

Opinions of Stakeholders and Consumers on the Sustainability of the Soy and Beef Supply Chain in Latin America and Europe

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Abstract

Long, complex and globalised food chains often pose major challenges in terms of the sustainability of their environmental, economic and social impacts. The aim of this study was to gain a better understanding of the sustainability of the beef and soy supply chains in Latin America and the European Union (EU). Within an FP 7 project called SALSA, we explored the attitudes towards, preferences for, and awareness of specific sustainability aspects of supply chains from the perspective of non-business and business stakeholders as well as consumers.

Keywords: *supply chain LA and EU, sustainability*

1 Introduction

Brundtland Report from the United Nations' World Commission on Environment and Development defined sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs.'

As a multidimensional concept, sustainability has three main pillars: environmental (*planet*; e.g., biodiversity, natural resources, soil, water, emissions, fossil and total energy), economic (*profitability*; performance of food chain actors, food quality, sustainable food products, affordability for consumers) and social (*people*; food safety, health and obesity, social and ethical conditions, animal welfare, fairness). These aspects are needed to consider together since they are interlinked. (Hansmann, R. et al. 2012).

This triple bottom-line approach requires us to select and design food production chains that can reduce environmental degradation, economic instability and social insecurity (A. Hegyi et al. 2013).

The livestock sector is the largest land user and exerts the biggest environmental impact on land. Beef production systems utilise 70% of global agricultural land for feed crop production and 26% of world land surface as grazing area. This activity has been identified as one of the major drivers of deforestation, followed by logging and soy production. Additionally, land-use changes due to deforestation make up 18.3% of total greenhouse gas emissions, while cattle are responsible for emitting about 22% of all global methane emissions relating to human activities. In the case of existing soy plantations, labour rights, erosion and the use of pesticides emerge as the key issues threatening the sustainability of the soy – and consequently the beef – supply chain (Godfray et al., 2010; Product Board MVO, 2011).

Within the soy and beef supply chain there are conflicting views and diverging attitudes between the food chain stakeholders. Such conflicts over quality and sustainability values etc. reduce the accessibility of both domestic and export markets for Latin American producers. According to bilateral EU-Latin America cooperation agreements, there is a mutual interest in developing strategies to tackle Latin American eco-challenges by promoting social cohesion, economic development, and improving food SMEs markets access (USITC, 2008; Product Board MVO, 2011).

Against this background, the European funded research project SALSA, a project that unites researcher and stakeholders of the beef and soy chain from Latin America and the EU, aims to investigate defines an integrated strategy for reducing negative socio-economic and environmental impact of soya bean and beef chains. The rationale is that these productions influence Latin America eco-challenges, reduction in food security and exclusion of SMEs and smaller farmers from market. One task within the project was to assess non-business stakeholders' (consumers', civil society organisations') and business-stakeholders' opinions and awareness of sustainability

issues of the soya and chains in order to identify major problems and challenges as well as derive measures how to improve the sustainability of the food chains.

2 Methods

2.1 *Business stakeholders' survey*

One of the targets in the survey is to identify the preferences of stakeholders regarding sustainability in beef and soy chains. In order to reveal this, we have set up an on line survey in which people were asked several questions on sustainability from a top down approach: starting with the main pillars and progressing to the subcategories within each pillar of sustainability. Beef and soy surveys were quite similar.

Ghent University built the surveys for beef and soy. The beef surveys were sent to partners in the following countries: Belgium, Netherlands, Mexico, Brazil and Germany. The surveys involving soy were sent out to the following project countries: Hungary, Belgium, Netherlands, Italy, Switzerland, Argentina, Germany and Brazil. In total, 55 business people versus 48 non-business people have completed the survey (which is a mix of beef and soy surveys). On the other hand 32 surveys on soy were completed in EU versus 42 in Latin-America, and 43 surveys on beef were completed in Latin America versus 15 in EU.

The survey contained questions about sustainability in general and the associated problems. General questions related to the importance, the opinion of the sustainability and the brand effect on sustainability. In the part of associated problems, we asked the respondents to rank the SAFA guideline indicators according to their significance (FAO). The guideline consists of comprehensive list of sustainability indicators in four categories: environmental integrity, economic resilience, social wellbeing and good governance. The respondents were also asked about certification schemes, concerns related to standards, evaluation of these standards, cost related to sustainability and the amount of the soy products imported/exported. The last question of the survey comprised strategies and policies regarding governance aspects.

In Hungary, the interviews by telephone were carried out between February and September 2012 with ten relevant stakeholders of Hungarian soy and beef supply chains. Respondent was a feed manufacturing company, a senior consultant of soy supply chain, a soy breeder, the Hungarian Seed Association, the National Association of Hungarian Grey Cattle Breeders and a Charolais cattle breeder as well.

