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Supervisor:	**John Lever**
Student Name:	**Martin Zanda**
Student No:	**U1871021**
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Dissertation Title

Consumers' perception of sustainability of a food system in the Czech Republic

Univerzita Tomáše Bati ve Zlíně
Fakulta managementu a ekonomiky
Ústav regionálního rozvoje, veřejné správy a práva

Akademický rok: 2019/2020

ZADÁNÍ BAKALÁŘSKÉ PRÁCE
(projektu, uměleckého díla, uměleckého výkonu)

Jméno a příjmení:	**Martin Žanda**
Osobní číslo:	**M16812**
Studijní program:	**B6202 Hospodářská politika a správa**
Studijní obor:	**Veřejná správa a regionální rozvoj**
Forma studia:	**Prezenční**
Téma práce:	**Consumers perception of sustainability of a food system in the Czech Republic**

Zásady pro vypracování

Úvod
Definujte cíle práce a použité metody zpracování práce.
I. Teoretická část

- Zpracujte literární rešerši na téma udržitelnosti potravinového systému z globálního hlediska.
- Podejte současný stav, problémy a vývoj potravinového řetězce a vývoj do budoucna.
- Představte iniciativy zabývající se udržitelnou produkcí potravin v ČR.

II. Praktická část

- Analyzujte obeznámenost spotřebitelů s problematikou udržitelnosti potravinového systému v ČR.
- Zpracujte a vyhodnoťte přehled distribučních kanálů spotřebitelů k nákupu udržitelných potravin.
- Proveďte zhodnocení motivace spotřebitelů k nákupu udržitelných i běžných produktů.

Závěr

Rozsah bakalářské práce: **cca 40 stran**
Forma zpracování bakalářské práce: **Tištěná/elektronická**
Jazyk zpracování: **Angličtina**

Seznam doporučené literatury:

EEA Report. Sustainable Consumption and production in South East Europe and Eastern Europe, Caucasus and Central Asia, 2007, No 3, 90 p. ISBN 987-92-9167-965-2.
FOA. The Right to a Food Guidelines, information papers and case studies, Rome, Italy, 2006. ISBN 92-5-105512-2.
IPCC. Climate Change 2007 – Impacts, Adaptation and Vulnerability, Contribution of Working Group II to the Fourth Assessment Report of the IPCC, Cambridge University Press. ISBN 978-0521-88010-7.
Ministerstvo zemědělství. (2016), Yearbook 2016, Organic Farming in the Czech Republic, Praha: Ministerstvo zemědělství, 2007, ISBN 978-80-7434-401-5.
NELLMAN C., MACDEVETTE M., MANDERS T., EICKHOUT B., SVIHUS, A.G. The environmental food crisis the environments role in adverting future food crises, UNEP, Norway, 2009, ISBN 978-82-7701-054-0.
TEIXEIRA J.A. Grand Challenges in Sustainable Food Processing. Frontiers in Sustainable Food System, 2018, vol. 2nd, article 19, ISSN 2571-581-X.
UNDP. Human development report 2006, United Nations Development programme. New York, NY, USA, 2006, ISBN 0-230-50058-7.

Vedoucí bakalářské práce: **John Lever**
Ústav regionálního rozvoje, veřejné správy a práva

Datum zadání bakalářské práce: **6. ledna 2020**
Termín odevzdání bakalářské práce: **19. května 2020**

L.S.

doc. Ing. David Tuček, Ph.D.
děkan

RNDr. Pavel Bednář, Ph.D.
ředitel ústavu

Ve Zlíně dne 6. ledna 2020

THE UNIVERSITY OF HUDDERSFIELD
Business School

STUDENT PROJECT / DISSERTATION ETHICAL REVIEW

APPLICABLE TO ALL UNDERGRADUATE AND POSTGRADUATE PROGRAMMES

Please complete and return via email to your Project / Dissertation Supervisor along with the required documents (shown below)

SECTION A: TO BE COMPLETED BY THE STUDENT

Before completing this section please refer to the Business School Research Ethics web pages which can be found at xxxx. Students should consult the appropriate ethical guidelines. The student's supervisor is responsible for advising the student on appropriate professional judgement in this review.

Please ensure that the statements in Section C are completed by the student and supervisor prior to submission.

Project Title:	Consumers' perception of sustainability of a food system in the Czech Republic
Student:	Martin Zanda
Student number:	U1871021
Course:	International Business BA (Hons)
Supervisor:	John Lever
Project start date	02 March 2019

SECTION B: PROJECT OUTLINE (TO BE COMPLETED IN FULL BY THE STUDENT)

Issue	Please provide sufficient detail for your supervisor to assess strategies used to address ethical issues in the research proposal
Aim / objectives of the study These need to be clearly stated and in accord with the title of the study. (Sensitive subject areas which might involve distress to the participants will be referred to the Course Approval Panel).	The main aim of dissertation is to show how sustainable food system in Czech Republic looks like, based analysis of awareness and contribution of customers to sustainability of food system. The objectives of dissertation are: - To find out of how aware consumers are about basic problematic of sustainability of food system in the Czech Republic - To answer whether consumers contribute to food sustainability - To detect what distribution networks customers use to purchase eco-friendly products - To find out consumers' habits regarding to a purchase of both regular and sustainable products - To analyse consumers' awareness and knowledge about sustainability of alternative ways of food production and distribution
Brief overview of research methodology The methodology only needs to be explained in sufficient detail to show the approach used (e.g. survey) and explain the research methods to be used during the study.	Usage of quantitative research method of questionnaire, with both closed and open questions, to analyse trends and knowledge of consumers about sustainability of a food system in the Czech Republic.
Does your study require any permissions for study? If so, please give details	It does not
Participants Please outline who will participate in your research. If your research involves vulnerable groups (e.g. children, adults with learning disabilities), it must be referred to the Course Assessment Panel.	The researched population will be consumers in general, living on the territory of the Czech Republic, regardless of social status, age or gender, who are participating on the food system in the Czech Republic.
Access to participants Please give details about how	Participants will be either contacted via email or on social media and asked to participate on research by completing questionnaire on a voluntary basis.

participants will be identified and contacted.	
How will your data be recorded and stored?	Data will be recorded by using an online survey website www.survio.com, data will be stored on my personal account, without any public access and deleted once the research is complete.
Confidentiality Please outline the level of confidentiality you will offer respondents and how this will be respected. You should also outline about who will have access to the data and how it will be stored. (This should be included on information sheet.)	Questionnaire will be anonymous, providing only basic information about population, (gender, age, education...) which will help to identify participants and sort them into categories. Data are not publicly available, only person with access to collected data will be researcher.
Anonymity Do you intend to offer anonymity? If so, please indicate how this will be achieved.	Questionnaire is purely anonymous, only required data will be those, which can help to identify researched population, no confidential information will be requested (name, address, social status...)
To what extent could the research induce psychological stress or anxiety, cause harm or negative consequences for the participants (beyond the risks encountered in normal life). If more than minimal risk, you should outline what support there will be for participants.	Risks encountered in normal life only.

SECTION C – SUMMARY OF ETHICAL ISSUES (TO BE COMPLETED BY THE STUDENT)

Please give a summary of the ethical issues and any action that will be taken to address the issue(s).

Questionnaire is purely anonymous, personal data are not required. The possible risk is if participants state any form of personal data into the open questions, however as the data will be analysed, all possible personal information will be erased.
The results of questionnaire are stored on a personal account and secured by twenty-digit password with both numbers, capital letter and special symbols on survio.com, with no public access to them, date will be erased after research is completed and account deleted.

SECTION D – ADDITIONAL DOCUMENTS CHECKLIST (TO BE COMPLETED BY THE STUDENT)

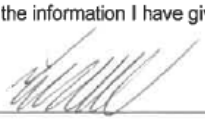
Please supply to your supervisors copies of all relevant supporting documentation electronically. If this is not available electronically, please provide explanation and supply hard copy

I have included the following documents

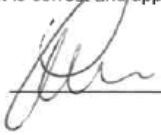
Information sheet	Yes ☐	Not applicable ☑
Consent form	Yes ☐	Not applicable ☑
Letters	Yes ☐	Not applicable ☑
Questionnaire	Yes ☑	Not applicable ☐
Interview schedule	Yes ☐	Not applicable ☑

SECTION E – STATEMENT BY STUDENT

I confirm that the information I have given in this form on ethical issues is correct.

Signature  Date: 24 / 03 / 2019

Affirmation by Supervisor
I have read the Ethical Review Checklist and I can confirm that, to the best of my understanding, the information presented by the student is correct and appropriate to allow an informed judgement on whether further ethical approval is required

Signature  Date: 25.3.19

SECTION F: SUPERVISOR RECOMMENDATION ON THE PROJECT'S ETHICAL STATUS

Having satisfied myself of the accuracy of the project's ethical statement, I believe that the appropriate action is:

The project proceeds in its present form	
The project proposal needs further assessment under the appropriate Course Approval Panel	
The project needs to be returned to the student for modification prior to further action	

All documentation must be submitted to the Course Department Office (normally, Course Assistant).

University of
HUDDERSFIELD

Huddersfield Business School
Department of Management

Declaration of Original Authorship

This declaration of Original Authorship must be bound into both copies of your dissertation

Name:	Martin Zanda
Course:	International Business BA (Hons)

Dissertation Title:

Consumers' perception of sustainability of a food system in the Czech Republic

In submitting this dissertation, I confirm that:

(If you are unable to sign off any of the conditions (i - v)... you must refer this dissertation to the module leader).

(i) The material contained within this dissertation is all my own work. Where the work of others has been drawn upon (for example: books; articles; unpublished papers including the work of staff and students; non-book materials such as videos and audio recordings; electronic publications on disk, CD-ROM or the internet), it has been acknowledged and properly referenced using APA 6th notation.

(ii) The work has not already been accepted in substance for any other degree and is not being concurrently submitted in substance for any degree other than the one on which I am currently registered.

(iii) My original (primary) data has been seen by, and discussed with, my dissertation supervisor.

(iv) I have down loaded an electronic version of this dissertation to Turn-it-in having made allowance for any confidentiality issues.

(v) If I consider any part of this work to be CONFIDENTIAL – I have detailed on the next page which parts are confidential. OTHERWISE DO NOT INCLUDE THAT PAGE IN YOUR DISSERTATION

Signed:	
Date:	26 March 2019

‘Consumers’ perception of sustainability of a food system in the Czech Republic’

ACKNOWLEDGEMENTS

I, Martin Zanda, would like to acknowledge and thank all responders who found dedicated their free time, helped me to spread my research questionnaire and took part in this research project, for their contributions to the finished project. I would also like to thank my supervisor Dr John Lever for his guidance. Great thanks also belongs to my friend who believed in me and provided me with an emotional support.

Thank you!

ABSTRACT

A global food system currently faces significant issues in a matter of impact on the environment, economy and society. Sustainable development aims to reduce impact of those issues are reach a certain level of sustainability. A food system is the Czech Republic is not an exception. This study aims to describe global issues of a food chain and sustainable development approach on how to solve them or at least reduce its impact and sustainable movements on how to contribute to the food system sustainability in the Czech Republic. Change however has to come from a bottom-up and it is up to each individual and changes of consumers' behaviour. The questions are how does consumers in the Czech Republic perceives a problem of a food system in the Czech Republic. Do they consider it problematic? What measures can businesses and each individual according to a consumer do to contribute?

Based on the literature review on a global food sustainability, an online survey was distributed to the consumers in the Czech Republic. The answers were analysed from a general point of view as everyone who purchase food is considered a consumer. Analysis demonstrated that consumers, regardless of age, education or place of living, have a basic knowledge about problematic of a food system. They are less aware of alternative approaches, however can state some of them benefits still. Consumers also contribute to a food sustainability however only to a certain extend.

