



TRANSMANGO

National Report: Latvia. Food and nutrition security debate

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This is TRANSMANGO project report on food and nutrition security debate and issues in Latvia prepared in the framework of Project's Work package 2 Task 2.3 "National level desk based research".

TRANSMANGO (Assessment of the impact of drivers of change on Europe's food and nutrition security) aims to obtain a comprehensive picture of the effects of the global drivers of change on European and global food demand and on raw material productions. The research focuses on the vulnerability and resilience of European food systems in a context of socio-economic, behavioural, technological, institutional and agro-ecological change and aims to enhance understanding of the new challenges and opportunities that the food sector will face in the future.

Project's Work package 2 aims to analyse how food and nutrition vulnerability is understood and discussed among the range of stakeholders and disciplines. This report in particular analyses how vulnerability is represented in Latvia's media, science, policy and food industry texts. The report identifies and analyses food system vulnerabilities, their main drivers and how these are related to FNS in Latvia. The meanings and controversies of food system vulnerabilities and framings of debate are explored. The analysis reflects the debate in public, scientific, market and policy spheres across a range of food system vulnerability dimensions (economic, political, socio-cultural, ecological) and FNS outcomes (stability and control, availability, access, utilisation).

The report addresses five specific research questions:

1. Which are the main characters of national FN system with particular regard to FN security?
2. What are the debates around FN security at the national level across the public, policy and scientific spheres?
3. What are the main hazards and the main vulnerabilities emerging from the media survey?
4. Which frames are recognizable in the debate? How do actors position themselves?
5. What evolution of the FNS discourse can be traced in the last years?

Analysis is based on review of 59 sources including print newspaper, online newspaper, magazine, social media, policy document, scientific paper, food industry publications selected according to common TRANSMANGO WP2 methodology and guidelines. The list of analysed sources is given in Appendix 1. In total 114 media texts and 32 science, policy and food industry texts were analysed.

Methods of data analysis included: quantitative and qualitative content analysis, tag cloud, discourse analysis, frame analysis, transversal analysis and synthesis. In synthesising findings a grounded approach was used.

The report has five main chapters. First chapter gives an overall introduction about aspects characterizing Latvia's food and nutrition system. Second chapter illustrates the main drivers and hazards food and nutrition security is related to as reflected in debate in Latvia's media. Third chapter describes main vulnerabilities identified in media, science and policy sources and social groups that are related to these vulnerabilities. A detailed description of vulnerabilities is given in Appendix 2. Fourth chapter analyses the frames used in public debate to address and represent the food and nutrition security issues and vulnerabilities. The final fifth chapter summarizes the conclusions of the analysis.

1. INTRODUCTION

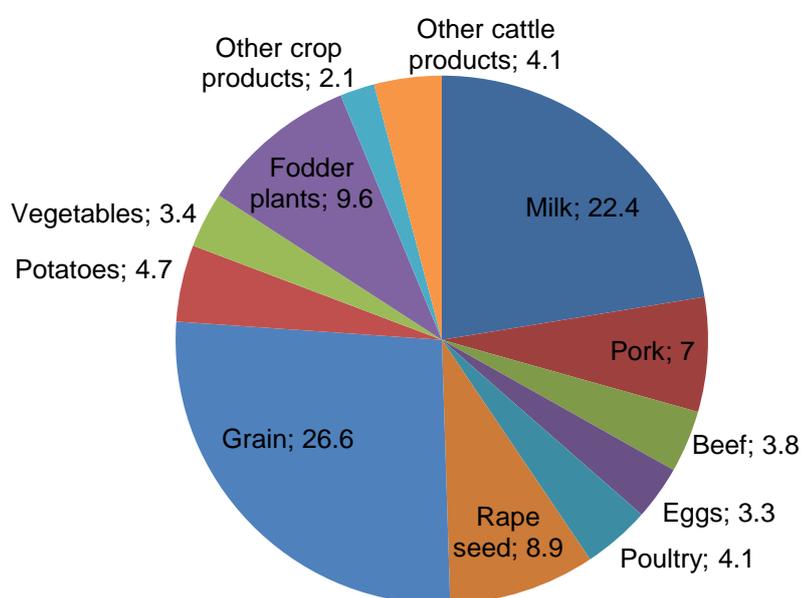
1.1. Production

Agriculture

Agriculture has been a traditional occupation in Latvia for centuries. There are appropriate agro-environmental conditions (climate, agricultural land, water...) and well-developed socio-cultural capital (traditions, knowledge, skills) for farming and food production. However, some experts estimate that these local conditions are much less advantageous when compared at European and also global scale, due to less favourable agro-climate, less developed technologies (Hansen & Vanags 2009) as well as discriminating EU agricultural support policies in new member-states.

After decreasing tendencies during 1990s and 2000s, the share of agriculture in the national economy has stabilised in terms of employment (8%, including forestry and fishery), contribution to GDP (~5%) and share in gross added value (2.1 %). Agricultural output has been ever increasing with some minor decreases in less productive years (Ministry of Agriculture 2014; Central Statistical Bureau of Latvia (CSB) 2014a). The major products are milk and cereals, which compose respectively 22.4 and 26.6 % of the total agricultural output.

Figure 1. Structure of agricultural products



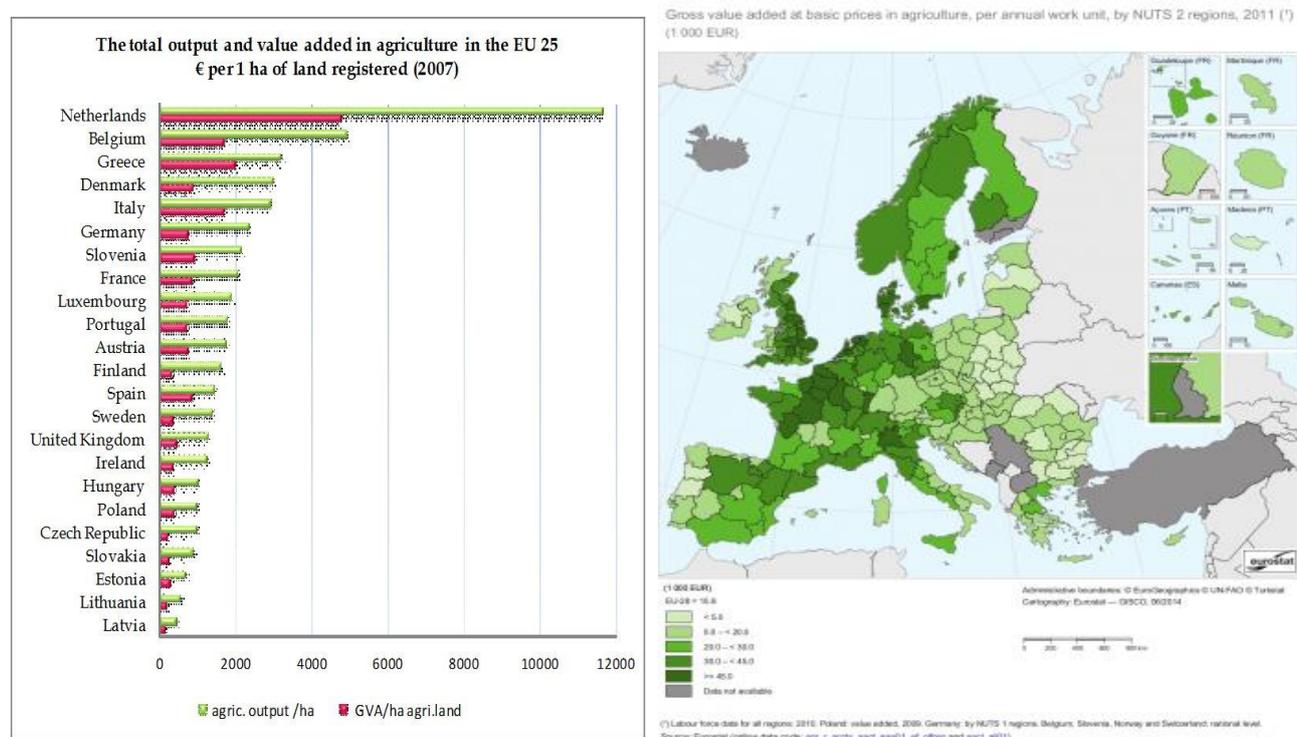
Source: CSB

Albeit agricultural productivity is increasing, it remains comparatively low (see figure 2). The existing production volumes meet local consumption, and food self-sufficiency can be reached in major product groups, except for pork and poultry (no data on vegetables and fruit, except for potatoes and legumes) (CSB 2014a). Still, in the global market and trade conditions, a considerable part of primary food stuff is imported, and the general dependence of local consumption on imported food has been even increasing, reaching 34% in 2007 (Melece et al. 2009). Šulca and Sproģe (2009) estimate that the share of imported foodstuff in consumption has increased even from 30 to 68 % in the time period between 2000 and 2007. In the meantime agricultural export is increasing as well, in recent years in a faster pace than import. But export does not exceed import and the foreign trade balance is negative. Milk, cereals and rape seed are major export products.

The low agricultural productivity is mostly associated to the fragmented small-scale farming structure. The average utilised agricultural area per holding was 20.7 ha in 2013 (CSB 2014a). Despite of on-going concentration trends in agriculture, there is a considerable prevalence of small farms in agricultural production – up to 90 % farms are considered as small. Low productivity means low income for farming families which have impact on their food consumption patterns. On the other hand, the small farms play important functions regarding FNS. They maintain biological and agricultural diversity, therefore contributing also to food and nutritional diversity (Šūmane et al. 2014b). Small farms apply less pesticides (CSB 2014a), which means also less polluted food delivered from these farms. It is also noteworthy that in the situation of scarce employment possibilities in rural regions, small farms perform the crucial role providing with income and food numerous farming families.

In addition to formal agricultural food production activities, there are historical habits of informal food production and self-provisioning, like foraging, fishing, allotment gardening, food distribution to relatives and friends, preparing preserves. Up to 82% of Latvian households practice some kind of food self-provisioning and stocking activities (SKDS 2012). Whereas these habits belong to cultural traditions and life-styles, for many low-income families they are indispensable food and income provision strategies.

Figure 2. Latvian agricultural productivity.



Source: Bečvářova (2011) and Eurostat (2014)

Food industry

Food production is the largest processing industry in Latvia, providing one fifth of the value-added of the industry. Its contribution to GDP composes 3.1%, and the production value reaches 1553.4 million euros (Ministry of Agriculture 2014). In 2009, the year of the deepest economic crises, due to lower local demand for food the sector has experienced decrease in turnover, production value and the number of employees (remaining 3% in 2013). However, its added value in GDP has been always growing.

The structure of the food industry has been remaining stable over years; dairy products (22%) meat and meat products (20%), and drinks (13%) keep the largest proportion in the total selling value (Ministry of Agriculture, 2014). Most of food industry segments are dominated by large producers, but the overall production structure is quite fragmented with many small enterprises with limited production capacity and volumes. The largest number of enterprises is in bakery (175) and fish processing (117). The industry's representatives see cooperation as one of the key necessities for food industry's development, especially to access export markets (VIAA 2012). However, there are few initiatives taken to implement this into practice.

Food industry is local market oriented: 70% of the food is sold in the local market. But export is expanding, and food industry is becoming one of the key export industries composing 17.6% (2010) of total export value (VIAA 2012). The major export products are drinks (21%) and dairy products (13%) (VIAA 2012). In the meantime, food import is increasing as well. The main importers (and competitors for local producers) are neighbouring countries Lithuania, Poland and Russia. Although import is an evident necessity for many food products (cocoa beans, bananas, citrus fruit etc.), a considerable proportion of import duplicates the kinds of food produced domestically (dairy products, bread and pastry, water and mineral water, chocolate etc.).

Most of the biggest food industry companies belong to foreign investors (Dižā 2013), and the trend is continuing. Although foreign investments improve technologies, productivity and market access, the concentration of food sector in

foreign hands together with the high share of imported food products increase food dependency on foreign actors and reduces local control over food.

Food prices in the production sector have been growing: between 2009 and 2014 the average increase reaches 16%; the biggest increase has been for such daily products as dairy products and eggs (26%), fish and sea products (15%), bread and bakery (8%) and meat (7%). Taking into account that salaries and employment have been cut down during the economic crises period, the food price increase have reduced the affordability of some food products.

1.2 Structure and governance: institutions, main actors, concentration

Food and FNS is an interdisciplinary field, with various policy, market, research and civic institutions and organisations involved. There is no one coherent food policy and governance structure in Latvia; instead there are various discourses, practices and governance structures co-existing. Food per se remains an invisible problem and policy domain (Grīviņš et al. 2013; Morrison 2013), it is approached from different, and sometimes contradictory, angles of other related social and economic issues – like, economic growth and competitiveness, health etc., - but it is rarely the central object of interest itself.

At national level, Ministry of Agriculture, Ministry of Economy, Ministry of Welfare and Ministry of Health are the major state level institutions involved in food system governance. Whereas the Ministry of Agriculture and Ministry of Economy overview food production and its supporting and controlling mechanisms, the Ministries of Welfare and Health are dealing more with consumers' food issues, like ensuring sufficient food to everyone and promoting healthy food. There is a well-developed regulative framework and controlling mechanisms for food circulation (Law on the supervision for food circulation, regulations for food labelling, Law on consumers' rights' protection, operation of Food and Veterinary Service...), which stress and set general standards for such FNS aspects as food quality, safety, transparency and traceability. These regulations are developed for the sake of consumers' safety and are obliging to food producers, retailers and catering services. Other food issues addressing and involving more consumers – like food security and healthiness – are integrated in welfare, health and also education policies.

In order to promote qualitative food production, there are introduced EU quality schemes (Organic agriculture, Protected Designation of Origin, Protected Geographical Indication, Traditional Speciality Guaranteed) as well as the national trademark "Qualitative product". Special measures are developed to promote healthy food consumption and they are targeting younger generations, like the State program for improvement of nutrition of schoolchildren, School Milk programme, the prohibition of sales of snacks and drinks containing sweeteners, colouring and caffeine in pre-schools and schools, recommendations for using of fruits and vegetables (2007), Implementation of Baby-Friendly Hospital Initiative.

Food issues are addressed at some regional and local municipalities. Public procurement of food, territory planning, local regulations, food assistance, funding of farmers and home-producers cooperatives, educational activities in schools are some of the tools that municipalities use to influence local food processes (Grīviņš et al. 2013). Although many municipalities deal with food security and food poverty of low-income families, there are few local initiatives which would address local food systems in their complexity and related to them broader issues of sustainable food production and consumption (Grīviņš et al. 2013).

As described above, food production system, both primary and secondary, is quite fragmented. The majority of individual small-scale actors have little influence on conventional food system processes, but they operate quite successfully in various niches. Various professional horizontal organizations, like cooperatives and associations, perform coordinating and lobbying functions within and across food production sectors. At food chain level, big processing companies and especially supermarket chains are powerful to set their standards and rules.

Several NGOs promote alternative, sustainable ways of food production and consumption; educate the public on environmental, social and health consequences of food-related practices. (For example, The Green Freedom popularizes the ideas of the ecological footprint as related to food consumption, accentuating the complex nature of calculations of the constituent impacts.) Their number, audience and public visibility are limited though. Many of alternative food initiatives which strive for improving food access or establishing access to special quality products and sustainable food are developed in a bottom-up way by civic society groups.

Agricultural and food research institutes might play important role in tackling FNS problems, however, the long-term structural problems in Latvian science together with poor funding (less than 1% from GDP) have undermined their potential. Recently trans-sector and trans-disciplinary platforms (for instance, knowledge transfer centres, industry innovation clusters, Platform of Food technologies, a large scale collaborative research programme "Sustainable use of land, wood, food and transport resources") have been established to concentrate resources, improve scientific quality and practical applicability of research (Šūmane et al. 2014a).

In the context of increasing global capital flows, globalisation of food chains, food market and their governance structures, there are considerable global influences on Latvian food system. Both market actors (investors, corporations...) and policy and regulative bodies (EU, WTO, WHO, quality schemes...) execute their interests with various consequences on Latvian food system and FNS.

1.3 Consumption

In order to assess affordability of food, spending on food as a percentage of the total household expenditure is used as the main indicator (MacMillan & Dowler 2012; Defra). Latvian households spend approximately 28% of their income for food (CSB 2014b). This percentage has remained stable since 2010, but has been firmly decreasing since mid-1990s; still it remains comparatively high to average EU level. The absolute amount of money spent for food is increasing (reaching 85 euros per person per month in 2013 (CSB 2014b)) which is due to increasing income and also food prices, and changing consumption patterns as more food is consumed outside home instead of preparing meals at home (Popluga & Melece, 2009). In general, the affordability of food is improving, albeit not evenly among all social groups (see 1.4. below).