2.2 *Non-business stakeholders' survey*

An online survey of non-business stakeholders was carried out during the months of January to March 2012. The general objective of this survey was to explore the opinions of EU and LA non-business stakeholders of the beef and soy supply chains in order to identify their attitudes, preferences and awareness regarding the sustainability of both supply chains.

The target group of the survey consisted of non-business stakeholders of the beef and soy supply chains that start in Brazil and Argentina and end in the EU. The Mexican beef supply chain was also included, but it was analysed only with regard to domestic consumption, with the aim of contributing to the overall project objective of improving the sustainability of domestic supply chains. The 48 respondents were mainly representatives of environmental non-profit organisations, universities, agricultural ministries and social non-profit organisations.

The EU and LA actors selected the three most important categories out of a list of 15 impacts related to the three dimensions of sustainability as defined in the SAFA guidelines (SAFA 2012.). These categories referred to environmental impacts (energy used, air quality, water quality, water use, soil quality, mineral resources used, waste produced, land use change within agriculture, land use change from natural land to agriculture, biodiversity), social impacts (labour rights including child labour, human health (food safety and food security) and economic impacts (value added in local chain and community, farm income, national economy).

2.3 *Consumer survey*

The consumer survey was carried out via an online survey between April and June 2012 in Brazil, Mexico, Italy and the Netherlands. In the case of the European consumers, aspects of the food supply chain from Latin America exporting to the EU were considered, while the Latin American consumers focussed on aspects of the domestic food supply chains. 522 valid questionnaires were received from Brazilian consumers, 140 from Mexican consumers, 131 from Italian consumers and 71 valid responses were received from Dutch consumers. In all countries except for Brazil, mainly women filled in the questionnaire.

The consumer questionnaire contained 19 closed questions and focussed mainly on aspects of the beef supply chain. Contrary to soy used for animal feed, the beef product is the actual product the consumer buys in the

market place and can therefore relate to. However, some soy specific questions were also asked, e.g. if the consumer knew that soy was used as animal feed and what aspects of soy production are important when choosing beef. Only those consumers who stated at the start of the questionnaire that they buy and/or consume beef were able to take part in the survey. Questions asked included the consumer's motives when choosing meat/beef; the importance of addressing specific environmental, economic and social aspects (as in the stakeholder survey) of the beef supply chain, and the actors who should take responsibility to address environmental sustainability. Special emphasis was put on different standards and labels known in the specific countries. Consumers were asked if they recognise the labels, how efficient they consider the specific labels are in addressing sustainability, and the consumers' willingness or unwillingness to pay for specific sustainability criteria of the beef supply chain. Furthermore, socio-demographic questions were asked (e.g. age, education level, income) and also how often consumers buy/consume beef.

3 Results

3.1 Results of the business stakeholders survey

In general, from all approaches we have taken into account, it can be stated that there is a significant difference (5 % level) in sustainability ranking between Latin-American and European stakeholders, either the whole group or the business community, in favour of the Latin-American stakeholders. Furthermore the social component is perceived less important in Europe compared to Latin-America.

Table 1 presents the results for the EU and Latin America (business) stakeholders regarding the environmental pillar. Regarding Soy, the results for the total European stakeholders (30) versus the Latin American ones (n=37) have been compared; then a focus on the business community (EU n= 20, versus LA n=11) was carried out. The respondents were asked to indicate the relative importance of the environmental subcategory.

In total 5 statements related to the environment have been presented to the stakeholders (Annex 1).

Table 1.
Ranking of environmental subcategories amongst EU and LATIN AMERICA (business) stakeholders. (The symbol * indicates a significant difference between LATIN AMERICA and EU.)

Statement	Stakeholders	Mean	Share	Mean business stakeholders	Share
1	Europe	12,9*	21%	13,7	22%
	Latin-America	16,8*	21%	15,5	20%
2	Europe	12,1	20%	13,7	17%
	Latin-America	13,4	18%	13,5	18%
3	Europe	12,9*	21%	13,4*	22%
	Latin-America	16,8*	23%	17,1*	22%
4	Europe	12,4	21%	12,5	20%
	Latin-America	14,6	20%	14,2	19%
5	Europe	11,0*	17%	11,7*	19%
	Latin-America	13,7*	18%	15,6*	21%

The European stakeholders assigned lower grades to renewable energy and material use, while the other sustainability impact indicators were considered somewhat equally important. The same holds for the Latin-American stakeholders, however air pollution was also given less points compared to the other impacts. The main differences between Latin American and European stakeholders regarding the allocation of points are found when comparing statement 2 and 3: Europeans seem to be more caring about air pollution, whereas Latin-American stakeholders are more concerned about soil degradation. The remaining statements are perceived as equally important by the two groups.

