Networking Related to Sustainability in Hungary

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Abstract

Sustainability is arguably one of the greatest challenges to Hungary in the future. The question is how to meet this need and tackle this challenge that requires commitment from the different players of the supply chain.
This aim of the work within the FP7 Salsa project was to detect, explore the importance of sustainability and categories of the sustainability by the actors of the network and identify those elements related to sustainability issues, which support the future success along the soya and beef supply chain.
In Hungary majority of the soy and beef enterprises are classic SMEs.
The topics was quite "hard" for the questioned SMEs, because in one hand it is an increasing needs for sustainability, but in the other hand the environmental concerns haven't acquired as significant awareness in Hungary as in western countries within the European Union. The needs regarding sustainability can be identified mainly from farmers and wholesalers (particularly multinational companies)., but most of the cases significant activities or changes have not been made yet.
The producers emphasized that they fulfill the sustainability requirement if it is a real needs from their customers or without risking their success of their businesses. The other frequently mentioned answer was that they dealt with the sustainable aspects if it supports the most efficient use of the natural resources or the better quality of the product.
Sustainability was associated with costs. The participants all agree that the cost of sustainability can be fairly high. However there is a significant need for sustainable production and products in Hungary, they do everything to meet the requirements of the sustainability standards. But in that case the members of the supply chain can see clearly the profitability of their investment in sustainability.
Based on the results we could conclude that there is a harmonized, good business relation between the stakeholders within the Hungarian soy and beef supply chains. The power relations are different within the soy and the beef chains. Within the beef supply chains the wholesalers make the rules, and 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.
Finally we could conclude that there is a real need from the players of the supply chains for collaboration, because only with the collective changing will contribute to enhance sustainable development in Hungary.

Keywords: *sustainability, soy and beef supply chain, networking*

1 Introduction

In the current **competitive global market environment**, innovation, networking are crucial for firms and all members of the supply chain to stay alive, save their position and establishing their position for further economic growth.
It is interesting to think it over the drivers of the competitive market. Due to food related diseases (e.g. EHEC, BSE) and globalization of food production (Salsa, 2012 cited Nepstad et al., 2006), consumers have a real need on being aware of the **origin** and reliability in **quality of food**. This fact results increasing interest in **traceability,** freshness and quality of products.

The other driver of the market is that manufacturers, producers **expand product portfolio** to fulfill the increasing consumer's claims.
To achieve this goal the producers have to pay more and more attention on **innovation**. The firms can innovate by internal and external resources. **I**nnovation can be more successful in networks rather than in individual firms. The networking can be facilitator for organizational learning which act as the locus of innovation. Generally, firms and researchers recognize the importance of networks in being a sustainable source of innovation (Kühne et al., 2010 cited Huggins 2010; Ozman 2009). That recognition among firms and researchers, also policy makers lead to have a better understand about the necessity of innovation networks (Kühne et al., 2010 cited Pittaway et al. 2004).The networking success is also depends on government's policy on stimulating collaboration between firms and research institutions.
In our study we put a lots of emphasis to be covered the opinions from all above mentioned actors belongs to soya and beef supply chain in Hungary.
The innovation based product portfolio development together with the complex and wide supply chains of the raw materials and ingredients, etc. results more complicated transparency and traceability systems.
Due to aforementioned facts explain why Food Supply Chain Management (FSCM) has become an important issue.
According to the approach launched by Kühne et al., 2010 the firms have the opportunity to participate in innovation networks, but it takes times which innovation network best fitting their needs. Any kinds of support are a big help for them. In many cases firms don't know which innovation networks are real valuable, informative for their activities and strategies. The most common approaches are:

- Triple Helix model (Kühne et al., 2010 cited Leydesdorff and Meyer 2003) covers university-industry-government approach. Lots of authors raised the importance of managing the networking efforts and their relationships with the actors in the network.
- Regarding open innovation framework, analyzing the network approach globalization in terms of knowledge from the outside the firm becomes very important.

Increased competition for market access, sustainability, new consumer trends and **food** scares, **secure** are among the key challenges the soya and beef food industry is also facing.
The global food shortages do not constitute the foremost challenge for future food security, but rising prices do. A further, parallel challenge involves working incrementally towards enhancing sustainability of the global food system.

The **main goal of this study** was to detect, explore the importance of sustainability and categories of the sustainability by the actors of the network and identify those elements related to sustainability issues, which support the future success along the soya and beef supply chain. The other purpose was to define an integrated framework for triple bottom line indicators covering the economic, environmental and social aspects of food chains along the entire life of the products. The framework will be extended with qualitative aspects from the triple bottom line, but also from governance issues. The study was done in EU FP7 SALSA research project, WP3, which was led by Ugent and whose approach was used and presented in that paper.
In this paper our objective is to show the outcomes from the interviews and literature review how the actors of the Hungarian soya and beef sectors think on their position in the competitive market and what their experiences in terms of sustainability, competitiveness and how the networking supports or not this purpose.

2 Networking

Strategy-structure-performance paradigm (SSP) of strategic management as a multi-dimensional framework was described by Lefebvre et.al, 2010. The SSP paradigm was developed initially to explain the performance of a firm, but it has been extended since then to the supply chain. Since supply chains can be considered as being special networks, the SSP paradigm which already has been extended to the supply chain, is most probably applicable to networks as well. At the basis, the SSP paradigm predicts that a firm's strategy, created in consideration of external and internal (i.e. infrastructure) environmental factors, drives the International EAAE-SYAL Seminar – Spatial Dynamics in Agri-food Systems development of organizational structure and processes, which in turn influence the firm's strategies.