What do Latvians eat? The biggest share of food expenditure is paid for meat and meat products, milk, cheese and eggs, vegetables, bread and cereals. There are some yearly fluctuations in purchasing of certain food products due to volatility of prices. In longer time period, ie between 1997 and 2006, the sharpest decrease in total food expenditure has been registered for bread and cereal products, and fats, whereas consumption of meat and its products have increased (Popluga & Melece 2009). However, when looking from trolleys into Latvian plates, the proportion of foodstuff actually consumed is different. Besides water and non-alcoholic drinks which compose respectively 20% and 23% of consumed food, the biggest shares in average Latvian menu are composed of milk and milk products (17%), vegetables (12%), bread and other cereal products (10%), and fruits (8%) (Joffe et al. 2009).

The major factor influencing Latvian consumer food choices is price and only then quality (DNB 2010; Braukša 2012, from Eurobarometer). Such preference has direct consequences on the nutritional quality of the consumed food. In terms of macronutrients (carbohydrate, protein, and fat), average Latvian diet is still rather well balanced with slightly increased share of protein intake (Joffe et al. 2009), which stems from the popularity of animal-based products. Micronutrients' intake is insufficient except for manganese, and also iron and phosphorus among men. Also vitamins' intake is deficient (only B1, B12, B3, B7 and K reach the recommended level) (Joffe et al. 2009). In addition, increased dioxin level has been detected in children's food intake and slightly increased benzopyrene - in men's (Joffe et al. 2009). Latvian consumers are more often worried about the presence of preservatives (60%), food additives (59%) and GMOs (54%) in their food rather than salt (21%), saturated fat (20%) and calories (17%) (DNB 2010). Dietary energy measured in kcal per capita per day has been fluctuating over the last few years, while the general trend marks a steadily increase (Popluga & Melece 2009). The data on the exact daily calorie consumption varies among authors, but it has been increasing and overpasses the recommended minimum.

Despite some positive changes in the dietary pattern of Latvian population over decades, like increasing consumption of fruits and vegetables, the general situation remains unsatisfactory due to the high share of animal origin fat, too much salt and sugar, poor vitamin intake, deficiencies in micro-elements, low share of plant origin calories. Such consumption habits create health risks and overweight. Analysing body mass index, 33% of women and 41% of men aged 19 to 65 years were overweight and 17.4% of women and 9.5% of men were obese (Selga & Sauka 2009). In the meantime 2.7% of women and 0.9% of men were classified as underweight. Unhealthy food-regime is among major causes of many (lethal) diseases: cardiovascular (53.7%) and oncologic diseases (19.9), diabetes (Ciproviča 2014).

A more nuanced picture of Latvian food consumption patterns emerges when considering several socio-demographic factors. They suggest that various social groups experience different food and nutritional security.

- **Income:** Income level affects considerably food consumption pattern and its nutritive value. For instance, consumption of cereal, oil and fat products tend to decline, whereas consumption of beverages, meat and fish rise with the increase of income (Popluga & Melece 2009). Assessment of staple food consumption in households with different income level shows that better secured households' diet is more diverse than that of poorer households. Richer households consume by 69.5% more diverse products than the poorest households and income is the main factor affecting the diversity of consumed food (Popluga & Melece 2009). The poorest households are those of a single parent (predominantly mothers), unemployed and located in rural areas, in particularly Latgale region, which indicates that these groups are also those with higher FNS risks.
- **Age:** although vitamin intake is insufficient in the population in general it is particularly low among elders (Joffe et al. 2009).
- **Unemployed persons** have the less energy (kcal) daily intake (Joffe et al. 2009).
- **Gender:** men consume more of everything, both nutritious and less healthy products (especially alcohol).

- Education: households with college and university education report higher daily availability of processed meat and fruit and vegetables (Elmadfa 2009).

Another bunch of factors to consider which impacts food consumption and related FNS refer to the organisation of food-chain organization etc.

- National food production pattern and traditions, as described above, have historically shaped food consumption habits (and vice versa). Although consumers' diets become more charged by various world products, traditional foods have their solid place in consumers' menus.
- Another central factor shaping food consumption is supermarkets' domination in retail. Nowadays majority (70%) of Latvian consumers purchase food in supermarkets (DnB 2010). Recent estimates suggest that four major retail chains have monopolised 54% of the food retail market (Grīviņš et al. 2013). Prevalence of supermarkets is changing consumers' choices and habits. They have diversified food choices in some food segments but have put limits in other: there are more international, convenience, offal foods and less seasonal, fresh and local. Supermarketisation also affects affordability of food by their pricing policies: they may keep prices high (as evidenced by 2008 debates on key retailers artificially keeping high prices), and on the other hand – it may provide low prices, and also low quality products.
- Other traditional food purchase channels are small shops (16%) and markets (7%) (DnB 2010), but they have lost both clients and suppliers.
- Alternative food retail channels have been forming, like farmers markets, small eco-food shops, roadside selling, direct selling in farms and other short food chains; they meet the growing consumers' demand for special quality food (fresh, local, organic, ...), but still a comparatively tiny part of consumers use them (for instance, 1% purchase food directly from farmers (DnB 2010)).
- Additionally, since the link between urban and rural population is strong, many urban consumers receive or buy food from their farming relatives or friends (Grīviņš et al. 2013).

FNS is related to consumption sustainability. Accordingly to some experts view, food consumption in Latvia is not sustainable. Around 216 th tonnes of food are wasted in Latvia (Monier et al. 2010) and 37% of food waste originates from households (58% – food production and processing, bet 5% – retail and catering) (Brizga 2013). 55% of households CO₂ emissions are of food origin which is due to comparatively high animal-based food consumption habits (Brizga et al. 2011). Between 1992 and 2009 food consumption and related CO₂e emissions have decreased in Latvia, but the ecological footprint of food consumption has grown (Brizga 2013). Although price is the major factor influencing consumer choices, also some environmental considerations appear: majority (67%) refuses GMO food whatever its price, and 1/5 look for organic food even if its access is more expensive and complicated (DNB 2010).

1.4 Data on food insecure / vulnerable and trends

As consumption data and trends show, an average Latvian does not face severe food insecurity problems, although consumption and lifestyle habits together with purchasing power create misbalanced diets. However, some groups of population are more exposed to insufficient FNS. Although personal food preferences and choices play role, also socio-economic structural causes influence considerably people's food habits. Low income and poverty are the key risk factors for food insecurity and vulnerability. Poverty in Latvia remains broad despite a decreasing tendency, and it affects a large part of the population (see Table 1). In 2012, 35.2 % of the Latvian population was at risk of poverty or social exclusion, and 19.6 % at risk of poverty (CSB 2014c). In 2013, the formal status of a poor person¹ was attributed to 134 397 people, including 46 334 children (34.5%) (Ministry of Welfare 2014). According to World Bank (2014) about 1% of population in Latvia live on less than 2.5 USD a day, and 2.9% live on less than 5 USD a day. This is extreme deprivation, absolute poverty². In the depth of the economic crisis 15% of low-income families could not afford to buy the necessary (amount of) food. 47.4% of population with revenues below those of poverty risk (and 23.3% in the total population), could not afford buying healthy and well balanced food as recommended (ie consuming meat, poultry or fish every second day) (CSB 2014d).

Single-parent families and also families with three children and more face the greatest risk of poverty (respectively 38.3 % and 32.2 % of these families are at risk) (CSB 2014c). As most of single parents are women, feminization of poverty is evident. This reveals also that children are more at poverty risk than other age groups. Latvia ranks fourth from the bottom of 28 advanced affluent countries in terms of child poverty. Children poverty is particularly worrying trend as poverty impact may be the strongest due to its long-term negative consequences (on health, education...). Other

¹ A person can demand for this status if his/her revenues have been below 128.06 euros during three months, do not possess any savings, securities or property, is registered as unemployed, do not receive long-term social care and is not imprisoned (Cabinet of Ministers 2010).

vulnerable socio-demographic groups exposed to poverty are unemployed persons (28%), retired people and also those with lower education. Poverty has a regional character: 62% of poor live in rural areas (while actually only half of population does), and the poverty risk is the highest in Latgale region.

Table 1. Index of poverty risk (%)

	2008	2009	2010	2011	2012
Of total population:	26.4	20.9	19.0	19.2	19.4
Age 0–17:	26.3	26.3	24.7	24.4	23.4
Age 18–64:	20.5	20.4	20.2	19.3	18.8
Age 65+:	47.6	17.2	9.1	13.9	17.7

Source: CSB (2014c)

The situation is exacerbated by unequal access to medical care. According to Ministry of Health (2008), Latvia has the greatest proportion of population (in the EU) of people who cannot access or afford medical care. (This is related to regional planning and infrastructure as well). Recent data on health service provision shows that the situation is worsening considerably as the structure of service provision deteriorating.

1.5 Data on food assistance

There are various initiatives carried out to provide food assistance for those in need, which involve both supra-national (EU), state, municipal, NGO and charity actors.

EU + NGOs: Since 2006, the EU programme “Food Distribution for the Most Deprived Persons of the Community”, funded by the European Agricultural Guarantee Fund, is implemented in Latvia. The Latvian Red Cross is one of the biggest distributors of EU food packages in Latvia; as well as several other NGOs are working with the EU programme throughout the country. There are 448 distribution points established all over Latvia. The number of people served from this programme has grown up to and stabilised around 150 000 people per year (Ministry of Welfare 2014). The funding has increased from 280th euros in 2006 to 5.2 million euros in 2013, which confirms the need for this kind of food assistance (Ministry of Welfare 2014).

Municipal: Municipalities’ and their social services, often in cooperation with NGOs, ensure food assistance in various ways: food packs, co-financing school meals for children from poor families, food allowances, soup kitchens... (GfK 2013). Other social, financial and material support that municipalities provide for these families reduces their food insecurity as more money can be used for food. In 2013, in total 116 951 families (235 094 people) have received various municipal social allowances (Ministry of Welfare 2014).

NGOs + Private sector+ general public: Several NGOs and charity organizations are carrying out various food assistance initiatives. For example, a well-known initiative is *Paēdušai Latvija* which provides food assistance to those persons not eligible for municipal food assistance as they have not been granted an official low-income status despite their income may be below the subsistence minimum. *Paēdušai Latvija* was founded in 2009 and has a network of 56 charity organizations throughout Latvia; it is funded by donations from individuals and private sector organisations facilitated by non-profit organisation *Ziedot*. According to *Paēdušai Latvija*, monthly emergency food requests are currently more than double than the available supply of food – for example, while 1200 emergency food packs are requested every month only 500 requests can be satisfied (pers. comm. 2nd May 2013) (Morrison 2012).

State financed school meal programmes implemented nationwide and regulations of food sold at schools target school children in order to ensure them healthy food. For example, these regulations determine, what kind of food is served and how frequently at school canteens. Restrictions are in place (e.g. no sweetened drinks and sweets allowed to be sold at school). In addition, the government finances free food distribution to students such as “School Fruit” and “School Milk” programmes. Findings show that free school lunches at times constituted the only nutritious meal during the day for children from poor households (Morrison 2012).

Despite various food assistance measures and initiatives, the available support for reducing food insecurity remains rather small and territorially fragmented: for instance, charity organizations and some municipal services cannot reach poor people in remote rural areas (Ministry of Welfare 2014). In the situation of limited public funding for social support, including food assistance, the role of public solidarity increases: 58% of Latvian population acknowledge that they donate to various charity projects (Ijabs 2013).

drivers and their impacts is not enough, we recognise need for exploring “*their interactions [and feedbacks] on a variety of different scales and levels, the mechanisms by which they generate vulnerability*” (Ingram et al. 2010).

Table 2. classifies drivers of change in Latvian food system along ecological, social, economic, political and technological domains. Drivers are identified mainly from scientific literature review. It should be noted that drivers can be both ‘negative’ and ‘positive’ cause of change.

Table 2. Drivers of change in Latvian food system

Ecological drivers	Social drivers	Economic drivers	Political drivers	Technological drivers
Climate change	Poverty , social inequality	Global trade	Regulation	Technological modernisation
	Dietary, consumption habits	Farm polarisation	Trade sanctions	Research and innovation
	Urban food initiatives	Retail concentration	Public sector food procurement	
	Food self-provisioning	Access to land		
	Knowledge and learning	Local food (systems)		

Climate change: In Latvian media climate change generated food system vulnerabilities are not perceived as major issue. Climate shocks are typically expatriated to third countries, especially of global south whereas Latvian agriculture is being portrayed as possibly benefitting from warming. Media and policy documents portray Latvia as green country with 47% of its territory covered by forests and 37% by agricultural land. In research publications climate change is perceived as serious negative driver in food system and threat to agricultural production. Policy documents of the Ministry of Agriculture relate climate change to natural disasters causing yield losses more and more often and to the spread of animal and plant diseases. On political level Latvia is aware of addressing climate change and agriculture issues both by introducing mitigation measures and supporting adaptive capacities of agriculture through development of new environmentally sound technologies. Sustainable intensification is highlighted as one direction. Other directions to address the climate challenge in agriculture are: recognise multiple modernization pathways; support learning and innovation networks; harness local resources and solutions; and acknowledge ‘quiet’ sustainability (Straujuma 2015). Agriculture is one of the main sources of greenhouse gas (GHG) emission and dairy and cattle farming which are the main sectors of ruminant GHG emission form 26% of total agricultural output. The government is considering to create market incentives to encourage emissions reductions in agriculture (e.g. grants, subsidies, levies, carbon taxes); introduce emissions standards or limits by regulation; adopt low-emission strategies through market measures (e.g. labelling for emissions); supporting green technology advancement especially for ruminant animal production. The government has set a climate and energy policy target to achieve 40% of renewable energy consumption by 2020 and to decrease by 20% through improved energy-efficiency. However enforcement of some recently introduced climate change mitigation measures has been perceived by farmers and general public as excessive and punishing farmers.

Relation to other drivers and mechanisms:

- Climate change → Regulation: new voluntary and mandatory measures to be negotiated and enforced, there are foreseeable difficulties to find right balance between compulsory and voluntary incentives;
- Climate change → Technological modernisation: more farms adopt new technologies;
- Climate change → Access to land: political support to renewable energy production increases competition for agricultural land.

Poverty, social inequality: Latvia is a country with relatively high economic inequality of population. Gini index in Latvia has risen from 35.3 in 2010 to 36.0 in 2011 and is higher than in Estonia and Lithuania (respectively 32.7 and 32.6 in 2011) (World Bank 2014). Although Latvia’s economy recovers steadily after economic crisis of 2008-2009, and GDP grew by 5.3%, 5.0% and 4.1% in 2011-2013, inequality and poverty remain widespread. In 2011 estimates indicated that 40.4% of the Latvian population was at risk of poverty or social exclusion, and in 2012 this ‘at risk’ group maintained a high percentage of the country’s population at almost 37% (Morrison 2013). Calculation by the Ministry of Welfare of “at-risk-of-poverty rate” is lower at 19% of population in 2011 (CSB 2013). In 2014 4% of Latvia’s population were given a status of ‘low income person’ which is a sigh of deep poverty and entitles a person for additional social benefits including

food assistance. Poverty and social inequality affect access and utilisation of food especially in the greatest risks groups which are by single-parent families and rural households.

Relation to other drivers and mechanisms:

- Poverty → Dietary habits: Poverty is related to poor nutritional value of food consumed (skewed proportions of nutrients, too much salt, poor vitamin intake for vitamins, marked deficiencies in micro-elements); thus – poor health.
- Poverty → Retail concentration: Disappearance of small shops and groceries limit access to food for poorer groups; low income citizens are being trapped in supermarket discount sales. inability to get access and the need to rely on assistance and donations which may form a vicious circle.

Dietary, consumption habits: Changing food habits reflect transformations in food system and values and act as drivers and sources of innovation. In the last two decades Latvia has seen marked transformations in consumption of food. Food purchase habits have been affected with the arrival of supermarkets and the increased availability of foods, both domestic and foreign. Certain food acquisition practices have disappeared (e.g. queuing, blat), others retain relevance (self-provision, gardening, collecting wild fruit), yet some others have emerged entirely anew or have increased in significance (e.g. supermarket buying, consumption of exotic foods, eating out, adherence to new diets) (Trenouth & Tisenkopfs 2015). Dietary habits have social class differences: new urban middle class food practices include wide diversity of products and choices offered by the market economy; affordability, availability, and diversity have all increased. Time constraints have also increased and home cooking has decreased in this household category. In economically poorer households there is high dependence on purchasing low cost, typically industrial foods, and reliance on discount food items. Consumer awareness and concerns about food additives, animal welfare, chemical residue on produce, food miles, and health aspects have all increased recently, but lack of purchasing power limits some groups ability to access foods they consider healthier. Consumer preferences and consumption practices inform and influence food system in two quite opposite directions: there is a spread of fast food culture in one segment of population (notably young generation) and avoidance of fast, convenience, highly processed, and industrial foods based on convictions of their low nutritional quality and negative health impacts (notably among educated urban middle class consumers).

