

Logistic System Efficiency in
Middle-sized Farms in the South-Eastern
Part of Romania

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Part of Romania

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Preface

The reason for which I have written this thesis is to obtain the Bachelor in Agribusiness & Business Administration, with specialization in Food Chain Management issued by Aeres University of Applied Sciences, Dronten.

This thesis was also written to help improve the financial situation of the medium-sized farms situated in the south-eastern part of Romania. The research has been aided by the company where I undertook my internship. The internship started on the 16th of March 2020 at Bayer and helped me meet a variety of farmers.

I would like to express my sincere gratitude towards my advisor Pat Burgess for the continuous support of my research, for his patience, immense knowledge and enthusiasm. His guidance helped me in all the time of research and writing of this thesis.

Besides my advisor, I would also like to thank the following farmers: Costea Gheorghe, Nelu Bercu, Catalin Dumitru, Adrian Dumitru, Liviu Titianu, Malinchi Titi, Cristian Dumitru, Iulian Cojocar, Costache Valeriu, Razvan Rugina, Scripcariu Bogdan, Teo Talmaciu, Pîrău Celestin, Cristinel Brînză, Iulian Popescu and Valentin Barbălată for their encouragement and willingness to support the research. Without their support, the data could not have been gathered.

Contents

List of Tables	vi
List of Graphs and Figures.....	vi
SUMMARY	1
CHAPTER I-INTRODUCTION.....	2
Theoretical Framework.....	5
Agriculture in Romania	5
Defining Logistics.....	5
Defining Agricultural Logistics	7
The Romanian Logistics Infrastructure	8
The opportunity of outsourcing logistics for the Romanian farmers	11
Brief Introduction on how the logistics work in Romania.....	11
Romanian Transport Services.....	12
Logistics Performance Index	14
Outsourcing considerations	15
External and Internal Factors supporting or impeding logistics.....	15
Farmers and Logistics.....	17
The Target Group	19
Critical Discussion	19
The Knowledge Gap.....	19
Main Research Question.....	22
Sub-questions.....	22
RESEARCH OBJECTIVE	22
PROBLEM DESCRIPTION AND DEMARCATION	23
Chapter II. Research Design and Methodology	24
Research Design	24
Research approach	24
Research strategies used	24
Population sampling	24
Data Analysis Methods	25
Limitations.....	26

Chapter III Research Findings	27
Sub-research question 1: Are farmers actually quantifying the economic losses because a logistics system is not put into place?	28
Sub-research question 2: Have the farmers ever considered using their own logistics system?	29
Sub-research question 3 : What are the challenges faced by the Romanian farmers in regards to the logistics system put in place?	30
Sub-research question 4: Are there any suggestions in regards to how these challenges can be overcome and the transport system improved?	33
Sub-research questions content analysis	34
CHAPTER IV. CRITICAL DISCUSSION	36
Research Limitations and Managerial Implications.....	38
Future research possibilities	39
Chapter V. Discussion and Possible Solutions	40
Answer to the main research question	40
Conclusions	41
Recommendations.....	41
Bibliography	43

List of Tables

Name of the Table	Page
Table 1- Logistics Theories	4
Table 2- Romanian Logistics Parks and their Geographical Distribution	5
Table 3- The company's main external factors	14
Table 4- Destep analysis for Romania	15
Table 5- Internal Factors	15
Table 6- Knowledge gaps found in the supply chain	18
Table 7- Response Data	35
Table 8- Solutions	31
Table 9- Content Analysis	32

List of Graphs and Figures

Name of the Figure/Graph	Page
Graph 1- The volume and structure of the national subsidies before and after the accession to the European Union	3
Figure 1- Romanian Railway Infrastructure	8
Figure 2- Romanian Road Infrastructure	9
Figure 3- Inland Freight Transport Split for the EU in 2017	11
Figure 4- Inland Freight Transport Split for Romania	11
Figure 5- The classification of freight by destination	18
Figure 6- Attitude towards the idea of owning a fleet of trucks	28
Figure 7- Challenges faced by Romanian farmers	29
Figure 8- Key aspects which derive from the set of sub-questions	31

SUMMARY

The following thesis has been written in order to analyze the logistic system present in medium-sized farms in Romania. Once analyzed, the logistic system can be better understood and improved if possible. The main scope of this thesis is to find any possible gaps in the logistic system and find ways to make it more efficient.

In order to achieve a good understanding of this topic, the researcher has created a main question which is followed by a set of sub-questions in order to guide the research. The foundation of the research is based on the four sub-questions used. With the information gathered, the researcher managed to see the different perspectives of the farmers and understand how the logistics work in Romania. Furthermore, the information found about logistics in general in Romania has also been of use in order to draw a conclusion.

The main findings depict a difficult situation in Romania in regards to logistics. First of all, the road and railway infrastructure in Romania is underdeveloped in comparison to other EU countries (Ipsos.com, 2019) (Eurostat, 2019), fact which impedes the general development of logistics. Secondly, the farmers do not invest in logistics since they are perceived as an option not a necessity (not being cost-effective enough). Furthermore the researcher, through the sub-questions used, found a set of issues related to logistics in most of the medium-sized farms. That being said, the researcher identified a solution proposed by the farmers. To conclude, the logistic system development in Romania is severely affected by the lack of infrastructure in the country. As a result, the possible implementation of such a system in a farm is harder to justify from a cost-effective perspective.

A set of recommendations were created in order to improve the logistic situation. The recommendations begin with a simple presentation of theory, so that the farmers will better understand how big companies use logistics as an advantage and end up with the implementation of a silo, as a feasible solution for the problem and the use of European subsidies to make logistics more cost-effective.

CHAPTER I-INTRODUCTION

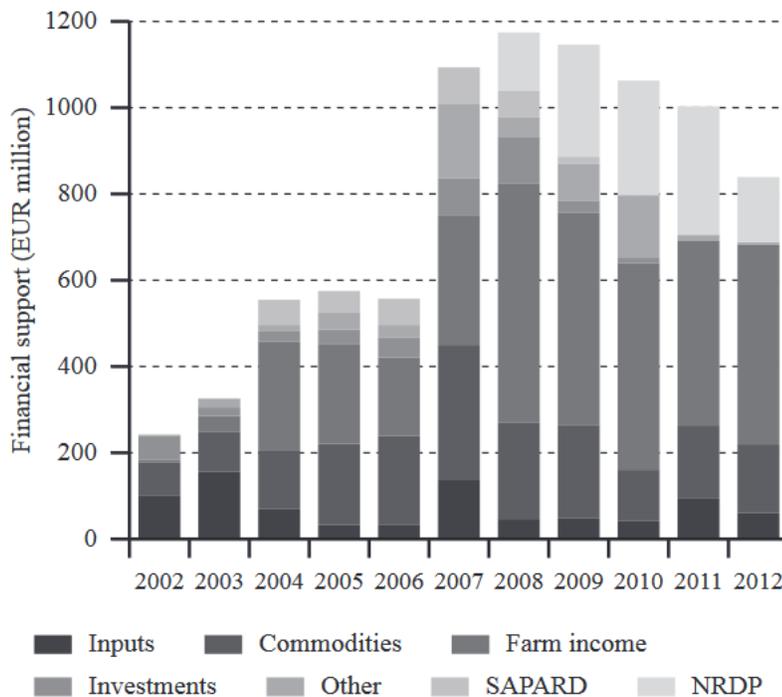
The aim of this research is to point out the effectiveness of the logistic system used in the small and middle-sized farms in south-east Romania. This region of Romania is considered to be the most suitable for agriculture. The lands are very fertile, there are basically no hills and most of the soil can be irrigated here (Romania can only irrigate about 9% of its land- which represents close to 620.000 hectares). Both river Danube and the Black Sea are close and give access to harbors and so on (Panaete, 2019). The Romanian Plain is known especially for its crops of grains. One of the most important areas of this region is Braila County. The County has about 476, 576 hectares out of which approximately 80% are used for agriculture (Constanta, et al., 2017). The fact that the County of Braila is so relevant, agriculture wise is pointed out by the fact that big foreign investors are willing to invest in this area. That being said, since 2008, an Abu Dhabi based group has taken over (through concession) the biggest farm in Romania. Al Dahra Agriculture, a group coming from United Arab Emirates has taken over Agricost Braila. Al Dahra Agriculture has now the concession of about 56.000 hectares. The hectares are situated on Insula Mare a Brailei (The Great Island of Braila). The island is situated on the Danube and it has the most fertile land in Romania. The value of the transaction is considered to be somewhere in between 200-250 million euros. The money has been paid only on the business and not on the land (Romania-Insider, 2018).

In regards to logistics, this thesis will point out elements of logistics in Agriculture. Logistics in Agriculture represent a key aspect for ensuring a continuous supply of food and other agricultural related products to the customers (Kramar, Darja, & Martin, 2013). Interesting enough, agricultural logistics have gone way further in the past few years. That being said, logistics went from optimising the production processes to innovating in order to attract more clients. To reach this level, a reform of the rural institutions might be needed (Zheng-you & et al, 2006) In this case, logistics themselves become actors which might lead to new sales and will not only represent a key factor in supporting the actual sales. China is an example for this kind of situation with its 'Farmer-Supermarket-Direct-Purchase'. This mode of circulation for the products is based on modern logistics and it leads to customers being able to buy fresh products from the supermarket. Unfortunately, there are some issues in regards to this new way of using logistics. The logistics costs and the technology required are unfortunately keeping a big number of farmers away from it (Han, Fresh Agricultural Products Logistics under "Farmer-Supermarket Direct-Purchase" : Problems and Suggestions Analysis. Applied Mechanics and Materials, 2011).

Since the fall of communism in 1989, the role of agriculture in Romania has changed dramatically. During the communist era, agriculture was seen as the bad aspect of the economy since the regime was focusing most of its power on industrialization (Carmen, Lucian, Mihaela, & Cecilia, 2014). Once the regime has been replaced by democracy in 1989, the role of agriculture has increased dramatically. For example, the contribution to total GDP has become way more significant reaching to about 3033.50 RON million (Economics, 2020). The Agricultural sector had a fresh start since 2007, when the European Union with its European Funds, Common Market, and the Agricultural Policies have created a positive environment for the farmers and for the people. Romania pretty much relies on imports to satisfy the needs of its people. For example, fish would not be present on the market given the fact that only 15% of the amount needed is being produced internally. Furthermore, 500.000 tons of sugar are consumed each year in Romania, out of which only 80.000 tons are produced locally (Iulia, 2007). Basically, the common market allowed an easier flow of goods.

Once the country has joined the European Union, a certain number of agricultural subsidies have been provided:

- Input subsidies
- Commodity/ Product subsidies
- Income subsidies
- Investment subsidies
- Other subsidies – for example access to credit at low interest rates, compensation for disasters and so on.