Key words: Environment, Sustainability, Food system, Food chain, Consumers

CONTENT

LIST OF FIGURES

1 INTRODUCTION

1.1 Background to the Study

Sustainable development is currently one of the mostdiscussed topics in the context of development of human society and entire civilization. Increased interest in sustainability is a direct answer to global problems, such as global warming and related problems of unusual weather fluctuations, protection of the environment, problems with poverty, water availability issues… In the recent years, there is an effort of stategovernments, national and private organizations to adapt to a new reality, modify their products, services, goods, actions and laws in a response to this trend, and meet requirements of sustainability.

One of the many issues is a pressure on current food system. This whole issue goes hand to hand with development of human society, in rapidly growing requirements for high standard of living. To meet those requirements a growth in food production is essential. The problem is limited production possibilities, we are using more and more natural resources, and we are changing our lifestyle and increasing personal consumption. As an answer to growing requirements, we are increasing food production.In order to deal with this unsustainable consumption, the food system needs to focus on the entire of food chain, including production methods, models and supply chains, including access to, quality, save consumption and price. Food production in the World multiplied in the recent years, thanks to the monoculture, irrigation, better technologies and usage of greater chemical inputs, such as pesticides and fertilizers, however these production methods have some consequences for the environment. Intensification in this form create a great pressure on the environment, leading to increased emissions, biodiversity loss on agricultural land and contamination of soil, air and water resources. Increased usage of external inputs in order to obtain higher yields in food production often reduces overall energy efficiency and nutrition values (eea.europa.eu ,2014).

Issues with current global food system are not possible to solve only on a global scale, it is up to individual countries and each individual consumer contribution to achieve global food sustainability. The local sustainable food system is a concept adopted by many countries, businesses and individual based in a direct link between producer, distributors and consumers within a certain region, including all links of food chain, such as production, distribution, consumption and food waste management. This create a concept

of sustainable food system on a local basis, contributing to a bigger picture of global food system (Diamond, 2014).

1.2 Aims and Objectives

Economic growth is an indicator that shows increasing in country's economic potential as a result of a quantitative increase in gross domestic product growth. Economic growth is reflected in growth of population purchasing power, leading to a bigger consumption and demand on food on the one hand. On the other hand, growing standard of living and purchasing power leads to increased interest of customers in a quality of food, problematic of food system in general and its impact on environment. This create a pressure on businesses involved in the food chain to adapt all the steps of their operations, ranging from food production, distribution, sales and waste disposal, to meet this new demand and adapt to a new situation.

Main contribution of this dissertation is a characteristic of sustainable food system in general from a theoretical point of view based on available literature and the analysis of sustainable food system in the Czech Republic based on research of perception and contribution of customers about sustainability of food system from a practical point of view.

The main aim of dissertation is to show how sustainable food system in Czech Republic looks like based analysis of awareness and contribution of customers to SFS based on questionnaire.

The objectives of the research are following:

- To find out of how aware consumers are about basic problematic of sustainability of food system in the Czech Republic
- To answer whether consumers contribute to food sustainability
- To detect what distribution networks customers use to purchaseeco-friendly products
- To find out customers'habits regarding to purchase of both regular and sustainable products
- To analyse consumers' awareness and knowledge about sustainability of alternative ways of food production

1.3 Structure of the Study

The whole study is divided into six main chapters.

The introduction briefly outlines the background of the problem, main aims and objectives of dissertation.

The following second part contains the critical literature review, description of problematics of links in a global food system and findings about how to deal with these problems within the framework of sustainable development and theoretical description and finding about approaches of how to achieve sustainability of food system in the Czech Republic.

The third chapter describes the methodology of the research, overview of other qualitative and quantitative methods and justification of used method.

The fourth chapter will contain the findings of the research according to data collection in methodology section. The results will be analysed and discussed concerning aims and objectives of the paper.

The last chapter will summarize the whole thesis and evaluate if the objectives were achieved. This section will also include recommendations for future research and if there were any issues and gaps in the literature review and research.

2 SUSTAINABLE FOOD SYSTEM

2.1 Sustainable food system definition

Sustainable food system is one aspect of Sustainable development and consist of many aspects of food chain. There are many definitions of what the sustainable food system actually is.

The SFS is a dynamic process, which achieve food security today, while preserving food security of the future generations and should seek sustainability in connection of three aspects of Sustainable development. Environmental, Social and Economical. SFS is defined by two sub-organizations of United Nations, HLTF and Nutrition Security entities as a *"System that embraces all the elements (environment, people, inputs, processes, infrastructure, institutions, markets and trade) and activities that relate to the production, processing, distribution and marketing, preparation and consumption of food and the outputs of these activities, including-socio economic and environmental outputs."*According to Calgary's definition, the SFS is a system of "Collaborative network that integrates several components in order to enhance a community's environmental, economic and social well-being. It is built on principles that further the ecological, social and economic values of a community and region. That have several characteristics, some of which are listed below:

- Is accessible and affordable to all members of society
- Is reliable and resilient to change
- Is economic generator for farmers and communities in region
- Is energy sufficient
- Is environmentally beneficial
- Contribute to community and ecological health
- Is promoted by community and local businesses

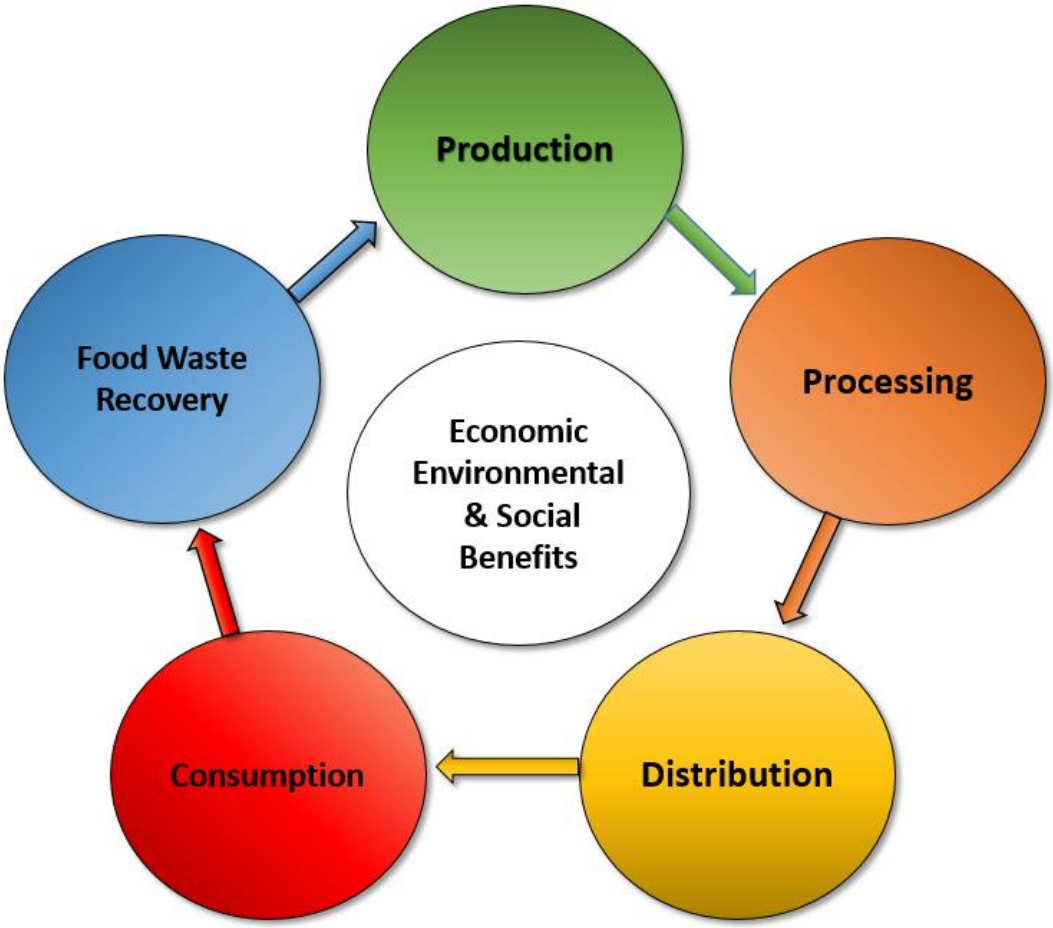


Figure 1: Sustainable Food System Scheme*, (source:* www.friends.org, 2018)

The food system is sustainable, if it maintaining or improving its performance in a long term and does not degrade the environment, human and societal resources that support it, including links of chain such as food production, primary through agriculture and livestock, processing, processing, distribution, consumption and post consumption food-waste (King, 2012).American Public Health Association defines the SFS defined as system, which "*provides healthy good to meet a current food needs while maintaining healthy ecosystem that can also provide food for generations to come with minimal negative impact on environment. A sustainable food system also encourages local production and distribution infrastructures and makes nutritious food available, accessible and affordable to all*" (APHA. 2007).

2.1.1 Production

The pressure on increase on global food production is mainly driven by rapid global population growth around 50 – 60 million annually, with estimation of nice to ten billion people in 2050, meaning, that current food production will need to be increased by 70% (Kiaya, 2014). This fast increase in production will have impact mainly on local farmers in developing countries, who will need to produce more than 1 billion tonnes of crops and 200 million of meat in annually. To fulfil the production needs, farmers will have to have access to new technologies (Ghasemzadeh, 2012).

At the same time, they will need to adapt to situation with decline of rural labour force caused by increasing urbanization, limited water, land, energy and adapt to a climate changes. It is estimated that by 2025 demand for water will exceeds current water supplies leading to water stress for about 3 billion people. Agriculture land will be limited due to urbanisation, competition for housing and growing industrial areas. This will create a need for a new agricultural land will be challenge, especially in tropic areas, due to climate changes (UNDP, 2006).

To secure sustainable agricultural production, this sector should focus on food and nutrition security. Make sure that nutritious food is available, accessible and produced in a sustainable way. The key will be to find a balance between increasing output and decreasing natural resources while reducing environmental impact on environment within food chain and intensify agriculture while remaining ecologically and socially sustainable. The right usage of natural fertilizers instead of pesticides could be an answer for sustainable farming, increasing soil fertility while minimalizing environmental impact. This could make farm holders to struggle in keeping up with fulfilling increasing demand.Extensive agriculture is currently widely spread in developing countries however; gains are far lower than in developed countries. Access of local farmers to new technologies, knowledge, improvements in irrigation and water management could be a solution how to overcome this gap. Innovation and knowledge transfer in agriculture will be essential to maximize benefits of agriculture and to move it closer to sustainability (Ghasemzadeh, 2012).

2.1.2 Processing

Food processing is one part of food system link, which aims is to transform raw materials into finished value-added product that is safe to eat, satisfy customer needs and convenience. One of the main issues is food spoilage happening in the post-harvest period due to inadequate storage and processing. It is estimated that between 40 – 50% of food is lost before reaching customers. (Aravindh, Sreekumar, 2016). Wrong techniques of food processing are responsible for some of the global health issues, such as malnutrition. Poor nutrition is one of the main causes of 5 million deaths per year and is indirectly responsible for one third of the diseases of children younger than five years, or vice versa is responsible for obesity, overweight and epidemic of metabolic diseases and associated health care. Chemical substances in ill processed food contribute to development of allergies and it is forecasted that up to 50% of population will suffer symptoms of allergies in the next years (Blank, Lee, Sybesma, 2017). It is estimated, that every 1 out of 10 people is exposed to contaminated food (WHO, 2017).

Another issue regarding to a food processing an energy consumption, for example, in the EU, the cost of electricity needed for food and tobacco processing consume 9,8% of energy in the whole manufacturing sector, with the majority of energy sources from natural gas, petroleum and coal, while only a small part is from renewable resources (Eurostat, 2013).

As mentioned above, food industry will need to overcome many challenges to deal with food processing issues to achieve sustainability.In order to deal with issue, food industry need to use new and effective methods in processing to minimalize the spoilage while keeping nutrition values of food and reducing needed energy and water. An answer to these problems is usage of nanotechnologies and eco-friendly drying methods as a way of food preservation (Texeira, 2018). One of the many ways to solve this problem is cold and solar drying. Even though cold drying is one of the drying methods how to preserve nutrition values, it is very energy intensive. The better way to preserve food is a solar drying method, which solve both nutrition values problem and energy consumption, therefore eliminating emissions and energy cost.This drying method is one of the oldest and is based on usage of sunlight, suing solar radiation to remove moisture, while keeping structure and nutrition values of food. Solar drying also does not produce almost any emissions due to usage of renewable energy source. However, this method also has its disadvantages as in the open air it is exposed to contamination from dust and insect and

while drying in chamber, they have limited capacity and options how to control a heating process. (Aravindh, Sreekumar, 2016).