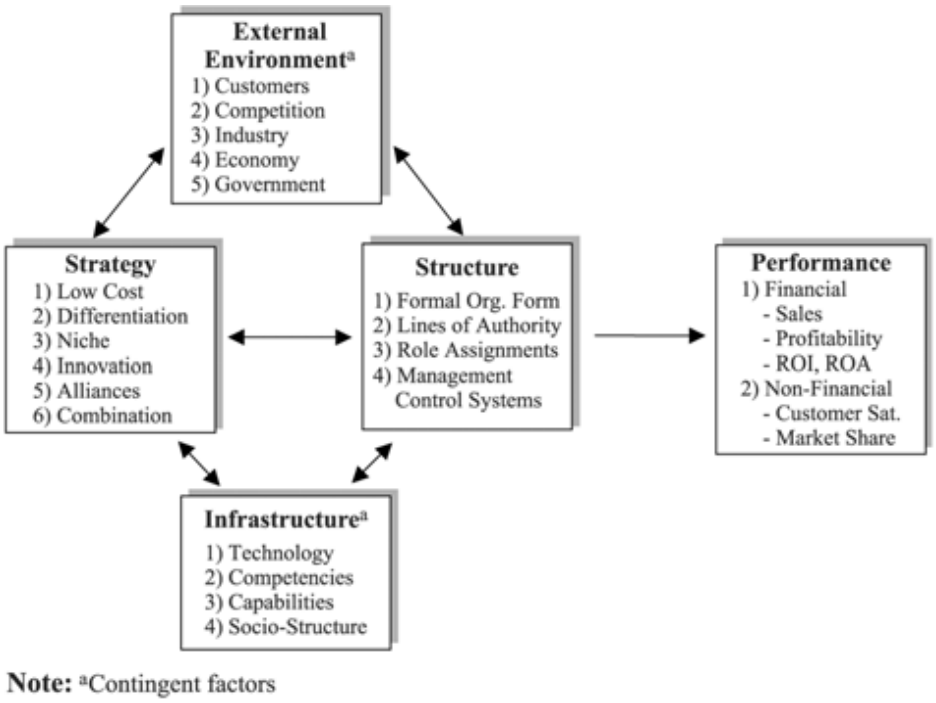

Figure 1. Strategy-structure-performance paradigm

In contrast to the SSP paradigm, Lefebvre al.'s framework proposes that network performance is the result of the combination of network strategy, network structure and external environment, and not solely the result of network structure like it is suggested in the SSP paradigm.

2.1 Supply Chain Management (SCM)

Sustainability is improving the quality of life not only for the current generation but also for the future generations. (Soysal et al., 2012 cited Bloemhof and Nunen, 2008)The FSCM over the traditional SCM requires a different management approach, such as sustainability but also considers intrinsic characteristics of food products and processes. Sustainable development deals with balancing between ecological, economic and social impacts at the level of society in the long term (Soysal et al., 2012 cited Aiking and Boer, 2004). Therefore, the quality of the product needs to be socially fair and environmentally friendly in addition to being produced efficiently, competitively and profitably (Soysal et al., 2012 cited Kepler,

2004). That results traditional strategies have become inappropriate. This led to a new concept, Sustainable Food Supply Chain Management (SFSCM).
The major factors contributing to the increased interest in SFSCM are: raising consciousness of the importance of sustainable system dynamics and, related to that, changing regulations set by governments that enact strict rules on food safety and sustainability issues. The main aim of these legislations is to impose firms taking necessary precautions against any negative social and environmental impacts of their operations. Companies operating in the agriculture and the food sector are confronted with the following: (1) accelerating environmental and social impact assessment policies and standards such as HACCP, BRC or ISO22000 enacted by governments; (2) the emerging concept of extended producer responsibility supporting the shift from "cradle to grave" to "cradle to cradle" perspective (Soysal et al., 2012 cited Quariguasi Frota Neto et al., 2009) pushed by either governments or influential private institutions and (3) gradually increasing preoccupation in society to live well without compromising future generation's rights to prosper.
The SFSCM increases the complexity of supply chains. The aforementioned developments have stimulated companies and researchers to consider multiple Key Performance Indicators (KPIs) such as cost, perishability and sustainability in their projects. As a result, the traditional performance indicator “cost” is replaced by the emerging triple bottom line concept in which Profit, People and Planet are the simultaneous drivers towards performance. It is apparent that this change evokes the need for an integrated approach that links SC decisions to the three pillars (economic, environmental and social pillars) of sustainability (Soysal et al., 2012 cited Chaabane et al., 2012).

2.2 Sustainability indicators

According to the FAO (2012), more than one hundred countries have established national strategies for sustainable development, including sustainability targets and indicators. In spite of the abundant attempts for making food and agriculture sectors sustainable, no internationally accepted standard defines what ‘sustainable food production’ essentially requires (FAO, 2012). “Neither a commonly accepted set of indicators that have to be taken into account when measuring sustainability performance, nor widely accepted definitions of the minimum requirements that would allow a company to qualify as ‘sustainable’, exist” (FAO, 2012).
The above mentioned facts require increased production while simultaneously demanding a decrease in the negative impact of production (SAFA, 2012). Baldwin stated, that
“Sustainable development has been defined as meeting the needs of the present without compromising the ability of future generations to meet their needs” (WBCSD, 2002 cited by Baldwin, 2009, page Xiii).
The concept of sustainability simultaneously covers social, ecological and economic issues of products and services. Among various sustainable products, a triple bottom-line (i.e. people, planet and profit) comprehensive assessment is suggested. This approach support us to select (and design) food production chains that can reduce environmental degradation, economic instability and social insecurity. Furthermore, such integrated assessments will ideally over the entire life of a product to ensure the inclusion of all relevant impacts including issues of waste, land use change and processing (SALSA, 2012 cited by UNEP/SETAC, 2009). Sustainability itself in food supply chains covers a broad range of activities that can differ among supply chains.