Regarding Beef, the first research question aim is to find out differences between Latin American (31) and European stakeholders in general (12), and in particular between the business communities (EU 3 versus LA 8). Table 2 presents the results for the EU and Latin American (business) stakeholders regarding the environmental pillar. Since the sample size is too small no statistical analysis was performed to assess a significant difference between Latin American and European stakeholders' means.

In total we presented the stakeholders 6 statements on the environment (*Annex 2*).

Table 2.

Ranking of environmental subcategories amongst EU and LATIN AMERICA *beef (business) stakeholders*. (The symbol * indicates a significant difference between LATIN AMERICA and EU).

Statement	Stakeholders	Mean	Share	Mean business stakeholders	Share
1	Europe	10,6	18%	14	19,2%
	Latin-America	17,5	18%	18,1	18,7%
2	Europe	11,6	20%	12,3	16,9%
	Latin-America	16,8	17%	15,9	16,4%
3	Europe	9	15%	9,7	17,8%
	Latin-America	16,3	16,8%	15,5	16,0%
4	Europe	9,5	16%	13,3	18,3%
	Latin-America	15,4	15,8%	15,4	15,9%
5	Europe	7,75	13%	9	12,3%
	Latin-America	15,3	15,7%	16,3	16,9%
6	Europe	10,9	18%	11,3	15,5%
	Latin-America	15,9	16,4%	15,6	16,1%

It seems that Latin-American stakeholders scored significantly higher for all environmental indicators compared to the European stakeholders. Regarding the share of each indicator, they scored more or less to the same extent; however impact on atmosphere and animal welfare score assigned by the European stakeholders is relatively higher.

Regarding Soy, the question for the respondents was to indicate the relative importance of the economic subcategory. *Table 3* presents the results for the EU and Latin American (business) stakeholders regarding the economic pillar (EU 30, EU bus 20 and LA 37, LA bus. 11). Since our data are not normally distributed, we opted for a non-parametric test in order to detect a significant difference in means between Latin American and European stakeholders. In total we have presented the stakeholders 4 statements on the economic pillar (*Annex 3*).

Table 3.

Ranking of economic subcategories amongst EU and Latin America soy (business) stakeholders. (The symbol * indicates a significant difference between Latin America and EU.)

Statement	Continent	Mean	Share	Mean Business stakeholders	Share
1	Europe	11,5*	24,1 %	12,9	24,8 %
	Latin-America	15,5*	25,3 %	13,8	23,3 %
2	Europe	12,1*	25,4 %	13,3	25,5 %
	Latin-America	14,8*	24,1 %	15,5	23,8 %
3	Europe	10,9*	22,8 %	11,8	22,8 %
	Latin-America	16,1*	26,3 %	15,6	26,4 %
4	Europe	13,2	27,7 %	14,1	27,0 %
	Latin- America	14,9	24,3 %	15,7	26,5 %

Latin-American stakeholders rank higher than European ones. In 3 out of 4 statements there exists a significant difference in favour of the Latin American stakeholders. Furthermore Europeans are more concerned about economic vulnerability, whereas Latin Americans allocated more points to national economic development. For the soy business stakeholders however, we could not find any significant difference in ranking. However, looking at

the share of each subcategory, the Latin-American business stakeholders find national economic development more important, whereas the European business stakeholders find profitability more important.

Regarding Beef, the same 4 subcategories within economy were presented to the stakeholders. Due to the limited amount of European business stakeholders who completed the survey, it is hard to draw conclusions from this limited sample, something that we encountered in the environmental pillar as well. Subsequently, we opt not to conduct an analysis, since it will not be possible to detect statistical significant differences among or between groups. Moreover from the ranking of the stakeholders, we could clearly detect the same trends as before: Latin Americans score higher (*Table 4*).

Table 4.

Ranking of economic subcategories amongst EU and LA (business) stakeholders. The symbol * indicates a significant difference between Latin America and EU.

Statement	Continent	N	Mean	Minimum	Maximum	Share
1	Europe	12	10,3*	1	18	22,7%
	Latin-America	31	16,7*	6	20	24,6%
2	Europe	12	11*	2	20	24,4%
	Latin-America	31	17,5*	5	20	25,8%
3	Europe	12	11,6*	2	20	25,6%
	Latin-America	31	16,4*	5	20	24,1%
4	Europe	12	12,3*	2	20	27,3%
	Latin-America	31	17,3*	10	20	25,4%

The beef stakeholders every statement regarding the economic pillar of sustainability delivers a statistical significant difference between the 2 groups of stakeholders. Looking at the share of each statement compared to the aggregated scores, it was found that EU stakeholders allocated higher ranks to the subcategory of economic vulnerability, whereas Latin Americans are more in favour of local economic development.