•

- *Graph 1.* The volume and structure of the national subsidies before and after the accession to the European Union . Adapted from 'Romanian farm support- Has the European Union membership made a difference' by H. Carmen, L. Lucian, L. Mihaela and A. Cecilia. 2014, Studies in Agricultural Economics, p. 100-106. Copyright by the Studies in Agricultural Economics Journal. Reprinted with permission.

As it can be seen in graph number 1, the amount of money given by the EU to the farmers is way larger in comparison to what the Romanian state was offering prior to the accession. The farms started developing; farmers started investing into high-tech equipment but not so much into logistics. The harsh situation is visible all across the country, with the logistics infrastructure being completely inefficient (Romanian Logistics, 2013).The gap between farms and their logistics system has become bigger since the farms modernize but the Romanian infrastructure does not in order to support the growth (Romanian Logistics, 2013). Furthermore, the farmers in general are not quantifying the impact of the logistics on the profitability of their farms. That being said, the thesis will analyze the efficiency and the impact of the logistic system already put into place and will give farmers some solutions considered to be optimal.

Theoretical Framework

Agriculture in Romania

Romania is a country with a considerable amount of arable land (about 9.4 million hectares which represents close to half a hectare per capita). The country occupies the 5th place when it comes to the amount of arable land at its disposal in the EU, showing that there is a great potential in achieving an important role in the European market for different food related products (Aceleanu M. I., Aceleanu, Molanescu, Craciun, & Voicu, 2015).

Another important aspect is the fact that the climate of Romania and the relief of the country are very suitable for agricultural activities (Posea, 2002). Unfortunately, the country's potential is not exploited in an efficient way because of the lack of organization when it comes to the agricultural land, or the cadastral measurements and so on (Britannica). Another unfortunate aspect is given by the lack of irrigation systems in most of the country. The lack of irrigation possibilities is making the farmers very dependable on climatic conditions (Agrostandard, 2013).

Furthermore, even though the country has relatively good yields, the way the product marketing is done is pretty inefficient. Some critics say that, from a food chain management point of view, the country is still in the 19th century (Paul, business-review.eu, 2019). The Romanian farmers have no legal association and because of that, their products are being sold either at the front gate or in markets. The vice-president of Pro Agro National Federation, Emil Dumitru, said that Romania has not been capable to organize its farmers in any way, although there are a few million of them (Dumitru, 2019). Unfortunately most of them are subsistence farmers, owning about half a hectare and farm to maintain their existence. The vice-president said: " We have not organized farmers and we do not have an organized market. We have not yet discussed what measures should be taken to stop selling raw material products. We shouldn't brag about the absorption of European funds if we do not have economic impact, if we do not convert raw materials into processed products that have added value. At the moment, we should finance the food industry so we can move on to the enormous economic step that will help farmers" (Paul, business-review.eu, 2019).

All in all, the Romanian agriculture has great potential but a poor organization. Its potential is given by the climate, the relief and it is backed up by the agricultural results of year 2018 in which the country has ranked first in EU for sunflower and maize yield (Aurel, business-review.eu, 2019).

Defining Logistics

Baron Antoine Henri de Jomini, has created the term logistics in his book *The Art of War* which was published in the nineteenth century in France (1836). His definition for logistics was 'Logistics comprises the means and arrangements which work out the plans of strategy and tactics' (Jomini A. H., 2007). One can see that logistics had a very military perspective in the

past but nowadays this perspective is way broader. The Council of Supply Chain Management has come with its own definition for the logistics system, asserting logistics as a part of the supply chain management: "Logistics is a part of the supply chain process which plans, implements and controls an efficient flow of goods and warehousing, services and relevant information from the point of origin to the point of consumption with the objective to meet the consumer needs" (Council of Supply Chain Management, 2013). Will Kenton refers to logistics as an overall process of managing the way the desired resources are obtained, deposited and transported to the end destination. Logistics have to identify possible distributors and suppliers and see how effective and accessible are they (Kenton W. , 2020). The business dictionary comes with a definition from which one can understand that logistics are comprised of a variety of processes starting from planning until the product reaches the end consumer (a management of the inventory while at rest but also while in motion) (Businessdictionary).

Out of these definitions, the most suitable for the situation in place is the one given by The Council of Supply Chain Management since it brings to the table all the elements of detail which define the logistics and it can be considered up to date. Furthermore, it explains quite well the role of the logistics in a company in such a manner in which even an untrained eye can understand that logistics are mandatory in order to maximize the everyday activities.

In the end, Napoleon has made a very interesting affirmation in regards to logistics "A real knowledge of supply and movement factors must be the basis of every leader's plan; only then can he know how and when to take risks with those factors, and battles are won by taking risks." From this affirmation, one can deduct that every manager has to take logistics into consideration, as they dictate how and when to make certain decisions.

Table 1.

Logistics Theories

THE THESIS'S MAIN THEORY	
Baron Antoine Henri de Jomini	
The Council of Supply Chain Management	X

Defining Agricultural Logistics

Once logistics have been defined as a whole, a definition for Agricultural Logistics must be given. For Agricultural Logistics, there are multiple definitions which can be found:

- The logistics of the agricultural products means moving information and material objects from a producer to the final consumer in order to meet the consumer's needs and achieve the value of the products (Zhang & Li, 2012).
- The food crops have a distinctive type of logistics of agricultural products. The harvest, the distribution, and the sale of the agricultural crops matters to state strategic reserve (Daopind & Lei, 2012).
- The logistics in the case of the agricultural products is nothing but a branch of the big logistics industry and it refers to the physical flows of physical entities plus the information which goes from producers to consumers that satisfy the demand of the consumer, including the harvest, the acquisition, the transportation, the storage, loading and unloading process, the handling process, the packaging process, the distribution process and so on (Liping, 2009).
- Agriculture products logistics dynamic alliance provided a suitable mode for agriculture products logistics (Yao, Cui, Ying, & Wei, 2009).
- It represents the use of the modern science in order to satisfy the needs of the modern society (Zhang & Wang, 2011).
- Integrated activities (both operation and management) which rely on advanced technologies, modern transport and modern storage spaces, through a large number of business information instructions, engaged in agricultural activities (transportation, storage, processing and so on). It has the objective of optimizing the channels of distribution of the agricultural products, reducing the overall costs and provide the fastest and the best service to end consumers (Wang L. , 2012).
- If the agricultural products are taken as a core, the logistics for this sector refers to the flow of elements from a producer to a receiver and all the involving technology, organization, management and other core activities. It is made of a certain number of links: the production, the purchasing process, transportation, information activities and so on. The objective of this kind of logistics is to bring more value addition to the table and reduce the costs of distribution (Zhou & Wang, 2012).
- The economic activity which starts from the producer and his agricultural product and ends with the consumer and his demand being met.
- Activities which relate to the process itself, in order to have a better quality of the agricultural products, reduce the costs and satisfy the needs of the consumers (Wang L. , 2012).

- The logistics of the modern agriculture must have the following functional elements: procurement, supply, storage, transportation, distribution, processing, marketing, recycling and the control of information. The modern logistics in agriculture must not focus only on optimizing costs but also on optimizing all the elements mentioned above (Wang, Liya, & Wei, 2010).

In the case of this study, the definition given by Wang Shufeng is the most useful; hence it expressed the great extent of the logistics phenomenon in a company.

The Romanian Logistics Infrastructure

The logistics infrastructure in Romania is not as developed as the one present in the western EU countries. Going even further with the idea, the western EU countries have an inferior logistics infrastructure in comparison to the one which exists in North America or Japan. Former CPPIB chief Mark Wiseman affirmed that the world is not developing at the same speed, so the concept of a 'two speed' world was born (Barbara S. , 2015). The idea of a two speed world was also implied a few decades before in 1993 (Sapir, Buigues, & Jacquemin, 1993). Fair enough this affirmation is interesting because it shows that some countries, especially those which are underdeveloped tend to evolve at a slower pace. Another element worth mentioning is the fact that those countries which are quite developed tend to reach a point in which they cannot develop any more. For the underdeveloped countries this aspect can be a key element since the other developed countries will be willing to invest. Albin Budinsky, CEO of DB Schenker Romania said that highly developed markets have no room left for development while some other countries, such as Romania are considered to be an emerging market, especially when it comes to the transport sector.

Judging by the Logistics Performance Index, with the data gathered from 2016, Romania had a score of 2.99, which is less than the score of Hungary (3.43) or Poland (3.43) or the Czech Republic (3.67).

According to the information provided by the National Institute of Statistics, during the first part of 2016, there was an increase of 33% in road freight volume. In the year 2014 the logistics market in Romania has reached 7.9 billion euros (Newsroom, 2016).

In regards to railway infrastructure, Romania is placed seventh in the European Union (judging by railway length) with 17.000 railway km but with only 10.500 km in use (FRD Center Market Entry Services, 2010).

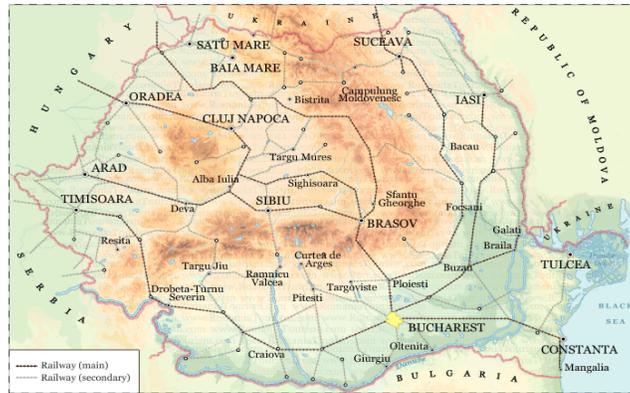


Figure 1. Romanian Railway Infrastructure. Adapted from 'romaniatourism.com' by romaniatourism.com, 2020. Copyright by romaniatourism.com. Reprinted with permission.

Experts say that the railway infrastructure in Romania is so degraded that it needs 15 years of continuous investments to catch up from behind (when compared to other EU countries). It is said that 40 billion euros are required in order to make the railway infrastructure at a decent level (actmedia.eu, 2020).

The road infrastructure is also lacking. A study done by Ipsos states that three out of four Romanians are unhappy with the country's infrastructure. Most of the Romanians are unhappy because of the lack of highways (93%) (Ipsos.com, 2019).

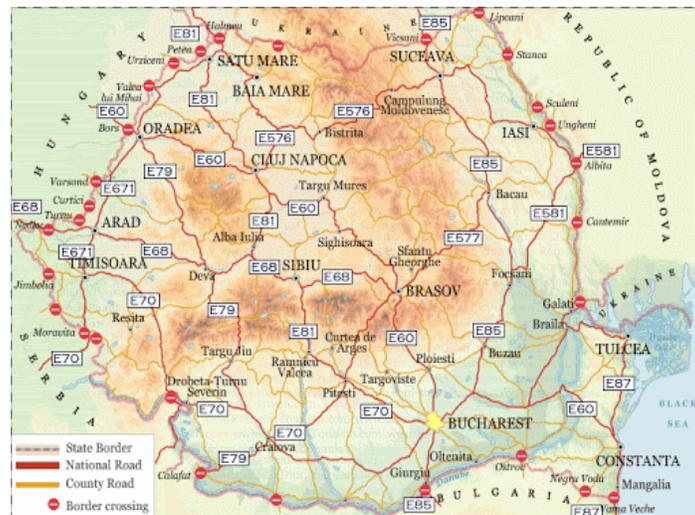


Figure 2. Romanian Road Infrastructure. Adapted from 'romaniatourism.com' by romaniatourism.com, 2020. Copyright by romaniatourism.com. Reprinted with permission.