SAFA, guideline on the Sustainability Assessment of Food and Agricultural Systems (FAO) was used as a reference in our studies evaluating the comprehensiveness of the selected sustainability indicators. We narrow our approach by LCA methodological approach.
The SAFA guidelines exist of a comprehensive list of sustainability indicators in four different categories: environmental integrity, economic resilience, social wellbeing and good governance. The list includes both qualitative and quantitative indicators.
Besides this work a lot of studies from different supply chain were reviewed to have a greater overview view about the indicators. The aim of our work was for measuring or exploring sustainability issues especially in the soy and beef chain.

3 Research and design

The interviews (N:10) with a structured interview guide and consultations during national workshops were carried out on telephone with the relevant stakeholders of the Hungarian soy and beef supply chains, such as feed manufacturing company, a senior consultant of the soy supply chain, a soy breeder, the Hungarian Seed Association, the National Association of Hungarian Grey Cattle Breeders, and a Charolais cattle breeder.

Agenda of the interviews

CBHU used the interview guide “Checklist for Business stakeholders” prepared by UGENT to reach the successful performance of the interviews with the stakeholders within the Hungarian soy and beef supply chains.
In Hungary the majority of the soy and beef enterprises are classic SMEs.

The checklist contained questions related to different areas such as sustainability, certification schemes, concerns related to the standards, evaluation of the standards, the amount of the soy products imported/exported, and costs related to sustainability.

The checklist contains the followings:
- To characterize the soya and beef sector and relevant stakeholders (Company background, Nature of business)
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<u>Sustainability: general</u>
- Is your company dealing with sustainability issues? Why?
- Sustainability: domestic driven or export oriented?
- Are your clients/consumers concerned about sustainability? Reason for demand of sustainability? Who undergoes pressure?
- How far down the supply chain is your brand linked to sustainability?

(hidden products: soy for feed)
- Why should you and your business be concerned about sustainability in the soy chain? (if possible: link to image of the soy chain)

Sustainability: problems

- What are the most important issues on/problems related with on sustainability for your business?

Certification

- Supplier/producer of certified soy?
- Which standards or certification schemes? (individual initiative or not?)
- Why certification: differentiation or compliance, commercially? Motivation?
- Type of contract: mass balance/ book and claim/ segregation WHY?
- Chain of custody? Or certificate trading?
- Are the certified products for the mainstream or niche market?
- Possible that certification is voluntary?
- Aware of other certification schemes?
- Pro/against certification? (or better to have a political solution to the issue of sustainability)
- On what sustainability (ecological, economic, social, governance) aspects should standards focus more or less to your opinion? Which specifically?
- Which are your preferences regarding sustainability categories?

Problems with standards compliance

- Problems of other stakeholders for compliance to standards?
- Smallholders are able to comply? Why/ Why not? Bottlenecks?

Evolution in standards/sustainability

- Have the standards changed? Trend? Pressure of certain groups? Indicators change for compliance?
- Too much standards? Harmonization towards 1 standard?
- Did you see any improvement in sustainability through the introduction of these standards? (Company level or in the entire chain?)
- Amount of soy imported/exported?
- Amount of tones certified soy purchased yearly (from LA – (non) certified
- Export share to China/EU-> evolution – impact on the demand for cert. soy
- Do you know that other stakeholders importing soy?
- Interested in separate streams GMO/non-GMO?

Costs/premium

- What are the costs and risks/ problems for your business to engage in sustainability standards/ certification?
- Do you feel you get adequate/appropriate compensation for these efforts? Price premium?
- Are you able to pass on the pressure on sustainability (and the costs) to the other stakeholders in the chain upstream and downstream? Can you let them pay for your efforts (downstream) or do you pay extra (upstream)?
- Are you willing to pay extra for certified soy?

Other
- How is your relation with the other business stakeholders in the soy/beef sector?
- Has your sector been influential in setting the standards in favour of your sector? Why (not)?
- How are the power relations in the soy/beef chain? How have they been evolved?
- Opposition to the soy chain/questions of sustainability reasonable? Why/ Why not?
- What are according to you acceptable levels of environmental impact?
- What are according to you acceptable levels of social impact?

After the questionnaire/ questions of the checklist the stakeholders prepared the ranking of the categories of sustainability. The template for ranking the categories of sustainability is collected. The three main impacts are environmental, social and economic impact, which consist of several sub-impacts which are listed below.

Environmental impacts:
- Total energy used
- Impact on air
- Impact on water quality
- Amount of water used
- Impact on soil quality
- Amount of mineral resources used
- Amount of waste produced
- Impact on land used change within agriculture
- Impact on land use change, from natural land to agriculture
- Impact on biodiversity

Social impacts:
- Impact on labour, including child labour
- Impact on human health

Economic impacts:
- Value added in local chain
- Impact on farm income
- Impact on national economy

4 Results and discussions

Introduction of the Hungarian agriculture especially for soy and beef sectors

In Hungary more than 60% of the total areas are agricultural area. The geographical circumstances in Hungary provide a good opportunity to achieve a strong position in agriculture, and agricultural production within Europe. The climate is favorable for almost all agricultural crops which can be produced in the temperate zone. The bottleneck of crop production usually is the lack of precipitation.
The production of agricultural goods and services are significant different both in value, in proportion and in the structure of production in each seven dedicated regions of Hungary.
Nearly half of the agricultural areas are arable lands. 83% of the area is used for agriculture purpose, from which 48% is used as arable field.