Relation to other drivers and mechanisms:

- Dietary habits → Local food systems: Raising demand for quality food products stimulate development of organic production and market, short supply chains and more localised food systems
- Dietary habits → Urban food initiatives: Many NUFI are inspired by dietary, health and ecological considerations.
- Dietary habits → Retail concentration: There is a recent market participant entry in fast food sector, for example, Streetburger, Subway, Hesburger fast food restaurant chains, Narvesen, Statoil kiosks which serve fast food. The tendency of fast food spreading has been associated with welfare improvement when people tend to eat outside homes (OECD 2014, p.264), but has been questioned by nutritionists and public health specialists.

Urban food initiatives: In the last years in Latvia there is a growing interest among urban and peri-urban inhabitants in food related problems and willingness to participate in new ways of how to interpret and organize food chains. These initiatives include farmers markets, direct buying, eco-catering, artisanal production, utilisation of food waste, multifunctional land use, organic marketing and other and are aimed at new modes of food provisioning in urban and peri-urban settings (Grivins & Tisenkopfs 2014a). New urban food initiatives (NUFI) are largely consumer driven, based on values of localness, organic, ecological sustainability, technological advancement, social solidarity and might have stronger or weaker market orientation. They develop new networks and relationships in wider food system that enables development of niches and create market avenues for local, organic and quality foods. NUFI also challenge the mainstream food distribution or develop new links with it (e.g. Slow Food Riga) and facilitate spread of new consumption patterns.

Relation to other drivers and mechanisms:

- NUFI → Poverty, social inequality: NUFI primarily involve middle class consumers and do not explicitly address food poverty issues
- NUFI → Dietary habits: NUFI have an effect on availability, access and subsequently consumption of locally grown, fresh, organic food. Consumer habits and nutrition quality of consumption is influenced by educational activities accompanying many NUFI
- NUFI → Local food systems: NUFI support local farmers, help them to organise in marketing networks, support farmers by offering technical assistance in marketing (e.g. internet market platform), promote local products and recipes, collaborate with municipalities and farmers organisations.

Food self-provisioning: Self-provisioning is culturally rooted and widespread practice in Latvia. Many small and subsistence farmers and substantial number of rural and urban households are engaged in plot farming and gardening activities and produce vegetables and fruit for self-consumption. Growing is also associated also with social exchange of food through family and social networks. Another widespread cultural practice is collecting wild fruit, e.g. mushrooms and forest berries (Grivins & Tisenkopfs 2014). Self-provisioning is a kind of parallel social and economic practice to mainstream food chains, described also as 'quiet sustainability' with positive environmental, social and food and nutrition security effects.

Relation to other drivers and mechanisms:

- Food self-provisioning → Poverty, social inequality: Self-provisioning practices may be used to address food poverty issues through improved access to land
- Food self-provisioning → Dietary, consumption habits: growing ones own food is the way how people address their specific dietary or health demands; new entrants in urban gardening are usually the people who care of nutritional quality, food safety, environment
- Food self-provisioning → Local food systems: both drivers are interrelated as small-scale gardening practices can be integrated with more systemic arrangements of local food economy

Knowledge and learning: Referring to sustainable FNS knowledge and learning is seen a 'positive' driver. When facing climate, market and societal challenges individuals and organisations in food system have to be able to learn and transform the new information into meaningful patterns that can guide new kinds of action. Combining a number of relevant knowledge sources is critical. This is best achieved by maintaining a network. With the prospect of food system challenges and shocks, informal networks in agriculture that engage in shared learning and are open to a certain degree of innovation would have a better chance to adapt. Examples of such networks exist everywhere in Europe, to some extent owing to gaps in provision by traditional agriculture knowledge systems (AKS). Research shows that in Latvia the learning and innovation network of fruit-growing demonstrates multiple knowledge flows between farmers, researchers, consultants, and consumers, which contributes to a broadening of the practice of integrated growing and promotes consumption of local fruit (Grivins et al. 2014). Such informal learning and innovation networks are often connected to traditional AKS institutions which provide various kinds of knowledge support (training courses, consultation, experiments, etc.) thus helping farmers and food companies to innovate (Sumane et al. 2014).

Relation to other drivers and mechanisms:

- Knowledge and learning → Climate change: learning to adapt and learning to adopt mitigation measures
- Knowledge and learning → Global trade: through making agricultural producers and food companies more competitive
- Knowledge and learning → Technological modernisation: learning to develop new technologies and learning to adapt existing technologies locally
- Knowledge and learning → Research and innovation: both formal and informal relations, networks and institutional components of learning and innovation are to be combined; this is reflected in the idea and practices of European Innovation Partnerships as driver for FNS. In Latvia 10 EIPs for agricultural sustainability and competitiveness are to be formed

Global trade: Global trade is an overall context of food system transformation in Latvia in the last two decades. After regaining independence in 1990 Latvia has chosen liberal economic policies and the development of agriculture and food sector has been determined by privatisation of farms and agricultural enterprises, liberal trade regime, and opening of land market. These policies have had four major consequences. First, the concentration of agricultural farms and food industry; food sector in Latvia is undergoing rapid concentration and is increasingly bought up and controlled by foreign investors. Second, the government support to modernisation of agricultural farms and food enterprises triggered concentration, market upscaling and raised competitiveness of bigger enterprises, but on the other hand indirectly disadvantaged smaller farmers and processors. Third, global trade (and government policies) are believed as being not fair enough for Latvian farmers and companies as production conditions and subsidies are more favourable in the neighbouring EU countries. This is especially the case in milk and milk product group where competitors from Lithuania can offer lower price for almost the same quality products (e.g. due to that there has been local producer's decrease in their turnover in year 2009, for some even till 35%. (OECD 2014). Fourth, the overall competitiveness of agriculture and food sector has increased, e.g. the export of agricultural and food products has tripled from 2005 till 2012 (Skakunova 2012), and the agricultural cooperative Latraps is the largest exporter in Latvia (Kiopa 2014). However, the global trade makes situation for local producers and small companies more difficult.

Relation to other drivers and mechanisms:

- Global trade → Access to land: big farms grow bigger, investors buy up agricultural lands and forests

- Global trade → Technological modernisation: availability of technologies and equipment developed elsewhere, difficulties may arise to adapt technologies to local production conditions
- Global trade → Trade sanctions: big companies first face difficulties imposed by trade sanctions; there are price fluctuations and price instability

Farm polarisation: Latvia is a country with polarised farm structure and large segment of small farms. In 2013 there were 81.8 thousands farms of which 94% were small holdings with standard output below 25000 EUR and average size of 10.5 hectares. The numbers of commercial farms (classified also as 'medium and big') that sell more than 50% of their produce were 20.7 thousands or 25% of the total number of farms. The average size of 'big' farms was 85 hectares and they cultivate 75% of total agricultural land. There is accelerating concentration of land (the average size of farms increased from 25.5 ha in 2007 to 34.5 ha in 2010). The public support for agriculture has been mostly directed to modernisation goals and absorbed by large farms or companies whereas the role and potential of small farms in sustainable rural development and food security remain vastly disregarded. (Sumane et al 2014). The situation has slightly changed lately as the new national rural development program 2014-2020 proposes more support to small-scale farmers.

Relation to other drivers and mechanisms:

- Farm polarisation → Retail concentration: Dominant food market structures, in particular the major processing companies and supermarket chains, and their quality and quantity requirements are not encouraging for small farmers.
- Farm polarisation → Local food systems: Small farms are viewed as resource base for emerging local food systems. Their opportunities have been sought in diversification of production, marketing cooperation, developing niche production, building short and regional supply chains, developing links with consumers and retail structures.
- Farm polarisation → Global trade: Big farms especially in dairy and grain production are vertically integrated and involved in globalised trade through contracts with processing companies or farmers marketing cooperatives. Orientation towards export makes these farms vulnerable to external market or political shocks → Trade sanctions
- Farm polarisation → Access to land: There is a growing tension in land market: expulsion of small producers, rising land prices, foreign acquisition of land, instability in land lease market, competition and constraints for big farms to access additional productive land. Farm concentration often means monoculture production and intensification with potentially negative resilience and sustainability effects → Climate change → Rural poverty, social inequality

Retail concentration: The retail sector in Latvia is characterised by quite high degree of concentration with two biggest retailers (RIMI Latvia and Maxima Latvija) controlling over 50% of the market and the third market participant controlling less than 10% of market (OECD 2014 p. 265). Two biggest food retailers both together have 250 shops all over Latvia, mostly supermarkets and hypermarkets. There exist high entry barriers for new market participants. Retail concentration affects territorial access to food for the population, especially in rural areas. According to Central Statistical Bureau accessibility of grocery services in all categories of households was evaluated as 'very easy' (25% of respondents), 'easy' 56%, 'with some difficulties' (14%) and 'with great difficulties'(5%); these figures differ for rural households which admit greater difficulties to access food stores. Food industry and farmers organisations often accuse retailers in exercising unjustly their power in negotiating prices (in milk and bread and bakery sectors producers take 50-80% from final retail price and retailers take around 20-50%). Recently retailers have started to introduce private label products which in general are offered at lower price for end consumers, thus responding to price priority in consumer shopping behaviour. On the other end – major retailers introduce organic and local/farm product stands, trying to capture upper market segments. They also take part in food assistance programs through product donations, thus showing social responsibility, also for reputation reasons. However, criticisms are made about supermarket treatment of food waste.

Relation to other drivers:

- Retail concentration → Farm polarisation
- Retail concentration → Local food
- Retail concentration → Regulation
- Retail concentration → Poverty, social inequality
- Retail concentration → Poor dietary choices

Access to land: This is currently one of the major discussion issues in agricultural and land use policies. For long the land policy has not been a priority and belief in liberal regulation ruled land policies and market. Currently 5% of agricultural land and 10% of forests belong to foreign owners and buying up land by foreign investors is seen as a

problem. On the other hand the scattered land property structure which was created after restitution of private ownership rights is limiting access to land for farmers who want to expand production. The government has recently introduced programmes, like farmers crediting, which are aimed to increase access to land for producing farmers and to reduce land speculations. Other support policies work in contrary direction, for example support to energy crop production which is economically more profitable than food crop growing limits access to land for food production purposes and creates strife among different categories of producers. Recent initiatives signal changes in land policies, the government recognises the issues and risks associated with speculative land acquisitions, excessive concentration, disproportionate support for food and energy crop production and its effects on access and price of land.

Relation to other drivers:

- Access to land → Farm polarisation
- Access to land → Regulation
- Access to land → Rural poverty, unemployment

Local food (systems): Localness and origin of food are among the main factors influencing consumer food choices after price and quality (DNB 2014). Local often means produced in Latvia with no further territorial or GI specification. These consumer aspirations and beliefs inform retailers in their strategic decisions about using the aspects of food origin, localness, traceability in their marketing. Local is captured by many parties in the food system: consumers, retailers, producers and regulators, albeit from different angles and interests. The Ministry of Agriculture together with advisory service, farmers organisations and municipalities seek to introduce new public food procurement regulations that favour purchasing of local products, thus promoting local producers and local economies. Local is captured from the perspective of public health by the Ministry of Health which supports this initiative. Consumers and farmers create their own horizontal initiatives to improve access to local food through collective purchasing groups or direct marketing projects. School food, farmers markets, new urban food initiatives, supermarket outlets of local produce, restaurants serving local specialities are the main spaces how the local finds manifestation in food system. Local food as a system in itself is a new political project though vaguely formulated, promoted by the Ministry of Agriculture, farmers organisations and local governments through school catering and using the instrument of public procurement.

Relation to other drivers:

- Local food → Public food procurement
- Local food → Urban food initiatives

Regulation: Regulation is a point of convergence of many drivers, interests and parties in food system. Regulation is a space where interest and lobby groups manifest their claims, the possibilities emerge to address critical issues and vulnerabilities in food system and also innovation can happen. Regulation has been criticised in many respects and by many actors, especially in EU accession and norm-adaptation context as too rigid, not taking into consideration the specific conditions of Latvian agriculture and farmers. Direct transfer of EU laws has been perceived as painful, especially by small producers. Recently this 'direct transfer' bureaucratic mentality is changing, giving increasing recognition to local specificity, creating enabling rather than restricting environment for producers. The new ideas and discussion topics introduced due to this new approach to policy making and regulation are, for example: nutrition and public health programmes initiated jointly by Ministry of Health and Ministry of Agriculture; emergence of food policy as joint policy field at intersection of agricultural, health, educational policies and the involved regulative institutions. Regulation is recently considered as capability to broaden policies, innovate in new policy measures, appropriate EU regulations with respect to local producers. Institutional interfaces and organisational innovations determine eventual emergence of FNS policies as new policy arena.

Relation to other drivers:

- Regulation → Many other drivers, however, due to scarce RTD financing the effect is limited

Trade sanctions: Sanctions as a driver became acute in 2014 after EU – Russia trade bans on certain categories of food products. Sanctions had an immediate effect on exporters, especially larger food companies, creating instant economic losses and considerable risks. Directly and in short term sanctions influence producers' access to markets and reduce income; in a longer term sanctions may lead to bankruptcies of enterprises, loss of jobs, increase of poverty levels. However, after first shock sanctions have triggered many food companies to look for new markets, diversify their market portfolio, find new ways of doing marketing and product innovation. Sudden economic sanctions sensitise also solidarity of consumers with local producers. The shock may also influence the way how actors in food chain prioritise the values on mass and niche production, bulk and quality products; transparency and trust.

Relation to other drivers:

- Trade sanctions → Farm polarisation: typically big producers are most exposed to negative economic effects of sanctions because of strong integration in mass product chains

Public sector food procurement: PFP is a mechanism to achieve many FNS objectives - stimulate purchasing of healthy, sustainable food, improve children nutrition, achieve environmental objectives, support local producers – if used properly. If PFP is used in uncoordinated way this instrument can deepen regional disparities both in economic and nutrition terms. Recently PFP has been rediscovered as an instrument in school meal programmes and the organisation of the service. Several municipalities in Latvia (e.g. Tukums) experiment with new public procurement rules and regulations to procure more fresh, locally grown and healthy products for school catering. The organization of new procurement and services trigger several other questions: who pays for the school meals; how the meals are prepared; what is the right level of school meal system centralization; how school feeding should be regulated and supported. PFP discussions and practices thus create new relations between actors involved on specific context related aspects.

Relation to other drivers:

- Public food procurement → Poverty , social inequality
- Public food procurement → Dietary, consumption habits
- Public food procurement → Regulation

Research and innovation: This driver triggers numerous FNS pathways: some may lead to food with reduced nutritional value, others – to reshaped food systems and increased FNS, achievement of balanced ecological, nutritional and efficiency goals. Research can create both equality and inequality in food system. The current mode of agricultural research in Latvia has favoured technological innovation and has had a shared goal with farming and food industry to promote technological modernisation, competitiveness and efficiency of the sector. Some research and food industry joint platforms and associations have been formed. However, the capacities of research to impact food sectors have been limited due to very scarce funding and relatively small number of institutions and researchers. The research and development expenditure as share of gross domestic product (GDP) in Latvia was only 0.66% in 2012 comparing with average 2.07% in EU. There are only 13 research institutes and organizations including Latvia University of Agriculture working in the agriculture science in Latvia and 3 research institutes in forestry. The total funding for agriculture science in Latvia was only 6.2 million euros in 2014. In 2014 these institutions employed 147 scientists and 120 technical employees and produced 523 publications in WOS or SCOPUS databases. Apart from financial limitations, modern approach to research would recognise also the possibilities and role of social innovations. Contemporary forward looking research has to deal with unexpected innovations and address urgent issues, e.g. children nutrition.