Romania has about 836 kilometers of highway, and the perspective of expanding it is quite grim. For example, in 2019, the country has built only 22 kilometers of highway even though the government planned to build more than 100 kilometers (PRO TV, 2019).

Most of the information presented here reveals the fact that the Romanian logistics system is not as efficient as it should be. Fortunately, other countries facing similar situation found solutions to address the issues. In South Africa, logistics have played a big role when it comes to the development of agriculture. In the past, Agriculture would represent about 16% (1950) of the South African GDP and right now it is only 3%. This decline has been attributed to the growth of other economic sectors, and logistics to a certain extent. Since food chain logistics is of a big importance to farmers, the lack of communication infrastructure, reduced market densities, increased input costs have led to a big decline in agriculture. Some of these issues, such as the increased input costs and the lack of communication infrastructure are also common in Romania. The solution for the South African problem is a conceptual transport or logistics model. The model inputs consist of products and volumes to be transported, the most suitable vehicles for the goods and the locations where the goods can be delivered. The outputs consist of – optimized routes and costs and suitable vehicle types (Zanele, 2015). This entire model has been created to improve the situation in the South African region but can also be applied to some extent in Romania. By optimizing the logistics with a similar model, the farmers will have a more efficient business.

Going even further, Thailand is another example in which the logistics system is not efficient. Unfortunately since the population is going through an aging process, the farmers are getting older and older and are not able to find successors to take over their farms. That being said, the situation is made even worse by a fairly bad supply chain system which forces the farmers to distribute the goods in an inconvenient way. In the case of mass production, if the marketplaces are not notified, the agricultural goods are at risk of being lost while waiting for buyers. In some other situations, the selling price is low that the farmers cannot cover their costs. The farmers go bankrupt and create an unbalanced relationship between those that supply and those that consume. In order to support these farmers, the government has come with a mobile application which enables the farmers to push their products on the internet. With this app, the selling channels are improved and a fair price is secured. Another beneficial aspect of such an app is that it can help society preserve agricultural careers.

By implementing a similar app, the Romanian farmers would be able to promote their products in a more efficient way and also cuts costs by distributing the exact amount of products to the desired place. In the end, all these elements might lead to a price reduction which translates in a higher demand.

To conclude, the Romanian transportation system is quite ineffective and underdeveloped in comparison to other EU countries and the logistics performance index is making it clear. Fortunately, as mentioned above, there is a positive aspect in this. The other developed countries have reached a point in which they cannot develop that much anymore and must

invest in other countries. That being said, the Romanian market is considered an emerging market and this might make it very prone towards an aggressive development in the future.

The opportunity of outsourcing logistics for the Romanian farmers

In order to analyze the efficiency of the logistic system for Romanian farms, one must understand if outsourcing represents the only opportunity for the companies. That being said, if there is no other option, there can be no analysis in regards to the effectiveness of the system, or if there is one, the solutions are quite narrowed to a very limited set.

Brief Introduction on how the logistics work in Romania

The Romanian logistics market has gone through a stable growth since the country has adhered to the European Union. Once the country has finished its accession, foreign investors have shown interest to invest (the country was very attractive because of the lower costs of production).

The years 2007 and 2008, have shown an increase in demand in logistics spaces and the transactions volume in regard to the logistics market has reached 250.000 square meters. Jones Lang LaSalle has done a study in 2008 in which he has shown that the Romanian logistics market has kept growing due to the demand from the companies which relocated a part of the supply chain in order to reduce costs. The situation has been fueled by the economic crisis which took place in that period of time, making the companies more vulnerable to bankruptcy (Petrariu, Ramona, & Radu, 2013).

Interesting enough, transactions volume started to decline in 2009, stagnated in 2010 and started to grow again since then. In regards to the rental cost of a square meter the price is about 4.5 euros. The prices have a tendency to drop even lower.

Table 2.

Romanian Logistics Parks and their geographical distribution

REGION	NAME	SURFACE
BUCHAREST	ProLogis Romania	295.000.00 square meters
BUCHAREST-WEST AREA	Valad Romania	260.000.00 square meters
BUCHAREST-BRAGADIRU AREA	Regatta	36.000.00 square meters
BUCHAREST- ILFOV COUNTY	Valad	17.027.00 square meters
BUCHAREST- HIGHWAY A1, KM49	Warehouses de Pauw	116.750.00 square meters
BUCHAREST-CONSTANTA, A2	Warehouses de Pauw	69.300.00 square meters
BUCHAREST- WEST PART, CHIAJNA	Europolis	360.000.00 square meters

BUCHAREST- RING ROAD	Helios Phoenis, GE Real Estate	12.100.00 square meters
PLOIESTI- ARICESTII RAHTIVANI	UBM	93.000.00 square meters
PLOIESTI	Warehouses de Pauw	110.000.00 square meters
BRASOV	Alinso Group	220 hectares
BRASOV	ICCO	290.000.00 square meters
CAMPULUNG	Warehouses de Pauw	100.000.00 square meters
CONSTANTA	Warehouses de Pauw	51.500.00 square meters

Note. Retrieved from <http://realestate.doingbusiness.ro/>.

Romanian Transport Services

The transport services represent a component of the logistics market. As mentioned before, once Romania has adhered to the European Union, a lot of foreign investors have appeared. As a result, the vehicle fleet has went through a boom (number wise), especially for the companies which were owned by local entrepreneurs. Interesting enough, the biggest revenue increase was recorded by the logistics companies. A good example would be Edy Spedition, a company which has increased its fleet of vehicles and got 4 times bigger and managed to obtain a distribution contract with Coca-Cola.

Taking all these aspects into consideration, one can see that Romania aligns to the European tendency of delivering most of its goods by road. The average split of inland freight transport for European countries is 76.7% for road transport (Eurostat, 2019). In the case of Romania the percentage of road transport is 42.4% (Eurostat, 2019), which makes it the most dominant but shows that the country has some issues in regards to the infrastructure.

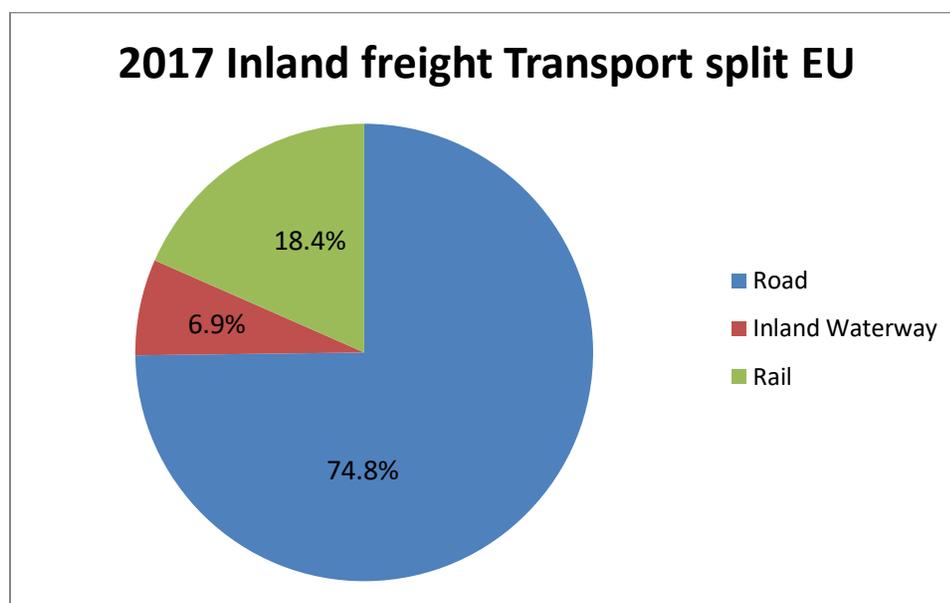


Figure 3. Inland Freight Transport in the EU in 2017. Adapted from (Eurostat, 2019).

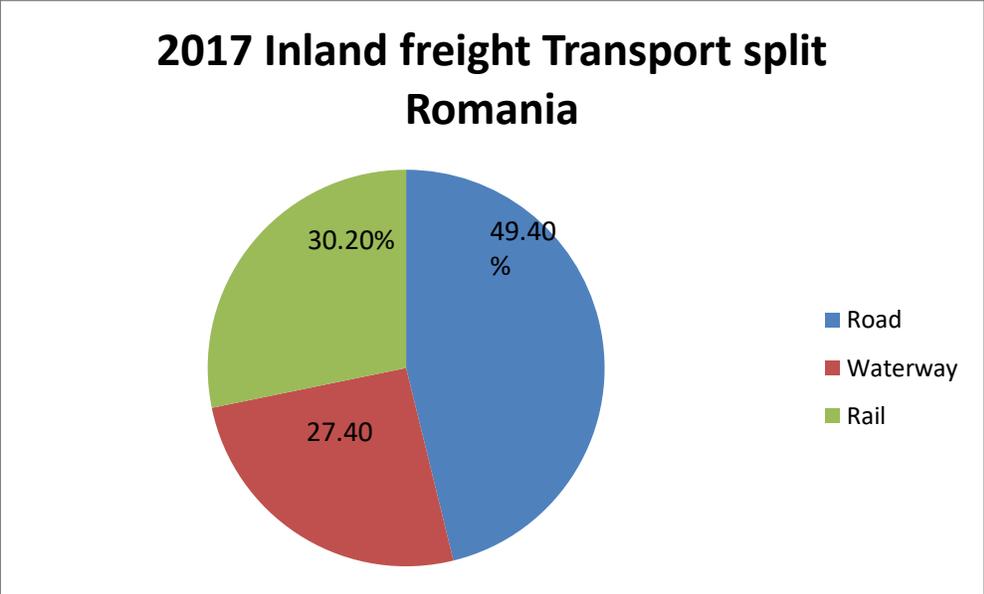


Figure 4- Inland Freight Transport Split For Romania in 2017. Adapted from (Eurostat, 2019)

By analyzing statistical data, researchers have found that approximately 37% of all the international deliveries are being outsourced to specialized companies whereas the other 63% of international shipments are transported by companies with their own vehicles.