Table 5 presents the results for the EU and LA soy stakeholders regarding the social pillar. Since our data are not normally distributed, we opted for a non-parametric test in order to detect a significant difference in means between Latin American and European stakeholders. In total we have presented the stakeholders 6 statements on the social pillar (*Annex 4*).

Table 5.

Ranking of social subcategories amongst EU and Latin American *soy stakeholders*. The symbol * indicates a significant difference between Latin America and EU.

Statement	Continent	Mean	Share	Mean business stakeholders	Share
1	Europe	14,1	17,50%	15	17,30%
	Latin-America	14,2	16,70%	15	17,60%
2	Europe	13,9	17,40%	14,8	17,10%
	Latin-America	14,9	17,60%	14,2	16,60%
3	Europe	13,3	16,60%	14,7	17,00%
	Latin-America	15,3	18,10%	16,1	18,90%
4	Europe	13,4	16,70%	14,4	16,60%
	Latin-America	14,7	17,30%	14,1	16,50%
5	Europe	13,3	16,50%	14,5	16,80%
	Latin-America	13	15,40%	12,3	14,40%
6	Europe	12,3	15,40%	13,2	15,20%
	Latin-America	12,7	15,00%	13,6	15,90%

For soy we could not find any statistical significant difference in ranking between the Latin American and European business stakeholders regarding the social subcategories. A closer look at each share of the statements, show that Latin American stakeholders attach great importance to working conditions (statement 3). All the other statements are somewhat similar.

The same 6 social subcategories were presented to the (business) stakeholders regarding beef. Results are summarized in *Table 6*.

Table 6.

Ranking of social subcategories amongst EU and Latin America *beef stakeholders*. The symbol * indicates a significant difference between Latin America and EU.

Statement	Continent	N	Mean	Minimum	Maximum	Share
1	Europe	12	13,1*	2	20	19,7%
	Latin-America	31	17,1*	5	20	18,0%
2	Europe	12	12,2*	2	20	18,4%
	Latin-America	31	17,4*	1	20	18,3%
3	Europe	12	8,9*	0	20	13,3%
	Latin-America	31	14,5*	1	20	15,3%
4	Europe	12	11,2*	0	20	16,9%
	Latin-America	31	16,7*	7	20	17,6%
5	Europe	12	9,8	0	20	14,7%
	Latin-America	31	12,5	0	20	13,1%
6	Europe	12	11,3*	3	20	17,0%
	Latin-America	31	16,7*	3	20	17,6%

It can be seen that only statement 5 does not imply a significant difference between the stakeholders. All the other statements involve a significant difference. Especially the statement on working conditions is more of interest to the Latin-American stakeholders. On average Latin American stakeholders also score higher, same trend as above. The Hungarian results showed that the participants were aware of National Sustainable Development Strategy, but they did not understand perfectly the definition of sustainability and that's why they showed moderate interest

towards it. They usually connected sustainability to the effective use of natural resources or better quality of the products. The more export orientated participants were more familiar the meaning of the definition. This confusion might also appear when the participants were asked to name standards which related to sustainability. The most frequently mentioned regulations were ISO 14000, ISO 22000 and HACCP, but sustainability specific standard were not named at all.