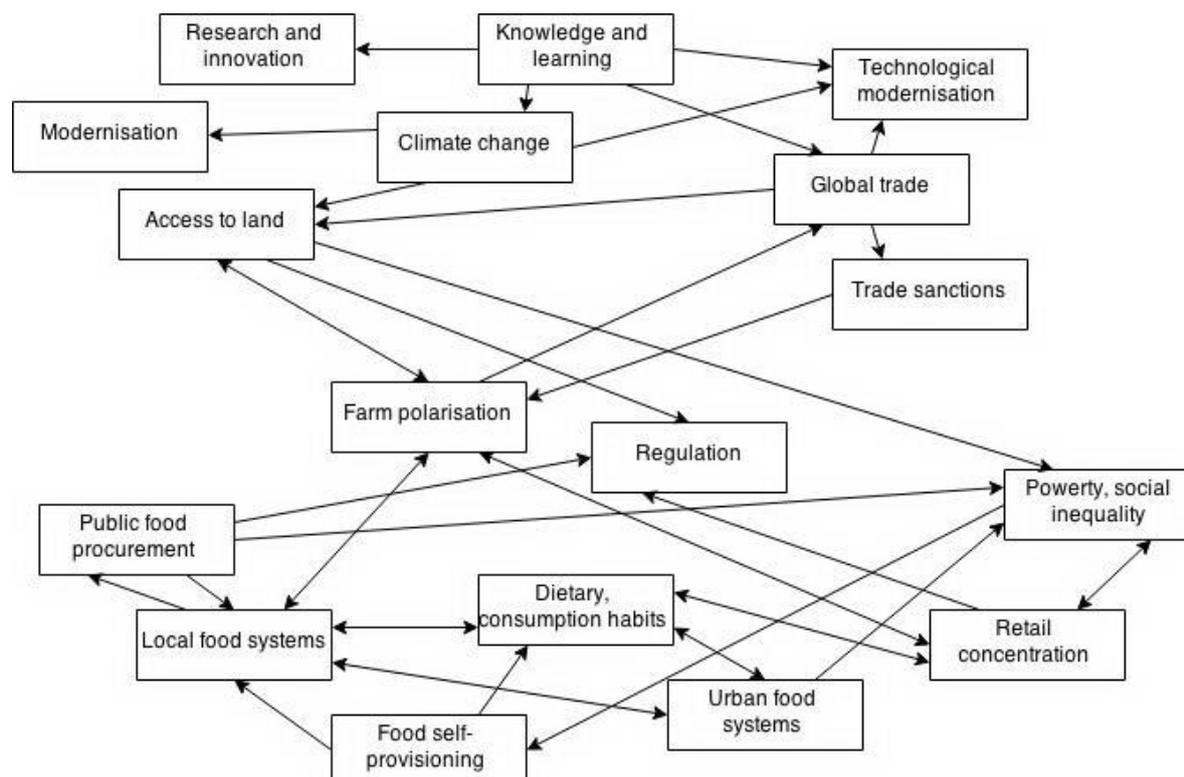
Relation to other drivers:

- Research and innovation → Many other drivers, however influence is limited due to scarce RTD funding

Figure 5 represents a comparative analysis of drivers and their mutual influences. Each box represents a driver. Lines with arrows indicate that driver has an influence on the driver arrow is pointing at. Two drivers (“Research and innovation” and “Regulation”) hold influence over all other drivers.

Figure 5 suggests two circles of drivers: first, oriented towards global market (the cluster of such drivers as global trade, modernization, knowledge and learning, access to land, farm polarization); second, oriented towards alternative food systems (such drivers as local food systems, dietary and consumption habits, urban food initiatives, food self-provisioning, poverty and social inequality, public food procurement). The latter group of drivers indicate the dynamics towards alternative more local and territorially organized food systems. Both clusters of drivers are strongly intertwined with two other drivers – regulation and farm polarization.

Figure 5. Relations of drivers



Hazards, risks, vulnerable groups and responses

This subsection analyses hazards and risks in food system in Latvia, the vulnerable groups affected and responses generated as described in Latvian media. The examination is based on content analysis of 114 media texts.

Transmango Conceptual Framework, following Turner et al. (2003), defines hazards as threats to a system, comprised of perturbations, shocks, stress and stressors and the consequences they produce (Brunori et al. 2014, p. 24). Probability and magnitude of a hazard are embodied in the concept of risk. Hazards are related to vulnerability through cause-effect relationship. The vulnerability of the food system is assessed in terms of the capacity of the actors, activities and processes to react to hazards and deal with them and deliver food security and other critical environmental and social outcomes of food system.

Latvian media analysis identified 15 most often discussed hazards. Table 4 sorts hazards along food system activities: production, distribution, consumption, nutrition, regulation. Interestingly, 6 of the drivers characterised in the previous section are benevolent, while some of the rest produce most of the hazards with retail concentration, farm polarisation, poor regulation the leaders in that.

Table 3. Hazards in Latvian food system

Production	Distribution	Consumption	Nutrition	Regulation
<ul style="list-style-type: none"> Animal diseases Food scares, cheating, lack of transparency Over-exploitation of agricultural land Insufficient use of technology Low competitiveness of local producers 	<ul style="list-style-type: none"> Sales of spoiled products Food waste 	<ul style="list-style-type: none"> Consumption of expired products Unaffordable food prices 	<ul style="list-style-type: none"> Children unhealthy food habits Potentially harmful contents of industrial foods Poor dietary habits of consumers Food related human diseases Consumer lack of knowledge 	<ul style="list-style-type: none"> Trade bans

Further analysis describes hazards in detail. Analysis includes characterisation of the main threats, shocks and risks associated with a particular hazard; identification of vulnerable groups affected by a hazard; and solutions identified or suggested to address a hazard.

- 1. Children unhealthy food habits:** Children unwilling to eat school meals; easy access of snacks and fast food often in close vicinity to schools; lack of parent control over children eating; less cooking in households; more consumption of ready-made products in families; for some children school meal is the only warm meal a day.

Vulnerable groups: Children; children from low income families

Solutions:

- Collaboration between school catering companies and dieticians
- Involvement of parents in decisions about school feeding
- Free school meals for all children
- Increased financing for school meals
- Long-term contracts with school catering companies
- More education about healthy nutrition for children
- Stronger control over practices of school caterers
- Investment in school kitchen equipment
- Balance between private business interests (school caterers) and public interests (children nutrition)
- Ban to sell snacks in schools

- 2. Animal diseases:** Swine diseases

Vulnerable groups: Pig farmers

Solutions:

- Stronger control over animal feed
- Bans for animal transportation
- Mobilization of hunters associations to control wild boar population

- 3. Sales of spoiled products:** Media reports incidences of sales of spoiled, hazardous products in some culinary shops and small groceries. This is a problem rather for small shops than big retailers.

Vulnerable groups: Consumers

Solution:

- Toughened control by the Public Health Agency
- More frequent sanitary controls in small groceries

- 4. Potentially harmful contents of industrial foods:** Many industrially produced food items contain E-substances, additives, artificial colorants and other chemical ingredients; there is popular believe that nowadays food is more harmful than it was before.

Vulnerable groups: Especially children

Solutions:

- New regulations of the Ministry of Health determining specific requirements for products by product categories and product names
- Involvement of experts in setting product standards and labelling requirements
- Improved food quality may lead to increased prices and decreased availability for some groups

- 5. Poor dietary habits of consumers:** Insufficient consumption of fruit and vegetables; excessive use of salt and fats; potential health risks.

Vulnerable groups: Children, youth, low income citizens

Solutions:

- Food education in popular media
- Organisation of food days and events to popularise healthy eating
- Improved quality standards introduced by food industry

6. Consumption of expired products: This practice is associated with supermarket discount policies and perceived as potential threat for consumers. Discount products are usually close to expiry and may cause health risks if consumed after.

Vulnerable groups: Wide segments of consumers as discount shopping is popular

Solutions:

- No institutionalized solutions identified
- Consumers own responsibility and critical choice making

7. Food waste (un-rational use of waste): The hazard has been highlighted at retail and household levels; the population does not appreciate un-rational disposal of food products; suggestions are made to find new ways in utilizing waste; missed opportunities to use waste, close nutrition cycles; waste as unappreciated resource.

Vulnerable groups: Effects on the environment and public morale

Solutions:

- Food waste management at supermarkets should be improved
- Supermarkets channel food waste to zoo and pet shelters
- Supermarkets could allow poor people to collect expired food stuff
- Use of supermarket food waste for animal feed
- At household level suggestions for composting initiatives
- Need for improved regulation regarding waste sorting in households

8. Unaffordable food prices: This hazard is associated with the driver 'poverty and social inequality'. Poverty reduces access to food of sufficient quantity and nutritional value; decrease of purchasing power of population after crisis negatively affects access to nutritious food.

Vulnerable groups: Low income citizens, families with children, unemployed, homeless people; however – all society in general feel this hazard

Solutions:

- Tax reductions for food items
- Tax reductions for low income citizens
- Food assistance: Soup kitchens; operation of food charities; food packs for low income persons; securing one hot meal a day for all people in need; involvement of food companies in donation of food for soup kitchens and charities
- Improved employment opportunities
- Control prices of products that are most important for healthy diets (as for example – fruits and vegetables)
- Restructuring of social assistance
- Wider use of self-growing practices
- Abolishment of social benefit system, people have to care for themselves

9. Food scares, cheating, lack of transparency: Horse meat scandal.

Vulnerable groups: Society in general

Solutions:

- Toughened control
- Greater responsibility of producers

- More precise labelling requirements

10. Trade bans: Russian ban on food import from EU.

Vulnerable groups: Food companies; big farmers

Solutions:

- Reorientation of export markets (e.g. to China)
- Decreased prices of farm products
- Marketing campaigns to increase domestic sales
- Triggered debate about development of niche products instead of mass products
- Product innovation and differentiation to attract new customers
- Push factor to offer mere healthy, ecological products
- Innovation in packaging

11. Over-exploitation of agricultural land: Common agricultural practices reduce natural diversity of the land and introduce new varieties; this may lead to unpredictable consequences; furthermore commonly accepted agriculture practices are based on extensive use of pesticides; this threatens sustainability of agricultural production and reduces the competitiveness of small farmers.

Vulnerable groups: Big and small farmers

Solutions:

- Support to alternative agricultural practices

12. Food related human diseases: Unhealthy food choices can cause health problems such as obesity and depression.

Vulnerable groups: children, low income groups

Solutions:

- marketing of healthy food choices
- the question about healthy diets should be more discussed in schools
- free school meals should be guaranteed for all children

13. Insufficient use of technologisation: Farmers and food companies insufficiently use technological innovation to increase production levels and raise competitiveness; technological improvement can prevent from low yields.

Vulnerable groups: entrepreneurs, farmers

Solution:

- Choose new science based production means
- involve science and scientists in planning and organization

14. Low competitiveness of local producers: This is especially attributed to small producers – their products might be more expensive and thus – uncompetitive; yet this is the case of bigger national enterprises as well – media (and enterprises them-selves) claim that they are unable to give competitive offer to upstream parties in food chains (milk industry is commonly given as an example). Hazard has been additionally stressed in the context of trade bans with Russia. Food retail chains hold power over food supply chains thus pressing producers to surrender to to retailer's requirements; meanwhile retail chains introduce their own product lines and labels; this reduces power of processors.

Vulnerable groups: Farmers, especially small farmers, small and medium food companies

Solutions:

- State should buy some share of products
- Consumers should boycott the global
- Consumers should choose other places to do their shopping (boycott retail chains)
- Emergence of alternative supply chains should be encouraged

15. Consumer lack of knowledge: Consumers lack information to make informed decisions. Meanwhile, in some cases information is distorted thus creating distrust between consumers and producers.

Vulnerable groups: Producers, consumers

Solutions:

- The best solution would be to promote information exchange through food chain
- Consumers alone cannot tackle this problem, food knowledge issues have to be addressed also institutionally through educational initiatives, public campaigns, healthy nutrition programmes
- Consumer food knowledge is shaped and contested at the same time by market actors, public health and educational authorities, family, social networks and own experience

2.3 Debate evaluation: over and underrepresented hazards and vulnerabilities

FNS is presented both directly and indirectly in the national media and academic debate. For us, directly means that media clearly indicates the problems within one or another FNS dimension and illustrates how these problems might lead to reduced possibilities to access food or reduces the quality of food. This means, that when we suggest that FNS is presented directly, we mean that FNS is recognized as a central problem in the discussion and it serves as the central point of reference for the described issue.

In academic debate there are several themes that are description of which presupposes **direct references to FNS**. For example, this is the case for medical scientists as well as representatives from Ministry of Health – these actors regularly publishes articles stressing food consumption trends of all population or of specific groups (Popluga & Melece 2009). Articles also addresses the popularity of unhealthy diets (Gobina et al. 2007) and possible health issues these diets may cause (stressing the economic consequences (Vilciņa & Kārklīņa 2005; 2004); obesity (Līmeža et al. 2012; Kārklīņa et al. 2011; Kārliņa et al. 2009), malnutrition (Popluga & Melece 2009) or prevalence of diseases (Vilciņa & Kārklīņa 2005; Remberga et al. 2009; Ligere et al. 2009)) or just illustrates healthiness of the products (their physical properties) (Vincevica-Gaile & Klavins 2012). When FNS is approached directly - the academic discussion stresses the importance of the micro level illustrating personal choices, limitations and practices thus approaching FNS from the perspective of access dimension and utilization dimension.

For public media direct interpretation of FNS covers broader range of issues. Here the analysis and critique of popular diets is common as well. Also – public media is keen to discuss the food quality and food accessibility arguing that healthy products are part of healthy diets. However, here multiple lenses to approach the issue are used. In some stories media recognizes that the high quality products are not accessible to everyone and that food prices can be an important barrier for the poor. The approach recognizes that product quality differs. Yet it also recognizes that low income vulnerable groups may choose or are forced to choose low quality products (for example with expired best before date). On the other hand, there are bunch of stories just indicating that organic food is better or the need to consume specific type of products (also stating that people should be educated about healthy diets). Thus the stories approach the food quality aspects from two perspectives – by indicating to the need caused by economic hardship or by forgetting about different economic abilities and just suggesting to consume specific product (presuming some idealistic world where only small choices are needed to improve things).

Apart from the mentioned, several other issues are raised when FNS is approached directly in the media. One of such topics discussed is support systems ensuring FNS. Media is keen to discuss the characteristics and influence of various food redistribution systems – as for example soup kitchens, food packs or other forms of non-governmental involvement that ensures vulnerable group access to food. Here support instruments available to governing institutions should be mentioned as well: one of such instruments that is widely discussed in media is school meals. Meanwhile, despite media recognition that there are vulnerable groups relying on operational support systems, there are conflicting interpretations how these groups should be approached. According to one interpretation it is a group that should receive direct assistance (as food packs). Oppositional interpretation suggests that there are some invisible aspects (either as laziness of vulnerable groups or pride of the poor) that limit the effectiveness of food redistribution systems. Thus this interpretation suggests that ensuring means for food self-provisioning should be the main target – governing institutions should concentrate on offering land and or other means of production that would allow vulnerable groups accessing food.

Meanwhile, issues of FNS are regarded with **indirect references to food** as well. In these cases aspects influencing food supply chains are brought forward, yet the links to FNS are stressed as well. In academic literature there are several discussions that could be described as indirect reference to FNS vulnerabilities. Most commonly this discussion analyses two central questions – the ways how production process and logistics influences product quality (see Ramane et al. 2012; Marčenkova & Ruciņš 2010) and how to use technologies to increase amount of produced goods. Significant share of studies approach control systems (both social and technical) regulating food production (Vanags et al. 2004; Mičule 2012) and competition between food system actors (Lapa 2008; Pancenko et al. 2008) or in some cases – even trying to indicate risks future food systems might be facing. Recently studies are also trying to identify the practices that would ensure sustainability of food system. Thus, apart from utilization dimension, all the other dimensions are used when FNS are approached indirectly in academic debate. However, in overall the range of recognized issues remains rather limited (this conclusion could be attributed to general FNS presence in academic discussion as well).

Meanwhile, much greater circle of problems is considered in public media. Similarly as in academic discussion, food system control is one of the central issues discussed. However, media articles expand the circle of interpretations that are attributed to the issue of control. As in academic discussion, media identifies the need to regulate the market in order to ensure the quality, predictable prices and limit the power of separate food chain actors. Furthermore, control is a way how one could limit the threat of over-technologization of food (for example – GMO are frequently represented as a risk we cannot understand yet). In this regulatory sense the interpretation of control presupposes need to introduce and monitor set of rules that should improve functioning of food system. Yet, an oppositional interpretation to the described issue is common in media as well: the articles introduce a line of limitations that may be caused by control. The idea under this critique is just the opposite to one stressing the need of control: critique states that agro-food systems are over-controlled and this reduces its abilities to function. Especially this is true in case of regulations coming from EU – it is claimed that these international regulations reduces accessibility to local, healthy food and that these regulations reduces legitimacy of self-supply, efficient disposal of food waste and ability to organize local procurement).