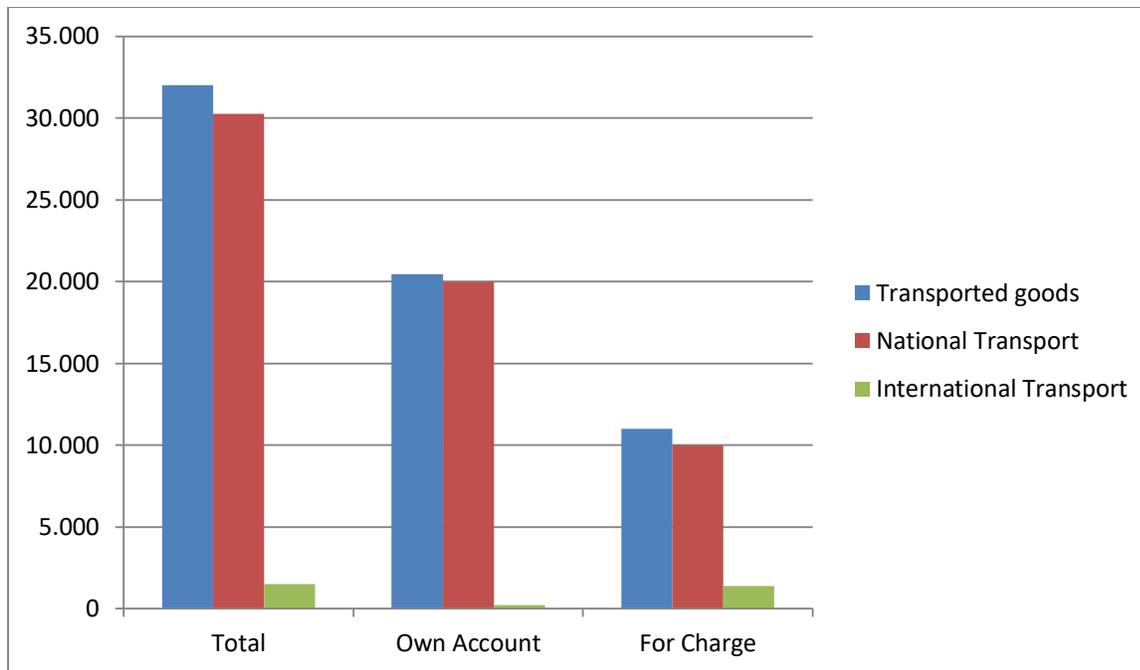


Figure 5. The classification of freight by destination (either international or national). Chart made by author with the data gathered from National Statistics Institute of Romania- (Romania, 2011).

Another aspect worth mentioning is that the Romanian market also has some foreign companies which offer services in regards to transportation and logistics. An example would be Waberers, a Hungarian company and DB SCHENKER Romtrans of Austrian origin.

Logistics Performance Index

When a company wants to decide in which market to expand, it uses the logistics attractiveness and other criteria to assess a certain country. Romania's logistics performance can be compared to the one of the other European countries by using the logistics performance index, which is calculated by the World Bank. Scores are given to certain criteria, such as: customs, infrastructure, tracking deliveries and more. The average of the scores given to these criteria is associated to the logistics performance index.

In order to calculate the logistics performance index, 6 criteria are to be assessed, by giving each criterion a score from 1 to 5. After that, the average of every criterion will be calculated and will result in 6 indicators. The 6 criteria which are taken into consideration in order to calculate the performance index are:

- ✓ Efficiency of passing through customs
- ✓ Quality of commercial and transport infrastructure
- ✓ Ease of contracting transport services at competitive prices

- ✓ Competence and quality of logistics services
- ✓ Ability to locate shipments
- ✓ The frequency with which shipments reach their destination without delay

In 2007, when the logistics performance index was calculated for the first time, Romania ranked on the 51 place. Other Central and South-Eastern countries have placed better: 35- Hungary, 37- Slovenia, 40-Poland (Petrariu, Ramona, & Radu, 2013).

Outsourcing considerations

Outsourcing the logistics system cannot be considered the only opportunity for the farmers. The statistics show that a lot of companies do not outsource logistics in Romania. Since Romania is part of the European Union and since its citizens can access a wide range of European Funds, farmers have quite a great opportunity to invest in transport fleets without having to possess high amounts of money. Nonetheless, the statistics also show that transporting goods on road have a smaller average percentage in comparison to the average of the European Union which in the end depicts the fact that the Romanian infrastructure is inferior. This element of inferiority is discouraging farmers, making them unwilling to spend money on a transport fleet.

External and Internal Factors supporting or impeding logistics

Having defined the logistics systems, one must see if there are certain external and internal factors which can support or impede the use of the logistics systems. That being said, Romania is part of the EU and the EU has an agricultural policy. Since the logistics systems are also part of the agricultural process, this policy represents an external factor which supports the development of the logistics. One must not forget the fact that the market has become more globally oriented than in the past. The market is changing continuously and the consumer is less faithful to a certain brand. The logistic system is detrimental in this fast-moving market. Unfortunately, the agricultural sector is not taking all the desired elements into consideration and is not investing as much as it should in this system. Other branches do acknowledge the relevance of the logistic system but this problem is not investigated in agriculture (Vanecek & Calab, 2003).

The European Union is a positive external factor which supports never-ending development of Agriculture in the Union. The Romanian state is another factor, but in this case a negative one. Through its policies, the state does not support the farmer in order to develop a logistic system. Having trucks can be a big problem for farmers since the infrastructure of the country is in a poor condition. The trucks get damaged pretty often because of the road quality. The transportation process is also very slow because of the lack of highways. Romania has one of the smallest number of highway kilometers in the whole European Union- 829,1 km, placing it 22nd out of 27. Furthermore, the policies of the government are not promising in regards to a

future development. In the case of the year 2019, 180 kilometers of highway have been promised but only 22 kilometers have been built (Fakete, 2019). From the perspective of this external factor, the efficiency of having a logistic system put in place is not as good as it should be. The European Union has a ranking in regards to infrastructure and its efficiency and Romania is the lowest ranking country in the EU for its road quality, placing 27th out of 27 (ec.europa.eu, 2020).

Provided the European Union will exist in the future, the possibilities of developing Romania's infrastructure is high, so that this impeding factor might be eliminated.

Table 3.

The company's main external factors

THE EUROPEAN UNION	Supporting the farms through funds and regulations in their favor
THE ROMANIAN STATE	Does not support the farmers- allocating small subsidies

In order to further depict the external situations that might influence a farm, a Destep analysis has been done:

Table 4.

DESTEP Analysis for Romania

D	20.1 million people, a decrease in the working population, 98% literacy rate (Wikipedia)
E	Employment rate 66%, unemployment rate 4%, GDP-211,8 billion USD, 5% economic growth (Economics T. , tradingeconomics.com, 2019)
S	Decreasing population due to emigration, high corruption (Lucintel, lucintel.com, 2014)
T	Leader in IT market in Eastern Europe, 60% growth in IT market per year (Startups, romanianstartups.com, 2018)
E	Low levels of product recycling, high use of pesticides, air and water pollution (Naturvernforbundet, naturvernforbundet.no, 2019)
P	Big tax rates, High political instability, High Corruption, Inflation (Bulgarian Investment Consulting, 2019)

Table 5.

Internal Factors

The company's financial capabilities
The company's main objectives
The company's workforce capabilities

Putting all these things into perspective both the internal and external factors play a crucial role for any company. While the European Union tries to support farmers through its policies, the Romanian state is indirectly countering these benefits through the taxes and regulations in place. The internal factors, in general, point out how strong the company is, economically speaking, and what the main targets are. That being said, lacking economic power will lead to less investment interest into logistics.

Farmers and Logistics

Any company on the market tries to achieve a more favorable position in comparison to the competitors by achieving a competitive advantage. In general, this competitive advantage can be achieved through the strategy, potential and the ability of the company (Petrisor, Management strategic (Strategic management), 2007).

In today's world, the end clients have become the key members of the chain and because of that their influence towards a company's activity has become bigger. The end clients will no longer support services or products which are brought to them in way in which their demand and expectation is not met (Payne, Sotbacka, & Frow, 2008).

Another important aspect which points out the relevance of the supply chain is the fact that most of the organizations do not deliver their products in an independent way. These companies rely on creating partnerships with different specialized companies, which in the end will lead to the creation of business networks (they include elements such as production, distribution, sales and so on). One can see that the competition has moved at the network level, the company with the most effective business network will gain a competitive advantage (Christopher & Lee, 2004).

All in all, a business network represents the external supply chain of a company. In order to make an external supply chain effective, the internal supply chain must be highly efficient. An organization must be managed in an effective way so that it can obtain the synchronization desired between the internal and external elements of the chain (Takeishi, Bridging inter- and intra-firm boundaries- Management of supplier involvement in automobile product development, 2001). By obtaining synchronization between these elements, more value will be

added to the supply chain which will lead to an increased level of competitiveness (Sheffi, Logistics Clusters. Delivering Value and Driving Growth, 2012).

Past decades have shown that the flow of goods has gone up, while the amount of goods found on the market remained the same (Techane, 2012). That being said, the volatility of the market, has led to a growth in the importance of the logistic system. The market is not supply driven anymore; demand is now the most important element (Martin, 2016). In this situation, having effective logistics is a critical factor in order to meet the demand. The market price of a certain harvest can go up and down very fast and farmers must be able to capitalize those opportunities by having implemented a good logistic system to help deliver the required products. Relying on the logistic system of the buyer can be very risky since not all the buyers are willing to have such a logistic system. The fact that there are other sellers which have a logistics system (especially the big farms) can satisfy the demand way faster can be a problem. The agrifood chains went through a very big change in past decades, going from traditional spot market sale to coordinated markets (Alboiu C. , 2013).

The lack of attention towards logistics has created a unique situation in the country. A lot of farmers have to throw away a big chunk of their goods since they are not able to sell them in the markets (Daniela I. , 2020).

All these elements point out the fact that a logistics system has both a direct influence but also an indirect influence. Furthermore, once a logistic system has been implemented, it must take into consideration some certain principles: the desired product at the right location, in good condition, the required amount at the required location and as cost efficient as possible (Kramar, Darja, & Martin, 2013).

The government does play an important role when it comes to logistics. The concept of logistics has evolved and has reached to a point where it is transposed into practice through logistics clusters which can be either at European level or global (Alexandru & Madalina, 2015). Romania has no national policy in regards to the field of cluster. The government has taken no action in the past years to change this situation while in certain countries like Spain, the government of Aragon has invested close to 700 million euros in the development of the logistics platform PLATFORM-ZARAGOZA which is the largest logistics park in Europe. Other big logistics clusters can be found in: Singapore, Rotterdam, Dubai and so on (Constantin & Madalina, 2015).

In conclusion, both farmers and the government have to work towards obtaining an efficient logistics system.