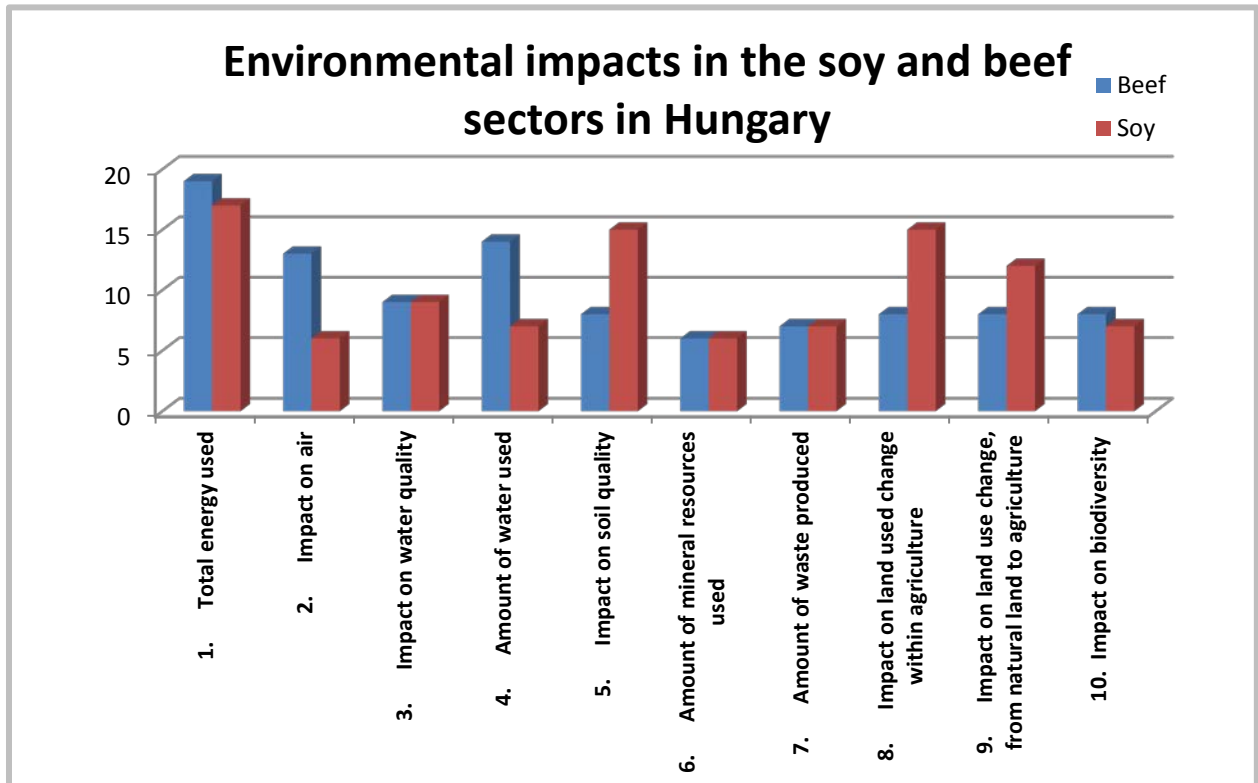


Figure 1. Environmental impacts in soy and beef sectors in Hungary (Source: own research)

There were not significant differences between the two supply chains regarding the categories. The results showed that the environmental categories dominated. The most important environmental impacts were the amount of used energy, air, water and soil quality and the impact on land used change within the agriculture (*Figure 1*). The first rank of the amount of energy was not a surprise, because energy saving is main point in each sectors. The high rank of the air quality was related to animal breeding and their carbon dioxide emission. Instead of water quality, the amount of the used water was the main issue because of the increasing costs. Soil quality and impact on land used change within the agriculture evaluated with higher rank by soy sectors which might come from the nature of soy. From the economical point of view all impacts (value added in local chain; impact on farm income, impact on national economy) were evaluated with the same weight. In case of social aspects, for the beef supply chain the dominated category was the impact on labour (including child labour) while soy sector focused on human health, which might connected to the non-GMO production in Hungary.

The stakeholders are influenced by the wholesalers for performing the standards in favour of their sector; to provide a special advantage to strengthen their competitiveness within the chains even the power relations are different within the soy and the beef chains. Within the beef supply chains the wholesalers make the rules. The bigger farms have bigger bargaining power compared to small and medium sized farms because it is easier for the wholesalers to purchase more livestock in less farms. In spite of this within the soy supply chain the bargaining power depends on the size of the soy production per year and on the market trends. Sometimes there is over demand or sometimes there is over supply within the seed market.

3.2 Results of the non-business stakeholders survey

Environmental, social and economic impacts were assessed by the non-business stakeholders. First, they were subdivided by regions, and after that it was investigated that preferences of the beef and soy supply chains differ from each other.

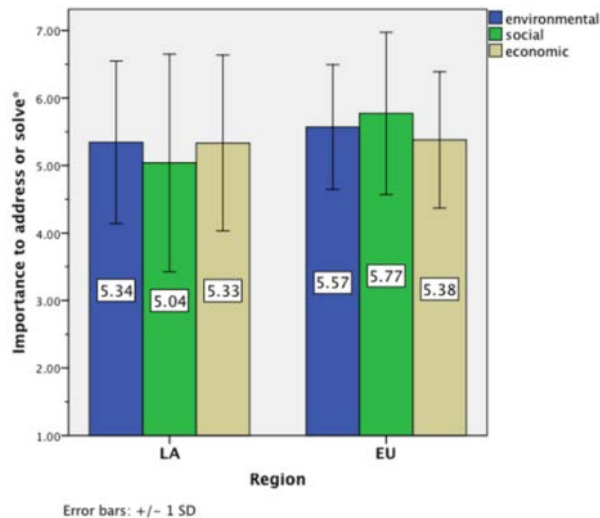


Figure 2. Importance to address or solve the environmental, social and economic impacts according to the non-business stakeholders of different regions. * Scale from 1 to 7 where 1=unimportant, 7=highly important. The numbers within each column represent the mean

All three dimensions were relatively equally important for LA and EU regions they ranged around 5.3 as shown in *Figure 2*. As we compared LA and EU region, we did not find significant differences between the two regions. The importance of the three dimensions ranged 5.04-5.34 according to LA actors, and in the case of EU respondents, it ranged 5.38-5.77.