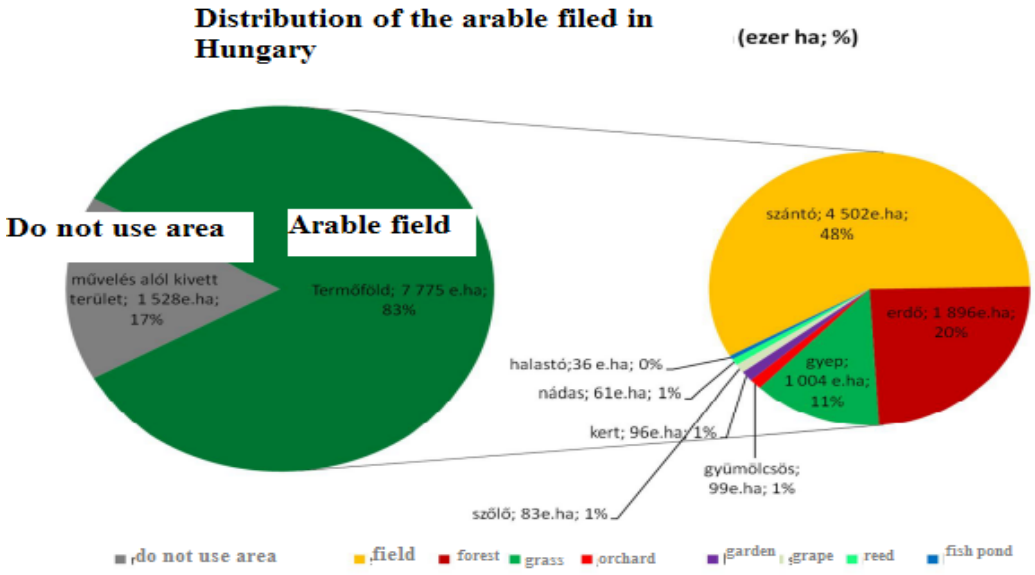


Figure 2. Distribution of the arable field in Hungary (KSH, 2010)

The dominant cultivated plants are cereals e.g. winter wheat and maize share more than 70% of the arable lands' production, and sunflower is also a significant crop in Hungary with an increasing production size.
The export of agriculture products had relevant importance within the Hungarian export. The amount of the production which is exported is around 25% of the total production per year.

Soy sector in Hungary

Horvát et al., 2011 summarized the sector as "the expansion of soybean production is significantly influenced by Hungarian wheat and maize. Hungarian farmers remain reluctant to abandon wheat and maize, despite a price ratio heavily weighted in favor of soy. Considering their reluctance heretofore, it may come as a surprise that this is finally about to change due to high fuel and fertilizer prices. Higher prices for fertilizer proportionally increase the prices of grains, oilseeds, and protein crops and have even wider consequences as well. A World Bank analysis suggests that food prices are at such a dangerous level that they may begin to endanger political and social stability. Regionally, Hungarian soybean processing can replace imported products and do so at a lower price. This lower price would be created thanks to cheaper local labor and resources, such as those of the Serbian soy chain. The soy processors' geographical proximity, tradition, and experience in Vojvodina can serve the emerging Hungarian industry well. Efficient market interest can yet be achieved in Hungarian soy processing!"

The barriers of the soy production summarized by the interviews:

- The lack of the irrigation, particularly in Great Plan area
- The straw could not be used for animal breeders
- The harvesting is usually in August and September, that interfere/blocks the sowing of the second planting plants
- The use of the products either for human or animal feeding purpose require heat treatment, that has energy cost.
- Higher seed and pesticide cost compared to the other products eg. Pea
- The distance of the sowing should be smaller to be able to increase the efficiency.

More soy is used in Hungary than it produced. The import of soy is approximately 600000 - 800000 tones per year. The majority of the import soy comes from the South American countries and China. Looking at the import distribution

In the international EU comparison, see in graph the Europe's soybean production was 3.35 million tons in 2009. The largest producer was Ukraine and Russia, from the EU countries Italy. Serbia's participation was 10.42%, Hungary's was only 2.14%. (Horvát et al., 2011)

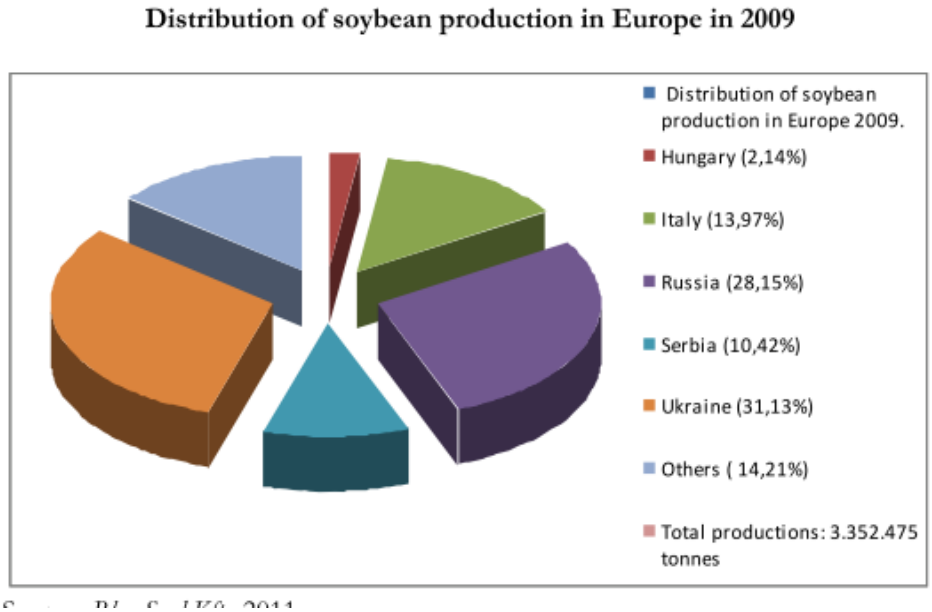


Figure 3. Distribution of soybean production in Europe, 2009 (Horvath et al., 2011 cited Blue seed Kft.)

A soybean production areas in the previous 10 years, with minor fluctuations, but shows an increasing tendency (Figure 4). The largest production in the South-Transdanubian county of Baranya, which is primarily Bóly Co. integrators, research-development activity is due. The soil and climatic conditions of Somogy and Tolna counties are also suitable for production, since the yields in these counties exceeded the national 2 270 kg/ha.