The Target Group

This research is one of a kind when it comes to raising the awareness of the logistics and their importance in the agricultural process. The target group is represented by the farmers with either small or middle-sized farms. In the case of this thesis, the most relevant of farmers will be the ones with the middle-sized farms (above 50 hectares) since they tend to rent the land of the small-sized farmers. The number of farmers which will be confronted for issues and solutions will be relatively small, but representative for the situation presented in the south-eastern part of Romania.

Critical Discussion

Romania is portrayed as a country with high agricultural potential (Georgiana, business-review, 2017), given by the fact that it has a big amount of arable land and a suitable climate but it also has a big downside which is the lack of irrigation capabilities (Paul, business-review, 2019). Going even further, the sources point out that most of the Romanian farms are quite small (hectare wise) which leads to low economic power (Agatha, et al., 2016).

Switching to the logistical elements, one can see how important logistics are in society, not only in a company. They help direct all the information and elements needed at the right moment for the best price (Constantin & Madalina, 2015). The agricultural logistics are the same, but they only focus on the agricultural companies (Wang, Liya, & Wei, 2010). That being said, the sources presented earlier depict the fact that the most profitable companies make use of logistics.

The Knowledge Gap

Since the supply chain has a high grade of complexity, staying up to date can be very difficult. That being said, information is getting outdated quite fast, the theories that we have learned in the past do not apply any more. For example, in the past, we were talking about a seller's market, where the seller would dictate which goods are to be sold and when (Leeman J. , 2017), right now, the situation is quite the opposite, with seller's having to comply with what the buyer's want. More precisely the buyer has a lot more power nowadays and as a result, the supply chain has suffered a lot of changes in order to manage this issue. These elements do come with a great deal of uncertainty for the companies which result in a high level of difficulty to adapt the supply chain to satisfy the demand.

Table 6.

Knowledge Gaps found in the Supply Chain

1. INSUFFICIENT BENCHMARKING KNOWLEDGE
2. KNOWING HOW TO MAKE A SPECIFIC STRATEGY FOR THE COMPANY'S SUPPLY CHAIN
3. KNOWLEDGE IN REGARDS TO OUTSOURCING
4. KNOWING HOW TO BALANCE THE SALES & OPERATIONS PLANNING
5. THE USE OF MANAGEMENT SYSTEMS
6. WILLINGNESS TO LEARN

1. Insufficient benchmarking knowledge

If the benchmarking process is not done accordingly a certain number of issues might arise. First of all, the company will be led on having a wrong approach in regards to the supply chain and the logistics. In this case, not only the improvement of the company will be limited, but the overall costs and efficiency of the company might be affected. Once a company lacks enough benchmarking knowledge, more harm than good can be done (Supply Chain Solutions, 2016).

2. Specific strategy for the company's supply chain

Every company is different, it has different objectives and different perspectives of the future. In this case, strategies can hardly be general, they need to be adapted to fit the needs of every specific company. What is troubling is the fact that, a big percentage of companies (somewhere in between 60%-80%) have no documented strategy for the supply chain (Supply Chain Solutions, 2016). Furthermore, this aspect is even more difficult to understand since studies depict the fact that having a global supply chain strategy (an up to date supply chain strategy) will increase the performance of the company (23% for Dell, 17% for OMV Group, 22% Siemens, 19% Skandia, 21% Arcelor Mittal, 13% Daimler) (Tomas Hult, 2014). Having taken all these aspects into consideration, the effect of having a logistic strategy for a medium sized farm is not that difficult to quantify. It can be said that going one step further, and having a global strategy can be out of reach for farms that small, but, having a basic supply chain strategy is detrimental.

3. Knowledge in regards to Outsourcing

Outsourcing represents a key element for some of the big companies such as Apple, Nike and so on (Stewart M. , 2014). Having the possibility to outsource the logistics can be very attractive for some, but in the case of other companies it might not lead to the best outcome, from a cost perspective. The knowledge gaps in this area may lead to the following problems:

- Bad selection process which leads to having an inadequate third party to deal with the logistics
- Having outsourced the logistics to a mediocre third party company may lead to unproductive partnerships
- Fail to understand why a certain process (the logistics in this case) should be outsourced (Supply Chain Solutions, 2016).

Lee Kuan Yew stated that: 'If you deprive yourself of outsourcing and your competitors do not, you are putting yourself out of business' (Lee, 2017).

4. Balancing Sales and Operations Planning

Sales and operations planning is a vital instrument which, if used accordingly, can lead to great benefits:

- ✓ Positive Inventory Levels
- ✓ Lower Costs with Stocks
- ✓ Little to no inventory obsolescence
- ✓ A more flexible and agile supply chain
- ✓ A better forecast accuracy
- ✓ A better demand planning accuracy

5. The Use of Management systems

When it comes to management systems, IT systems represent the foundation. There is a certain amount of knowledge which comes from those systems and there is a certain amount of knowledge which needs to be known about them.

All in all, the knowledge gaps in the literature in regards to the supply chain can be quite many and they can be seen in practice at certain companies. The study presented here aims to point out how a logistic system put in place can help the farmers improve their farm's financial situation.

Main Research Question

The thesis's main question is: 'How to improve the logistics system put into place by the small and middle-sized farms in the south-eastern part of Romania'. Romania is a big country, placing 9th in Europe by square kilometers and 7th if the population size is taken into consideration. Since the dimensions of the country are quite big, the country has not developed evenly. In order to be able to make a deeper analysis, the south-eastern region of Romania has been taken into consideration.

Sub-questions

Having a main question defined, a certain number of sub-questions are created in order to help finding an answer and a set of solutions for the main question:

1. Are farmers actually quantifying the possible economic losses because a logistics system is not put into place?
2. Have the farmers ever considered using their own logistics system?
3. What are the challenges faced by the Romanian farmers in regards to the logistics system put in place?
4. Are there any suggestions in regards to how these challenges can be overcome and the transport system improved?

RESEARCH OBJECTIVE

The following research has been conducted in order to better understand the logistics situation in the south-eastern region of Romania and to come up with solutions to improve this situation and create a more cost-efficient system for the farmers. First of all, agriculture is an important branch in the Romanian economy, it represents about 6% of the GDP in comparison to the average of 1.7% in the European Union (Ministry of Agriculture and Rural Development, 2014). Secondly, Romania has a big production capacity, some sources say it can feed about 35 million people (Romania Insider, 2015) and some other sources 80 million people (Financial Intelligence, 2019). Thirdly, being part of the European Union can offer big opportunities to local farms to access the funds needed for modernization.

The core objective will be solved by making use of these secondary objectives:

1. Describing the logistic system used by the small and middle-sized farms in Romania.
2. Analyzing any possible constraints which may lead to not having the farm's own logistic system.
3. Exploring any possible actions which can be taken in order to solve the issues found.
4. Come up with other approaches which can fit the necessities of the farmers.

PROBLEM DESCRIPTION AND DEMARCATION

Data shows the fact that most of the farms in Romania have no logistics system implemented and are reluctant towards implementing one (Florescu, 2018). That being said, finding out why the logistics system is underdeveloped and how it can be made more efficient is a very serious issue which must be taken into consideration.

Chapter II. Research Design and Methodology

Research Design

This paper will be written by making use of cross-sectional design. This means that data will be collected at one point in time. To have the best possible results, both qualitative and quantitative methods will be used to get insights on how logistics work and what farmers think about the efficiency of the logistic system.

Research approach

As stated above, the researcher will make use of both quantitative and qualitative methods. The quantitative methods, will allow for a better understanding of the logistics systems and how the literature sees the ideal system and the qualitative methods help the researcher to stay grounded in the real-life situation. By making use of the qualitative methods, one can dive deeper in the context by keeping in touch with the real-life information provided by the subjects of the research (Saunders, Lewis, Thornhill, & Lewis, 2008).

The research will be conducted in a case study form since it looked to be the most effective way (mostly because of the interaction with the subjects of the study- farmers).

Research strategies used

The following strategies will be used in this paper:

1. Desk Research- confronting the existing theories about logistics and applying them in the real-life scenario presented by the farms in the south-eastern part of Romania.
2. Questionnaire- used to find out what are the main issues that the farmers face in regards to the logistics systems.
3. Interview- used to get in touch with the farmers

Population sampling

The researcher has chosen the purposive sampling technique. This technique is based on consciously determining a number of samples rather than picking them randomly out of the general population (Stewart, Shamdasani, & Rook, 2007). Judging by what Calcraft (2005) and Steinberg and Prince (2008) said, the sample size of a qualitative research is not always associated with the number of people (the population size). It is mostly influenced by the depth and focus of detail employed in the analysis of the data.

The interviews with the farmers will be held at their own farm. A total number of 10 farmers will be interviewed. The farmers interviewed own somewhere in between 300-600 hectares. To make this research even broader, a certain number of farm employees will be interviewed too (6 employees which are representative for the farms). The interviews will not be recorded, since most of the farmers do not speak English.

In order to have more tangible information and a more accurate result, the researcher will also make use of a questionnaire given to all the interviewed farmers. Questionnaires are considered to be superior to an interview because the subject cannot be influenced in any way. In the case of an interview, the interviewer can indirectly suggest certain answers and may lead to results which are not so accurate.

The role of the questionnaire is to help the researcher understand the point of view the farmers have towards the research elements. The questionnaire will come as a foundation for the interview since it will address the 4 sub-questions and will help the researcher prepare the interview. The sub-questions themselves will be part of the questionnaire. Furthermore, questions such money allocated towards logistics and costs of outsourcing will be addressed.

The interview is used to help the researcher better understand the opinions of the farmers. The interview provides a deeper understanding of the opinion of the farmers. For example, if the farmers answered that they do not quantify the economic losses because of the lack of logistics put in place, the researcher will ask if they do not consider this element to be important. Opinions regarding the usefulness of a logistics system and on how to create a logistics system will be asked. In the end, the researcher will also try to find out if the farmers have any solutions for the situation in place.

The questionnaire will have only the basic information required to create the interview. It will be very short and will lead to the preparation of the interview. The questionnaire is aimed towards creating a connection with the farmer. The interview is aimed towards defining the ideas that the farmers have towards the present situation.

The desk research method will be used as a tool to find the theoretical aspects which are most relevant for the thesis and the farmers. For example, will be informed how bad Romania ranks in regards to the infrastructure level in Romania. Also, during the interview, the farmers will be informed in regards to the different solutions found in different countries to similar situations (as explained before in regards to Sudan and Thailand). All in all, the desk research will help the researcher create the questionnaire for it will provide a better understanding towards all the logistical elements present in Romania and in the EU.

Data Analysis Methods

Once the desk research will be done and the literature will be analyzed, the researcher will prepare the questionnaire and the interview. The questionnaire will be sent via e-mail, and the results will be analyzed. The researcher will try to find a pattern in the answer given by the farmers so that a common solution can be found. The interview is built as a friendly discussion about the perspective of implementing logistics and the benefits of having a good logistics system. That being said, the questionnaire and the interview are somewhat complementary

one to each other. Interview quotations will be added to support the findings and the conclusions.