2.1.3 Distribution

Distribution in general is an action or process of supplying goods to customers. Food distribution is different from the distribution of other products. A global food distribution presents several problems, environmental problem in emissions produced by transport vehicles and social problem with uneven food distribution among population.

The environmental issue grows as the purchasing power of customers and international trade increases.Even though economic development is beneficial, it results in expansion of a road traffic transport, which brings further environmental problems.One of the problems of distribution traffic network is usage a wrong usage of load space of trucks. Around one third of the vehicles are running empty, which occurs when operators are not able to find a return load, however in some countries such as UK number of empty trucks has been declining. Number of empty trucks fell from 33% in 1980 to a 27% in 1999; saving £1.1 billion and helped to reduce emissions by 1.3 million tonnes per year, it is clear from this example, that even a small decrease had significant environmental benefit (McKinnon, 2000).Another way is to improve of measure vehicle loading by increasing of return loading (Department of the Environment, transport and the regions, 1998). Rising limits on vehicle carrying capacity, which is within the EU 40 tonnes for cross-border transport and 40 – 60 tonnes for domestic distribution which could lead to an additional reduction of CO_2(McKinnon, 2000).

The social aspect of due to a gap between the wealthy and the poor part of society.The wealthy control food distribution, aiming mostly on those who are able to afford it. This makes sense from an economical point of view; food is a commodity that is sold for profit. From a social point of view, the poor, who are not able to afford it, do not get their share of food leading to a deprivation. This problem does not occur only in developing countries but in every country all around the World (Martinez, 2014). There were several attempts to secure a right to food for everyone, first in the 1948, the Universal Declaration of Human rights affirmed the right to food, however, this document was not adopted by most of the governments (Van Esterik, 1999). The first great success of government and multi-national initiatives was document The Right to food guidelines from 2004 which was

adopted by most of the countries, moving closer to achieve sustainable food distribution (FAO, 2006).

2.1.4 Consumption

Sustainable food consumption is a form of consumption strategyadopted in a reflection on human development and its increase in food demand. With increasing demand, a pressure on higher food offer is created, leading to intensive production of food of low quality. Current food consumption cannot be considered as a sustainable. With a demographic change, estimate population is likely to rise up to 9 billion in 2050; problems of food consumption will likely become even more serious, with an impact on environment, economy and human society (Eberle, Lorek, Reisch, 2013).

Sustainable food consumption was defined as a "*Holistic approach to minimalize a negative environmental impacts of the production-consumption system of society, aiming to maximize efficiency and effectiveness of products, services and investment in such manner that the needs of society are met without jeopardising the ability of future generations to meet their needs*" by the Norwegian ministry of Environment during Oslo Symposium in 1994 (EEAReport, 2007). In a matter of sustainable food system, link of sustainable consumption focuses mainly on reduction of the environmental impact of food consumption; promote economic accessibility to a varied diet from economic aspect, socio-cultural aspect as a guardian of food traditions and culture and local food tastes and preferences and securing a diversified balance and seasonal diet (DoublePyramid, 2015).

The Government of Sweden headline a strategy for sustainable consumption, in the Strategy for Sustainable Consumption document from 2016. Some of the headlinedways to achieve sustainable food consumption are increasing knowledge and deepening cooperation, by establishing and eco-smart consumption forum, by bringing together actors who can influence consumers by spreading awareness of the problem, establishing environmental focus in schools. Encourage sustainable ways of consuming by more efficienteco-labelling. Improve information on companies' sustainable efforts. By phasing out harmful chemicals using toxin-free every day environment strategy, which includes contribution to regulate chemicals in food and ensuring to phase out harmful substances from eco-cycle and their replacement with alternatives.

2.1.5 Food Waste recovery

Last link of global food system is a food waste issue. It has been estimated that between 25% and 50% of a total food production is wasted along the food supply chain, in production, processing distribution and consumption counting for nearly 1.3 billion tonnes of food (Hoek, 2017).This creates a serious global problem in many aspects. First, food waste creates a huge problem for a human society when millions of people suffer from hunger and could lead to famine and global food crisis in the future (Nellman et al., 2009). From economical point of view between 780 billion and 1 trillion dollars annually are lost due to food waste (Hoek, 2017). One of the impact of food waste on environment is an inefficient usage of energy and water resources, as well as greenhouse emissions created in process of food waste disposal.

The purpose of sustainable food recovery is to minimalize environmental, social and ecological impact of food waste. In order to deal with food waste, it is needed to reduce a food loss amount across the whole supply chain, which will benefit all members of a food system. Reducing a food waste can significantly improve the sustainability of the whole production system (Galanaks, 2016).

Effectivity of a waste management is a critical move to secure and increase profitability of food supply chain members, by achieving an efficient use of the raw materials, energy and resources used during a food production process. There are two ways how to achieve that, firstly by utilizing the material that would be otherwise wasted and processing food in an efficient way. For example, water and food residues could be used for an extraction of chemical substances from a waste to be transformed into new materials with economic value or as a supplementation to other food products bringing economic benefits by reducing need for buying a new ingredient. Re-utilization of substrates that are nowadays considered a food waste. Their extraction could be used to develop new products or even extend food durability of already existing products (Galanaks, 2016).

One of the many problems with food waste are on a basic level of a food system in a distribution link. Supermarkets, as a distribution centre are the main contributors to a food waste, regarding to a food expiration date. There is a huge difference between expiration date and actually food spoilage and contamination. Possible solution to this problem is information standardisation of distribution network, reduction of the amount of food they

offer, donation of food to a food banks, surplus a food from supermarkets, which could be distributed among charities and community groups, securing access to otherwise wasted food for the poorest members of our society. Significant discounts of products, which would be thrown out as a food waste, these measures could help to reduce an impact of a food waste (Nolet, 2018).

2.2 Sustainable food system in the Czech Republic

2.2.1 Local food system definition

A local sustainable food system is one of the alternative concepts based on growing concern with current globalization in food system.

There are many definitions what the local food system is. Local food system is generally understood as a system, where production and marketing occurs within a certain geographic region or the number of kilometres the food travels from a production location, through whole food chain to the end customer (Johnson, 2016). The definition of what is considered local is various country from country. USDA consider a local food to be produced, distributed and sold within less than 400 miles or within a state where local food is produced (Hand, 2009). In Canada, food products can be marked as a local if they are produced, distributed and sold within a 50 kilometres range (CFIA, 2019). Every country has its own definition of what the local actually is, however most of them agrees that local food is the one, produced within the state borders (Durham, 2009).

Figure 2: Local Sustainable Food System *(source: Cairns, 2018)*

One of the arguments supporting local food systems as a way to sustainability of the food chain. The main arguments for local food system is an environmental benefit in reduction of ecological footprints of locally produced products. According to IPCC (2007), global food system accounts for one third of the entire greenhouse emissions production. The idea behind promotion of local food production is a reduction of emissions due to short transportation requirements.In a global scale, food travels from even greater distances from all around the World, mostly relying on fossil fuels. Increasing demand for global food creates needs for an additional packaging and preservation, for a cost of quality and nutrition values. Intensive food production also creates additional problem in a form of pollutants, having impact on both environment and health of population (Briefing 1, 2002).

Local food system also has a positive impact on sustainable economy development and society by creating environmentally sustainable jobs within a food chain, in production, processing, manufacture and distribution. The local food network could increase availability, and affordability of products, due to reduction of distribution time. Shorter distribution time reduces a need for usage of pesticides and chemical preservation methods, improving nutrition and quality of food (MAFF., PSD, HRE, 1999). Direct interaction within community can help to a better reflection of customer preferences.

Support of local food producers can also contribute to combat the trend of large-scale retailing and conserve the characteristics of local landscape (FLAIR, 2002).

2.2.2 Sustainable agriculture

Organic farming has been developing in the Czech Republic since the early 1990s, but the basic principles of organic farming are based on thousands of years' experience with ecologic farming These traditional ways combined with latest technologies and scientific knowledge and created a contemporary ecological agriculture (Urbaskovsa, Pohankova, Novak, 2009). In 1990, first three economic farms were founded and the Ministry of Agriculture of the Czech Republic was established (Sarapatka, 2007).

Ecological farms

By the end of 2016, there were around 4243 eco-farms on total area of 506 070 ha, representing 12.03% of the total agricultural area. Between 1990 and 2016, the area has grown from original 480 ha to 506 thousand and the number of organic farms from three to a 4243, mostly thanks to governmental financing. In Czech, organic farming is being developed mainly in areas where emphasis is placed on nature conservation or in areas with deteriorated production conditions, with average size of farmsteads of 119 ha (Ministerstvo zemedelstvi, 2016). In a matter of domestic and local production, 3/5 people grow their own crops. In additional around 50% of population are producing and processing their own food, mostly jams and compotes, juices vegetable and even dairy products, honey and sausages (AMSP, 2016).

Year	Number of ecologic farms	Total area of ecological farms (ha)	Percentage of total agricultural land (%)	Annual change in the number of farms (%)	Annual change of total land in EF (%)
1990	3	480	-	-	-
1991	132	17 507	0,41	-	-
1992	135	15 371	0,36	2,3	-12,2

1993	**141**	**15 667**	**0,37**	**4,4**	**1,9**
1994	**187**	**15 818**	**0,37**	**32,6**	**1,0**
1995	**181**	**14 982**	**0,35**	**-3,2**	**-5,3**
1996	**182**	**17 022**	**0,40**	**0,6**	**13,6**
1997	**211**	**20 239**	**0,47**	**15,9**	**18,9**
1998	**348**	**71 621**	**1,67**	**64,9**	**253,9**
1999	**473**	**110 756**	**2,58**	**35,9**	**54,6**
2000	**563**	**165 699**	**3,86**	**19,0**	**49,6**
2001	**654**	**217 869**	**5,09**	**16,2**	**31,5**
2002	**721**	**235 136**	**5,50**	**10,2**	**7,9**
2003	**810**	**254 995**	**5,97**	**13,3**	**8,4**
2004	**836**	**263 299**	**6.16**	**3,2**	**3,3**
2005	**829**	**254 982**	**5,98**	**-0,8**	**-3,2**
2006	**963**	**281 535**	**6,61**	**16,2**	**10,4**
2007	**1 318**	**312 890**	**7,35**	**36,9**	**11,1**
2008	**1 946**	**341 632**	**8,04**	**47,6**	**9,2**
2009	**2 689**	**398 407**	**9,36**	**38,2**	**16,6**
2010	**3 517**	**448 202**	**10,55**	**30,8**	**12,5**
2011	**3 920**	**482 927**	**11,40**	**11,5**	**7,7**
2012	**3 923**	**488 483**	**11,56**	**0,1**	**1,2**
2013	**3 926**	**493 896**	**11,70**	**0,1**	**1,1**
2014	**3 885**	**493 971**	**11,72**	**-0,1**	**0,0**
2015	**4 115**	**494 661**	**11,74**	**5,9**	**0,1**
2016	**4 243**	**506 070**	**12,03**	**3,1**	**2,3**

Figure 3: Table of agricultural land and number holdings in organic farming 1990-2016 (source: Ministerstvo Zemedelstvi, 2016)

Community supported agriculture

Another form of all alternative ways of a food production is and one of the stronger movements in the Czech agricultural production is a Community supported agriculture. There were around 32 CAS groups in 2015, the oldest from 2009, with around 32 farmers involved with more than half of them are certified organic farmers. There are about 600 members directly involved in Czech CSA, mostly family members with around 1500 benefiting from CSA. The whole concept is based on a close relationship between

customer and producer which main principles being community, localization, solidarity and mutual benefit (Krcilkova et al. 2015).