Meanwhile media articles discuss several other issues absent (or only weakly present) in academic FNS debate. For example, media regularly raises questions about power relations between actors within food chains, weakness of local producers (especially small producers) and presupposes strong correlation between local and healthiness (this is a common interpretation – local products automatically have certain characteristics that make them superior compared to foreign products (media has fallen into so called local trap)); it covers discussions about animal diseases which is recognized as an aspect that may cause health issues as well as limit availability of certain products; the importance of global markets are stressed and effects it may cause on local enterprises is illustrated; and finally – media illustrates links farmers (mainly local thou) might have to FNS stressing wide range of claims: for example illustrating how foresting policy and real-estate market may influence agriculture and land access or pointing out the overall difficulties faced by small farmers, etc.

In overall – when media approach FNS indirectly, the discussed topics covers all FNS dimensions. However, even thou the issues raised reflected on wide range of questions, in general the media (as well as academic) interpretations reflect on local issues. The discussions recognize that there is significant global influence. However, these issues seem to be overshadowed by questions and interpretations originating in local context.

3 VULNERABILITIES INFLUENCING FN SYSTEM OUTCOMES WITH REGARD TO FN SECURITY

3.1 System vulnerabilities identified in the media: introduction

Basing on this overall description of questions relevant in national FNS debate we have identified 11 major vulnerabilities (see Table 4). Some of these vulnerabilities reflect overall long-term interest while others have been recognized by the media either because specific event (as for example 10th vulnerability has been present in recent debate mainly due to African swine fever) or because of active work of lobbying groups (as for example 8th vulnerability can be associated with NGOs promoting anti-GMO movement)

Table 4. Vulnerabilities present in national discussion

No	Vulnerability	System vulnerabilities	Description
1	Control and regulation of food systems	Political vulnerability	Vulnerability indicate on interaction between regulating actors and the food system. It illustrates the need to find a balance between purely neo-liberal approach and overregulation of the various levels of food system.
2	Power concentration in retail	Economic vulnerability	Vulnerability represents power relations across food chain. It is concerned with consumers' opportunities to choose and with the relations between food retailers and producers.
3	Systems inability to support local producers	Political vulnerability	Vulnerability illustrates potential loss of national food producers (both big and small). National producers are seen as a proof of economic development and future possibilities, as a warranty of food availability, and - local products are uncritically interpreted as better and more fitting for local consumer.
4	Unhealthy consumer choices and unsustainable food habits	Socio-cultural vulnerability	Vulnerability addresses the choices made by consumer and food knowledge consumers have. This is the main perspective used in the media to address consumer and consumers' position in FN systems and food chains.
5	Inequality of society – poverty	Socio-cultural vulnerability	Vulnerability addressess difficulties that the poorest groups of society might face to access healthy and nutritious food. These groups are exposed to threats posed by low quality food or unhealthy diets.
6	Insufficient requirements for product labelling	Political vulnerability	Vulnerability presents consumer inability to make informed decision. The media discussion identifies line of limitations current labeling system has.
7	Poorly planned land distribution	Political vulnerability	This vulnerability represents difficulties to access land. Amount of land marked as agriculture land has diminished in last decades. There are several causes of this, for example – forestation is one of them.
8	Technologization of food production process	Technological vulnerability	Vulnerability illustrates unknown consequences technologies might cause. Media suggest that it is impossible to predict health consequences of the new products and that the products originating from laboratories may lack nutritional value.
9	Instability of global food markets (global food relations)	Economic vulnerability	The discussion mainly covers questions concerning the development of local enterprises in the context of trade ban with Russia.
10	Prevalence of animal diseases	Ecological vulnerability	The vulnerability has been raised in the context of African swine fever. Vulnerability addresses analyses the efficiency of states reaction to the disease, calculates the consequences of the fever and describes the overall trends of the spread of the fever.
11	Climate changes caused by global warming	Ecological vulnerability	Global warming is a contradictory field of discussions. Global warming is seen as a source of climate instability and future loss of land.

3.2 FNS outcomes and system vulnerabilities

As illustrated before, public discussions cover all FNS dimensions. Here we will illustrate the links between dimensions and vulnerabilities.

Table 5. Vulnerability dimensions

Stability and control	Availability	Access	Utilization
These vulnerabilities condition the rest of FNS. While discussion of control is ever-present, the discussion of stability emerges in context of significant shocks. Control is presented as states need to monitor the market and the need to issue regulations.	There are few discussions about overall food shortages. The present discussions could be split in those caused by natural processes (presented as global and approached cyclically) and those caused by human (ever-present and presented as much more local).	Most commonly associated with certain groups that may have access limitations (the poorest groups of society is the most common example). However, dimension also covers aspects of geographical inequality	Addresses personal choices people can make about the food. In our studies main vulnerabilities that associated with this dimension are unsustainable diets and insufficient knowledge to make informed decisions.

Stability and control. The vulnerabilities that can be attributed to the dimension Stability and Control condition the rest of FNS – these vulnerabilities interweave the ones related to all other dimensions. There are several ways how the dimension is shaped in public FNS debate. Furthermore, while discussion about the control is ever-present, the stability issues are raised and discussed only along with significant shocks (mainly global) or inevitable global changes (as for example globalization, climate changes). Some of the more recent events that have caused questioning of stability are: (1) trade embargos posed between EU and Russia that have limited possibilities of countless Latvia's food producers; (2) economic crisis – an event that gave an opportunity to discuss the stability all across food chain posing questions about the level of producer competitiveness, consumer purchasing power, weakness of food redistribution systems, chain polarization, etc. (thus the shock caused by crisis forced to re-evaluate the stability of food chains across all other FNS dimensions); 3) currency exchange – transitions from Lats to Euros raised questions about changes in food prices and competitiveness of local enterprises. Thus we can conclude that global factors are presented as a threat for FNS stability. Meanwhile, control is a dimension presented dimension. This could be the reason why control discussions are continuous.

Control is presented in several ways. First, it is illustrated as states need to monitor (and fine) the food production and distribution systems (market). In the simplest sense this means that products need to be labelled and product content needs to be explained so that consumer could make an informed choice. Also this means that state must ensure that retailers and producers comply with regulations following both the way product is produced and quality of products sold in the shops. Thus in this case the discussion is mainly about the quality of the sold products suggesting that products of low quality might be a source of vulnerability. The discussion of control also covers questions about the competition and consequently – distribution of added value between food chain actors. The interpretation underneath this discussion asks questions about the power relations within the food chain claiming that disproportionate power distribution might lead to future vulnerabilities.

Second, control is presented as policy making. This part of the discussion is most controversial. As an ongoing dispute it is a clash of opposing interpretations of how states involvement in food chain regulation should be evaluated. On the one hand, introduced laws (as for example regulations stating the quality requirements of school meals) are seen as states willingness to support actors involved. From this perspective regulations reduces possible vulnerabilities (as for example – unhealthy diets). On the other hand, states willingness to regulate (as in the case of school meals) is opposed with strong ideological claims (as “consumers can choose themselves” or “market will regulate itself”). These claims are escorted with grim predictions of emerging vulnerabilities (as – “products will become more expensive”, “enterprises will go bankrupt”). Furthermore, in the background of this discussion is ever present idea of over-regulation – in articles some actors suggest that uncritical acceptance of quality regulations might harm the small producers (thus reducing availability of locally produced food). It is commonly claimed that this is what happened when state “*uncritically*” accepted EU regulations.

Availability. There are few discussions about overall food shortages and the need to search for new food sources in media debate (furthermore, in most cases when these discussions are present they seem to be presented as somewhat

insignificant). However, we can distinct some vulnerabilities related to availability that are more pronounced than other. First of these is climate change. Common interpretation suggests that because of climate change agriculture will have to search for new ways how to operate. Despite the fact that it is represented as vulnerability, it is also identified as possibility – climate change will bring to Latvia new and exotic products (it is a common joke about Latvia as future wine making country). Availability depends on other unpredictable natural processes as well (as for example spreading of animal diseases). These naturally caused vulnerabilities associate FN system with possible hypothetical food shortages in the future. However, the links drawn are abstract and rarely illustrate problems that might be faced by people “*here and now*” (the problem is more commonly somewhere far away).

The meaning of FN vulnerabilities (closeness of threats) is presented differently in case of human caused issues – in this case main problem is lack of healthy or high quality food (for example organic food or artisan food) – problems that can be easily associated with everybody’s personal experience.

Additional vulnerabilities under availability dimension are insufficient support to local producers, over-technologization of products or even instability of global markets. These vulnerabilities presuppose insufficient supply of certain products (evaluated as healthier) or on the contrary – oversupply of products (that are less nutritious). Thus for these vulnerabilities availability indicates the insufficiency of local food chains (and local food production practices). These chains might provide consumers with local products that corresponds local traditions – but they don’t. On the opposite, reliance on technologic advances and global supply chains ensures unpredictable availability of cheaper global food that most likely have lower nutritional value and which long-term effects on human body are unclear.

Access. Most common vulnerability associated with access is consumer income. Low income groups (as for example unemployed, single parents, elderly people, inhabitants of deep rural territories) are portrayed as vulnerable and their access to food is questioned in the media. It is suggested that these groups are exposed to low quality food and insufficient diets. For these groups food redistribution systems are of great significance (box schemes, soup kitchens and other redistribution mechanisms). For these people not only the income itself can become as source of unequal access to food but geographical location can serve as the hindering aspect reducing the access to food as well. Poor municipalities are not able to provide social services in the level their riches counterparts do. Therefore, while some municipalities offer free meals in schools to all pupils and experiments with local procurement (thus offering kids fresh local products) some other municipalities offers free meals only to pupils studying in first or second grade (as set by law) and are choosing the cheapest offer. Because of these inequalities some of the schools located in *poorest* municipalities have started to experiment with food self-supply (for example, have created school gardens).

Finally, access should be associated with vulnerabilities originating from food chain structure. Growing strength of food retail chains polarizes access to food. While recent years have brought the development of alternative food supply chains these are more often accessible in urban territories for wealthier part of population.

Utilization. Dimension addresses personal choices people can make about the food. In our studies main vulnerabilities that can be associated with this dimension are unsustainable diets (unhealthy lifestyle consumption models that may cause health problems) and insufficient knowledge to make informed decisions.

On the one hand, this means that people are choosing the wrong products (or use wrong aspects to choose products – for example by purely relying on prices and discounts or convenience of consumption). Clearly, causes for these consumption practices might differ – for some it is insufficient income that hinders the use of other selection criteria. However, for others it might be lack of interest in food, everyday rhythm that does not leave time for healthier meals or – they might be unaware of the differences or holding totally different interpretation of proper intake (food as an element of lifestyle or just as a mean to achieve certain goal).

On the other hand, the utilization is related to cooking practices – the knowledge how products can be prepared, the practices followed to ensure hygiene of preparation process and the ingredients used and of course actual cooking. Some sources are indicating that society in general is losing its knowledge about food. However, this is just a minor discussion absent from most of the media. Furthermore, the amount of materials dedicated to cooking and instrument sold for cooking allows us concluding that cooking itself has become an important source of self-identity. Still, the popularity does not mean that in certain groups healthy cooking practices might be problematic (especially so because most of the cooking materials seem to be marketed to groups that comparatively well situated).

3.3 FNS outcomes and vulnerable groups

What is defined as vulnerable differs depending from the dimension that is used to interpret the FNS. Therefore, similarly as there are several hierarchical levels how we can classify dimensions, there are also several levels how the vulnerable groups can be interpreted – for example, in general, when low quality products are represented as threat, it is represented as such for all the population without any hint that in practice consumption practices between various groups differs and that threat is most likely would harm only the most vulnerable groups. Thus this is a way how many of the

FNS issues are presented – as problematic for society in general without one clear actor who would suffer more than others. However, this does not exclude the possibility that many articles identify separated groups that are harmed by specific agro-food system practices.

Table 6. Vulnerable groups

Groups	Description
Small farmers (and local producers)	The group represents institutionalized actors. Small local farmers (and local producers) are introduced as an important actor to overcome system vulnerabilities. However, the group is threatened by economies of scale and global free trade.
Municipalities	Representative of governing actors. Municipalities are important in order to overcome geographical FNS inequalities and to secure overall access to welfare system. Meanwhile, centralization and unequal income across the territory of Latvia threatens these functions.
People with low income, Homeless people, Elderly people, Single parents, Large families, Lonely people, Unemployed	These groups have common problems ensuring access to healthy and nutritious food. The reasons why these groups have problems accessing healthy food is the same: either lack of consistent income or insufficient income. Furthermore, for some of these groups lack of supporting networks (of friends, family, colleagues) might add to the difficulties to overcome the vulnerability. Finally, these groups are often searching for new forms how food could be accessed and relays on food support systems.
People with weak food knowledge	The group that lacks sufficient food knowledge that would allow making informed decisions about consumption and cooking practices.
People pursuing specific diets	As the group mentioned above – these people make their decisions on biased or incomplete knowledge about healthy consumption.
Children (pupils)	Group that is most often recognized as vulnerable. Group that cannot protect itself and therefore relays on public support systems.
Rural population	All problems associated with food are more pronounced if they are analysed in rural context. Thus, the rural population is especially exposed to the identified vulnerabilities.

Apart from the references to vulnerable citizens there is frequent pointing out of vulnerable institutionalized actors – as **small farmers** or **local producers**. These actors hold specific roles in food systems and in FNS systems yet their existence is threatened due to some political practices, characteristics of particular food chains, support to economy of scale and globalization of food chains. Common interpretation presented in media is that these actors will not withstand the pressure coming from global food chains without institutional support. These small local actors are presented as important element in order to reduce FN insecurity. However, if they are pushed out of agro-food systems, their role in securing FNS would disappear as well.

Another bunch of actors that hold somewhat similar role to small local farmers is **municipalities** – it is an institution that has the power to initiate FNS support systems and is responsible for catering in municipal institutions (as schools and hospitals). It is also the possible source of geographical FNS inequality (both due to lack of resources and knowledge).

Apart from institutionalized actors, there are several vulnerable groups that are frequently identified in the media.

One of the central groups described as vulnerable is **people with low income**. Because of the low income level the group is not able to secure sufficient amount of healthy food and therefore they are exposed to hunger and health risks posed by low quality products. This is the group that relays on the food redistribution system. However, their reliance on the food packs and soup kitchen is portrayed controversially in the media.

Meanwhile, media articles identify specific subgroups that forms general low income risk group. The groups that suffer from low income caused food shortages are diverse: the most visible and radical case is **homeless people**. However, there are several other less visible groups - as for example, **elderly people**, **single parents** (in media more often referred to as **single mothers** thus suggesting that there might be split in FNS between gender), **large families**, **lonely people**, **unemployed**. We can speculate that the vulnerable groups have some common characteristics – apart from the fact that these groups are frequently assessed as risk groups for poverty, one can suggest that these are also the

groups that in general are more lonely – either lacking groups support at all or relying on a group that is vulnerable as well.

Weak food knowledge is one more aspect that causes FNS vulnerability. Lack of knowledge may lead to unhealthy food choices or selection of harmful diets. The importance of knowledge is just reinforced by huge marketing budgets of global food production enterprises that often are used to encourage unhealthy consumption. Food is also a part of cultural self-representation - popular culture as well as distorted self-perception may cause harmful food intake. And finally, lack of knowledge results in uncritical acceptance of convenient choices – the rapid rhythm of everyday life and quick/ easy access to unhealthy goods results in lifestyle oriented unhealthy choices.

Group that is mentioned as most exposed to vulnerabilities are **pupils and children** in general. According to media, there are several reasons why this group should receive extra attention. First of all – this is because children are one of the most exposed groups to FN insecurity. Furthermore, children also do not have the means to protect themselves. Children would also feel the most pronounced consequences of insufficient food intake (physical symptoms of which might be changes in development or/and health problems in the future, insufficient food intake caused diseases). Finally, children are less educated about healthy food consumption and thus they are more exposed to unhealthy choices. Additionally, kids are the frequent target group of marketing activities. Because of this school has become a major institution where FNS should be ensured.

Finally, rural inhabitants are exposed to insecurity. Insecurity of **rural population** emerges from concentration of most of the previously mentioned aspects in rural areas – rural population has lower income and less employment possibilities, it is a group that has less means to protect itself and it lives in territory where less mechanism of food education exists. Additionally to the mentioned – rural society is the one that have limited access to food chains – thus it is more difficult for alternative chains to emerge in rural territories. And finally – rural inhabitants are victims of prejudice (it is a common claim that if they have difficulties to access food, they should just grow it).

4 FRAMES ANALYSIS / VULNERABILITIES

4.1 Introduction

The analysis of public sources of FNS debate in Latvia revealed 8 relevant frames, most of them variations on those outlined in the TRANSMANGO Theoretical Framework. However, it must be noted that two frames - poverty and (unhealthy) food choices - required the introduction of more nuanced framing, as in these two cases there was a manifest debate on whether the issue is of personal responsibility or societal/policy/environmental (cf. see Lawrence R.G. 2004 on framing obesity in the US), thus producing different framing.