Limitations

There were certain limitations which will affect the research process. One of the limitations present is represented by the fact that a lot of farmers were not willing to communicate. Most of the farmers in Romania are quite old and are not open to having this kind of interviews, and when they are, the idea of implementing a logistic system is not considered to be of their concern. Another limiting factor is represented by the short period of time in which this research can be conducted. The interviews could not be too long since the busy schedule of the farmers. The Interview has been conducted in one city- Braila, which means that the findings will most likely be suitable for the farmers in this region.

Chapter III Research Findings

The thesis is structured as a case study, the goal was to collect data from a group big enough in order to have a real picture of what is happening in this region. The area which is to be analyzed is quite large, aspect which leads to having a large number of farmers. Since the area is so widespread, the researcher tried to find the most relevant subjects for the topic. The subjects were selected from different areas of this region so that the results should be more representative for the whole region. Below, a table portraying the response rates is drawn.

Table 7

Response Data

FARMS	REGION	EMPLOYEES INTERVIEWED	DATE OF INTERVIEW
Farm 1	MARTACESTI	3	11.03.2020
Farm 2	SILISTEA	1	13.03.2020
Farm 3	URLEASCA	1	05.03.2020
Farm 4	INSULA MARE A BRAILEI	2	26.02.2020
Farm 5	SUTU	2	27.02.2020
Farm 6	VIZIRU	2	03.03.2020
Farm 7	INSULA MARE A BRAILEI	4	14.03.2020
Farm 8	MARTACESTI	1	16.03.2020

Most of the farms taken into consideration for this research have an agricultural plant-oriented profile. That being said, the crops cultivated are the following: Corn, Wheat, Soybean and Sunflower. One of the farms from Martacesti, "SC AGROGRUP SRL", has a mixed profile, having both pigs and crops.

All farms analyzed are considering corn as their main crop since it is seen as the most cost-effective crop possible. The main corn hybrids used in these farms are the ones from Bayer (DKC4908 for example) and Corteva (PR0943). Unfortunately, the farms from Sutu area, are unable to irrigate their land, thus they depend completely on the climate. The farms situated in "Insula Mare a Brailei", have a very big advantage, given by the fact that the river Danube is close and the price of irrigation is rather cheap.

Coming back to logistics, all the farms have issues from this perspective. Interesting enough, even though the logistics are lacking, the farms are quite reluctant towards the idea of investing into them, given the fact that they are not going to bring that much profit in the immediate future.

Sub-research question 1: Are farmers actually quantifying the economic losses because a logistics system is not put into place?

The foundation of this question is based on the fact that, apparently, most of the farmers disqualify the idea of having a transport system even from the beginning. That being said, most likely, a big percentage of them are not taking into consideration the possible economic losses which result from such an attitude. After having interacted with the farmers, the answers were quite clear and were proof that there was either no quantifying or just some suppositions.

Out of 16 respondents, 12 of them came with pretty much the same answer, which can be summed up by what the respondent 8 from Martacesti farm said:

'I do not consider having a logistics system put in place efficient. Why would I, a farmer or another farmer with 400-500 hectares of land be willing to buy trucks? Why would I invest in something, if the company which is buying my harvest is most likely willing to handle the transportation aspect? Why would I invest in something that I will most likely use only a few weeks every year? Why would I hire someone, just to use him for a short period of time every year? What would be the purpose?'

The answer given by respondent number 8 depicts an attitude of complete rejection towards any possibility of having a transport fleet. This attitude is shared by the other 11 respondents, since they have given answers which are rather similar.

In the case of the other 4 respondents, the answers lead to the same conclusion, even though the farmers do not disqualify completely the idea of having a logistics system. In this case, the farmers have an opinion based on a supposition and do not really have strong arguments as in the case of the farmer mentioned before. Respondent number 15 said:

'For me, money is what matters the most. I do not want to have biggest yield, if that means that it will reduce my profit (because of the high costs which lead to having a big yield). Simply put, I do not see how a logistics system can reduce my costs.'

When the same respondent was asked about the quantification in regards to cost and profit, the following answer was received:

'No, I have never quantified the economic impact of having a transport fleet since, to my mind, it is obvious that it will not bring me more money'

The answers given by the respondents are quite clear and as mentioned before, they depict a repulsive attitude towards having a logistics system put into place which in the end shows that the farmers do not quantify the possibility of having a logistics system.

Even if logistics can represent a foundation to make more money, the farms assessed are not really considering investing in them. One can see that the farmers are not willing to invest into something that is not guaranteeing a boost in profits. Going even further, a logistics system, especially owning a fleet of trucks, requires money in order to do the regular maintenance.

Unfortunately, the negative attitude towards logistics is quite general among the farmers and is not based on facts but on assumptions. As the researcher has found out, one of the farmers is not even quantifying the possible economic impact of having a logistics system.

Summary:

- Negative attitude towards logistics- all respondents
- Some of the buyers are willing to handle the transport- 11 respondents
- Attitude based on assumptions – all respondents
- No economic quantification done- all respondents

Most respondents do not have willingness to invest in logistics. Logistics are seen as an addition which is neither cost-effective nor mandatory.

Sub-research question 2: Have the farmers ever considered using their own logistics system?

Since the respondents have such a negative attitude towards the idea of owning a logistics system, it can be said that there is little to no intention to change this aspect. Just by reading the answers given above, one can see that the farmers did not consider having a logistics system.

Even if the answer was obvious, the researcher still asked the question. All the respondents had quite similar responses, and they can be summed up, again, by the answer given by respondent number 8:

'As I told you before, I see no reason to invest into something which is not mandatory for my company. I cannot be a farmer without a tractor, but I can be a farmer without a truck as long as other companies, such as Cargill or Monsanto are willing to transport my yields. When there will be no other option left, I will buy my own trucks. And even when there will be no big companies willing to transport my yield, there will be a big number of companies and other individuals with trucks willing to transport my yields. I have no interest in owning a fleet of trucks.'

Attitude towards the idea of owning a fleet of trucks

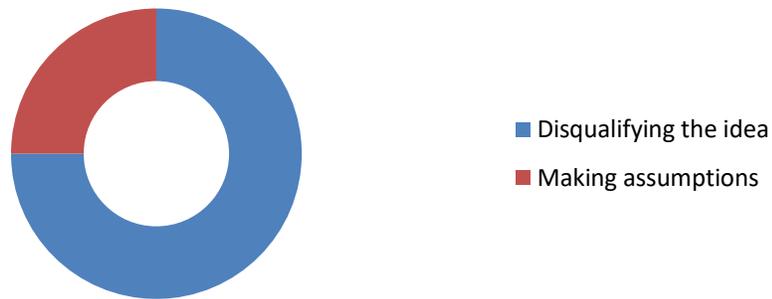


Figure 6- Attitude towards the idea of owning a fleet of trucks

Judging by the answers given, 75% of the respondents disqualify the idea, whereas 25% of them are making assumptions that it will not work.

Sub-research question 2 reinforced the idea depicted in the first one: logistics are not seen as being relevant in a farm". The farmers have quite a narrow perspective over things and do not go beyond the production aspect. For example, as respondent number 8 has affirmed, tractors are directly involved into making money and are mandatory in any farm, but a truck is far from a "must-have" since it can be rented from a logistics company.

Summary:

- Logistics not mandatory in a farm- all respondents
- Tractors are a must-have while trucks are not- respondent number 8
- Narrow Perspective- all respondents

Simply put, logistics are not seen as a direct way of making profit. As respondent 8 mentioned, a farm can't manage without having a tractor but it can do well without a truck.

Sub-research question 3 : What are the challenges faced by the Romanian farmers in regards to the logistics system put in place?

Until now, the researcher has found out that the farmers are quite reluctant towards the idea of owning their own transport fleet for their yields. That being said, the researcher tried to find any possible challenges generated by the fact that all the transport is being outsourced. In this regards, the respondents had somewhat similar answers.

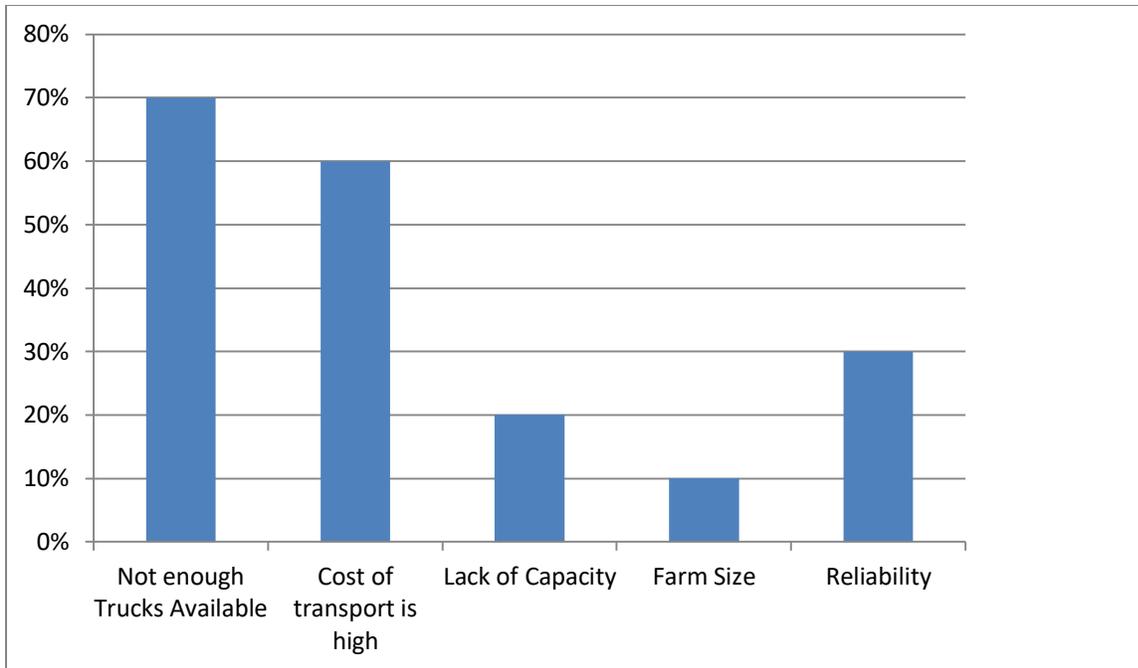


Figure 7- Challenges faced by Romanian farmers

As figure 7 depicts, farmers are actually facing a certain number of issues when it comes to the logistics system already put into place. All the respondents had problems to express in regards to the situation, fact which implies that all of them are actually aware of the challenges they face.

From the figure above, one can see that 70% of the respondents do consider that the number of trucks available, during the harvesting period is not enough to satisfy the needs of the farmers.

'Personally, finding trucks and truck drivers is a very big issue. The biggest problem that I have every year when I need to harvest, is not the harvesting itself and any other thing which is related to the process, but the difficulty with which I find trucks to carry my yield.'