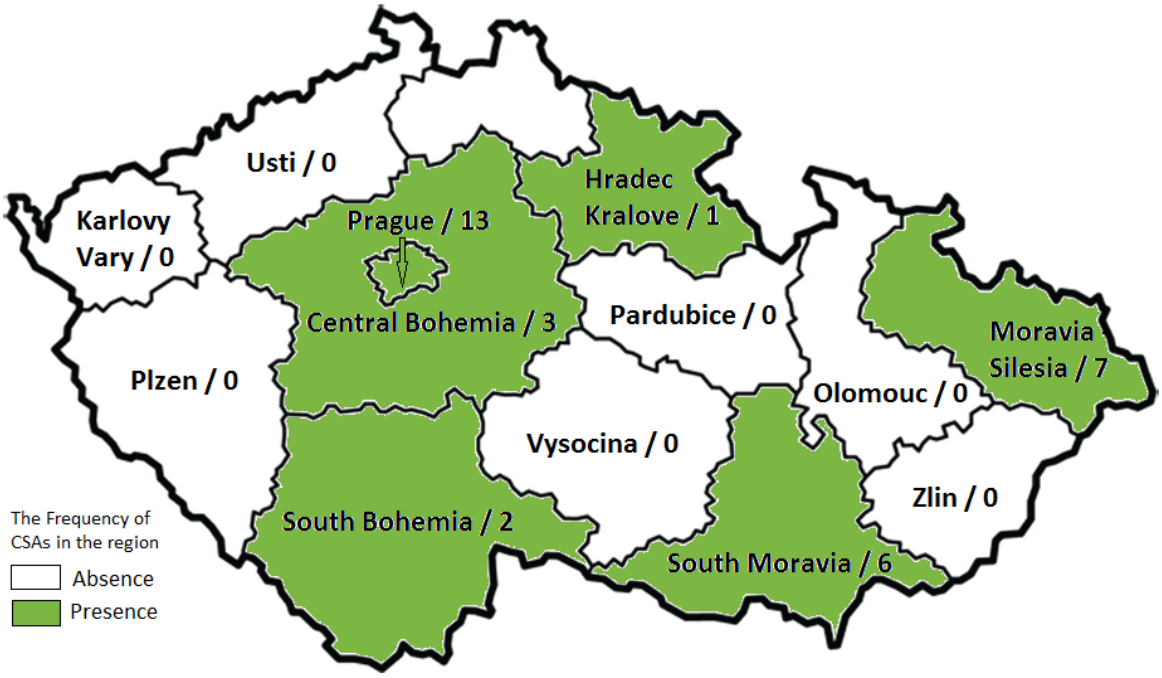


Figure 4: Location of CSA in the Czech Republic by regions *(source: Krcilkova et al. 2015)*

There are two main types of CSA in the Czech Republic, community subscriber group, described as a group of consumers with commitment to an already functioning farm for a specific period, usually by seasons. Farming is a responsibility of a farmer who is selling his products to its members, while members are responsible for organising the administration of the group and location of distribution. Profit is usually shared among a community and is based on outputs. Second type – community shared farms are organized by non-governmental organization hiring a farmer to work on a land rented by the enterprise with all costs and profits shared among members (Krcilkova et al. 2015).

Majority of the CSAs farmers are certified organic producers with the rest of contributors operate without certificate following concept of CSA, which are associated with support of environmentally friendly way of farming and direct connection with local production and consumption. The main reasons behind joining the community are desire to access fresh, healthy and local food, concern about safety and reliability of the products (Krcilkova et al. 2015).

2.2.3 Sustainable distribution and access

There are several main distribution centres in the Czech Republic. The largest distribution centre for organic food market being supermarkets. Followed by small local shops with ecological produced food is almost every city. An important and most sustainable way of food distribution are the direct sales of organic food, allowing farmers to sell their products directly to the customer without any other intermediaries. Not everyone has enough purchasing power to buy organically produced food, as the cost of eco-products are usually higher, unlike in the case of farmers' markets. Organic food farmers generally have slightly lower yields, a significantly higher proportion of manual labour and higher costs associated with organic food certification. The price of organic food isaffected by price of primal raw materials that are more expensive, less available and there is a low competition on the market. Lack of pesticides and chemical substances cause slower growth, which also reflects on financial value (Veronika, Ekologicky institut).

The very first famers' market in the Czech Republic was held in the capital city of Prague in 2010 after realization that unlike in our country, the farmers' markets with fresh local food operate abroad on a daily basis. *"The problem with the first market was that it was difficult to convince the farmers to come, despite organizers offer of a full service and free stand place location. The idea behind it was to try this new concept and find out if people of Prague will be interested. The estimated number of people visiting market was one thousand, but eventually, around ten thousand people came over. The market started at 8 am only after 2 hours, farmers had nothing to sell and had to call home at once to get there anything and come to sell it. Those who have come from a faraway were desperate that they did not take more goods with them",*Pavel Stastny, one of the organizers. In a following few years, markets gained popularity all around the country and their number increased since up to 135 locations in 2019 (www.ceskyfarmar.cz; 2019, Bohutinska 2011).

Farmers' markets have great benefits for a society, local economy and environment. They give a chance to all Czech farmers who want to make honest products from domestic materials. People and businesses learn about them, thanks to the markets and provide them with significant outlets (Frajtova, 2012). Imported products that travel over the half of continent often lose many nutrients and vitamins. The direct contact between farmer and customer is the opportunity to meet the seller and ask him directly about under what conditions its product originated and what it is composed of. Local farmer markets also help to maintain employment opportunities in the countryside and agriculture in

general.Customers also benefit from markets as they have access to the products of organic farming and organic food, usually cheaper than from the super markets thanks to the lack of manufacturers' margins (Leibl, 2011).

This kind of food distribution also have a positive impact on environment. Focus on local rather than global products helps to reduce greenhouse emissions otherwise produced by long distance transportation of goods. A goodexample is a case of import of tomatoes from Spain, when to transport one kilo of tomatoes 200 grams of CO_2 into the atmosphere is released. On the other hand, if tomatoes travel only 30 kilometres from local farmer, only 20 grams of CO2 is released, i.e. 10 times less (Poncarova, 2012).

2.2.4 Consumption trends

The Czech diet has undergone several significant changes in recent years, especially a meat consumption experienced a growth with an increase culminating in 1980s and decline only 10 years later in 1990 with largest decline in beef consumption, from 29kg in 1980 to 8 kg in 2012, while other types of meat, such as poultry, which consumption increased 10 times. The decline in meat consumption is positive from sustainable point of view, however shift from beef to poultry is mainly due to higher price and health concerns, despite that, current meat consumption is 77 kg annually, which in still 10 higher than recommended. Fruit and vegetable consumption has also experienced growth (Stikova, et al., 2013).

According to AMSP (2016)research of 800 customer preferences, over ¾ of customers are shopping in supermarkets, at the same time 1/3 of them are also of them regularly purchase food in the local bakeries, markets and specialized small stores. A further 50% of customer shop in small shops and farmer markets irregularly. Customers begin to favour the origin of food. Despite their supermarket shopping trends, more than half customers perceive the importance of local producers as an important aspect of landscape conservation.Around 4/5 of respondents believe that local crops have better taste and nutritional qualities. Unlike in retail, in restaurants, the Czechs are not asking for origin of raw materials. They do not consider it as an important information.

Another research done by the Shopping monitor (Hebakova, et al., 2014) showed that 86 % of their respondents preferred a large shop. Customersare usually purchasing products in sales where it is estimated that over 40% of products are sold in. Flyer campaign is one of the important advertising campaign and possible channel of how to guide consumers to

sustainable food as over 70% of them do read them and 40% of them are shopping according to them, however they are mainly build on current social practices of food consumption with very little sustainable elements.

In overall there are two concepts of customer consumption, the first one is the supermarket consumption and the other being farmer markets, which experienced boom in 2009 and 2012, in past years FM number stagnated and most of them outside big cities disappear. Customers in the cities usually earn more and they are willing to pay more for the products (Hebakova et al., 2014).

2.2.5 Sustainability of food waste recovery

The current level of food waste globally ranges between 30 – 50% with only EU states producing around 90 million tonnes of food waste annually making it 170 kilos of food waste per capita and it is estimated that by 2020 it will be 126 million tonnes. In the Czech Republic food waste is around 5% of an entire food production, 80kg per capita annually.

In terms of total volume, the most important area of products in food industry is a feed and fertilizers. The feed industry in is using about 70% of tonnes of by products with the rest used by farmers. By-products play a significant role in the feeding of livestock, sunflower seeds, oil form soybeans are used as a main source of protein for livestock. Some of the by-products are also used as organic fertilizers, increasing nutrition quality if the soil. Farmers by this help to improve soil structure and reduce acidity (PK CR, 2012).

Supermarkets are one of the main contributors to food waste creation in the Czech Republic. One of the more progressive food chains, what contribute to a food waste recovery is Tesco. In 2017 Tesco sold 651 575 tonnes of food, of which 13 245 tonnes were not sold to consumers and recorded as a food surplus. In 2018, the total amount of food waste was reduced from 13 245 to 10 227 tonnes. At the same time, Tesco managed to increase the volume of donated food to 7020, which makes 156% increases. Of this number, 3016 tonnes were donated to the food banks or as animal feed, makes it 23% of total donated surpluses in the Czech Republic. Since 2018, Tesco changed its internal processes of ordering food to reduce number of ordered food with a minimum date of durability and increased the volume of donated food to local food banks (tyden.cz, 2018).

In addition to optimizing the ordering process, Tesco also fights food waste with its own food donation program, with 154 stores offering surpluses to partner food banks and organizations. In 2017, Tesco launched the sale of “crooked” vegetable and fruit. This

helps their suppliers by accepting their food and vegetable of non-standard shapes and sizes that would otherwise not reach the normal sales network and end up as a waste. Tesco also launched another campaign called Food Waste Hotline in Central Europe, allowing suppliers to highlight whether they have any potential food surpluses from the supply chain that Tesco can use in its activities (tyden.cz, 2018).

From January 1, 2018, all grocery stores with a retail space over 400 m^2will have to donate and offer food that would otherwise end up as a landfill to charities. The donated food must be hygienically safe including consumer save packing. The chains can also give products that have a deformed wrapper or products that are inaccurately labelled. The main aim of the amendment is to legislate on additional reduction of food waste (narodnipotravinovasbirka.cz, 2018).

2.3 Literature review summary

In summary, global food system is not sustainable, each part of food system link is problematic from either social, environmental or ecological point or all combined. Sustainable development is aiming to lower impacts of these issues on a global scale by taking measures and approaches to reach certain level of sustainability in an ever-changing global environment.

The sustainable system in the Czech Republic is not an exception. One of the ways how to change or move food system towards sustainability is promotion of local food system, which is supposed to help reduce negative impact and promote benefits of this approach. Before the 1989 the state did very little to contribute to sustainability, the private companies almost did not exist as almost every company was owned by state. This changed after the Velvet revolution in 1989, when population and state opened to the world and started to care about environment.

The first organic farms were founded in 1990 especially thanks to state financing and their number increased to 4243 in 2016. State was not the only one who promoted sustainable agriculture initiatives, in 2009 first farm on community-supported agriculture was founded, on a principle when people from close proximity are working on a farm and share both loses and profits.

Sustainable way of food distribution presents farmers' markets, which gained popularity in 2011, since then their number decreased and can be found mostly in the larger cities. Regardless, this concept brings social, ecological and economic benefits, such as emission reduction due to close proximity from production location and contribution to local economy and society in the region.

A big contributor to a food system sustainability are consumption trends of consumers, even though most of the Czech consumers tent to purchase their food in supermarkets in discounts, there is a great number of them buying their products in a local small retail shops, farmers' markets, or grow their own fruit and vegetable, contributing to a food sustainability.