The section is structured as follows: first we describe the main frames identified (as a summary, then in detail); then we comment of where the frames appear in relation to specific vulnerabilities, and we finish with demonstrating the positioning of certain system actors, some quite unexpected.

Table 7. Summary table of frames

Frame	Key concept/s and oppositions	Key problem	Who is responsible	Moral basis	Solution
Food sovereignty	Local – global	Hindering the opportunities of local producers	Global players, incl supermarkets; government	Self-determination, patriotism	Development of own production capacity, favourable regulations
Food democracy and food citizenship	Resource-conscious, moderate and knowledgeable consumption	Food system is alienated from the consumer; resources are wasted	Global players, passive consumers	Concern for environment, personal responsibility, empowerment, local solutions	Be more knowledgeable, take the small steps that everyone can. Raise awareness.
Solidarity with those in hardship	Social justice, solidarity, practical help, food assistance, local community relations, soup kitchens	Local communities alone cannot cope with the aftermath of economic crisis	The Government (although the blame is not directly assigned)	Value of any human life, shared responsibility	Communities, enterprises, churches and citizens doing their share to keep their people fed and supported (NB: often with the presence of major supermarket chains)
Productivism (relatively little)	GMO, organic food not superior, science can solve nutrition problems	People have irrational objections to scientific methods of tackling the food problems	Implicitly – people who reject artificially produced foods	Everything is acceptable to produce more food	GMO, technocratic and globalised food practices
Livelihood	The right to get access to resources to feed oneself. Resourceful poor vs. indifferent and incompetent public	Government solutions are incapable of solving issues and generate new problems	The government, ignoring sound advice of international organisations and scientific data	Social justice, human dignity	Reconsider social assistance measures; give back dignity to the poor

	authorities				
Poverty is laziness	Benefits, food assistance as promoters of passivity; Misuse of well-meant measures	The poor get lazy and expect that they will get their social benefits, and not have to work	The government as too trusting, the poor – as too scheming	Assistance corrupts?	Discontinue social benefits and food assistance and force people look for work, however inadequate
Healthy food habits as individual responsibility	Nutritional value, unhealthy food (vs. „temptations”)	Individuals are either used to, or do not recognise the low value of the food their use and thus are candidates for various diseases	Individuals lacking either will-power or information, not consulting doctors enough	(Implicitly) An individual should be able to counteract all the food consumption system which is skewed towards the unhealthy, the excessive, the impulsive	Educate, urge them to have more will-power, suggest medication (for supermarkets and pharmacy are hidden advice-givers there)
Healthy food habits as social/environmental responsibility	Nutritional value, unhealthy food, marketing traps	Only a small segment of the problem is routinely addressed, (e.g. with school meals; supermarket schemes)	Ineffective policy system, possibly influenced by industry lobbies	(Implicit) – an individual is not the only actor in food consumption, the practices are heavily skewed by the food industry and policy	Take a critical stance; find out what can be implemented for healthier options (e.g. in school)

4.2 Description of main frames

4.2.1. Food sovereignty: the central concept is local food which is valuable and patriotic; opposed to unfair dealings of global players (incl. supermarkets, foreign investors buying up land). The practices of large retail chains may also be depicted as risky for consumers (unsafe food, esp. ready-made). The failure to regulate land use properly may result in empty countryside and loss of people. The state is depicted as unable to devise and carry out a viable plan, including strategic vision of the food industry, knowledgeability about international markets, individual attention to each of the not-too-many major food enterprises, distinguishing between those likely to enter Western – or Eastern markets (if any at all).

The frame stresses the need for self-determination (e.g. not becoming a raw material annex to Lithuanian milk industry); own capacity to produce food (as Latvia has the necessary resources).

The frame shows links to the food citizenship and solidarity frame. The small local producers are generally shown as hard-working and deserving, with large-scale retailers the „bad” ones. Local authorities try to support local producers also by explaining that they are the basis of local employment opportunities, and urge their citizens to be patriotic.

While supermarkets perceive home-producing enterprises as competitors and are „angry” at them, some supermarket chains have been able to capitalise on the patriotic interest in local food and have special places for local produce (with some reservations as to volume of produce they can provide), even with specific stands for produce from the very specific local area.

Metaphors: empty countryside; the beauty of the vegetables is not from e-stuffs, impending elimination of farms; being slave-workers in our own land; the Russian embargo is a plague, and to survive we have to have a strong immune system and good medicine.

Objects of critique: supermarket chains and their unfair practices that put in an untenable position the small producers, unsafe food preparation practices of supermarkets, foreign investors who can buy up large amounts of land; ability to feed ourselves vs. dependency from foreign food producers; the well-to-do citizens of foreign countries; Revenue Service's prejudiced attitude towards local farmers (preference is given to neighbouring countries' farmers who do not have to pay tax). State inability to go beyond short-term measures in the case of Russia's embargo.

Rhetorical devices: family traditions; it is not fashion, it will stay; Latvia's landscape and nature, Latvia's green image; will there be people in Latvia's countryside or not.

4.2.2. Food democracy and food citizenship – the frame emphasises a more personal and mindful consumer involvement, patriotism, health, concern for environment, less use of resources, and the desire to make food-production related processes more open and transparent.

Consumers express a wish to become more knowledgeable, and actively participate in alleviating the ills of the present system. The themes may be related to food waste, to direct buying, to individual's right to decide what she consumes (e.g. food that is past its sell by date). Food citizenship is also often present when describing school activities to provide healthy meals to children, especially in rural areas.

Among the best solutions one must note the proliferation of local procurement procedures which take into account quality and origin of produce. The solution for food waste decrease is more mindful shopping and composting, even in city apartments. There is also some mention of salvage groceries and alternative arrangements to provide access to certain past sell-by foods to the poor (trusting their ability to make decisions for themselves).

Metaphors – marketing trap; bureaucratic madness, collecting points for a better karma; renewing earth's fecundity; green-fingers; escaping e-stuff;

Objects of critique – supermarket chains, mindless consumption, waste of resources; bureaucracy (esp. in the case of school meals, food waste) – the Food and Veterinary Authority; illegal business in stolen foods at the Central Market (obviously the food that are past sell-by date); lack of respect for food – as a possible moral cause of the crisis.

Rhetorical devices – diminutive names for vegetables (to express appreciation of local and grown by own); immediacy of experience: „I drive by and I see where this vegetable grows” (vs. anonymous imports); guilt-free getting rid of marginally less-than-fresh produce; heart contracted painfully every time when food was thrown in the bin.

4.2.3. Solidarity with those in hardship – the frame is utilised mostly with regard to the aftermath of the economic crisis, this frame accentuates social justice, solidarity – human values, inclusiveness, shared responsibility.

This frame is manifest in the stories of food assistance to specific localities and specific communities, entrepreneurs, churches, citizens rallying to help. Although the nature of hardship is related to national level trends, it is local, specific social relations and local opportunities what either relieve or exacerbate the problem.

Another version is the stories by national charity organisation, but these too accentuate the need to assess individual situations, and helping in a way that stimulates people's ability to be masters of their life.

Interestingly, that local entrepreneurs in the very worst time of the crisis (2009) also offered „crisis products” - in cheaper or larger packaging, but still healthy.

Metaphors: be masters of their lives, our soup says – your life has value; crisis products,

Objects of critique: inability to provide decent livelihood to people; generic assistance, not tailored to actual needs, not related to social rehabilitation, assistance in getting a job, or re-training.

Rhetorical devices: you are loved and wanted in this world; shame; the need to coax out these people out of their homes; names of products: „the Strong/Brave people's bread” .

4.2.4. The texts also contain some **productivism**: the frame that presupposes that solutions that produce a bulk of food are desirable; this includes aversion to organic foods (these are for the upper classes, no special benefits); GMO is acceptable (in a regulated way) to produce more food; science applied to food can provide solutions to nutrition problems (synthetic meat, margarine as a substitute for a balanced diet). Solutions are globalised and technocratic. The frame evidences itself in applying technocratic, scientific language.

4.2.5. Livelihood – the frame focusses on experiences of poor people and emphasises human empowerment: ordinary people struggle vs. indifferent and incompetent, possibly corrupt policy makers. Articles focuss on the struggles that

people engage to get access to food. Although the stories are on the micro-level, often they are placed within the broader outline of national level policies and inability to tackle root causes of problems.

Often institutional contexts are brought into the picture to demonstrate the difficulties placed in the way of vulnerable people (inadequate support measures, stereotypes, bureaucratic obstacles).

Metaphors – trying on to live in the skin of the poor

Objects of critique – policy-makers („ up there”); being removed from reality (deluded? Cynical? Stupid? Indifferent?); social injustice

Rhetorical devices – lots of dramatic devices; „ mother’s heart breaks” , „ the situation is simply horrendous”; „ the hopelessness is deeper every day” , „ there is even no bread”; pride and desperate shame, cruel selfishness of the well-to-do.

4.2.6. Poverty is laziness– this stream of framing emphasises the individual responsibility (not systemic) of people for their poverty and poor access to adequate nutrition and simultaneously assigns various negative moral traits, and describes devious strategies of the poor.

The assumption is that they are poor though some deficiencies in their moral character, plus they are a drain on society’s resources. The opinion tends to be expressed by local level municipality actors, small local entrepreneurs, and social assistance workers, who either offer pseudo-solutions (e.g. access to allotment gardens, though gardening does require monetary and technological inputs; offering below-subsistence wage jobs), or expressing open mistrust of these people (having stories of fraud at the ready).

It must be noted that the garden allotment issue is indeed complicated, as it does require skills, equipment, and in many places (esp. in Riga) these areas are simply not safe, as evidenced by media stories („ there is nothing to steal any more, everything has been stolen”).

Another controversial issue is food assistance. Even representatives of charity organisations admit what food assistance packages may degrade people if they genuinely do not seek employment. A more targeted assistance is more effective.

A very notable piece of news is the interview with the state president Andris Bērziņš who was reluctant to admit that many people in Latvia do live in poverty; he said „ he was not convinced”.

The solution implied or openly advocated for is to disband the social assistance and social benefits system.

Metaphors – dependency on social benefits; ‘it’s their own fault; it’s media hype

Objects of critique – social benefits and food assistance which seemingly corrupt those who are poor; should be disbanded; those poor who use their assistance money for drinks and make social workers look after them like children; those poor who do not want to cultivate allotments.

Rhetorical devices – „people want to have everything given to them on a platter”;
„ people don’t want to do anything for themselves”

4.2.7. Healthy food habits as individual responsibility – the frame deals with healthy and unhealthy food, there the choice predominantly rests with the individual. Interestingly, consumers do tend to have „temptations”, and generally there is a lot of sin-related language. It presupposes that individuals lack will-power and have bad habits. The assumption is that an individual should be able to counteract all the food consumption system which is skewed towards the unhealthy, the excessive, the impulsive indulgences (exacerbated by aggressive marketing).

The solutions always include providing information (assisted by Experts), thus firmly lodging the responsibility not with the food industry but with the individual, urge them to have more will-power, suggest medication (when unhealthy diets have already produced disease). Interestingly, supermarkets and pharmacy chains are hidden advice givers there.

The key paradox seems to be that everyone is aware of the unhealthiness of the bulk of produce on supermarket shelves but accepts it as a situation that cannot be changed, as a given, with own responsibility to keep in check the urge to indulge too much only to feel guilty. This learned passivity seems really pervasive and taken for granted.

Metaphors – children will be denied joy (if tax is increased on unhealthy snacks); in a store, you can count on one hand’s fingers the food that are healthy; chemical foods are everywhere

Objects of critique – unhealthy pre-processed foods, overly expensive ecological food,

Rhetorical devices - unhealthy food is cheaper than healthy food, thus we need to buy it for survival; I know it is not healthy but they taste so good; you can’t find healthy sausages, everyone eats them and I do too.

4.2.8. Healthy food habits as system/environmental responsibility –

This frame manifests itself somewhat indirectly and ambiguously, yet it has to be characterised to show underrepresented areas of discourse. It has to be emphasised that the authors have not encountered a media piece which would clearly relate obesity to non-actions or actions taken on systemic level (esp. the food industry). Yet some failures tend to be mentioned, although they do not form a coherent story.

The system is often equated with the state budget which simply has to be filled in the fastest and cheapest way possible (regardless of citizen's health). Some other elements of the system that get blamed are the system of school meal providers which (by limits put by the state budget) cannot really provide healthy meals.

Notably, in 2011 the media actively discussed the a priori lower quality of food that Latvia gets from various Western importers, while the Ministry of Agriculture tried to hush down the allegations.

Interestingly, both supermarkets and pharmaceutical industries are keen to sneak into public debates their advice and stories of their good deeds (e.g. supporting soup kitchens) – the link between the source and the information not obvious immediately.

Objects of critique – the greedy state budget; the greedy school meal provider firms.

Rhetorical devices – our state resolves problems by prohibitions.

A summary note on food-habits related framing:

The framing is twofold, even manifold. The key issue is – who is to blame for people using unhealthy food, do they have control over it, and can it be improved through individual level actions – or is it a systemic problem, reinforcing poor choices through poor policies: no safe places for physical activities, no control over what is sold in schools, and how appealing it is (Lawrence 2004, 63).

Media debates show various versions of these two. Adults are depicted either as generally capable of taking the right decisions (but succumbing to „temptations“) or only safe when they approach „experts“ (mostly doctors). Unhealthy choices seem pervasive and taken for granted, inescapable, and one can only limit the consumption somewhat.

In the same vein, schoolchildren (as the main objects of nutrition socialisation AND CONSUMERS OF THE LARGEST FOOD MARKET of soft drinks, sweets and snacks) most often are heavily regulated by „experts“, including parents. It is only in rare cases that systems are put in place to counteract the pervasive marketing of unhealthy foods and to make the healthy options attractive enough (e.g. through own involvement in growing).

Thus the responsibility is a mix of paternalistic (experts know best, consumers must be guided as they are unable to exercise their individual responsibility properly), and sometimes and in an ambiguous way - systemic (represented by state budget makers and school meal providers, but very rarely the food industry).

4.3 Frames by FNS outcomes and vulnerabilities, mutual linkages

In addressing various FNS system outcomes (availability, access, utilisation), specific frames and clusters of frames appear to be used in the public debate. In this subsection we characterise the most main-stream frames encountered in association with the specific FNS outcomes.

4.3.1. Availability (defined as the existence of food for distribution and consumption, made available by natural resources, trade, broader economic system activities).

Latvia's vulnerabilities: 1) Access to land: reduced availability of land for local farmers; 2) Control and over-regulation: The system's inability to control fair labelling of food products and support local produce; 3) Power concentration in retail (and food industry pushes down producers' prices, while keeping retail prices high. 4) System inability to effectively support local producers. 5) Texts also refer to Global food relations – the open market and somewhat 'difficult', 'unfair' competition with food companies from the neighbouring countries where production costs are lower.

These vulnerabilities are predominantly presented through frames of **food sovereignty** (the ownership and use of land; structure of farms, retail structure and the such) – related strongly to patriotism, especially in the light of recent political events; availability further linked to risks of **productivism** (of global financial crises, animal disease, overly technologized food).

Another frame manifest in discussing the above vulnerabilities is **food citizenship** as decreasing waste and thus increasing availability of food and/or improving environmental conditions.

4.3.2. Access to food (defined as ability of individuals and families gain access to food either through purchasing it, growing it or getting through social exchanges or donations. It was obviously an extremely rich topic in 2007 – 2014.

Latvia's key vulnerabilities: 1) some access to land issues (for allotment plots to grow produce for own consumption); 2) Control and regulation: inability to control expired product utilisation by supermarkets, and poor ability to adapt EU level regulations to local contexts. 3) Power concentration in retail (and food industry?) keeps prices high; 4) System inability to effectively support local producers: 5) Global food relations: Texts refer to open market and somewhat 'difficult', 'unfair' competition with food companies from the neighbouring countries where production costs are lower. Usually the Lithuanian dairy companies are mentioned as those outcompeting or potentially taking over Latvian dairies; 6) Poverty: unemployment, demographic structure (prevalence of single parent families), geographical and regional inequalities, poor policy responses. Self-provisioning is an important asset.

Another venue for accessing food appears to be supermarket food with past sell-by dates, and it is mostly frames as a **food citizenship** issue.

Other issues are presented through strong frames of livelyhood, solidarity, strong critique of overregulation and social injustice. Simultaneously, vulnerable populations could also be depicted in a negative light, accentuating their negative moral traits – related to the already mentioned issue whether poverty is a systemic problem or an individual one. (This comes mostly from certain sections of entrepreneurs and local authorities or social welfare authorities, but also from Ministry officials). Thus we introduced a specific frame *Poverty is laziness*.