Comparing the soy and beef supply chains, the results showed that the environmental factors and social factors were more important to the soy supply chain than beef supply chain. There was a significant difference between the two supply chains. However, economic impacts did not differ significantly between the beef and soy supply chains actors.

For LA respondents, land use change from natural land to agriculture was the most important issue which is followed by water and soil quality. In case of the EU respondents energy used, soil quality and land use change within the agricultural were the main issues. They were followed by the impact of biodiversity and the impact of labour rights. The use of mineral resources got low ranks from both region. In a social aspect, both LA and EU actors gave priority to the development of local market. The second most important issue was poverty prevention and alleviation. For LA respondents, health and the satisfaction of the consumers were more important than for the EU respondents. They gave 4.3 while EU actors 4.14 importance rate. EU respondents were more interested in solving social and ethical issues and supporting local production and small producers. Animal welfare was the least important issue for both regions (LA: 3.52; EU: 3.64).

The non-business stakeholders were asked to prioritise measures and initiatives from the capability of enhancing the environment sustainability. In case of four measures, there were significant differences between LA and EU actors. As long as EU actors ranked "give priority to local sourcing" as first (4.29), from LA actors this measure gave significantly lower capability (3.50). According to EU actors (2.91), "New and more sustainable labels" were the least capable measure to enhance sustainability. From LA actors this measure got higher ranks (3.48). The third difference is the opinion on discouraging the use of GM raw materials. LA actors (2.65) considered as not proficient measure, EU actors gave significantly higher ranks (3.59). For the LA actors the reduction of beef consumption was the least useable measure to enhance capability, while from EU actors it gave significantly higher (3.81) capability. LA and EU region suggested some measures to upgrade the environmental sustainability. For both regions, it was important to prevent the deforestation, to protect biodiversity and instead of cleaning the native areas and recover the pastures. LA actors had more concerns about GMOs than EU actors because they were affected directly by GMO corps.

The opinions on the capability of the whole supply chain stakeholders to enhance the environmental sustainability of the beef and soy supply chain did not show significant differences, but there were differences in preferences of each group. For LA, national and international policy makers were the most capable actors to enhance environmental sustainability. After those industrial-scale producers and feed processors were the most powerful actors. In the case of EU, international policy makers and consumer were the most important key players. They were followed by national policy makers and farmers' organizations.

EU and LA actors agreed in the efficiency of standards to enhance environmental sustainability, there were not significant differences between them. The SQF and GFSI standards were considered as the most efficient standards to enhance environmental sustainability and SA 8000 and Leaf marque got the lowest efficiency.

3.3 Consumer survey

The respondents were asked to rank the motives which lead them the most when they choose meat/beef. The most important aspects were, beside taste, traceability, quality control and the lacking of hormones, antibiotics and pesticides residues. Furthermore, animal welfare and the ethical aspects of animal transportation and slaughtering were quite important as well; however animal welfare was not important to non-business stakeholders. The transportation distance and air freighting were the less important aspects.

There were some differences between the countries. One of them was the opinion of the GMOs. It was very important to Brazil and Mexico and it was neither important nor unimportant for Italy and Netherlands. Regional production and the protection of the environment and the biodiversity were the most important to Italy. For Brazil and Mexico the rainforests protection and the price and the colour of the beef were the most relevant aspects.

The survey contained questions about soy production and its influence on the consumer's meat choice. Most of the respondents knew that soy is used for feeding. The lack of residues and the protection of the environment were also important, as well as social aspects like fair prices for the farmers and good working conditions. Organic production and no air freighting were still less important. The price of the meat and the ban of GMOs were also important aspects. However, most of the consumers reported that they were willing to pay more for individual sustainability aspects, for example Italian, Brazilian and Dutch consumers were willing to pay more for better water quality and Mexican consumers were willing to pay more for higher farm incomes. But sometimes the consumers do not recognize the label and they are not willing to pay premium price for sustainable quality food. The most well-known labels were Organic and Fair Trade label. 30% of LA consumers could identify USDA Organic label. EU Organic label was recognized by 43% of Dutch and 73% of Italian consumers. Fair Trade label seemed to be known in EU, 80% of Dutch and 66% of Italian consumers recognized it, in contrary in LA only 12% of the consumers could identify it. Most of the consumers did not know the meaning of the Food Alliance label (LA 22%, IT 20%, NL 9%). The SAN Rainforest Alliance label was identified by 21-24% of the LA and the EU consumers and in Brazil 25% of the consumers knew Global Partnership for Good Agricultural Practice label. Existing standards considered as quite efficient to improve sustainability. Organic standards (EU and USDA) considered as most effective standards compared to others, followed by Fair Trade standard, SAN Rainforest Alliance and Food Alliance. The domestic labels also got high ranks because they were familiar to the consumers.