As the rest of the world and Europe, the Czech Republic has a great number of food waste per capita, number that is increasing annually. Farmers and animal feed companies recover a certain percentage of food waste. Supermarkets also has a lion share on creation of a food waste. One of the more progressive supermarkets that realized problem with a food waste is Tesco Company, which is trying to put an effort into its reduction and creating an example for others as well. In 2018, the government passed a law forcing companies to donate their food and prevent additional creation of a food waste.

3 METHODOLOGY

3.1 Data Collection

Aims of dissertation	Survey question
To find out of how aware consumers are about basic problematic of sustainability of food system in the Czech Republic	6, 7, 17, 27, 29, 30, 31, 32, 33
To detect what distribution networks consumers use to purchase eco-friendly products	15, 25
To analyse consumers' awareness and knowledge about sustainability of alternative ways of food production and distribution	8, 9, 10, 11, 12, 13, 14, 16
To find out customers' habits regarding to purchase of both regular and sustainable products	19, 20, 21, 22, 23, 24, 26, 28
To answer whether consumers contribute to food sustainability	5, 18, 32

Figure 5: Table of aims of dissertation and link of survey questions to the objectives (own source)

Survey questions:

1. What gender are you?

2. What age are you?

3. Where do you live?

4. What is your education?

5. Do you consider yourself a person who is interested in the environment sustainability?

6. Do you consider agriculture in the Czech Republic to be environmentally sustainable?

7. What do you think are the main problems of the agriculture in the Czech Republic?

8. Are there any ecological farms in your area?

9. Do you think ecological farms would be profitable without subsidies?

10. Are you familiar with a term: Community-Supported Agriculture?

11. What are the benefits of CSA concept?

12. What are the drawbacks of CSA concept?

13. Should there be any CSA in your neighbourhood would you participate in it?

14. Are farmers' markets organized in your area?

15. Do you shop on farmers' markets?

16. How do you assess the benefits of farmers' markets? Farmers' markets:

17. Do you think that food availability for all should be enshrined in Czech legislation as a fundamental human right?

18. Do you consider yourself a person who eats healthily?

19. Are you familiar with term organic food?

20. How would you define organic food?

21. Do you think Organic Food is healthier than regular foods?

22. Do you buy Organic Food?

23. What are your reasons for purchasing Organic Food? (Even if you do not buy them, try to state arguments for)

24. What are your reasons for not to buy Organic Food? (Even if you do not buy them, try to state arguments against)

25. Where do you buy organic food?

26. What matters to you in a matter of food purchasing (in general, not just organic food)

27. Do you consider food waste in the Czech Republic to be problematic?

28. If so, what do you consider main problems are?

29. At what stage of the food chain do you think most food waste is produced?

30. Do you think shops do enough to prevent food waste?

31. What measures do you think can shops do to avoid food waste as much as possible?

32. How do you handle food waste?

33. Are there any initiatives in your city that exploit discarded foods?

Survey link to the Aims of dissertation

Data were collected between 18 March and 23 March, using survey method computer questionnaire type, with both closed and open questions, data were collected through a social media and emailing. This method proved to be effective in a matter of speed and number of responders, in a five days, questionnaire was completed by 208 responders, however quality of answers is debatable, especially at open questions where consumers were supposed to actually think about question and write their own statement. Collected data were analysed from a general, open questions were analysed in a way where similar answers were placed into categories due to large number of them, with a similar undertone.

The questionnaires are perhaps the most widespread and most sophisticated technique of quantitative data collection. Their main purpose it to describe the reality as it is. They are described as a method that collects data based on series of questions and are appropriate for a bulk data collection. (Skalkova et al, 1983).

Tree types of questions according to Olecka and Ivanova (2010)

- Open question – Open questions are different from another type of questions used in questionnaire. It gives responders freedom of answer and it gives impulse to think, however this can lead to unpredictable results that are hard to categorize and process.
- Semi-closed questions – the variants of the answers are fixed in advance, however, it is complemented with option for “other answer” offering the responder to make his own statement.
- Closed questions – a fixed list of questions to which respondent respond with fixed answer
    - Dichotomous questions – yes or no
    - Selective – choosing of one answer
    - Enumeration – choosing more answers
    - Exclusion – selecting one alternative which we exclude
    - Scaling questions – ranking of questions usually on scale 1 – 10

The research method chosen for this project is a quantitative method of online questionnaire. I chose a questionnaire method as it is one of the best ways of quantitative research about how to gather a lot of information from great number of respondents in a short period. The way of data collecting is come comfortable than face-to-face survey or interviews. The topic of dissertation is a consumer perception of a sustainability of a food system in the Czech Republic;therefore, I need to collect data from as many respondents as possible, which makes an online questionnaire an appropriate option for a data collection. Because this method is based on anonymity, it may be more effective to gather information about what respondents actually think about questions and answer honestly (McLeod, 2018).

Advantages

+ It is one of the cheapest way to gather data

+ Data are easy and quick to gather

+ Questionnaires allows to collect data from a great number of responders

+ Collected data are easy to analyse, proceed and get results

+ Respondents maintain their anonymity and keep their privacy, which could influence honesty of their answers

+ No time limit – responders have time to think their answers through

Disadvantages

- Answers can be misunderstood or can be interpreted in a different way than they meant to be

- As a questionnaire usually do not require personal contact the researcher cannot capture the - feelings of responders about questionnaire or questions

- Anonymity can also result in dishonest and unreliable information

- Respondents could leave some questions unanswered or straight up ignore the questionnaire

3.2 Quantitative methods

A quantitative methods approach is based on a theory by which we create a hypothesis by means of operationalization and then verify by statistical methods. The most common logical operation used here is the deduction, meaning that before we start our research we already know variables and the way of how we interpret the data. The goal is to verify relation between variables or to determine what variables are related to each other (Svaricek, Sedova, 2014). Quantitative approach work mostly with numerical data.

The basic forms of quantitative research are non-experimental, the researcher does not change the situation, conditions or experience of individuals, or experimental when the researcher's independent variable change. The characteristic of quantitative research is that it can limit chosen reality. Another characteristic being that quantitative research seeks to address social trends of larger dimensions (Hendl J, 2016).

The main advantages of quantitative research methods are the ability to test and validate theories, to generalize the results of the population, to eliminate disruptive variables, therefore proving their causal link, its usefulness in researching of large groups and populations, relatively fast and straightforward data collection. Another advantage is that we are working with accurate, numerical data that allows us to quickly analyse them. The results of quantitative methods are independent of the researcher (Hendl, 2016).

The drawback of quantitative methods is reductionism, which can lead to the omission of some phenomena because it is focused only on testing a theory, not its development. In addition, the categories used may not match the local peculiarities. The generalization in a context of drawbacks can be also considered disadvantage because results can be too general and abstract for direct application under given conditions (Hendl, 2016).

3.2.1 Structured interview

One of the methods of quantitative research is structured interview, with standardized questions with a no or little space for an opinion or explanation of interviewed. The researcher proceeds exactly according to the structure of the form and with person selected according to certain and fixed criteria.

The structured interview takes place according to precisely prepared form with an exclusively closed, categorical and multi-alternative or scale questions. The researcher

reads questions to the respondent and possible variants of the responses and record or highlights the ones that respondent chose (McLeod, 2014).

3.2.2 Correlation analysis

Term correlation analysis originated in Latin, meaning the relation between two variables. The relation is described in a way that if there is a change in one quantity, the correlation has to change as well. Correlation does not mean causality (the relation between cause and the effect). This method is widely used in statistics (Lean six sigma, 2019).

The coefficient r is a measure or indicator of the correlation between two continuous variables is coefficient r and it takes value in the interval [-1, 1]. Where r = -1 informs about a perfect negative linear relationship, value r = 0 informs about existence of linear relationship and value r = 1 indicated a perfectly linear relationship (Lean six sigma, 2019).

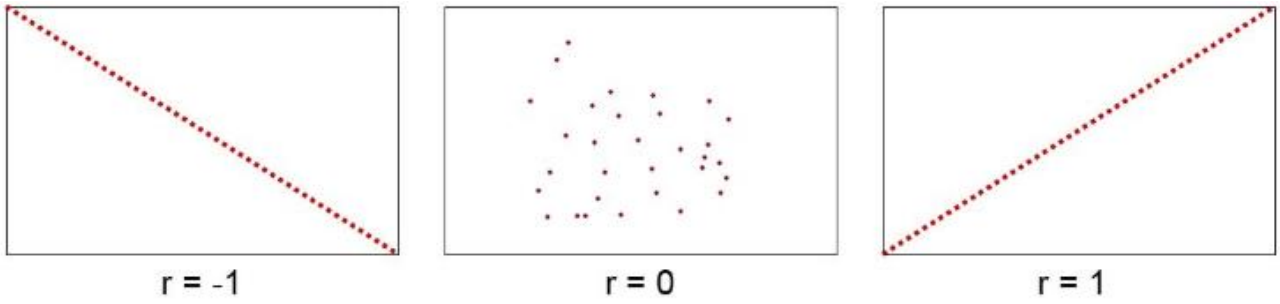


Figure 6: Graphic expression of correlation (source: © Lean six sigma, 2019)

3.2.3 Regression analysis

Regression analysis is used to determine the dependence of our input (X_1, X_2…) on the output (Y). The aim of regression analysis is to estimate this relationship as accurately as possible. Unlike in correlation analysis we are not looking only for linear relationship. The measured data will fit the curve to reflect the behaviour of the measured data sample. In the ideal case. It will be linear relationship, a linear regression (Lean six sigma, 2019).

The least squares method is used to select the correct regression function, so we are looking for a function that is closest to the value of our data sample. The function may not

be only linear, but also quadratic, cubic or logarithmic. The indicators of the correctness of the model is the determination coefficient R^2 (Lean six sigma, 2019).

Determination coefficient R^2 – an indicator of adequacy of the model, expressed on percentage points and tell us how much percent of the output variability (Y) is caused by our inputs (X_1, X_2…) or input.

Modified determination coefficient R^2– adjusted coefficient of determination that takes into account the number of predicators in the model. This adjusted coefficient is useful especially when comparing models with different number predicators.

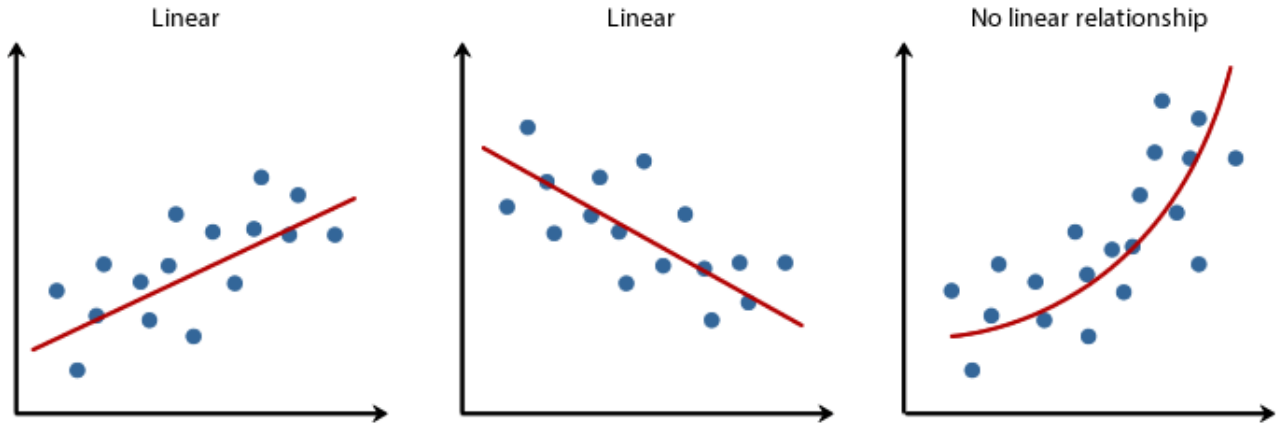


Figure 7: Graphic expression of regression analysis (© Laerd Statistics, 2019)

3.3 Qualitative methods

The main concept of in qualitative methods is to collect data without having the baseline variable set. Unlike in quantitative research the project does not depend on the pre-built theory and the hypothesis is not predetermined. The logical operation used here is induction – after collection of enough data we begin to look for regularities that appear in them (Svaricek, Sedova, 2014).