'I don't know why or how, but the number of trucks I can find every year is somehow decreasing. This situation is quite unique, since the amount of money they charge per ton is getting bigger and bigger.'

In this statement one can see that two challenges are actually becoming interconnected, fact which makes the situation even more difficult for the famers. Not only do they have to face a situation in which transporting opportunities are quite limited, but they also have to face the higher cost asked by the truck drivers.

Another important challenge is represented by the cost of transport. As the figure points out, 60% of the respondents argued about the cost being way too high.

'It is getting harder and harder to face all these indirect costs. Transporting the yield is bringing me no value addition, only costs. We are lucky to be so close to the harbor; I do not know what the farmers from the other regions of Romania do to handle these costs.'

This concern can be seen at a big number of respondents, and the person I quoted above is pointing out that the farms in this area are quite close to Danube River and they can ship their yields quite cheap. Trucks only have to take the harvest from the farm and transport it to the harbor.

Going further, the third most pressing issue would be the reliability of these small truck companies. There are certain situations in which the drivers do not arrive in time or they just ask for more money compared to the amount discussed before.

'I had a few moments in which I thought I was going mad. The driver I talked to a day before, because it is hard to find them way ahead of time, told me that he will not come unless I will pay more. He told me that he received a better offer and since we only had a verbal agreement he wanted to leave. Obviously, I could not check if what he said is true but I needed him so I had to pay. The good thing is that right now I am way more selective when it comes to drivers and I try to stay in touch with the ones which I had a good relationship'

The other two concerns were in regards to the lack of capacity, which is a result of some companies only having small trucks and the farms size, which means that certain big logistics companies were not interested in working with smaller farms because most of the big farms were booking all their trucks.

Summary:

- Not enough trucks- 11 respondents
- High cost of transport- 9 respondents
- Reliability- 4 respondents
- Lack of capacity- 3 respondents
- Farm size-1 respondent

Even though the farmers are not willing to develop their own logistics system, the most frequent complaints rely on the fact that the number of trucks available for transportation is not enough and the fact that the cost of transport is too high.

Sub-research question 4: Are there any suggestions in regards to how these challenges can be overcome and the transport system improved?

By using this research question, the researcher sought to find out the respondent's opinion on what positive solutions can be found and implemented in order to improve the logistics system. This question has brought to light one idea. The vast majority of those interviewed thought that building storage facilities in their farms would be a great option since it will allow them to sell their yield at a different time, not at harvest which can be translated in a higher selling price and a bigger chance to find available trucks.

'Right now I am trying to think of a thing which will benefit my farm for the whole year. I am trying to think about an investment which will help me make more money. I believe that building a big silo will be a very good investment, since it will allow me to sell the yield whenever I want. Not only will I have more flexibility when it comes to selling my harvest, but the number of drivers I will find available at the given is always bigger since most of the farmers are not selling in that period of time.'

Table 8

Solutions

RESPONDENT NUMBER	RESPONSE
1	Deposits
2	Silo
3	-
4	-
5	Storing the harvest
6	Silo
7	-
8	Create a Partnership
9	Silo
10	Silo
11	Silo
12	Silo
13	Silo
14	Silo
15	Silo
16	-

As table 8 suggests, the idea of storing the yield is the most common amongst the farmers. Another interesting solution, found at only one respondent, would be a partnership with a logistic company.

Summary:

- Future-proof investment

The main element depicted from this sub-question is the willingness to invest into a future-proof solution which will decrease the issues related to not having a logistics system. In this case, 9 respondents opted for building a silo, 4 respondents did not think of any possible solutions yet, 1 respondent opted for building a deposit, 1 respondent opted for a partnership and another one opted for finding a way to storage the harvest (solution which is somewhat similar to the silo or deposit solution).

Sub-research questions content analysis

Since the foundation of this thesis is based on a set of sub-questions, a content analysis is required in order to better understand the real-life situation when it comes to logistics in Romania.

Table 9-

Content Analysis

Sub-Question	Main Themes
Are farmers actually quantifying the economic losses because a logistics system is not put into place?	-No quantification -Farmers do not see profit coming from logistics -Ideas based on Suppositions
Have the farmers ever considered using their own logistics system?	-Disqualifying the idea -Outsourcing is better
What are the challenges faced by the Romanian farmers in regards to the logistics system put in place?	-Not enough trucks -Not cost effective enough
Are there any suggestions in regards to how these challenges can be overcome and the transport system improved?	-Silo/Deposit

Based on the content analysis table, the researcher was able to identify the main themes which are relevant to the sub-questions. The first sub-question has its own set of themes which were identified from the statements made by the farmers. That being said, affirmations such as "*I have never quantified the economic impact...*" are proof that the farmers are not taking into consideration the economic implications of logistics systems. Furthermore, statements such as: "*Why would I be willing to invest in something, if the company which is buying my harvest is most likely willing to handle the transportation aspect?*" depict another theme which is the lack

of profit which might come from logistics. In this situation, both themes are complementary one to each other. Even though the farmers do not quantify the economic aspect of owning a logistics system, they suppose that it will be highly inefficient from an economic perspective. This two themes help create another one, represented by the fact that all the affirmations are based only on assumptions.

The second sub-question has its own main themes which dive even deeper into the topic. The farmers are basically disqualifying the idea of owning a logistics system since outsourcing is considered to be a better idea: "*I see no reason to invest into something which is not mandatory for my company. I cannot be a farmer without a tractor, but I can be a farmer without a truck, as long as other companies, such as Cargill and Monsanto are willing to transport my yields*".

Going further, sub-questions 3 and 4 depicted other themes present in the minds of the farmers: lack of trucks, low cost effectiveness and having a silo as a possible solution. Statements such as: "*Personally, finding trucks and truck drivers is a very big issue for me*", "*The situation is quite unique, since the amount of money they charge per transported ton is getting higher and higher*", "*I believe that building a silo will be a very good investment*".

By analyzing all these themes, the researcher has noticed that every sub-question has themes which can represent a foundation for the ones from the next sub-question. For example, the first set of themes which correspond to the first sub-question "no quantification" and "no profit" lead to the ones which correspond to the ones from the second sub-question, for example "outsourcing is better".

CHAPTER IV. CRITICAL DISCUSSION

Every sub-question has brought important elements in regards to the efficiency of the logistics system in Romania. Some of the sub-questions pointed out how the logistics are portrayed amongst the farmers in Romania and the other question are the foundation of what is going well and what not in regards to logistics and how to improve the situation.

First of all, the first part of the thesis, represented by the desk research done, has pointed out how vital a logistics system can be. In order to put more accent on how vital logistics are, most of the big companies can only stay at the top by making use of a good logistics system and that is theory put into practice. As (Stewart M. , 2014) said, companies such as Coca Cola or Apple really rely on logistics in order to better satisfy the end customer and to boost profits. Unfortunately, the farmers come with a completely different perspective and do not consider logistics being relevant.

Secondly, the first two sub-questions depict a completely antagonist perspective of the farmers in regards to logistics. As mentioned in the definitions of the agricultural logistics given by (Zhang & Wang, 2011) (Wang Shufeng, 2010) and (W., 2009), their relevance is given by the fact that they help move information and goods in order to satisfy the needs of the end customer in the best way possible at the best price possible. Simply enough, farmers do not see these elements and do not see the long term implications of a logistics system. Big companies have reached that point and were able to maintain it because they managed to satisfy the demands of the customers at the highest possible level and with the most favourable costs (Stewart M. , 2014). To better understand the issue, sub-question 3 is a starting point. The main two challenges faced by the Romanian farmers are the lack of trucks available when needed and the price of renting a truck. Understanding how the price works is not difficult, since it is dependent on offer and demand. Since the number of trucks is low, the price is high. That being said, the farmers do not dive deep into the situation, because if they were to build their own fleet of trucks, both of these issues would be solved. All these elements point out towards the definitions of agricultural logistics which were mentioned earlier proving that farmers are not in line with what the research states. The problem which arises from this situation is that the farmers have to pay more and are less efficient in comparison to how they could have been, provided they understood the complexity of logistics. Finding a solution to the problem is quite difficult. The farmers consider building silos in order to store their harvest and sell it later when the number of entrepreneurs having harvest available for sale is reduced (as mentioned in sub-question number 4).

While the solution is feasible, it is not a long term move. The market is quite flexible and the demand for products can vary greatly from one period to another. Having a silo will not guarantee the farmer the most efficient way to satisfy the desires of the consumers when needed.

Thirdly, by making use of the main themes depicted in chapter III, the researcher has spotted a contradictory perspective coming from the farmers. The themes which were identified on the first two sub-questions, the farmers are not quantifying the economic elements which are linked to logistics and are only open towards outsourcing this activity. Sub-question number three points out the contradictory aspect coming from the farmers. Outsourcing is considered to be a superior alternative in comparison to owning a fleet of trucks, yet the farmers complain in regards to the fact that the number of trucks and

truck drivers is limited and they hardly ever find what they are looking for. That being said, the two main ideas which are discussed by the farmers in the first two sub-questions are countered by what they said in the third sub-question. In the end, the last sub-question has come with a solution, perceived as optimal, by the farmers. The solution is portrayed in figure number 8.