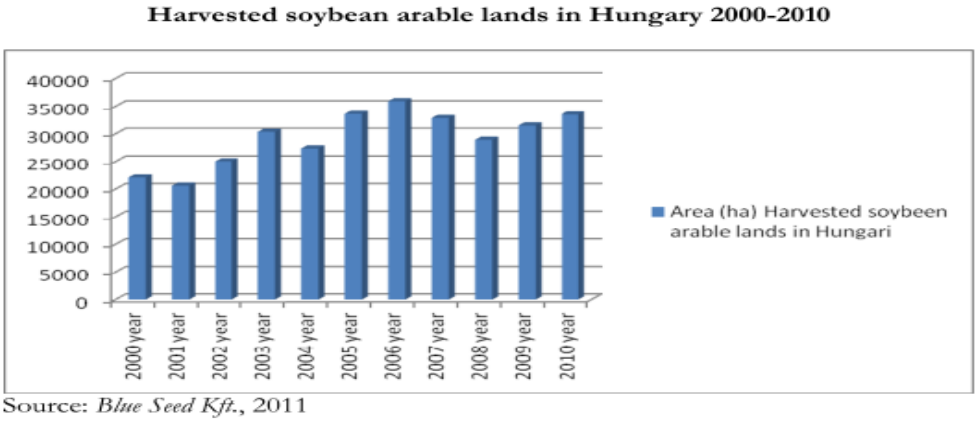


Figure 4. Harvested soybean arable lands in Hungary, 2000-2010 (Horvath et al., 2011 cited Blue seed Kft.)

The system of production used is appropriate for in the strict EU criteria, for EU producers and it is a cause of disadvantage in competition (www.agrarkamara.hu, 2010). The ramp-up of European Union protein plant production held a discussion and was established that it would be desirable to increase the proportion of protein plants in order both the rotation and the conversation of biodiversity. But this is depend on several external factors, such as the demand for protein crops primarily depend on livestock, encouraged with production grant, but this so far the only Member State not associated with a significant expansion of production. In any case, the date suggest a reconsideration of imported soy feed, where near the current economic interests also calculates in long-term with the impact of economic decisions.

Characteristically, the soybeans can be grown successfully in areas where maize is plenty produced and therefore can buy more soybeans than the same land could produce (Horvát et al., 2011 cited Potori, 2011). The economic calculations however are necessary to enumerate soybean and corn production costs, calculating relevant benefits of soy, taking into account the profitability impact of monoculture production damage. production of soy and soy products markets (animal feed-soya food ratio) depends on the economic calculations that determine the place of the soy products in the national economy and it's role in agriculture. Soy purchase average price and yield evolution in Hungary of the 2000-2010 (Figure 5) shows that the cultivation primarily influences the actual purchase price, which is adapted to the prevailing world market price, or less than 200 USD/t and for 400-500 USD/t price level. This claim is supported by the supplied data in the main parameters of the European soya cultivation.

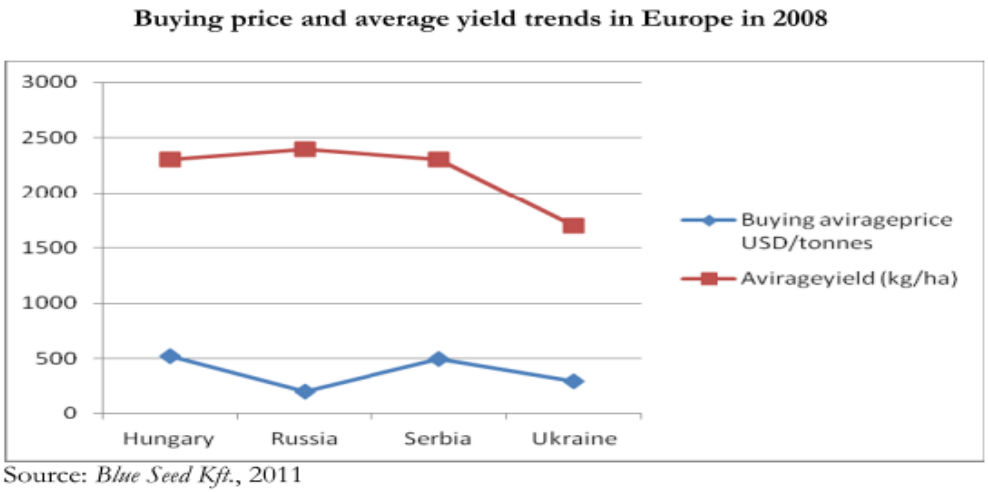


Figure 5. Buying price and average yield trends in Europe, 2008 (Horvath et al., 2011 cited Blue seed Kft.)

The Hungarian agriculture persisted even while the wheat and maize production, which was a much better price parity in favor of soybeans. The high grain prices are not favorable for the growth of the soybean crop area. However, you may come as a surprise change of attitude in order to high fertilizer and fuel prices. The fertilizer prices follow the grain, oilseeds and protein crops, price increases, it can even exceed it. The expected rise in fuel is also a lot of surprises in store for the farmers, if for no other reason than the prolonged crisis in Libya.

According to the summary of Horvát et al., 2011 soy foods for our everyday is not mean to leave food of animal origin. **Soy foods** like substitute product (vegetarianism and lactose intolerance) is a major success, however who has incorporated into the everyday with the consumption of meat and dairy, health improvement and better-being reported. In Hungary the consumer can choose mostly from a wide pallet of soy food in healthy food stores, drug stores and are likely to be targeted space there, because eating attitudes and customs so require. The different sized chain stores next to the milk products is soy milk with different flavoring and it is the demand for it, while next to the meat panels there is no potential range of soy products. Not to mention the division of salty and sweet snacks, where you cannot find a specifically „soy snack".

