledge’s networks in practices evolutions of artisanal dairy supply chain’s stakeholders in Egypt and does this supply chain have strong asset in the social dimension of sustainability?

**Hypothesis:**

- H1. Egyptian **artisanal dairy supply chain** contribute significantly to promote basic agricultural **services** (loan, veterinary, feed supply, milk marketing) to farmers.

- H2. Main **agricultural knowledge's networks** are strongly influenced by basic agricultural **services networks**.

- H3. **Practices** of the dairy supply chain stakeholders are a permanent **trade-off between market and domestic drivers**.

- H4. Artisanal dairy supply chain have strong social assets in a sustainable perspective.
A. Description of **family farming systems** in two contrasted areas
   (TYPOLOGY of farmers)

B. Description **dairy supply chain** in one area
   (TYPOLOGY of intermediaries)

C. Services and **knowledges networks** along the supply chain.

D. **Social Life Cycle Analysis:** identification of the social strength and weaknesses of the dairy supply chain from a social point of view

**Social Life Cycle Analysis**
(UNEP-SETAC guideline, 2009)

**Netchain Framework**
(Lazzarini et al., 2001)

4. Material and Methods: Conceptual framework of the phD
4. Material and Methods: **What is Social Life Cycle Analysis (S-LCA)?**

Tool to assess the social impact of a product or economical activity.
Inspired by Environment-LCA to complete sustainability picture.

- 2009: First Guideline
- 2015: Still on-going process

Method:
- from **cradle to grave** using a **functional unit**
  - (1 litre of milk in our cases).

**Stakeholder categories**

**Impact categories**

**Subcategories**

**Inventory Indicators**

- Farmers
  - Knowledge access
    - Animal knowledge
    - Crop knowledge
  - Quality of information
  - Density of information
  - Frequency of information

**S-LCA data**

Case study required to test the tool.
Informal sector less addressed.
Opportunity to develop new indicators.
4. Material and Methods: Step A: Description of family farming systems

**Family farming systems typologies**
- Socio-economic semi-directed questionnaires in 2 contrasted areas (3 and 3 villages)
- 175 interviews

- Description of family farming system
- Dairy practices (marketing, milking...)
- Services networks
4. Material and Methods: Step B: Supply chain analysis: Focus in old land

Dairy supply chain description and in-depth social network analysis:
• Open discussion with key persons
• 87 family farming systems interviews
• 12 semi-directed questionnaires with dairy intermediaries.

• Typology of dairy intermediaries
• Flows transiting along the supply chain
• Services
• Knowledge flows
4. Material and Methods: What remain to do?

Step C
In depth social network analysis in one village focusing on: knowledge’s network and services network at farm and dairy intermediaries level.

Step D
Apply Social-Life Cycle Analysis to the case study including local knowledge’s and services networks dimension.
5. Results: Step A: Typology of family farming systems in two contrasted area

Beni Suef: 87 families
- Family inhabit their territory since centuries.
- Structural component main discriminative factors.
- 100% integrating crop livestock productions.
- 80% of farms have a Utilized Agricultural Area under 1 ha.
- Systematic self-consumption of the production.
- Sale surplus only.

Behera: 88 families
- Pioneer front, recent installation of those families.
- Cropping systems distinguish those farming systems.
- 100% integrating crop livestock productions.

Hard to compare the two farming systems. 
**Choose to consider it independently**

Focus on Old Land from the Nile Valley
Social

Mce: Micro farm with educated head
UAA= 0.52 ha, tenant mainly, 6.2 TLU, 6 members/family, sometime governmental job

Mcb: Micro farm with head’s basic level of education
UAA= 0.63 ha, tenant mainly, 4.8 TLU, 7-8 members/family, No regular off-farm job

Sma: Small farm specialized in animal production
UAA= 0.7 ha, 7.3 TLU, tenant mainly, 6 members/family, head illiterate, No regular off-farm job

Mdm: Medium farm
UAA= 1.5 ha, 50% in property, 9.6 TLU, 5.5 members/family, basic level of education of the head, No regular off-farm job

Smc: Small farm specialized in cash crop production
UAA= 0.85 ha, mainly in property, 4.8 TLU, 8 members/family, head illiterate, No regular off-farm job

Beni Suef

Lge: Large farm
UAA= 2.2 ha, 50% in property, 25 TLU, 5.5 members/family, educated head, No regular off-farm job

UAA and herd
5. Results: Step B: Dairy supply chain in Beni Suef

| Past | • 1990: Rapid expansion of artisanal dairy supply chain begin.  
      • Two main drivers: **cities supply** (Beni Suef and Cairo) + **dairy agribusiness expansion** |
|-------|--------------------------------------------------|
| Today | • Artisanal supply chain dominating but many connection with dairy agribusiness  
      • **High diversity and numbers of dairy intermediaries.** |
| Perspectives | • Dairy product demand will continue to grow.  
               • Politic will to enforce agricultural cooperatives roles. |
1: Primary milk intermediaries
2: Primary and secondary milk intermediaries
3: Primary and secondary intermediaries + Processing
4: Primary and secondary intermediaries + processing + distribution
5: Cheese factory
6: Dairy Agribusiness companies

Local market
7: Traders
8: Traders
Wholesale

Liquid milks
Processed products
5. Results: Step C: Dairy supply chain services and knowledge networks in Beni Suef

Services along dairy chain:

Dairy intermediaries: Proximity network providing **agricultural services:**

- Milk collection
- Loan
- Transport
- Feed supply

Dairy intermediaries: Proximity network **knowledge’s transfers roles:**

- Technical advices (milking and breeding practices)
- Marketing information to farmers

**Strong links between stakeholders** (long history, everyday contacts) **impacting practices** (marketing practices).
6. Conclusion-Perspectives

**Achievements:**
Description of dairy supply chain
First understanding of the services and knowledge’s network channels.

**Perspectives:**
In-depth social network analysis
Willingness to operationalize S-LCA framework and to consider social network dimension build around one product: milk.

phD architecture build mainly by field work =>necessity to strength the research with literature planned in the coming month
Thank you!
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Bibliography


• Website:
  ◦ http://www.escwa.un.org/