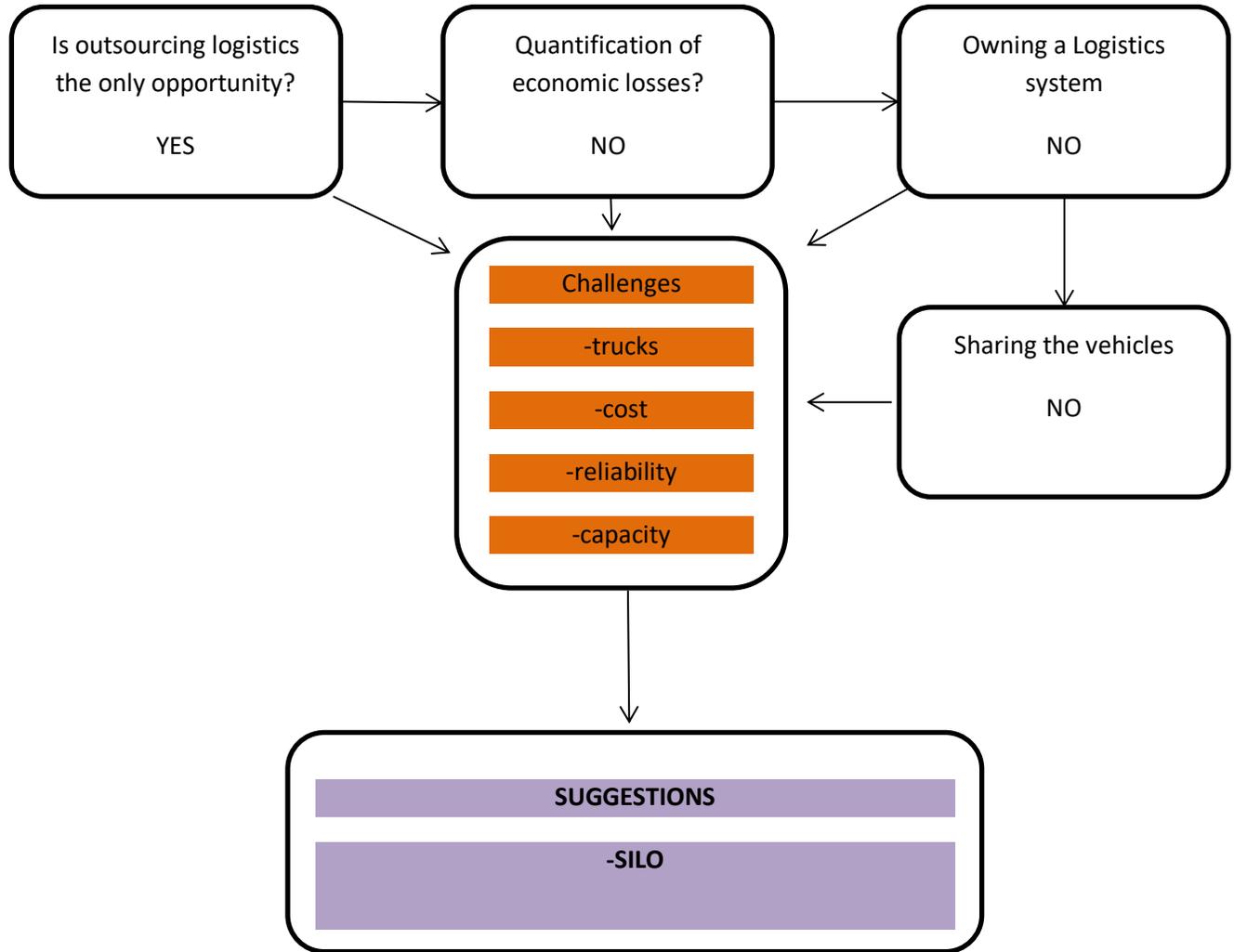


Figure 8- Key aspects which derive from the set of sub-questions

With the help of theory, the implication of the elements presented in figure number 8 can be explained. That being said, farmers consider outsourcing as the only way to ensure the flow of goods is optimal. That being said, they also complain about the number of trucks available. By taking into consideration what (Kramar, Darja, & Martin, 2013) said logistics in agriculture represent a key aspect for ensuring a continuous supply of food and other agricultural related products to the customer. Unfortunately, the farmers are missing this opportunity to make use of the benefits of having an efficient logistics system.

Furthermore, farmers do not quantify the economic impact of having established a logistics system. For this aspect, theory comes in and suggests through the affirmations of (Zheng-you & et all, 2006) that logistics themselves become actors which might lead to new sales and will not only represent a key factor in supporting the actual sales. In this regard, the farmers are losing money in two ways. The first way relates to the fact that since the number of trucks is quite small, the cost of transport is high, making it a not so efficient alternative to outsource logistics. From the second perspective, farmers also risk not finding free trucks available to transport their goods which in the end might affect their possibility to make profit.

Farmers are unwilling to own or share the same logistics system with other farmers. In this regard, agricultural logistics are not correctly understood by the farmers. As (Zhang & Li, 2012) mentioned, a well-built logistics system will bring the highest possible satisfaction to both the producer and the consumer. In the case of the respondents interviewed, this vital element (logistics) is not taken into consideration and can lead to difficult situations for both the consumer and the producer. As (Sapir, Buigues, & Jacquemin, 1993) mentioned, the world is not developing at the same speed (two-speed world). From the logistics perspective, the Logistics Performance Index is quite suggestive in this matter, showing that Romania develops way slower in comparison to the Czech Republic, or even Hungary.

To conclude, building a logistics system is mandatory in order to reach maximum efficiency. This statement is backed by three elements: theory (Vanecek & Calab, 2003) (Yao, Cui, Ying, & Wei, 2009) (which points out what a logistics system does and how important it is in order to satisfy the demand), practice, (Stewart M. , 2014) (the fact that big companies rely on logistics in order to maximize profits while also maximizing customer satisfaction, and the contradictory perspective coming from the farmers.

Research Limitations and Managerial Implications

Every sub-question had its limitations and managerial implications which must be taken into consideration since they can affect the results of the research.

In the case of the first sub-question, which points out the economic losses promoted by the lack of logistics, the limitation is given by the fact that the economic aspects of a company are rather confidential, and the farmers are not really willing to communicate them. In regards to the managerial implications, the head of the farm should take note of how big of an impact a logistics system put into place can have and try to implement it in the farm to a certain extent.

The second sub-question has depicted how reluctant farmers are towards the idea of owning a fleet of trucks. No matter what the researcher has tried to tell the farmers, their mind was set and this was one big limitation. An important managerial element which needs to be taken into consideration is the fact that any leader should be open-minded to new ideas. The fact that the head of the farms were not willing to listen to arguments did not benefit neither them nor the researcher.

Going further to sub-question number three, the challenges pointed out by the farmers are quite interconnected which means that solving one can will lead to the other ones being solved too. Both

limitations present in sub-question number one and sub-question number two apply in this case. A very narrow perspective has quite a big impact on the farmer's ability to make changes. The managerial implications are the same as presented in the first two paragraphs.

Last but not least, sub-question number four has come with the suggestions the farmers had. The suggestion itself can be considered a limitation, since it does not have a long term implication. As mentioned before, a silo has a short-term impact. The managerial implications could be that the head of the farms should be considering long term solutions for their own businesses.

In the end, most of the sub-questions were not open-ended, fact which has led to them not offering enough information to debate about.

Future research possibilities

Understanding demand and how to better satisfy it is a turning point for any company. Logistics can be portrayed as a "bridge" between the producers and the consumers. If this bridge is built better, the demand can be satisfied faster. That being said, future research is vital in order to maximize customer satisfaction through a better developed logistics system.

Another element worth researching would be how impactful is a logistics system for the big companies. A question the researchers can ask themselves could be: "Where would the big companies be now if they did not invest into logistics systems before?" or "How big of a role did the logistics system play in the development of the company?".

Both quantitative research and explanatory research must be conducted. The quantitative research will help farmers understand the financial implications of logistics through statistics and numbers. The explanatory research will further accentuate how logistics are related to boosting economic efficiency.

Chapter V. Discussion and Possible Solutions

In this chapter, the main findings will be discussed and a set of possible solutions will be proposed.

Answer to the main research question

With all the information gathered, the researcher was able to answer to the main research question. As the thesis indicates, the researcher made use of a set of sub-questions in order to gather the required data to answer the main question. The information which resulted from this research has been compiled in such a manner in order to achieve a holistic answer to the main question.

All the information gathered has allowed the researcher to come up with key themes in regards to answering to the main research question: *'How efficient is the logistic system put into place by the small and middle-sized farms in the south-eastern part of Romania.'*

It is very difficult to talk about logistics efficiency when it comes to Romania. The farmers themselves have pointed out that outsourcing is the only feasible alternative for small and middle-sized farms. That being said, outsourcing itself is not seen as being inefficient but, the fact that the farmers hardly ever find the trucks required is a problem.

Based on what the farmers have said, the question should be rephrased into *"How can the logistics system be improved in order to meet the demands of the farmers?"*.

Indeed, a possible solution can be the silo since it can reduce the pressure which is being put on the already inefficient logistics system. Once the farmers have built a certain number of silos, the number of trucks required to transport the yield can be phased over in more rounds. Once everything is phased over in more rounds the demand will go down and the price to rent trucks will also go down. Unfortunately, if the situation is not addressed in a direct fashion, the problem will come back in time and might not be fixed by this temporary solution. Simply put, the logistics system present in the south-eastern part of Romania for the farms evaluated severely lacks effectiveness.

The following results have been found:

- Lack of basic knowledge in regards to logistics
- No efficiency when it comes to applying logistics elements in practice
- No long term perspective coming from the farmers

Conclusions

As mentioned in the beginning, the Romanian infrastructure is severely underdeveloped in comparison to other European countries. That being said, farmers are not keen on implementing a logistic system as long as it is not seen as mandatory. The possibility to make use of the trucks of another company is perceived as sufficient by the farmers. Furthermore, the fact that logistics are not a direct source of profit impedes the possibility for them to be developed. The third sub-question has revealed the challenges faced by the farmers, challenges which are based on the fact that the respondents do not have a logistics system put in place. For example, the high cost of transport would not be an issue if the farms had implemented a logistics system before. Going even further, the issues faced by the farmers are somewhat addressed in the theory presented by the (Council of Supply Chain Management, 2013). Based on theory, logistics should bring the highest value to both the producer and the consumer. In the case of middle-sized farms, logistics are not understood properly and are only seen as an option. The middle sized farms do not take logistics into consideration at their own cost, cost which is reflected in the main challenges faced by them, challenges which were depicted in sub-question number 3 (high cost of transport, lack of trucks).

Recommendations

There are certain recommendations which can be made in order to improve the situation. The researcher strongly recommends the implementation of the "silo solution" proposed by the farmers since it will help reduce the costs of transport for a while. Furthermore, a short examination of transport should be done, in order to understand how cost efficient it is to outsource in comparison to insourcing this activity. It might occur that buying trucks might end up being cheaper in the long run.

Since the farmers are reluctant towards having their own logistics system because the knowledge in regards to how logistics work is lacking, workshops can be used to explain farmers how logistics can boost finances.

Nonetheless, the fact that the farmers have a contradictory perspective (pointed out by the sub-questions), shows that they do not really understand that logistics represent a key element in order to make the farm profitable. Making affirmations based on assumptions, cumulated with the lack of trucks has led to a truly difficult situation. The farmers are working against themselves and the researcher will try to educate them by promoting its research amongst them.

The researcher also recommends the use of the seven step approach. This approach is based on a few steps which will help solve the issue. The following seven things should be done by the respondents:

- Find the problem- identify the problem- cause and effect
- Create an objective- outcome

- Find alternatives- any possibility
 - Build an Action Plan- how to get from point A to point B
 - Troubleshoot- imagine the worst case-scenario?
 - Communication- farmers should work together in order to find a common solution
 - Implement- Solve the problem
- Source: (Joiner, 2014)

Finally, European subsidies can also be used to improve the cost-effectiveness of logistics. That being said, most of the farms assessed have already used EU subsidies to develop their farms. For example, one farm from Martacesti has used EU subsidies to buy up-to-date irrigation systems. In this case, for the period 2021-2027, the EU has granted Romania 31 billion euros which can be used by different companies. By making use of the subsidies, farmer can buy trucks at a good price, making the investment more efficient. The silo solution followed up by the acquisition of trucks can maximize logistic efficiency in farms.

Summary:

- Workshops for farmers- better understand logistics
 - Implement the Silo solution
- European subsidies- buy trucks at an advantageous price

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