The use of soy-food support that essential vitamins, micro elements, rich in fiber population, a high protein content (32-52%), which contains the easily metabolizable and human consumption of 20 essential amino acids not dispensable. Soy protein does not contain purine bases, which are the disease in blood pressure; presence essential fatty acid content of the ancient science of nutrition is recognized. In Hungary, the majority of consumers are underestimates the soy foods, the majority opinion in damning them because of the beliefs, while the organic food stores, drug stores, supermarket chains, web stores, prices refer to high-quality food. Long-term goal of our research is to resolve this anomaly, consumer attitudes and understanding of the basis for the development of marketing strategy.

The export had important rule regarding the **seeding s**ector as well.

The seed production and distribution are fully privatized in the recent years, only the research and breeding sector remained in state owned.

At present more than 800 enterprises are involved in seed business from which app. the 25% of this quantity are individual enterprises.

The majority of the seed sector is SMEs, but the large-sized companies play the main role, particularly the multinational ones.

Beef sector in Hungary

The livestock production of Hungary has decreased in the recent years.
The changes of the number of the bovine livestock in the annual statistic are because of including beef cattle and dairy cattle. In 2008 the number of the bovine livestock was 701000 and on the 1st of December, 2011 this quantity was 698000. In addition increases can be observed in relation to the amount of beef cattle.
The amount of the beef slaughtering in Hungary was decreased in the recent years similarly to the decrease of the amount of bovine livestock (beef and dairy cattle) the majority of the slaughterhouses were closed down at the same time.
During the interviews it became clear that there is a need for a clear definition of sustainability by the stakeholders within the Hungarian soy and beef supply chains.
The definition of sustainable development prepared by the Hungarian National Council for Sustainable Development which was included in the National Sustainable Strategy is "Sustainable development is aimed at preserving and improving the quality of life permanently and in the long run".

The barriers of the beef sector summarized by the interviews:

Within the Hungarian meat sector we can face transparency problems related to the prime quality meat. During the lifetime of the animals beef passport and the ear tags ensure good identification. Transparency problems start at the slaughterhouse.
When the fat stock/ animal is slaughtered identification became more difficult (risk of adulteration). One of the main barriers of the Hungarian beef sale in domestic markets is the relatively high price of the meat. The quality of the Hungarian beef cattle is prominently good, but the majority of the animals are sold in abroad.
There is a lack of Hungarian beef slaughterhouses.
There are also concerns related to the broken trust of the consumers, since the majority of the meat is sold at Hungarian markets is made of dairy cows meat, thus it is low-quality product.
There is a lack of the branded and high quality Hungarian cattle meat. Besides, consumers and caterers use poor practices in maturing beef because there is a lack of the experiences related to maturing procedures or matured meat and mistakes can be made by the caterers whose can spoil the quality advantages of Hungarian cattle meat related to the elimination of the maturing time, or shortening the maturing period.

Importance of sustainability

The interviewed participants are aware of National Sustainable Development Strategy. However moderate interest was showed related to the sustainability, because the lack of understanding of the definition of sustainability and application in the everyday life. The commonly mentioned explanation was "most effective use of the natural resources or better quality of the product".
There was slightly different approach in those players in both sectors where their businesses are export oriented. They were more aware of the necessarily of dealing with sustainability. These companies usually give support regarding sustainability from their retailers. However

one producer from beef sector lost business the lack of the sustainability data regarding their product.
The main objective within Hungarian soy and beef sector is to produce and sale good quality products that fulfill the market needs. They also noted if any business needs or compulsory legal requirement require the application of sustainability they make all efforts to meet with them, but in these cases they emphasized the importance collective and profitable approach, that led to enhance sustainability.

Standard, certification

ISO 14000, ISO 22000 HACCP and relevant regulations are most frequently mentioned, spontaneously no sustainability specific standard was named. The detailed results presented in another article.
There was a perceivable change within the trend of the standards which shows that at the present sustainable issues are highlighted in the standards. At the same time, multinational companies have started to make pressure on suppliers to perform these standards, since the knowledge has increased related to sustainability and the demand is occurred by the consumers too. In relation with this aspect the indicators for compliance also have been changed.
There is a need by the stakeholders within the soy and beef supply chains for the harmonization of the standards, because the mass of the existing standards and labels can be confusing for the end users, particularly the consumers.
The first steps have made to achieve sustainability in Hungary. The quantity of the water use and the efficiency of the use of nutrients will be improved by the expansion of the yield and productivity of the Hungarian species. This change will generate a continuous decrease in the use of energy.
In the recent 20 years in Hungary the average yield of soy has increased by 29%. At the same time the energy which is used for the cultivation of soy is decreased by 65%. In addition the emission of the Green House Gases has decreased by 38%. The water use efficiency of the species has improved by 20 %. This data shows the contribution of plant breeding to the sustainable development of the agricultural production.

To achieve sustainability it is important to minimize the import of Hungary from distant lands, particularly soy import from LA countries and maximize the soy production within the EU countries. Besides, almost the whole amount of the imported soy is GMO or the origin is unknown of these items.
Within Hungary the stakeholders are interested in the separation of the streams of GMO and non-GMO because they have advantages of the non-GMO soy production within domestic and European markets.

Categories of sustainability along soya and beef supply chain

In table 1 the pictures show the most important impacts along the soya and beef supply chain. The listed economic impacts are equally important from both sector.