Data collection and analysis is based on long-term data collection, while both processes being carried out simultaneously. During the cycles of data collection and analysis, we review our own assumptions and conclusions. Another characteristic of the qualitative approach include further and intensive contact with the phenomenon being investigated, the attempt to obtain an integrated view use of low standardized methods of data acquisition, the difficult replication of the research and the difficulty of generalizing (Hendl, 2016). The output of a qualitative research design is the formulation of a new hypothesis or theory (Bahbouh, 2013).

During the conduction of qualitative research, care must be taken to ensure transparency of research – there should always be mentioned how individuals were selected for our research and how the analysis was conducted (Hendl, 2016). In a quantitative research, if we are trying to reconcile our results with reality, we should rely on more sources of information. This does not mean a quantity rather than more tools and approaches used to find and verify the same information (Ferjencik, 2000).

The advantage of qualitative method is that phenomenon is explored as far as possible in their entirety, which allow us to cover many interrelations and connections (Ferjencik, 2000).Using this method, we are able to take into account the context and the local conditions, obtain detailed information and in-depth description of the case that we can compare, track their development and examine the relevant processes. It allows us to explore phenomena in their natural environment and to respond well to local conditions. It helps us find local causal connections and the initial exploration of phenomena. Qualitative design is appropriate especially for smaller social units (Hendl, 2016).

The drawback of qualitative research is that its results cannot be generalized or transferred to another environment. It does not allow us to make quantitative predictions and it makes it difficult to test hypotheses and theories. Analysis and collection of data is much more time consuming than quantitative research. The qualitative research does not have to be objective since the researcher and his personal opinions, assumption and preferences (Svaricek, Sedova, 2014) easily influence it.

3.3.1 Observation

Observation is a frequently used method of qualitative research. This method is based on experience and ability to engage both the selective and holistic perceptions of the reality of study. It involves all senses of researcher, visual, auditory, even sense of sell and perception. One of the main characteristics is that it also reveals that aspects that participants would otherwise did not share.

3.3.2 Unstructured Interviews

One of the most common methods of qualitative data collection are unstructured in-depth interviews, where the aim is to collect more detailed information based on interviewed

experience, understanding and perception. They are usually informal, open ended and free flowing, based on friendly environment and non-threating conversation. Questions are usually not pre-set, however, the whole conversation is still framed by some specific topic based on specific research of interviewer with some basic structure and direction. Researcher have some questions prepared in advance, more questions appear during the interview and are based on interviewed responses (Trueman, 2015).

3.3.3 Focus Groups

Focus group is one of the main qualitative research methods that provides information of certain topic through open questions. The method is a discussion within a small group of people with a certain interest and knowledge about problematic of discussed topic, used to generate information, view about problematic and explore the origin and reason behind these views. Focus group is lead and managed by moderator whose purpose is to guide, monitor and record discussion (Morgan, 1998).

The size of the focus group should be six to eight participants however, it can make do even with three or as many as fourteen participants. The key is to ensure as good quality as possible based on interaction between participants. Pre-existing group coming from a similar environment and background can make a conversation more comfortable and easy going. On the other hand, group of strangers can lead to a freer discussion, because of certain level of anonymity of members (Frankland, Robson, Thomas, 2001).

A size of a group is also important factor; small group composition can lead to a lack of discussion occurring, while the bigger group discussion can turn out to be chaotic and hard to moderate as some members may feel overlooked or not given enough space to express their opinions.

3.3.4 Case study

Case study is a method of qualitative research based on an intensive study of one case – situation, person or problem aiming to examine current phenomena to their depth in their real context (Yin, 2009).

Its aim is to describe and explore one or several cases. It is considered one of the most suitable research strategy in situations, where the questions are how or why the certain

processes are happening, and over which we do not have any or very limited control, researcher can have a minimal influence over this processes (Svaricek, Sedotova, 2007).

3.4 Methodology summary

As a method of data, collection in this dissertation was used survey – computer questionnaire approach, which is type of quantitative data collection. This way was used because of its advantages in covering as large population as possible in a short time, which was an appropriate method how to collect data from large number of consumers. Data gained from open questions were interpreted and data from open questions were analysed and sorted into categories based on similarities and same core and principle of answers.

Methodology chapter also include description of other quantitative and qualitative methods used for research. The main difference between them is that quantitative data operate with data on numeric basis, it is easy to analyse and write results and is based on testing of hypothesis, however do not influence of change conditions of research, with one of the drawbacks being generalization of results, overlooking possible phenomena.Some of the described methods are structured interview, and statistic approaches correlation and regression analysis.On the other hand, qualitative research is not based on pre-build theory where researcher directly participate and is in contact with phenomena. The advantage is that we can place collected data or results in context with in-depth description of phenomena. The drawback is that researcher can influence qualitative research and therefore data may not be objective, also data cannot be reinterpreted in a different environment. Some of the described methods are observation, unstructured interview, focus groups and case study.

4 RESEARCHRESULTS

1. What gender are you?

208 responders completed questionnaire with a female male ratio being 120 females, which makes 57.7% of responders and 88 males making 42.3%.

2. What age are you?

153, which makes 73.6% of all responders, were in age between 18 – 25

21 were in age 26 – 35 (10.1%)

14 responders were in age of 36 – 45 (6.7%)

12 responders were in age 46 – 65 (5.8%)

5 responders were in age of 66 and more (2.4%)

The least frequent number of responders was of age 17 and less, 3, making 1,4% of entire population.

3. Where do you live?

Third question of questionnaire was about place of living of responders, 108 (51.9%) stated a place of living being city, and 100 (48.1%) stated a place of living being countryside.

4. What's your education?

143 reached a high school education (68.8%), 34 of responders were of Higher education (16.3%), 18 responders were of primary education (8.7%), 10 responders were of higher professional education (4.8) and 3 responders were of none or primary education (1.4%).

5. Do you consider yourself to be a person who is interested in the environmental sustainability?

124 responders are interested and contribute to environmental sustainability (59.6%), 72 stated that they are interested in environmental sustainability however they do not directly contribute (34.6%) and 12 responders are not interested in environmental sustainability at all (5.8%).

6. **Do you consider agriculture in the Czech Republic to be environmentally sustainable?**

   Of total 209 responders, 51 (24.5%) stated that agriculture in the Republic is environmentally sustainable, 157 of them (75.5%) stated that it is not sustainable.

7. **What do you think are the main problems of the agriculture in the Czech Republic?**

   68 (32.7%) think the problem of agriculture in a matter of sustainability is caused by impairment of agricultural land caused by intensive farming.

   104 (50%) consider a problem to be gradual soil degradation due to large-scale cultivation of monocultures.

   95 (45.7%) stated that main problem of is a decrease of agricultural land caused by urbanization.

   87 (41.8%) responders think the main problem to be climate change in the Czech Republic especially in recent years.

   Water loss needed for a food production is problem according to 66, (31.7%) of responders.

   4 responders (1.9%) stated other problems, 2 of them stated that a problem is usage of chemical substances and pesticides, 1 think the problem is ineffective propagation and awareness about problem, 1 stated problem to be a colza production, 2 (1%) do not think there is any problem with agriculture.

8. **Are there any ecological farms in your area?**

   120 (57.7%) of responders stated that there are 1 – 2 ecological farms in their area, 67 (30.8%) said there are no ecological farms in their area, 17 (8.2) of

responders have 3 – 5 ecological farms in their area a 7 (3.4%) stated there are more than 7 eco-farms

9. Do you think ecological farms would be profitable without subsidies?

178 (85.6%) responders think that ecological farms would not be profitable without subsidies while 30 (14.4%) think farms would survive and be profitable on their own.

10. Are you familiar with a term: Community-Supported Agriculture?

161 (77.4%) of responders are not familiar with term Community Supported Agriculture, while 47 (22.6%) are familiar with this term.

11. What are the benefits of CSA concept?

Question number 11 was an open question, results can be summarized into four categories:

Social benefits for community – 41 (19.7%) of responders stated social benefits of CSA concept, the main arguments being that people gather to reach the common goal, the concept helps to strengthen community, help to gain new contacts, new friends and actually gather people with the same interests together.

Information about products – 25 (12.1%) stated that participants are informed about exact origin, composition and quality of products and can be sure with their quality since they directly participate on farm.

Economic benefits – 22 (10.57%) think CSA brings economic benefits; they consider that concept to help to promote employment in the region, also is beneficial to farmers who do can give them lower or no salaries and therefore save money.

Environmental benefits – 19 (9.1%) responders stated that CSA concept is one of the ecologically sustainable ways however, most of them did not specify their statements, most frequent answer was that this concept is environment friendly and that help to reduce emission production during distribution.

No answer – most of the respondents 101 (48.56%) count not think of any benefits of CSA.

12. What are the drawbacks of CSA concept?

Question number 12 was also opened question, with results that can be categorized into following categories:

Human factor – 27 (12.98%) of respondents this the human factor is one of the main drawbacks, workforce working on a farm is usually inexperienced, it also depends on each individual how he or she is going to contribute to work on a farm and lack of stable employees or people may not be interested in general.

Ineffective – 23 (11.05%) responders think that such a farm would be ineffective in a matter of profit, lack of competitiveness with regular producers, profit of farm is not granted and is always exposed to the risks, also farms are limited by size and farm number.

Time consuming – 16 (7.7%) of responders consider a time consumption to be one of the problem, firstly because it will discourage people to participate and secondly because farming in sustainable way is more time consuming in general than regular farming.

Other factors – 4 (1.9%) stated other factors that makes CSA disadvantaged, debatable environmental impact caused by fact that workers still need to get to the farm in some way, creating emissions anyway, lack of State promotion.

No answer – 138 (66.3%) of respondents cannot think of any disadvantage of CSA concept, are not familiar with this term or did not state any answer at all.

13. Should there be any CSA in your area would you participate in it?

69 (33.2%) of responders are not aware if there is any farm in their area but would not participate even if there was.

60 (28.8%) of responders do not know if there is any CSA in their area but they would participate if there was.

47 (22.6%) of responders stated that there is no CSA community in their area but they would participate if there was.

24 (11.5%) of responders are sure that there is no CSA in their area but they would not participate.

6 (2.9%) of respondent stated that there is CSA in their proximity, but they are not participating.

2 (1%) are actively participate on CSA that is located in their area.

14. Are farmers' markets organized in your area?

Question number 14 was to find out if there are any farmers' markets in area of responders.

78 (37.5%) of responders stated that there are famers' markets multiple times a year.

52 (25%) stated that there are farmers' markets at least twice or three time per year.

42 (20.2%) of responders stated that there are farmers' markets at least once a year in their area.

36 (17.3) stated that there are no farmers' markets in their area at all.

15. Do you shop on farmer's markets?

In a matter of food purchases on farmers' markets, 98 (47.1%) stated that there are not purchasing their food on a farmers' markets, following with 90 responders (43.3%) who are purchasing their food on farmers' markets, irregularly however, only 20 (9.6%) of responders are purchasing their food on a farmer's markets regularly.

16. How do you assess benefits of farmers' markets?

Question number 16, was question on how consumers perceive benefits of farmers' markets, using scale, agree, neutral, disagree.

Strengthen local communities

Of total 208 responders, 136 agree with this statement, 59 have a neutral attitude towards this statement and 13 of them disagree.

Help with preservation of local culture

145 of responders agree 43 chose a neutral answer and 20 of responders disagree with this statement.

Help maintain the original landscape

96 of responders agree with this statement, 79 are neutral and 34 disagree with this statement.

Promote employment in region

86 of responders agree with this statement, 87 are neutral and 35 disagree.

Due to proximity of the production, site food does not lose nutrients and quality

154 of responders agree with this statement, 45 are neutral or have no opinion about it, 9 disagree.

Thanks to direct contact with farmers, customers can directly ask about exact composition and quality of product

186 agree, 16 are neutral and 6 disagree.