4 Discussion

In general, the results showed that the European and Latin-American actors rated different the importance of the sustainability issues. According to the Report of Economic Commission on Latin America and the Caribbean (ECLAC) social exclusion, lack of social safety and informality in employment are persistent problems in this area. It might explain the higher ranks of social issues (especially working conditions) in Latin America than in Europe (ECLAC 2010) because the stakeholders might be pressurized to solve these issues.

For the Hungarian business stakeholders environmental aspects (the amount of used energy, air, water and soil quality and the impact on land used change within the agriculture) dominated over the other two dimensions related to the nature of soy and beef production. The main objective of sustainability within the Hungarian industry is to produce the best quality product by the most efficient use of the natural resources. It became clear during the interviews that the power relations are different within the soy and the beef chains. Within the soy production the bargaining power depends on the size of the soy production per year and on the market trends, while within the beef production, it mostly depends on the size of the farms. There is a real need from the players of the supply chains for collaboration because only the collective changing will contribute to enhance sustainable development in Hungary. Stakeholders have to strive for be in a good relation to the wholesalers.

At the first glance, it seemed that the non-business stakeholders evaluated as equally important the environmental, social and economic dimensions of sustainability. But in case of Latin-American actors, as we looked the more detailed pictures, it was obvious that environmental aspects dominated over the other two. They ranked as first and second most important impact, one of the environmental categories and an economic impact was considered as third. These issues have been addressed in the Cerrado for example, by prohibiting growers planting on hilltops and ensuring they dedicate 20% of their land holdings to natural vegetation (Greenenergy Perspectives, 2011). While from EU actors five categories got the same importance rate. Third of them belonged to the environmental category and the other two was economic impacts. The impact of the biodiversity was considered as second priority and the impact on labour rights was ranked as third priority. Concluding EU actors

represented a more comprehensive conception of sustainability, than LA non-business stakeholders. The ranking of the importance of mineral resources was similar in the two regions. It reflected that the non-business stakeholders were not aware of how essential the mineral resources are for plants, animals and the energy industry as well (FAO, 2007; Seuring and Müller, 2008; Bitsch, 2010).

In the point of ethical and social aspects, EU actors were more interested in solving these issues than LA actors. They would more likely support the inclusion of local products and small producers within established beef and soy chains. Animal welfare got the lowest importance rate from both regions which showed if human health is compared with animal welfare, human health has priority. EU actors ranked higher human health and consumer satisfaction than LA actors. It can be related to the safety scandals (like horsemeat scandal in 2013) which led to the stricter regulation within EU, while in LA, there are some obstacle in the implementation of these regulations (Roep et al. 2005). In general, actors from LA and EU considered as well that the regulatory framework at local and international level is weak, policies are lacking or inefficient. They suggested that polices should consider the interest of farmers' organization in order to achieve more sustainable food supply chains. That why they considered as the most capable players the national and international policy makers.

Health and environmental concerns gained in importance in the purchase decision of consumers, especially in European countries. Consumers often see these two aspects as interlinked. Animal welfare is an important motive for the purchase of beef and often directly linked to a better food quality; interests in e.g. in the origin of the meat, the feeding of animals (especially GMO-free fed) and the raising conditions of animals are growing. However, animal welfare issues are also important due to altruistic reasons, as well as social and ethical values as 'fair prices to farmers', 'supporting the local economy' or 'environmentally friendly production'. 'Environmentally friendly production' is an important purchase motive for consumers. In terms of beef, e.g. shorter transport distances for animals as means to reduce the transport times for animals but also the reduction of CO₂ emissions are important aspects. However, a French study has shown that sometimes consumers do not concerned about transportation because they have other motivation to choose local products rather than exported ones (Sirieix et al 2008). Results showed that the consumers are willing to pay higher prices for the products if they expect added value. This means that most of the consumers are motivated and open to use the existing sustainability labels, but right now there is large number of labels are on the market, and the consumers are often uncertain what the concept of the label is all about. For the future it would be efficient if meaning of the labels become more well-known rather than creating new labels (Grunert, K. G. et al. 2014).

