

Comparison of the results of social life cycle analysis of capacities for the two turkish processed tomato sectors

Heval Yildirim

Montpellier University 1- Mediterranean Agronomic Institute of Montpellier (France)

1. Introduction

Today, thanks to the new mode of consumption, many people become aware of the fact that their consumption choices have important environmental, social and nutritional impacts. This gives rise to many questions related to Social Life Cycle Analysis (SCLA), a methodology that aims to estimate the socio-economic impacts along the life cycle of a product in order to encourage more sustainable production systems. It is in this context that we have developed our research.

In this research, we used a new methodology, Capacities-SCLA, which is developed by Montpellier University 1-Cirad-IAMM¹ in Montpellier. It is based on SCLA approach and aims to estimate potential impacts of the production activity on the different form of capital along the life cycle. A good quality of life, good health, a good job, social and legal institutions that work well, a wide range of environmental goods and services can all be considered as the key factors of the development process. These factors refer to the different form of capital: human capital, natural capital, technical capital, financial capital, social capital, institutional capital. In the Capacities-SCLA approach, we analyze social and socio-economic aspects of a product and estimate its potential impacts (positive or negative) along the life cycle. The positive impact on any capital class means that there is an increase in the capacity for the concerning actors. The term capacity is linked to the term “capability” used by Amartya Sen (1998 Nobel Prize winner in economics) in his research of development. The capacity in our approach refers to the “information translated in a homogenous manner in terms of increasing or diminishing capabilities” (Garrabé and Feschet, 2013, p 81).

It should be noted that the production and accumulation process of each type of capital are affected by the marginal change in social and environmental conditions. The Capacities-SCLA aims to estimate the impact and its nature using efficient indicators. Thus, our problematic is *«to construct indicators that measure corporate action (for each level of industry, for each category of actor and for each category of capital) on the transformation of endowments individual in additional operating capabilities»* (Garrabé and Feschet, 2013).

1 Professor Michel Garrabé, Montpellier University 1

In this research, we've tried to estimate the impacts of the production activity on the concerning actors using Capacities-SLCA indicators for the Turkish processed tomato sector (tomato paste and dried tomato). The results are presented according to the indicators of the five capital class: human capital, technical capital, financial capital, social capital and institutional capital.

2. Application of the Capacities SLCA to the Turkish Processed Tomato

During the first stage of our research, we identified production zone and type of product. The research has been conducted in Izmir and Manisa, the two cities of Aegean Region in western Turkey where the tomato based industry is very important for region's economy. We've worked on the two main sectors of tomato: tomato paste sector and dried tomato sector.

The survey of our research is based on five capital classes and their sub-classes. Categories of Potential Effects of Capacity (PCE) and Indicators of Conditions of Potential Capacities Effects (ICPCE) are identified according to each type of capital². Table 1 illustrates the classes and sub-classes of capital of our research.

In the next stage, we identified the sources of internal and external information. The main sources for the collection of internal information are as follows:

- To contact various actors of the Turkish processed tomato sector
- To collect the quantitative and qualitative information related to the production of tomato and its industry
- To collaborate with research organizations to obtain more information about the sector
- To conduct interviews with 5 firms, 10 producers and 3 logistics companies in the Turkish tomato paste sector
- To conduct interviews with 5 firms, 10 producers and 2 logistics companies (same of the tomato paste sector) in the Turkish dried tomato sector

Table 1: Classes and sub-classes of capital

Human capital	Technical capital	Financial capital	Social capital	Institutional capital
Education (E)	Company (C)	Subsidies (Sbs)	Justice/fairness (Jus)	Rules of protection (RP)
Working conditions (WC)	Infrastructures (I)	Equities (Eq)	Participation (Pcp)	Rules of monitoring (RM)
Health (H)	Information (Info)	Saving (Sv)	Trust (T)	Rules of regulation (RR)
Security (Se)	Market (M)	Wages (W)	Integration&culture (IC)	Rules of coverage (RC)
Parity (P)	Administration (Adm)	Public funds (PuR)	Social Networks (SN)	Rules of arbitration (RA)
		Credits (Cr)		

² For more information related to methodology, refer to the study of Garrabé et Feschet (2013)

External information has been obtained from the sources below:

- Standards and regulations at sectoral level: Turkish processed tomato industry
- Standards and regulations at national level: Turkish law
- Standards and regulations at international level
- Research and papers, interview with workers, union (Tek-Gıda İs), experts (Agricultural Insurance Pool-Manisa), academics from Ege University
- Observation of researcher

3. Results of the study

3.1 General Situation

Firms in tomato paste sector

- Firms are located close to the places of culture.
- In general, they have individual contracts with producers. All stages of production (from planting to the harvest) are monitored by the agronomists of the company.
- 1 kg of tomato paste requires 5.8-6 kg of fresh tomato. Brix value of tomato paste is 28-30.