They have environmental benefits due to short distance from the production site

147 responders agree with this statement, 44 are neutral and 17 disagree.

17. Do you think that food availability for all should be enriched in Czech Republic legislation as a fundamental human right?

In a matter of food as a fundamental human right, 115 (55.3%) says yes to an implementation of a food as a fundamental human right into legislation of the Czech Republic, while 93 (44.7%) is against.

18. Do you consider yourself a person who eats healthily?

Question number 18 regarding to a sustainable food consumption, where 106 responders (51%) consider themselves as a person who eats healthily, 102 (49%) think of themselves as people who does not eat healthily.

19. Are you familiar with term organic food?

202 responders (97,1%) are familiar with a term organic food, while 6 (2,9%) is not familiar.

20. How would you define organic food?

134 (64.4%) of responders consider organic food to be a product of organic farming, following with 57 (27,4%) who think of organic food as a one without any chemical additives during production and processing. 15 (7.2%) think that organic food is just ordinary one, produced in accordance with Czech legislation. 2 responders (1%) have their own definition, both product without chemical additives and product of organic farming and that organic food is thing of marketing only.

21. Do you think Organic Food is healthier than regular food?

152 (73.1%) responders consider organic food to be healthier than a regular food, while 56 (26.9%) do not think it is healthier.

22. Do you buy organic food?

Only 105 (50.5%) of all responders stated that they purchase organic food irregularly, 84 (40.4%) does not purchase organic food, only 19 (9.1%) buy organic food on a regular basis.

23. What are your reasons for purchasing Organic Food? (Even if you don't buy them, try to state arguments for)

The following question was a multiple answer one, to find a reasons behind consumers purchases of organic food, 98 (47.1%) responders but organic food because they think it has better quality than ordinary one. 116 (55.8%) believe that organic food is healthier, 70 (33.7%) stated a better taste as a reason.

For118 (56.7%) it is important positive environmental impact in food production and processing. 19 (9.1%) think that organic food looks better than regular food. 76 (36.5%) stated that important factor is a support of local farmers. 12 (5.8%) stated other reasons, 6 of them stated they do not purchase. 4 purchase food because of personal feeling that they are doing something for them, for 2 respondents is important what they offer and 1 wants to make friends in vegan community.

24. What is your reason for Not to buy Organic Food? (Even if you don't buy them, try to state arguments against)

The following question was a multiple answer one, to find a reason why consumers do not want to buy organic food. 170 (81.7%) stated that organic food is more expensive that ordinary, 61 (29.3%) think that organic food is just marketing and promotion move, 66 (31.7%) have a distrust in organic food, 31 (14.9%) of responders do not see a difference between organic food and ordinary one, 90 (43.3%) stated that reason for not to buy organic food is that they grow their own themselves or within a family, 10 (4.8%) do not like the taste of organic food, 1 (0.5%) answer goes to other reasons, which is that organic food is usually in two packages, creating more waste than ordinary food.

25. Where do you buy organic food?

Question number 25 regarding to a location where consumers purchase organic food. 137 (66,8%) stated that they buy organic food in a Healthy food stores, 135 (65.9%) purchase organic food in supermarkets, 32 (15.6%) than buy organic food directly at the producer, 36, (17.6%) make purchases in drugstores, 16 (7.8%) buy organic food in pharmacies, 96 (46.8%) but organic food at farmers' markets. 115 (55.28%) of responders grow their own organic food themselves or within family. 3 (1.4%) responders stated that they do not buy organic food at all.

26. What matters to you in a matter of food purchasing? (In general)

Question number 26 is a multiple answer question about what is for consumers important in a matter of products, 109 (52.4%) find a food composition to be a main factor influencing their product purchasing decision, 169 (81.3%) stated that the price of product is important to them, 139 (66.8%) seeks a quality of products, for 136 (6.,4%) the taste is the main motivation, 43 (20.7%) state as a decision to buy a product recommendation, 25 (12%) based their purchasing decision on a brand, packaging of product is important for 11 (5.3%) of responders, 70 (33.7%) buys food by origin of product, 2 responders (1%) stated that nutrition values are important for them.

27. Do you consider food waste in the Czech Republic to be problematic?

Creating of food waste consider to be problematic 183 (88%) responders, whole 25 (12%) think that Czech Republic does not have a problem with food waste.

28. If so, what do you consider to be main problems?

As the main problems regarding to food waste, 51 (24,5%) of responders consider economic losses to be a main problem, 82 (39,4%) think that wasted energy and resources that are used to produce, process and distribution of food are the main problem, 104 (50%) think that main problem is that companies dispose good food just because they don't meet requirements for shapes, and standard, 144 (69,2%)

of responders consider main problem to be the fact that on one hand food is being disposed and on the other hand there are people without access to food, 19 (9,1%) do not see food waste in the Czech Republic to be problematic, 2 (1%) of responders stated other problem, one that it is not consistent with principles of sustainable development and other that food should be offered to poor and social disadvantaged.

29. At what stage of the food chain do you think most food waste is produced?

More than half of responders 122 (58.7%) think that most of the food waste is produced at the end of the food chain by customers and stores. 35 (16,8%) think that most of the food waste is created during distribution, 28 (13.5%) think that most of the food waste is created during processing and 23 (11.1%) consider to production of food as a main contributor of creation of food waste.

30. Do you think shops do enough to prevent food waste?

Regarding to if a shops do enough to prevent food waste, 182 (87.5%) responder do not think that shops do enough to prevent food waste, whole 26 (12.5%) believe they are doing enough.

31. What measures do you think can shops do to avoid food waste as much as possible?

Question number 31 was an open question where responders were given space to write what they think shops can do to prevent creation of food waste in the first place, answers were analysed and sorted into four categories.

Food donation – 56(26.92%) of responders think that supermarkets should donate food what is about to expire to charities, or some social organization what would then distribute food among homeless and poor or donate food to ZOOs

Discounts on food – 45 (21.63%) responders think supermarkets should either discount a food that is about to expire soon, or just to discount a food in general so customers would be able and willing to afford even food they would not normally buy

Products reduction - 29 (13.94%) of responders think that product reduction in supermarkets could reduce food waste caused by super markets coming from a simple philosophy that if they do not order that much food, if they know they do not sell it, they would not have to throw out so many foods

Bad shaped food offers - 12 (5.7%) responders think that supermarkets should sell food in unusual shapes instead just throwing it out or not accept it at all

Food manipulation – 10 (4.8%) of responders think that supermarkets can prevent food waste by better manipulation with a food, avoid damage of products and packages

Change of legislation – 8, (3.8%) responders think, that food waste management should change on legislation level. Supermarkets do not have competencies to dispose a food waste on their own

Other answer – 8 (3.8%) responders wrote an answer that does not fit categories above, the answers were that shop should not sell plastic bags, improve product management, give away food to some additional processing, 1 responder stated that he / she think that supermarkets are doing enough to prevent a food waste

No answer – 50(24.3%) of responders do not know how supermarkets could prevent a creation of additional food waste

32. How do you handle food waste?

The following question aims to find out how consumers handle a food waste, 113, (54,3%) stated that they just throw out food waste, 40 (19,2%) use food waste as a fertilizer for their own food production, 93 (44,7%) use food residues as a compost, 106 (51%) use food waste as an animal feed, 3 (1,4%) stated other answer, being that they buy just as much as they can eat.

33. Are there any initiatives in your city that exploit discarded food?

The last answer of questionnaire was about knowledge of any initiative which exploit discarded food in responders' proximity. 61 (29,3%) know about a food bank operation in their city, 53 (25,5%) have a charity running canteens for the

poor in their city, 107 (51,4%) stated other answer, from whom 100 (48,07%) answered that either do not have any initiative in the city or at least they did not know about any, 7 (3,36%) stated other initiative, animal feed production company, organic food containers and supermarkets food collection.

5 DISCUSSION

In a discussion part of dissertation, I am going to link my finding from a literature review the research of my research, which was conducted using quantitative survey method of questionnaire. The first five questions bring basic information about researched population of consumers and information if they are interested in sustainability of food system and environment at all where 196 / 208 of responders answered that they are interested, regardless if they are contributing or not. Even though there are strong movements for moving agriculture in the Czech Republic towards sustainability, most 157 / 208 responders think agriculture is still not sustainable. The main problems being intensive farming, gradual soil degradation, decrease of agricultural land climate changes and water losses, which is not problem of Czech Republic only, rather than global trend where the global agriculture is currently heading and dealt with, however realizing there is a problem is a first step to its solution.Is a 26 years period organic farms experienced a boom from 3 farms in 1990 to 4243 in 2016. Organic farms are supposed to be ecologically friendly while remaining economic and competitive on their own. Success of organic farms was mainly due to a governmental financing.This number is reflected in a results where majority of responders 144 / 208 knows about 1 – 6+ ecologic farms in their area, this may be caused by number of responders living in the cities, at the same time most of the responders think that organic farms are not profitable without subsidies, which goes against principles of sustainability of food system.

Moving on to Community-supported agriculture, most of the responders do not know this term, which is not surprising considering that there are only around 32 farms, mostly located in a fertile low lands around large cities of regions, with only around 2000 people benefiting from this concept. More than half responders also could not state any drawbacks and benefits of CSA. In a matter of benefits, the main benefits according to consumers consists of social benefits such as strengthening of community and creation of a new connections, economic, such as benefits for farmers and promotion of employment in the region, environmental and benefits in a matter of food composition and information about products. Thehuman factor is considered a main drawback as farm is depending on individuals and their experience. Inefficiency and as the farms are not competitive and takes longer to produce any food and profit is not granted and that such a concept is time consuming, this proportion of answers is reflected in question if the consumers would participate or not, when 109 / 208 would or are participating and 99 / 208 would not participate or does not participate.

One of the ways of sustainable food distributions are farmers' markets, which gained popularity and experienced boom especially in 2011 – 2012. Since then their numbers in a small cities stagnated. However most of the responders, 172/208, stated that there are farmers' markets in their area at least once a year. Even though only 110 / 208 of responders are purchasing their products on farmers' markets, they are assess their benefits positively. According to responders, FM help to maintain original landscape and promote employment in region is according to consumers debatable, this corresponds with findings in literature review, where it is said that farmers' markets, thanks to a close proximity form a production location actually help to reduce emissions and help preserve nutrition quality of products.

Access and availability of poorer part of a society to the food is one of the main global issues of food chain. There have been many initiatives to enrich into countries laws food access as a fundamental human right. With this statement 115 / 208 of responders agree, as for the negative responses, the main reason may be that people who can afford food would exploit it or would feel disadvantaged that they have to actually work while others can have food as a granted without lifting a finger to be able to afford it.

In a matter of consumption, consumers in the Czech Republic are starting to move toward more sustainable products consumption, however they still consume more meat than it is healthy. Regardless, 106 / 208 consider themselves a person who eats healthily, 202 / 208 is familiar with a term organic food. Only 152 consider organic food to be healthier than ordinary food with a main reason about their purchasing being better quality and better taste. 118 / 208 stated arguments for purchasing of organic food being reasons and contribution towards sustainability as a positive environmental impact during production. 76 / 208 as a support for local farmers and would define it as a product that is produced without a chemical additives and as a product of organic farming. Most of the responders stated reasons for not purchasing organic food as being expensive, which goes against theory of organic products which is that organic products should be less expensive than ordinary products so it would make consumers to purchase organic food which is produced with a lower environmental impact forcing producers to shift towards sustainability. 112 / 208 answered that they grow their own food themselves or within family, which is in general more sustainable because food is produced without chemical additives, therefore healthier, people with their own gardens tend to have animals, which can be feed with a food waste. Own grown food does not require being stored in plastic packages, leading to a reduction of waste in general. Consumers buy organic food mostly

in Healthy stores and supermarkets and famers' markets or producers, contributing to a sustainability of a local food system by promoting local growers and benefits that come with it. In general, consumers are motivated mainly by price, quality and taste of products, which links to the finding in literature review where it said that consumers purchase their food in sales, only 70 / 208 are motivated by a food origin.