Discussions of these FNS outcomes always include strong oppositions of moral stands, including the preferability of the local, and patriotism. However it has to be repeatedly emphasised that the issue of poverty and how best to help people in this condition is very value-laden and controversial.

Another duality is seen in the role of supermarkets, which are sometimes quite openly and sometimes implicitly found in articles using solidarity and even livelyhood frames.

4.3.3.Utilisation (as ways of using food to achieve health and well-being, predominantly centered around the issue of unhealthy food and the problem of obesity.)

Vulnerabilities as seen in Latvian public debate: 1) Insufficient ability of FNS to enforce healthy food choices (Unsustainable food habits): 2) Power of food industries and supermarkets 3) Poverty: low income and limited channel of obtaining varied, nutritious food, hence poor nutritional value of diets, also the stigma of using food banks.

In discussing unhealthy habits the battle of framings is rich, yet predictably manifests itself as paternalistic domination of agents who know what is right, and those who either err or sin or have poor habits or poor information and must be regulated, guided and educated. It is interesting to note the interplay of blaming individual habits vs the unhealthy policies and environments. The authors note the predominance of blaming individual choices for unhealthy diets, although occasionally (and mostly with regard to school meals) some system elements emerge. It is noteworthy that there is an absence of concerted effort of analyse the role of retail chains in marketing and selling (especially to children) unhealthy food on a massive scale.

In addition, food citizenship is prominent, arguing that people are capable of distinguishing between what is good and what is not (local again).

Looking at the vulnerabilities of frames in **an opposite way**: which frames are used to describe specific vulnerabilities, we may arrive at the following table :

Frame	FNS outcomes and vulnerabilities	Related to others
Food sovereignty	Availability <ul style="list-style-type: none"> of land, of retail opportunities for local producers 	Risks of global diseases etc. (productivism) Overly technological food
Food democracy and food citizenship	<ul style="list-style-type: none"> Availability (as related to food waste reduction) Access (legalise access to waste for people in need) Making informed utilisation choices 	Related to healthy diets, both with individual and system responsibility
Livelyhood	<ul style="list-style-type: none"> Access (to land for growing for self-consumption) Overregulation of small producers Power concentration in retail Domination of global concerns 	Related to The poor and lazy frame.

	<ul style="list-style-type: none"> Poverty (as a system problem and an individual one) 	
Solidarity with those in hardship	Access to donated food	Linked to two kinds of poverty perceptions Hidden and over manifestations of retail chain good deeds
Poor diet choices (individual)	Utilisation – own inability, need for experts	Linked to Food citizenship
Poor diet choices (systemic)	Utilisation- system failures, need for consumer action and experts	Very marginal and incomplete as a frame.

4.4 What is relevant actors' positioning?

Although the roles of the relevant agents have already been mentioned in our analysis, to sum it up, we may point out to some critical distinctions and several ambiguities.

Local producers (incl. farmers) have number of roles, mostly positive. They are providing lower-cost crisis products, donating food to local soup kitchens, and do their best to bring their produce to the customers via different channels. On the other hand, they are sometimes also exploiting desperate jobless people by offering extremely low pay and unsafe jobs locally, and express the opinion that poverty is only caused by laziness. However, overall local producers are the moral, if not economic backbone of the food system.

National authorities are often depicted as cynical or at least separated by a huge gap from the people trying to cope with the crisis; often only concerned with maintaining the facade of the „success story” of austerity measures in Latvia. In a number of articles they act just as experts and interpret the regulations impassively to demonstrate their „objective” position.

Local authorities and local communities often are positioned as providing solutions and support to people hit by the crisis, with practical measures. However, some of them seem to support the Poverty is Laziness frame. Overall, however, local authorities are nearer to the possible solutions and act for the benefit of their population and entrepreneurs.

The articles demonstrate interesting roles of **supermarket chains**, and even pharmacy chains – apart from those articles that point out the crushing down of local producers and making illegal agreements and providing unsafe food, some articles may depict these chains as wise educators/experts and supporters of food assistance initiatives, local producers etc.

NGOs tend to be the only ones concerned about **environmental issues** (e.g. food waste), and skilfully use various media channels to focus on the message.

It is worth noting that **scientists** seem to be practically absent from public media, and appear only in foreign news about some breakthrough about synthetic meat or insects.

Thus several of the agents have dual or multiple roles, while some of them have only a specialised niche role, according to our analysis.

5. MAIN FINDINGS AND CONCLUSIONS

Our study indicates that FNS outcomes are shaped by interlinked individual and structural factors. Certain combinations of these factors may cause insecurity: individual preferences and choices, social structures (belonging to certain social groups, values, lifestyles), economic structures (food production and market patterns, food chain organization), policy (regulating food production and defining food assistance and welfare measures at large), and other. Furthermore, some aspects might automatically be the cause for several processes leading to reduced FNS. Thus, FNS is a complex matter.

5.1 FNS media discussion in Latvia

An average Latvian does not face severe food insecurity problems. However, consumption and lifestyle habits together with purchasing power create misbalanced diets. Furthermore, some groups of population are more exposed to insufficient FNS. For example, single-parent families and also families with three children and more face the greatest risk of poverty. As most of single parents are women, feminization of poverty is evident.

Despite various food assistance measures and initiatives, the available support for reducing food insecurity remains rather small and territorially fragmented. The situation is exacerbated by unequal access to medical care. Furthermore, as was illustrated in chapter 1 – the structure of primary and secondary food production as well as processes in food retail raises questions in media that should promote political discussion in the state level. Additionally agro-food chains have been the object of interest of several NGOs and activists in recent years. Yet – a direct food discussion is absent in media.

Mostly this is because food and FNS is an interdisciplinary field, with various policy, market, research and civic institutions and organisations involved. There is no one coherent food policy and governance structure in Latvia; instead there are various discourses, practices and governance structures co-existing. Food per se remains an invisible problem and policy domain approached from different, and sometimes contradictory, angles of other related social and economic issues.

Meanwhile **media** is quite keen to reflect on food related issues. Our analysis of 114 articles illustrates that **media** debate covers the production, distribution, consumption, nutrition and regulation dimensions of food system, with greater emphasis on consumption side. The national debate altogether can be characterized by the plurality of viewpoints, actors (from individual to global), practices (from cooking to overcoming global ecological changes) and beliefs (from specific diets to interpretations of global relations).

Despite the plurality, the societal implications of food system are highlighted mostly in terms of public health outcomes, social justice, and solidarity with local producers (proposing strong relation between local and healthy). Thus media discussion in first place is concerned with human centred outcomes. Meanwhile, support to local transforms into critical stance towards globalisations (resulting in power imbalances) and critical governance interpretation (media criticises both over and lack of regulation). The critical and human-centred approach allows media to grasp most essential issues and vulnerabilities of food system: poverty, social inequality, food access difficulties, poor dietary habits, identify the most vulnerable groups.

The scientific, policy and food industry literature pays less attention to food poverty and focusses on four broad themes: i) consumer habits, sustainable nutrition and health, ii) quality assurance in food production and services, iii) financial and economic risks in agricultural production, food industry and retail, iv) social aspects of sustainable food provisioning including the role of knowledge, innovation and cooperation. It seems that while media predominantly focus on FNS outcomes and system dis-functionalities, reporting on hazards, shocks or crisis whereas scientific and policy papers focus more on systemic issues of chain performance, governance and risk reduction.

5.2 Drivers, Hazards and Vulnerabilities

From the media analysis we have identified 16 drivers, 15 hazards and 11 vulnerabilities. The identified elements covered wide spectre of agro-food system aspects – from micro level cooking practices to global climate changes or international power relations. The unexpected result of the media analysis was the conclusion that some of elements of food systems are simultaneously drivers, hazards and vulnerability of FNS (for example global warming or diets). Although the conclusion has been made from media analysis and should not be generalized, we would like to suggest that this indicates that food system are strongly tied to limited number of major elements that causes most of changes.

Media and scientific texts allowed identifying 16 **drivers** that influence Latvian food system and may have both positive and negative effect on FNS. The drivers are intertwined, however their thickening mutual relationships suggest two clusters of drivers: one cluster is related to such drivers as global trade, modernization, knowledge and learning, access to land, farm polarization, and clearly indicates the global influences on FNS; the other group of drivers include local food systems, dietary and consumption habits, urban food initiatives, food self-provisioning, poverty and social inequality,

public food procurement, and indicate the dynamics towards alternative more local and territorially organized food systems.

The drivers allowed us identifying **15 hazards** presented in media. Similarly as drivers, FNS hazards covered wide range of food system elements and food system levels: we have identified hazards related to production (Animal diseases, Food scares, cheating, lack of transparency, Over-exploitation of agricultural land, Insufficient use of technology, Low competitiveness of local producers), distribution (Sales of spoiled products, Food waste), consumption (Consumption of expired products, Unaffordable food prices), nutrition (Children unhealthy food habits, Potentially harmful contents of industrial foods, Poor dietary habits of consumers, Food related human diseases, Consumer lack of knowledge) and regulation (Trade bans).

Finally, in our analysis we have identified **11 vulnerabilities** (some of them directly shown in media – as main topic of the discussion, while other illustrated indirectly – as a consequences of some much general social processes). Similarly as hazards, vulnerabilities cover wide range of questions. For example socio-cultural vulnerability “Unhealthy consumer choices and unsustainable food habits” include micro level processes that on their own are diverse. As described above - for some unhealthy food habits are caused from insufficient income. For others it might be caused by the lack of interest in food or everyday rhythm that does not leave time for healthier meals. Food is also a part of cultural self-representation - popular culture as well as distorted self-perception may cause harmful food intake. Thus, even a small share of arguments shaping this vulnerability allows grasping the fragmented nature of it and many links to wider social issues vulnerability may hold. Yet the illustrated micro level vulnerability on its own holds significant differences from macro level vulnerabilities (for example „Instability of global food markets”).

The vulnerabilities we have identified in the media analysis are Control and regulation of food systems, Power concentration in retail, Systems inability to support local producers, Unhealthy consumer choices and unsustainable food habits, Inequality of society – poverty, Insufficient requirements for product labelling, Poorly planned land distribution, Technologization of food production process, Instability of global food markets (global food relations), Prevalence of animal diseases, Climate changes caused by global warming.

5.3 FNS discussion frames

The analysis of media debate in Latvia revealed 8 relevant frames. The frames allow noticing that media holds rather simplistic interpretation of markets and global processes yet much more complicated interpretation of individual in the market. Thus as has been already shown – the media discussion is mainly oriented towards a person and discussion seems to have quite limited interest in the food chain beyond consumer experiences. Frames present in Latvia’s media we can structure in three groups – addressing overall food distribution, addressing consumption practices and addressing relations to global markets. Here we will shortly describe each of the categories.

Food sovereignty and Productivism are frames that clearly articulate global food chains and local – global market interaction. Both at least partly stress the need to strengthen local thus illustrating the significance of local. Furthermore, both to some extent illustrate global competition. However, the first frame (food sovereignty) criticizes global in order to strengthen local and thus ensure local safety. The second frame (productivism) (less pronounced in media but more often present in market and policy documents) approaches global markets in order to ensure greater possibilities. Thus, both at least partly are concerned with control of food chains yet values different solutions.

Second branch of frames helps media interpreting the food relations with *others* – with those in need. We associate with this branch following frames: Solidarity with those in hardship, Livelihood, and Poverty is laziness. Solidarity with those in hardship stress human values, solidarity and justice and claim that social support mechanisms are needed. Livelihood focuses on experiences of poor people. Frame focus on struggles of these people and searches for mechanisms of empowerment. Still, both of these frames have a lot in common – yet they choose to address the struggle of the poor from different angles. The final frame, however, holds significant differences from the two. Poverty is laziness claims that it is individual responsibility to solve their problems. The frame suggests that poverty is just a form negative traits. Most likely these frames are originating outside the food debate and are a glint of wider ideological debate.

Finally, frames Food democracy and food citizenship, Healthy food habits as individual responsibility, and Healthy food habits as system/environmental responsibility questions individual food practices. Similarly as in case of other frames – most likely these frames does not originate in food system but is a copy of some overall discussion about the consumption practices. Food democracy and food citizenship is somewhat supportive to other two frames from this group. While the other two stresses the importance of consumption directed towards the *self*, the food democracy are concerned with the decision relations with the market – here consumption is part of the market and thus – one should be responsive of his choices. For other two frames – consumption is part of self. The difference between the two is the response to the questions: who should be responsible for healthy consumption – individual or the system.

5.4 Emerging integral issues

Despite the diversity of the sources of analysed texts (representing public, scientific, market and policy spheres) and stylistic diversity of texts (media articles, blogs, scientific papers, policy documents, etc.) some FNS issues seemed to be more present than others. Some integral issues emerge from transversal analysis that characterise and may shape potential pathways and policies towards sustainable food and nutrition security in the Latvian context.

- 1) **Children as the first line in the battle for reasonable consumption.** The allegory of battle can be stretched even further by suggesting that schools are the battlegrounds. School children as the most vulnerable group are again and again portrayed in articles as the object of threat. Media illustrates that producers of cheap and unhealthy products recognize kids as easiest prey and do not hesitate to direct their marketing instruments towards this group. Meanwhile, state and municipality lacks funding to offer any alternatives.
- 2) **Who is responsible for nutrition (in)security?** The framing of unhealthy food habits is twofold, even manifold. The key issue is – who is to blame for people using unhealthy food, do they have control over it, and can it be improved through individual level actions – or is it a systemic problem. Unhealthy choices seem pervasive and taken for granted, inescapable, and one can only somewhat limit the consumption. This bleak situation is partly recognised by public health and educational authorities and civic groups who initiate new programmes and measures to promote sustainable diets. It seems that focussing only on consumer choices and reflexive, informed, responsible consumption is not a solution without institutional incentives and actions to promote healthy diets and nutrition.
- 3) **FNS policy formation and governance:** FNS in Latvia is an emerging policy field. At national level, Ministry of Agriculture, Ministry of Economy, Ministry of Welfare and Ministry of Health are the major institutions involved in food system governance. Whereas the Ministry of Agriculture and Ministry of Economy overview food production and its supporting and controlling mechanisms, the Ministries of Welfare and Health are dealing more with consumers' food issues, like ensuring sufficient food to everyone and promoting healthy food. But these institutions rarely act together. Food issues are addressed at some regional and local municipalities. Public procurement of food, territory planning, local regulations, food assistance, funding of farmers and home-producers cooperatives, educational activities in schools are some of the tools that municipalities use to influence local food processes.
- 4) **Binary drivers of FNS:** The whole food system in Latvia is binary influenced – by the globalised market and by consumer food-patriotism, food-nationalism, the claims to the state and aspirations with the local. These double signals and often conflicting drivers inform media discourse, people's choices, and political attitudes and also frame initiatives and pathways towards improved FNS.
- 5) **Complementary discourses:** Additionally we have to point out, that even after this analysis we have difficulties indicating **what is good food** in media interpretation? On one hand, the national discussion points to natural, healthy, fresh, local (the discourse of pleasure). On the other – it is food produced in a strictly controlled production process, safe, traceable, also nutritionally balanced (the discourse of control). These understandings point to different views on how FNS can be improved: for instance, supporting food initiatives, local procurement, self-provisioning for the first, or research and innovation based technological modernisation, improving food regulation and control, for the latter.

ANNEX 1: SOURCES

Source	Newspaper, online newspaper, magazine, social media, policy document, scientific paper	Sphere*	Description/relevance (copies, readership impact on other media)	Positioning (political; w regard to other debate fields)	Contents*
7guru; http://www.7guru.lv	A communications and expert PR blog	Pu	Aimed at discussing positioning strategies	professional	F, O
Agropols	An online newsletter with economic and policy news (agriculture)	Pu, Po	Addresses food system professionals	Action-oriented, practical	F, O, P
Apollo	internet portal addressing a broad spectrum of issues	Pu	6th most visited internet portal in Latvia	„neutral”	F, O
businessmadona.lv	Local internet portal (of a specific small town in the northern part of Latvia)	Pu, PO	Related to local authorities; represents a specific semi-rural locality	Patriotic, business-oriented	F, O, P
bizness.lv	Internet portal specialising in economics (since 2008)	Pu	Latvian National Business portal	entrepreneurship	F, O, P
Delfi. lv	News portal	Pu	The most popular news portal in Latvia (Latvian and Russian combined)	„neutral”	F, O, P
Diena.lv	National daily newspaper, exists also in electronic form	Pu	Circulation 31 000, one of the largest dailies in Latvia (top 10 of those read by Latvians)	Used to be „independent” and „liberal”, ownership changed several times	F, O, P
Dienas Bizness; http://www.db.lv	THE National business newspaper, exists also in electronic form	Pu	A stable and growing readership	entrepreneurship	F, O, P
Dzirkstele http://www.tvnet.lv	Local newspaper (on local topics of interest)	Pu	Relevant for the population of the north-east area of Latvia	Practical, entrepreneurship, local authority decisions	F., O., P
easyget.lv	A portal on lifestyle, events, health	Pu	Relevant for the active, younger, city dwellers	More concerned with leisure	F., O.
esilabs.lv	The homepage of Red Cross Youth	NGO	Represents people with certain values	ditto	F, O
Euro Aptieka	The internet portal for a big chain of pharmacies	Pu	A growing chain of pharmacies in the 5 largest cities of Latvia, provides plentiful advice on health (in the portal)	Own usiness interests	F., O
FinanceNet.	A branch of the popular news portal Tvnet	PU	Public information attests that they are the most popular internet portal with the Latvian audience	„neutral”	F, O., P.
focus.lv	A new (since 2013) multimedial portal both in	PU	Rated 21st by number of visits in October	„neutral”	F., O.