5 Conclusion

The market for sustainable food products will keep increasing in the following years. Producing beef and soy under sustainable standards will open up more opportunities for reaching export markets not only in Europe but also in the USA and Canada and other countries. The standard chosen will be of primordial importance to comply with the requirements of the export markets. A set of standards is available in this document which matches the current preferences of non-business stakeholders and consumers in terms of sustainability. However, business stakeholders can elect to comply with different standards that can improve sustainability in the supply chain and at the same time provide access to different markets or enjoy better acceptance among customers and consumers. One example could be the use of the SAN standards and an organic standard, or ProTerra and an organic standard. This method of combining standards is already being carried out in the case of commodities such as cocoa and coffee (organic plus FLO Standards) or fruits such as bananas (SAN standards plus organic).

Consumers showed a limited awareness of what sustainability involves and how it is tackled by the food market. A more reliable and comprehensive range of information on the different dimensions of sustainability is needed. Communication, mostly to final consumers should be as clear as possible, avoiding information overload and/or too many contradictory and partial indications. The aim of the SALSA project will then be to provide deeper and clearer information to consumers about what sustainable beef and soy products stand for in order to increase their awareness on sustainability and their influence on the sustainable food demand. Provide more information to consumers and other stakeholders about the negative environmental, social and ethical impacts associated with beef and soy production and how they can be resolved. Inform consumers about the relationship between the beef and soy supply chains, and how upgrading sustainability within one translates into enhanced sustainability in the other, and vice-versa. Promote the most sustainable standards among business stakeholders and consumers in order to cover the four dimension of sustainability holistically in addition to complying with their preferences.

Policy makers should give priority to the land use change from natural land to agriculture, water footprint and soil quality in LA. On the other hand, give priority to the amount of energy used, soil quality and land use change from natural land to agriculture in the EU. Take into account in policy programmes and regulations the need to focus

also on the value added in the local chain and community (development of the local economy); and to focus on the impact on farm income and the poverty prevention and alleviation, regardless of the region. Design agricultural policies based on food sovereignty and the needs of the local population. Diversify the beef and soy supply chains by creating an environment that supports the inclusion of local beef and soy products and small producers in the existing supply chains. Regulations for the beef and soy supply chains should focus on the four dimension of sustainability. Most of the regulations have been formulated according the interest of the consumers (e.g. free of pesticides, quality, and food safety); as has been mentioned, however, policy makers can exert great influence if they orientate the legislation holistically towards sustainability. To make the regulations more accessible and easier to understand it is necessary to have a compendium of the regulations that cover all aspects of the supply chain. SALSA project aim is, anyway, also related to assess how much the international trade of beef and soy, which is, and will be, highly in demand in EU, will influence both the sustainability in Latin America and EU. Within this context the food transport impact on sustainability (food miles) and other dimension related to the international trade impact will be carefully analysed through a Life Cycle Assessment (LCA) approach; this will provide a sounder discussion base to the debate on how much local economy development contributes to a sustainable development as opposed to a more global one.

Consumers should become more aware of the relationship between soy production and animal production. Consumers should have the possibility to choose beef products that are not fed GMO soy but mainly pasture-fed. Organic is an alternative for increasing sustainability along the supply chain; consumers should therefore have access to organic beef products without greatly increasing their expenditure. On the other hand consumers should access a more comprehensive and transparent set of information on sustainability based on as reliable as possible set of data. It is, on the other hand, necessary to communicate sustainability in a relatively simple and concise way. Considering the strong impact on consumers' demand coming from the media, a specific attention should be given in communicating the results of studies on sustainability in the food chain. To avoid opportunistic behaviour from large private companies, or other bodies involved in conflicts of interest, defining and communicating their own sustainability scores, a third party organization should be defined to monitor the analysis and communication of sustainability

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7 Annex

Annex 1: Presented statements on environmental for the soy business stakeholders

- Impact on water use and quality (eutrophication, water deprivation, chemical pollution,) (1)
- Impact on the atmosphere (Air pollution, Greenhouse gas emissions, etc.) (2)
- Impact on land degradation and soil quality (soil erosion, nutrient depletion, etc.) (3)
- Impact on biodiversity (diversity within and outside the farm) (4)
- Impact on non-renewable energy and material use (5)

Annex 2: Presented statements on environmental for the beef business stakeholders

- Impact on water use and quality (1)
- Impact on the atmosphere (2)
- Impact on land degradation and soil quality (3)
- Impact on biodiversity (4)
- Impact on non-renewable energy and material use (5)
- Impact on animal welfare (6)

Annex 3: Presented statements on economic for the soy and beef business stakeholders

- Impact on local economic development (1)
- Impact on profitability (2)
- Impact on national economic development (3)
- Impact on economic vulnerability (4)

Annex 4: Presented statements on social aspects for the soy and beef business stakeholders

- Impact on food/product safety (1)
- Impact on human health and safety of the local community (2)

- Impact on working conditions and labour rights of employees (3)
- Impact on global food security (4)
- Impact on land distribution and land acquisition for small and landless farmers (5)
- Impact on food sovereignty (6).