Firms in dried tomato sector

- Firms are located close to the places of culture. The majority of firms produce sun-dried tomato
- In general, they don't have individual contracts with producers.
- 1 kg of dried tomato requires 12-14 kg of fresh tomato.

Producers

- All producers surveyed in the tomato paste sector work under individual contract with firms. They give 80-85% of the quantity of tomato production to the company, and reserve the rest for the market and self consumption. Three out of ten producers have income apart from agriculture.
- The majority of producers surveyed in dried tomato sector do not work under individual contracts with firms. 20-30 % of the quantity of their tomato production is given to the company; the rest is reserved for the market and self consumption.
- All the producers have social security.

Logistics companies

- They are located in the center of Izmir. They practice maritime transportation.

Seasonal workers

- They come from eastern regions of Turkey. They travel in trucks.
- There is inequality between man and woman salary.
- They do not housing.

3.2 Scores of Capacities-SLCA for the Turkish Processed Tomato Sector

Figure 1 and 2 show some extracted results on capacities. The first two lines of the tables refer to the classes and sub-classes of capital mentioned in Section 2. The lines of P (P1, P4...) show the results obtained for the producers interviewed in two sectors. The next T lines (T or Ts) correspond to the firms interviewed in each sector. Finally the last lines in the tables (L1, L2, L3) refer to the results for the logistics companies.

	Human Capital					Technical Capital					Financial Capital					Social Capital					Institutional Capital					
	E	WC	H	Se	P	C	I	Info	M	Adm	Sbs	Eq	Sv	W	PuR	Cr	Jus	Pcp	T	IC	SN	RP	RM	RR	RC	RA
P1	2+	4+	2+	0	0	3+	2+	0	0	0	4+	2+	0	0	1+	0	1+	0	2+	2+	1+	0	1+	0	2+	0
P4	0	3+	2+	0	0	2+	2+	0	0	0	4+	0	0	0	1+	0	1+	0	2+	2+	1+	2+	1+	0	2+	0
P6	0	2+	0	0	0	2+	2+	0	0	0	4+	0	0	0	1+	0	1+	0	2+	2+	1+	2+	0	0	2+	0
T2	3+	8+	3+	5+	3+	4+	5+	7+	4+	5+	1+	3+	2+	2+	1+	2+	3+	2+	2+	2+	2+	3+	2+	6+	4+	2+
T3	4+	12+	6+	3+	3+	7+	5+	7+	6+	2+	5+	6+	1+	3+	2+	4+	5+	6+	4+	3+	4+	8+	4+	3+	2+	3+
T4	1+	3+	5+	2+	4+	5+	3+	9+	4+	2+	5+	1+	3+	6+	4+	1+	2+	4+	4+	2+	1+	4+	3+	1+	2+	2+
L2	5+	10+	7+	3+	7+	10+	8+	4+	5+	2+	4+	6+	6+	0	2+	0	7+	4+	1+	1+	3+	5+	4+	2+	2+	4+
L3	0	7+	3+	2+	3+	4+	2+	2+	3+	2+	2+	4+	4+	0	2+	0	4+	2+	4+	1+	3+	3+	2+	0	2+	3+

Education

Infrastructure

No union,
no social dialogue

Figure 1: Variations of Effective Potential Capacity in Capital for Turkish Tomato Paste Sector (Source: Our Surveys, 2012)

	Human Capital					Technical Capital					Financial Capital					Social Capital					Institutional Capital					
	E	WC	H	Se	P	C	I	Info	M	Adm	Sbs	Eq	Sv	W	PuR	Cr	Jus	Pcp	T	IC	SN	RP	RM	RR	RC	RA
P2	0	1+	1+	0	0	3+	0	0	0	0	3+	1+	0	0	1+	0	0	0	0	4+	1+	2+	1+	0	0	0
P3	0	1+	1+	3+	0	3+	0	0	0	0	3+	1+	0	0	1+	2-	1+	0	1+	6+	0	2+	0	0	0	0
Ts1	0	3+	2-	0	2+	1+	1-	6+	1+	0	2+	1+	2+	1+	3+	0	2+	0	2+	1+	1+	0	1+	2+	0	2+
Ts3	1+	6+	1+	2+	1+	6+	3+	0	2+	1+	2+	2+	0	0	2+	0	3+	2-	2+	2+	2+	4+	2+	0	2+	1+
Ts5	5+	8+	3+	3+	2+	8+	3+	1+	0	2+	2+	3+	4+	2+	2+	0	5+	1+	2-	4+	2+	4+	4+	3+	2+	1+
L1	5+	10+	7+	5+	7+	10+	8+	8+	7+	2+	3+	6+	6+	2+	3+	0	7+	6+	5+	4+	4+	7+	4+	2+	2+	4+