In a matter of food waste per capita 80 kg and it is estimated that this number will grow in the future. 183 / 208 consumers are realizing a problem, stated, and consider a food waste creation in the Czech Republic to be problematic. the main problems being in a food availability to the poorest where food is on one hand disposed and on the other there are people who do not have access to a food and dispose of good food just because they do not meet standards, which is one of the main global problems of distribution. Environmental perspective in an environmental impact where resources used in production come vain this problem is debatable because every link of food chain creates its own, regardless 122 / 208 think that most food waste is produced at the end, by consumers and stores, following by distribution where thanks to the poor storage and damage of products most food is wasted. Strong majority of consumers think that shops and supermarkets do not do enough to prevent a food waste. In the Czech Republic, only one of the major players on supermarkets field is actively trying to prevent creation of waste, which is Tesco. Company that supports food banks and actively donating their food waste.Tesco has its own campaign on selling food in a "Bad shape" also changing their food waste management accordingly to a sustainability. Those measures are also realized by consumers where in the next question, what measures can shops doto prevent creation of a food waste do almost describe this strategy as an optimal for preventing a creation of food waste. Another way to prevent waste is to reduce price of food with a low expiration date or give away expired food for free to locals which can use it as animal feed. Responders also stated that it has to change on a legislation levels because stores just do not have a competence to change it on their own. There have been some government movements to improve this situation. In addition, consumers contribute to food waste recovery by using food waste as a fertilizer, compost or animal feed, however 103 / 208 still dispose food by throwing it out, mostly in the cities where sustainable disposal is not really an option. Social organizations also aim to help prevent a food waste, using food banks or charities, solving both a food waste and food availability problems. Only 114 / 208 stated that they do have in their city or close proximity either food bank, charity-running canteen for the poor.

6 CONCLUSION AND RECOMMENDATIONS

In conclusion, aim of this dissertation was to describe a problem with a global food system and sustainable development approach of how to solve. Focus was placed on a global food system in general and special focus on sustainability of a food system in the Czech Republic using both theoretical point of view and research, based on consumers' perception of a sustainability of a food system in the Czech Republic. As a method of research was used a survey method - questionnaire, complemented with other possible quantitative and qualitative methods of research.

Global food system is far from being sustainable and it is expected that problem will only grow and will be even more challenging in the near future. Each link presents its issues in a global food production. Sustainable development aims to solve those problems and reach environmental, economic and social sustainability of a food system, one of the ways being focus on local food system, in this case system in the Czech Republic.

In theory, local food system in the Republic is slowly moving towards sustainability since 1990. On a government level, state financially supporting organic-farms foundations and by creating laws to reduce a food waste creation, however it is up to each individual and company to contribute. One of the social movements towards sustainability is Community-supported agriculture where people from close proximity work on the farm. Farmers' markets as a way of sustainable food distribution and access to food are held in every bigger town, additionally promoting social, environmental and economic of the region. As the purchasing power is increasing and awareness about food problem is growing, Czech consumers tent to contribute more and more towards food sustainability, contributing by growing their own food or by changing their eating habits, however consumers still tent to purchase food based on price rather than quality. In a matter of food waste, average food waste per capita is 80kg and is estimated to grow. There are some both business and individual initiatives on how to prevent it, one of the progressive businesses being Tesco, which launched campaign to prevent a food waste as much as possible using a food donation, better food management and special food sales. On the individual level, consumers tend to use food as a fertilizers or animal feed.

This theory was supported by conducted research, describing consumers' perception of a sustainability of a food system, using quantitative method of survey – questionnaire and data collection from 208 responders. In addition, other possible research methods are

described, quantitative methods using a numerical data and qualitative methods based on qualitative data that cannot be generalize, analysis depending on context and environment.

According to research, consumers in the Czech Republic are aware of problematic of a food system with the main issues being in agriculture and food waste creation. Consumers are not aware about alternative ways of production in general;however,they can still state some benefits and drawbacks of this concept and would participate if there were any in their area.Their shopping behaviour is moving towards organic products, with most of them purchasing organic food in supermarkets, however small specialized shops and farmers' markets are the second largest category where to purchase food with a main reason for their purchase is statement that they are healthier and their production brings social, environmental and economic benefits. Consumers also contribute to create a sustainable food environment, by purchasing their food on farmers' markets, growing their own fruit and vegetable at home and by usage a food waste animal feed, fertilizers and compost. Food waste is considered problematic and that businesses do not do enough to prevent a food waste creation, however in general can agree on ways how to improve it either by businesses themselves or on governmental level.

In overall, consumers do realize there is a problem with a food sustainability and are aware about initiatives trying to solve those issues or at least reduce their impact. Consumers themselves are also willing to contribute, however only to the certain extend.

As a recommendation for future researchers on topic of sustainability of a food system, either global or local, I would recommend to focus on a certain topic of sustainability of food system rather than on a bigger picture. Global issue of food sustainability is a well-described topic, perhaps too well; therefore, it is not possible to describe it in a one dissertation only, considering limits of dissertation. There are so many described issues and sustainable solutions from a different authors and organizations, covering almost every problematic. In regard to a sustainability of a food system in the Czech Republic, basic problematic is described, however only on the surface, there is lack of authors how goes into the depth of topic. The largest gap is in the sustainability of a food processing and a large gap in the sustainable food consumption trends. Regarding to research, questionnaire proved to an effective method of data collection as nature of this topic require covering as big population as possible in a shorter period, while being as informative as possible. Other methods are more appropriate in a long-term data collection.

APPENDICES

Survey questions about consumers' perception of food sustainability in the Czech Republic.

Sustainability of food system in the Czech Republic from a consumer point of view

1. What gender are you?

Select one answer

- ○ Male
- ○ Female

2. What age are you?

Select one answer

- ○ 17 and less
- ○ 18 - 25
- ○ 26 - 35
- ○ 36 - 45
- ○ 46 - 65
- ○ 66 and more

3. Where do you live?

Select one answer

- ○ City
- ○ Coutryside

4. What's your education?

Select one answer

- ○ No education of incomplete primary education
- ○ Primary education
- ○ Highschool education
- ○ Higher professional education
- ○ Higher education

5. Do you consider yourself to be a person who is interested in the environment sustainability?

Select one answer

- ○ Yes. I am interested and contributing
- ○ Yes, I am interested, but not contributing
- ○ No, I am not interested

Sustainability of agriculture in the Czech Republic

6. Do you consider agriculture in the Czech Republic to be environmentally sustainable?

Select one answer

- ○ Yes
- ○ No

7. What do you think are the main problems of the agriculture in the Czech Republic?

Select one or more answers

- ☐ Impairment of agricultural land caused by intensive farming
- ☐ Gradual soil degradation due to large-scale cultivation of monocultures
- ☐ Decrease of agricultural land caused by urbanization
- ☐ Climate change in the Czech Republic especially in recent years
- ☐ Water loss needed for food production
- ☐ Other problem ☐

8. Are there any ecological farms in your area?

Select one answer

- ○ 0
- ○ 1 - 2
- ○ 3 - 5
- ○ 6 and more

9. Do you think ecological farms would be profitable without subsidies?

Select one answer

- ○ Yes
- ○ No

10. Are you familiar with a term: Community-Supported Agriculture?

Select one answer

- ○ Yes
- ○ No

Community Supported Agriculture (CSA) is an initiative where people from the neighborhood who are commuting and working on the farm and are involved in the farm's income and losses. CSA is considered to be one of the environmentally friendly alternatives to agricultural production and should also bring economic and social benefits. In 2015, there were 32 farms in the Czech Republic.

11. What are the benefits of CSA concept?

Nápověda k otázce: *Open question*

12. What are the drawbacks of CSA concept?

Open question

13. Should there be any CSA in your neighborhood, would you participate in it?

Select one answer

- ○ Yes, there are and I am participate
- ○ Yes, there are, but I am not participate
- ○ No, there are not, but I would participate
- ○ No, there are not, but I would not participate
- ○ Don't know if there are any, but I would participate
- ○ Don't know if there are any, but I would not participate

14. Are farmers' markets organized in your area?

Select one answer

- ○ Yes, once a year
- ○ Yes, twice or three times a year
- ○ Yes. multiple times a year
- ○ No

15. Do you shop on farmers' markets?

Select one answer

- ○ Yes, regularly
- ○ Yes, irregularly
- ○ No

16. How do you assess the benefits of farmers' markets? Farmers' markets:

Select one answer in each row

	Agree	Neutral	Disagree
- Strengthen local communities	○	○	○
- They help with preservation of local culture	○	○	○
- They help maintain the original landscape	○	○	○
- Help raise awareness of local farmers	○	○	○
- Promote employment in the region	○	○	○
- Due to the proximity of the production site, food does not lose nutrients and quality	○	○	○
- Thanks to direct contact with the farmer, customers can directly ask about the exact composition and quality of the product	○	○	○
- They have environmental benefits due to the short distance from the production site (shorter distance - less pollutants)	○	○	○

17. Do you think that food availability for all should be enshrined in Czech legislation as a fundamental human right?

Select one answer

- ○ Yes
- ○ No

Sustainable food consumption

18. Do you consider yourself a person who eats healthily?

Select one answer

- ○ Yes
- ○ No

19. Are you familiar with term organic food?

Select one answer

- ○ Yes
- ○ No

20. How would you define organic food

Select one answer

- ○ Without chemical additives
- ○ Product of organic farming
- ○ Ordinary food, only grown in accordance with Czech legislation
- ○ Own definition [ ]

21. Do you think Organic Food is healthier than regular foods?

Select one answer

- ○ Yes
- ○ No

22. Do you buy Organic Food?

Select one answer

- ○ Yes, regularly
- ○ Yes, irregularly
- ○ No

23. What are your reasons for purchasing Organic Food? (Even if you don't buy them, try to state arguments for)

Select one or more answers

- ☐ Better quality
- ☐ They are healthier
- ☐ Better taste
- ☐ Positive environmental impact
- ☐ Better look
- ☐ Support of local farmers
- ☐ Other... [ ]

24. What are your reasons for not to buy Organic Food? (Even if you don't buy them, try to state arguments against)

Select one or more answers

- ☐ They are expensive
- ☐ It's just a promotional move
- ☐ Distrust of organic food
- ☐ I don't see the difference between organic food and ordinary food
- ☐ I grow my own (within the family)
- ☐ I don't like their taste
- ☐ Other...

25. Where do you buy organic food?

Select one or more answers

- ☐ Healthy food store
- ☐ Supermarkets
- ☐ At the producer
- ☐ In the drugstore
- ☐ In pharmacy
- ☐ Farmers' markets
- ☐ I grow my own (within the family)
- ☐ Other...

26. What matters to you in a matter of food purchasing (in general, not just organic food)

Select one or more answers

- ☐ Composition
- ☐ Price
- ☐ Quality
- ☐ Taste
- ☐ Recommendation
- ☐ Brand
- ☐ Packaging
- ☐ Origin
- ☐ Other...

27. Do you consider food waste in the Czech Republic to be problematic?

Select one answer

- ○ Yes
- ○ No

28. If so, What do you consider to be main problems?

Select one or more answers

- ☐ Economic losses
- ☐ Energy and resources that are lost
- ☐ Dispose of good foods just because they don't meet the standards
- ☐ The fact that on the one hand food is being disposed and the other there are people without access to food
- ☐ I don't see a problem
- ☐ Other...

29. At what stage of the food chain do you think most food waste is produced?

Select one answer

- ○ During production
- ○ During processing
- ○ During distribution
- ○ In the end at customers and stores

30. Do you think shops do enough to prevent food waste?

Select one answer

- ○ Yes
- ○ No

31. What measures do you think can shops do to avoid food waste as much as possible?

32. How do you handle food waste?

Select one or more answers

- ☐ Just throw out
- ☐ I use it as a fertilizer
- ☐ I use food residues as a compost
- ☐ Animal feed
- ☐ Other...

33. Are there any initiatives in your city that exploit discarded foods?

Select one or more answers

- ☐ Food Bank
- ☐ Charity running canteens for the poor
- ☐ Other iniciative ☐

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