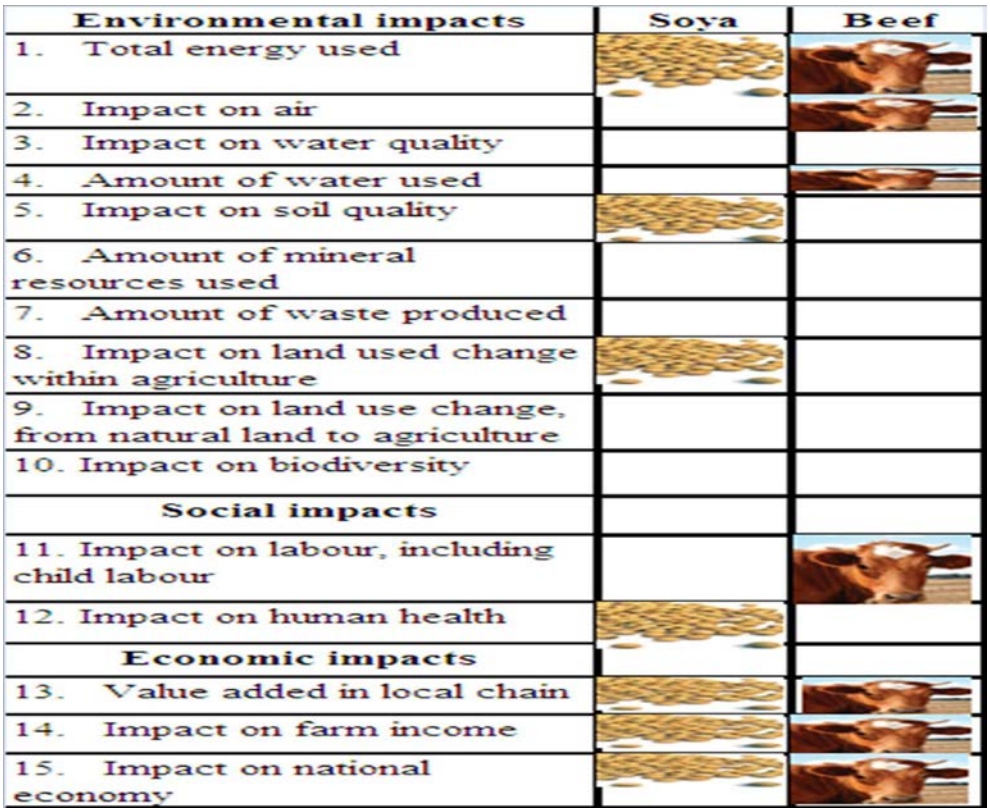


Figure 6. Importance of Categories of sustainability along soya and beef supply chain (Based on average scores)

Environmental impacts in the soy sector:

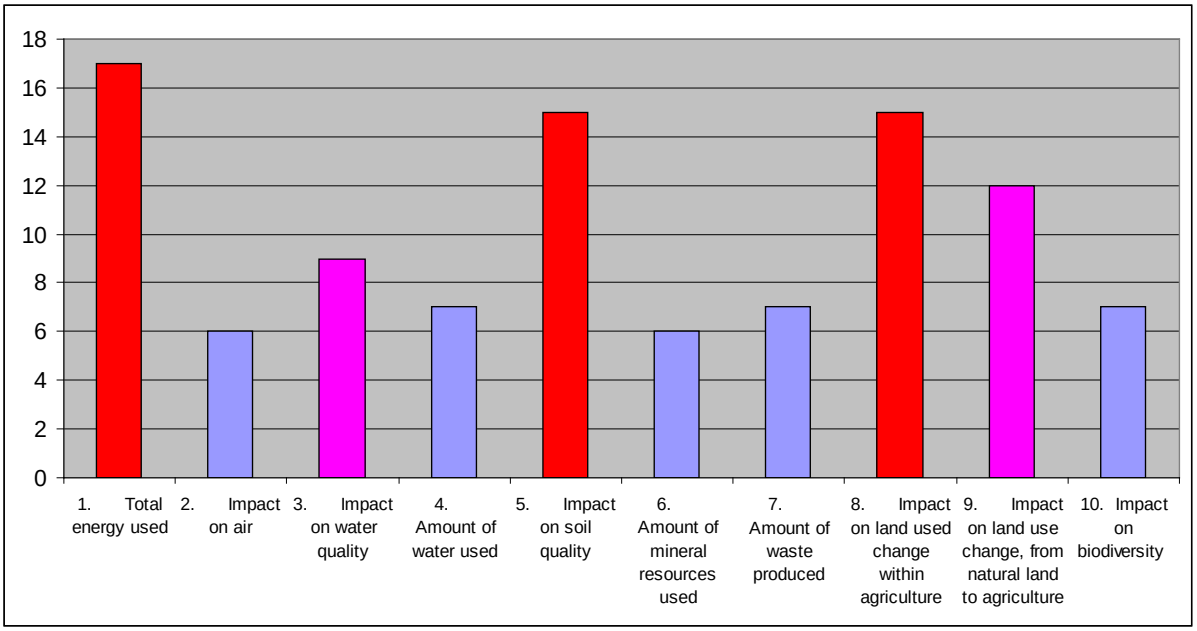


Figure 7. Importance of Environmental impacts along soya supply chain (Based on average scores)

Environmental impacts in the beef sector:

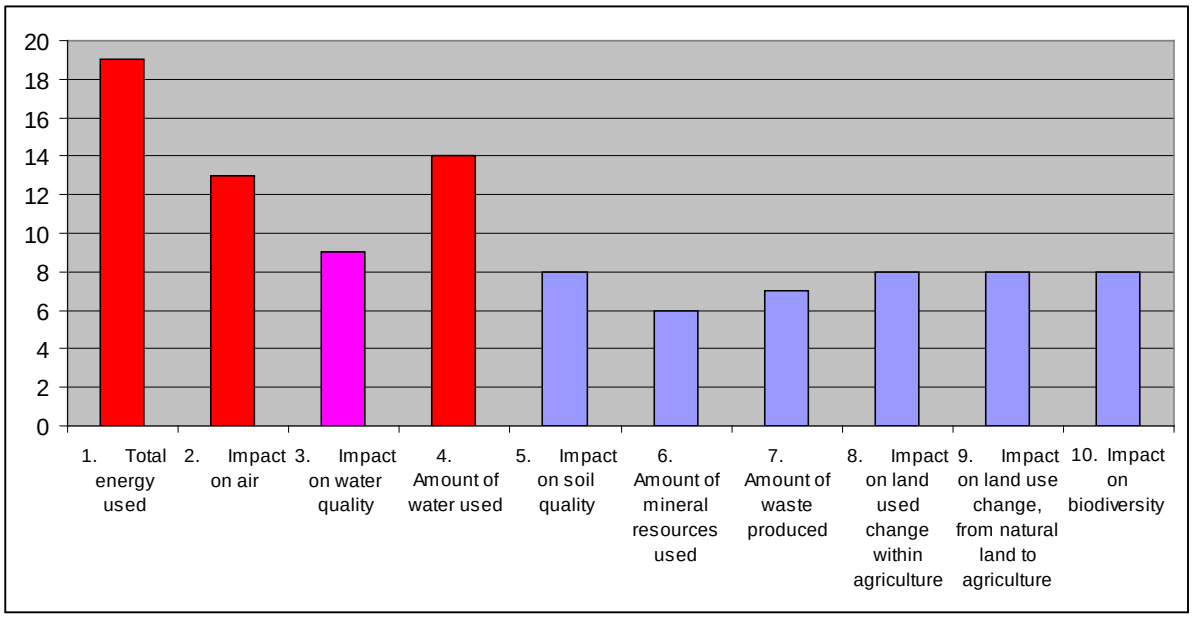


Figure 8. Importance of Environmental impacts along beef supply chain (Based on average scores)

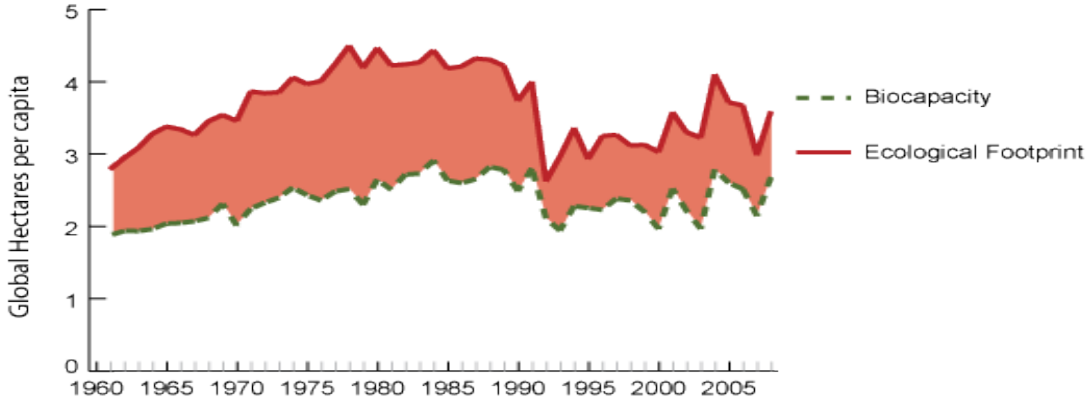
The high importance of the total energy used is not surprising because the energy saving is crucial issue in each sector. This kind of approach is supported by the businesses themselves by the player of the government sector as well.

Due to the currently know information, data about the animal breeding on carbon dioxin emission and media presentence of this news compared to similar issues explain why the impact of the animal breeding on the air is so relatively high. The score was relatively lower in those respondents who have reliable and well paying market.

The impact of water quality was evaluated at the same weight. The water quality is not a difficulty at the moment for the evaluated sector, although the amount of water used was highlighted in the beef sector due to the increasing cost. The financial aspect was stronger here than the pure environmental aspects. The relatively lower interest regarding this issue in the soy sector is due to the lack of irrigation.

The quality of soil was considered as an important factor by the participants from the soy sector. This might come from the nature of the soy. The impact on land use changed within agriculture was nearly similarly evaluated by the participants from the soy sector.

There was not big difference **among the player of the supply chain**. The representatives of association and authorities relatively ranked higher the amount of waste and biodiversity.



Hungary has overshot its biocapacity, because it had fewer natural resources.

Regarding the social impact

The differences arose that the producers scored the importance relatively higher of the impact on health, because this might be beneficial for the business rather than the impact on labor. They stated that all legal requirement are maximally followed by them.
There was no difference among the player of the supply chain.

From the **economical** point of view surprisingly all impacts were nearly equally scored by the participants. Of course the supplier and producers ranked slightly higher the impact on farm income, followed by value added local chain, than the representative of the government sectors appreciated slightly higher the national income.

To identify barriers related to sustainability

The main barriers related to sustainability:

- Lack of definition of sustainability (clear requirements in the everyday life)
- Moderate business, market needs
- Lack of cost benefit understanding of their investment in terms of sustainability

Other comments related to sustainability issues

Within the Hungarian soy and beef supply chains there is a harmonized, good business relation between the stakeholders; particularly there is a good relation with the supplier, because it is important for the stakeholders upstream to trust in their suppliers and keep daily contact with them to achieve a whole assurance in business.

The stakeholders are influenced by the wholesalers for performing the standards in favor 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.

It became clear during the interviews, that there is a need for a collective approach changing by the stakeholders within the supply chains and also by the Hungarian Government to enhance sustainable development in Hungary.

5 Conclusions

Based on the results we could conclude that there is a harmonized, good business relation between the stakeholders within the Hungarian soy and beef supply chains.

The SMEs are surrounded by an extremely challenging business environment, where they are

pressed both by the suppliers and consumers to innovate. Regarding that their innovation capacity is very much limited; they can utilize this specific economic resource in an efficient way only if they cooperate with other business players.

The power relations are different within the soy and the beef chains. Within the beef supply chains the wholesalers make the rules, and 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.

Finally we could conclude that 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.

Sustainability is an initial stage in Hungary, but the future importance is well-know by the players of the supply chain. The question is how quickly the supply chain system copes with this new challenge.

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