Figure 2: Variations of Effective Potential Capacity in Capital for Turkish Dried Tomato Sector (Source: Our Surveys, 2013)

Increase in capacity: low level , average level , high level
 Decrease in capacity: low level , average level , high level
 Neutral: no impact on capacity

3.2.1 Some results concerning the producers

Human Capital: It is seen that there is a very low participation to the capacity for the sub-class “education” by the producers in both sectors. There is an increase in low level for the sub-classes “working conditions” and “health” in both. The hard working conditions of seasonal workers are considered “neutral” due to the exemption of the standards in national level. However, the impact is particularly negative for the seasonal workers according to the international standards. For the sub-class “parity”, the impact of the production activity is neutral in both sectors.

Technical Capital: For the sub-class “company” and “infrastructures”, there is an increase at low level for the majority of producers in the first table. For the producers in the second table, the impact on “company” is positive and there is no impact on “infrastructures”. The impact on the other sub-classes of technical capital is neutral for both sectors producers.

Financial Capital: It is the small amount of subsidies that create an impact relatively positive on the financial capital for both tables. Subsidies are considered as “capacitating” because input prices (oil, fertilizer, electricity) in Turkey are higher than those of other countries. We see that there is a neutral impact on sub-classes “saving” and “credits”.

Social Capital: The production activity has no impact on participation for both groups of producers.

Institutional Capital: For the majority in two tables, there is an increase of capacity at low level for the sub-classes “rules of protection” and “rules of monitoring”. However, the impact is neutral for “rules of regulation” and “rules of arbitration”.

3.2.2 Some results concerning the firms

Human capital: For the majority of the firms in the first table, there is an increase at average level in the capacity of sub-classes of human capital except for firm 2 and 4 with some negative impacts on “education” and “working conditions”. In table 2, we see that all firms create an increasing capacity except for firm 1 with negative impacts on “working conditions” and “parity”.

Technical capital: The impact is very positive on sub-class “company” especially for firms which have a great market share. For other sub-classes, the firms in table 1 create an increasing capacity at average level whereas those in the table 2 are creating a positive impact at low level.

Financial capital: It is the sub-class “equities” for which impact is the highest for financial capital in table 1. For other sub-classes, there is an increasing capacity at low level for the majority. In table 2, the impact on financial capital is quite low compared to table 1.

Social capital: In table 1, there is a positive impact on the sub-classes “justice” and “participation” especially for those that encourage unison's activity in the workplace. The impact on “participation” is negative for all firms in dried tomato sector.

Institutional capital: In table 1, there is an increasing capacity especially for the firms with a large market share. In table 2, we see that the overall impact on institutional capital is less positive. This is because the firms in tomato paste sector were founded a long time ago than those in dried tomato sector.

3.3.3 Some results concerning the logistics companies

Human capital: The logistics companies L1 and L2 create more increasing capacities along the life cycle. These are the firms with a great share in the logistics sector. For the third one, the impact is in general positive at average level.

Technical capital: The first company L1 has the more positive impact on the sub-classes “company”, “infrastructures”, “information” and “market”.

Financial capital: For the sub-classes “equities” and “saving”, there is an increasing capacity at high level for all firms. The impact is positive at low level for the other sub-classes.

Social capital: The overall impact on the social capital is positive for all companies. The impact is less positive on the sub-classes “integration and culture” and “social networks”.

Institutional capital: The companies L1 and L2 create more increasing capacities for institutional capital. The impact is less positive on the sub-classes “rules of regulation” and “rules of coverage”.

4. Conclusion

Our methodology aims to develop a new approach based on the relationship between SLCA and economic development theory. In this study, we tried to apply this methodology to Turkish processed tomato sector to identify the impacts in terms of capacities. This field study is important for the fact that it can be useful to determine the limits of Capacities-SLCA in order to improve it while proposing convenient remedies. Also, it allows us to see comparative results for the two sectors of Turkish processed tomato for each type of capital category and actor.

Reference

Garrabé M. et Feschet P., 2013. Un cas particulier : l'ACV sociale des capacités. Cirad. (éd.), ACV Sociales - Effets socio-économiques des chaînes de valeurs. Cirad, Montpellier, 87-117