	Latvian and in Russian		2014;		
Latvijas avīze, LA.lv	A newspaper and an online newspaper, focusses on economic, human development, local interest issues	PU	Internet portal rated 8th; newspaper among top 10 media read by Latvians	Somewhat politically engaged	F., O, P
garsasbaudas.espati.lv	A new internet portal aimed at young city women on lifestyle issues	PU	Aims to become a social platform	More concerned with leisure beauty, health	F., O.
IR	Weekly magazine (exists also in online form) on topical social-political-economic issues	PU	Addressess „ liberal” , broad-minded, modern city-dwellers	Often engages in revelatory, uncomfortable investigative journalism	F., O, P
irlepaja.lv	City portal, news and general interest	PU	Local news	neutral	F., O
jelgavasvestnesis.lv	City portal, news and general interest	PU	Local news	Neutral, includes also local authority news	F. O., P
jumalasvards.lv	Bilingual newspaper and online newspaper on issues of the city of Jūrmala	PU	Local news	neutral	F., O.
www.kasjauns.lv	Weekly newspaper, also exists in online form	PU	Top 3 among all publications	A broad spectrum of news	F. O
Latgales Reģionālā Televīzija http://www.lsm.lv/lv/	Regional TV, reported through a joint public media portal	PU	Public media on a major region in Latvia	General interest news	F., O., P
Latvijas sabiedriskie mediji; www.lsm.lv/lv	Public media portal, main stories of the day from all Latvia	PU	An indication of the content of all radio and TV statetions and local press	various	F., O., P.
Latvijas Zemnieku federācija http://www.lzf.lv	The portal of the main organisation joining rural entrepreneurs and farmers	PO	Jointly formulated opinion in the dialogue with government	Pro-farmers (major ones, predominantly)	F, O., P.
laukutikls.lv	Rural development e-portal closely related to the Ministry of Agriculture	PO	The focal point for news on agricultural policy, initiatives between various stakeholders	Pro-rural development	F, O, P
ldusa.lv	A portal of the Latvian Association of Diet and Nutrition Specialists	PO	The focal point for experts and expert advice	Pro-expert-defined health	F., O, P
Irpartneriba.lv	An internet portal for active population of Liepāja region (western part)	Po	Informs on development opportunities, involves and builds on LEADER experience	Concerned with empowerment of rural communities	F, O, P
liepajniekiem.lv	City portal of general interest	Pu	Although regional, it is in the top 10 portals, perhaps due to the special popularity of the city	General interest	F, O, P

llkc.lv	The portal of the key rural development consultation service provider in Latvia	Po	A focal information point for all sorts of farmers and rural enetpreneurs	Practical advice, opportunities, funding openings, experience stories	F, O, P
lu.lv	The portal of the largest public university in Latvia	Pu	The audience in about 20 000; new students are given practical advice (on health, nutrition, etc.)	Practical (scientifically sound?) tips for a specific audience	F, O
ludzaszeme.lv	Local news and development opportunities in the major eastern part f the country (with low Latvian popuulation proportion)	Pu	Local news, opportunities, development. Published twice a week in Latvian and Russian.	Practical, opportuniites, loal interest stories	F, O, P
makroekonomika.lv/	A blog analysis the trends in economy development	PO	Expert analysis of macro trends by specialists from major banks	analytical	F, O, P
sievietespasaule.lv	A portal for women on „women’s” issues	PU	Produced by two individuals, claims to be visited by 100 000 visitors monthly	miscellaneous	F., O
lvportals.lv	The internet portal of the only official government newspaper in Latvia	PO	The place where laws and regulations get published and commented by experts	official	F, P
mammamunteti.lv	A portal on parenting, practical discussions and shared help initiatives	PU	Considerable popularity, just below major news portals	Miscellaneous, appears a bit sensationalist	F, O
medicine.lv	An informative portal of diseases and health and helth services in Latvia, opportunity to get online expert advice	Po	Provides official information on health related issues (stable, but moderate nomerb of visitors)	„ scientific” official	F, P
lat2.mixnews.lv	An internet portal, part of a media group, contemporary presentation	Pu	Content both in Latvian and Russian, rapidly growing audience; associated with a high profile bankers’ family	miscellaneous	F., O
nra.lv	A daily newspaper and an internet portal in Latvian, a bit sesnsationalist	Pu	Mostly read outside of the capital by people over 40; the readership is stable, if not high	patriotic	F, O, P
pareizs-uzturs.com	A portal on diets and healthy eating, apparently aimed at women; opportunity to ask questions to experts	Pu	Affiliations and readership unclear	„ scientific”	F
pietiek.com	A portal specialising in unmasking shady deals and unsavoury activities by state officials	PO/ Pu	Apparently privately funded, claims 800 000 hits a month. (In Latvin)	Uncovering „scandals”	F, O, P

providus.lv	A Think-tank portal with social-political debates, original investigative pieces (Latvian and English)	PO	Privately funded, its readership is decreasing owing to the similar profile of the newspaper IR	analytical	F., O., P
rimi.lv	Internet portal of one of the two major retail chains in Latvia; features sections Rimi Cares, healthy Lifestyle, Recpies, etc.	PU	Readership is uncertain. However the links of a retailer with healthy life advice are noteworthy.	Friendly, caring	F., O
saeima.lv	The official portal of Latvia's legislator	PO	The only official source of this kind.	official	Po
sieviesuklubs.lv	A portal for women, trying to become a social media; advice and news on beauty, health, heavy advertising, exp. from pharmacy	Pu	No data on its popularity, but appears to be very diverse and thriving (lots of advertising)	Miscellaneous; food is only tangential	F., O.
www.manasfinanses.lv	A research branch of Swedbank, communicating personal finance-related information	Sc	Major bank with a broad individual client base. Analytical materials on personal finances of population.	analytical	F., O, P
Tvnet.lv	A news internet portal	Pu	Claims to be the most visited internet portal in Latvian	Miscellaneous, often reports from regional press	F., O., P
valmiera.pilseta24.lv	A city portal maintained by the municipality	Pu	A major city, all local news	Miscellaneous, often commented from citizens	F., O., P
vegetarisms.lv	A portal popularising vegetarian diet; provides recipes, experiences of the public, philosophy	Pu	Appears quite marginal and with low traffic	biased	F., O.
Vides Fakti.	A TV programme on environmental issues	Pu	High viewer ratings.	Pro-environment	F., O., P
brivsnogmo.lv	The homepage of the leading NGO in fighting against GMOs in Latvia.	Po	Successful in attracting foreign donor funds and constant project activities. A bit marginal, locally.	Against GMO	F., O., P
lff.kompetences.lv	An internet portal of a national centre for community development (ex-LEADER)	PO	Nation-wide, a broad range of training programs and activities.	Local food issues quite prominent.	F., O., P.
ziedot.lv	A charity organisation (in affiliation with Swedbank) portal, where one can get news about the most pressing needs of vulnerable groups.	Po	Nation-wide, broad-range of activities, very visible presence, considerable donations from individuals.	Was and is very involved in the issue of food assistance.	F., O., P.
Latvijas Universitātes Raksti	An academic journal published by Latvia University. Journal	Sc	Journal has printed and web version (accessible for free to	Academically oriented and open to various	F.

	publishes issues representing all science fields.		everybody). It is the main academic journal of University of Latvia.	interpretations. Food is just one of the issues analysed in these journals.	
Latvijas Lauksaimniecības universitātes raksti	An academic journal published by Latvia University of Agriculture. Journal publishes issues concerned with issues studied in the university.	Sc	Journal has printed and web version (accessible for free to everybody). This is the main academic journal of the University.	Academically oriented and open to wide spectre of interpretations. Food and agriculture is rather significant topics for the journal.	F
RTU zinātniskie raksti	Branch of academic journals issued by Riga Technical University. Journals cover wide range of issues.	Sc	Journal has printed and web version (accessible for free to everybody). Main publication platform for the university.	Academically oriented publications covering mainly technical sciences. Food is marginal issue of the journal.	F.

* Sphere - Public – Pu, Policy – Po, Science – Sc
 Contents - Facts/oids, Opinions Policy Positions

ANNEX 2: MOST RELEVANT VULNERABILITIES

Vulnerability 1: Control and regulation of food systems

Name	Control and regulation of food systems
Description	Control and regulation indicate on interaction between regulating actors and the food systems. It illustrates the need to find a balance between overregulation of the various levels of food system; to find a way how to integrate various interpretations of the actors involved in food systems while securing everybody's rights and states common goals (including the need to moderate relations between international food chain regulation (for example EU regulations) and local market); to introduce control over the agro-food systems. Additionally, apart from the control function, in is expected that controlling bodies will introduce possibilities for local producers (for example, introduce regulations providing opportunities for smaller actors or linking smaller actors with local consumers).
Hazards	Several hazards are associated with this vulnerability. First of all lack of control may lead to sales or production of low quality products (sales of spoiled products, potentially harmful contents of industrial food). It can be an aspect that creates certain limitations for more efficient functioning of food chains (regulations may, for example, limit the possibilities of food waste use). Also, government institutions may cause the food system new challenges by following accepting certain agreements (as for example import ban of Russia's products).
Mechanisms	The introduced regulations are binding to all actors. However, needs, interests and interpretations of the actors involved in food chains differ. Thus the challenge is to balance the interests: promote the interests of producers and retailers while securing populations rights to access healthy and nutritious food. Furthermore, ethical standards of actors participating in food chain may differ. Therefore some actors might value the possibility to make quick profits higher than the possibility to obey the common food circulation regulations. For these cases state control system is crucial.
Exposure & Sensitiveness	Aspects that strengthens the hazards: <ul style="list-style-type: none"> - Industries search for higher profits; - High food prices and low average income; - Legislators lack of experience; - Lobby of big enterprises.
Assets	Consumer initiatives (as groups of parents), professional organizations (as doctors, dietologists), non-food governing bodies (as Ministry of Health) and non-governmental sector is becoming more active and more involved in food system structuring.
Groups	All actors involved in agro-food system
Activities	All practices associated with agro-food system
Outcomes	There are several aspects that may be influenced by the vulnerability (covering mainly access and availability of food). These are: <ul style="list-style-type: none"> - food prices; - power relations within food chain; - food quality; - opportunities for local producers;

Vulnerability 2: Power concentration in retail

Name	Power concentration in retail
Description	Power concentration in retail represents power relations across food chain. The vulnerability is represented through two sides: one side is concerned with consumers' opportunities to choose – the dominance of retail chains pushes out all the competing food chains which often means limited specter of offered products. Other side of the discussion stresses relations between food retailers and producers. Common interpretation suggests that un-proportional power relations end up in

	overall producer dependency on retailers (thus leaving the local food production systems vulnerable). Thus the vulnerability illustrates reduced possibility to choose, possible market dependency on just few actors and threats to national production systems.
Hazards	Power concentration in retail is main hazard. Additionally there are several other hazards as for example - low competitiveness of local producers and competing – alternative chains, globalization of actors and orientation towards global and profits (reduced responsibility) and convenience of supermarket (including discounts, cheapness).
Mechanisms	Consumer search for convenience shopping experience leads to food retail chain dominance. Mainly these food chains are global
Exposure & Sensitiveness	Consumer search for cheaper offer and low purchasing power.
Assets	Initiatives merging conventional and alternative food chains; alternative food chains; consumer support to local producers
Groups	All population – however, especially people with low income, rural inhabitants.
Activities	Food production; consumption practices
Outcomes	Reduced access possibilities; reduced product diversity

Vulnerability 3: Systems inability to support local producers

Name	Systems inability to support local producers
Description	<p>The loss of national food producers (both big and small) is presented as significant threat. In general, the question is associated with several issues: first, national enterprises are seen as a proof of economic development and future possibilities; second, national food producers are presented as warranty of food availability (national producers are seen in the light of self-sufficiency); third, local products are uncritically seen as better and more fitting for local consumer. Enterprises in general are presented as opposing to foreign producers.</p> <p>However, media is especially interested in small producers. In overall, small enterprises hold the same promise as described above. However, it is interpreted that small enterprises more pronouncedly represents issues associated with local producers. Additionally, small entrepreneurs are positioned as opposing to global actors involved in global chains</p>
Hazards	Main hazard associated with this vulnerability is low competitiveness of local producers. However, additionally we can mention globalization of local chains and orientation towards profitmaking.
Mechanisms	<p>In some cases it turns out that local producers are uncompetitive when compared to their global competition. In the same vein – it often turns out that small local producers are uncompetitive when compared to bigger national producers.</p> <p>Common interpretation suggests state should be more involved to raise competitiveness of local producers. Meanwhile, other opinion claims that low competitiveness has been caused by unprofessional policy making that has uncritically accepted foreign interests.</p>
Exposure & Sensitiveness	Short experience with free trade.
Assets	Emerging alternative food supply chains.
Groups	Food producers, indirectly consumers
Activities	Food production
Outcomes	Outcomes are mainly related to availability and access. In this case main outcome is lower levels

	of local food accessible in the market (and thus increased food dependency).
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Vulnerability 4: Unhealthy consumer choices and unsustainable food habits

Name	Unhealthy consumer choices and unsustainable food habits
Description	<p>This is a widely discussed vulnerability questioning the choices made by consumer and food knowledge consumers have. This is the main perspective used in the media to address consumer and consumers' position in FN systems and food chains.</p> <p>Primarily, vulnerability questions consumers' knowledge. The media discusses overall consumer knowledge and offers interpretations of what should be considered as healthy. Furthermore, it offers experts' interpretations on society's consumption habits. Meanwhile variety of alternative diets for various purposes is discussed thus supporting rather conflicting views what should be eaten.</p> <p>Apart from food knowledge, several other reasons for unhealthy consumption are offered. Some of the reasons given are: convenience of unhealthy choices; everyday rhythm of modern society; appeal (and strength of marketing) of modern products.</p>
Hazards	<p>Main hazard is poor overall dietary habits of population. Importance of consumers' inability to choose healthy products is made more pronounced by the low quality products that can cause future health problems, to spread of food related diseases.</p> <p>However, additionally one of the central hazards dominating the public discussion is children food consumption patterns. Kids are represented as group that is fully relying on society's protection and unable to make their own informed decision. Kids are the group most exposed and most vulnerable to appeal of unhealthy choices.</p>
Mechanisms	Lack of knowledge, interest, practice, opportunities lead to unhealthy food choices (diets). Unhealthy consumption can then lead to health problems.
Exposure & Sensitiveness	The vulnerability is strengthened by the loss of food knowledge caused by modern consumption. Furthermore, the consumption of these products strengthens the knowledge about the proper product properties (its shape, smell, taste).
Assets	<p>Some of the assets are:</p> <ul style="list-style-type: none"> - Programs and legislation ensuring free meals in schools; - Programs educating about healthy food consumption; - Wide representation of experts in food policy making.
Groups	All population; especially employed people with busy schedule, poor people, poorly educated part of population, children
Activities	Consumption practices... Including the ways how food is prepared at home.
Outcomes	Vulnerability should be mainly associated with access and utilization of food.

Vulnerability 5: Inequality of society – poverty

Name	Inequality of society – poverty
Description	It might be difficult for poor groups of the society to access healthy and nutritious food. These groups are exposed to threats posed by low quality food or unhealthy diets.
Hazards	Most of hazards are directly and indirectly related to people's income. Low income groups are exposed to low quality food with potentially harmful contents, they have poor food selection habits, and these groups are highly sensitive to food prices and are less food-educated. Because of this, these groups are more exposed to food related diseases.

Mechanisms	Income has direct and indirect ties with consumption. Obviously – income influences which products people can afford. Yet there are several indirect aspects as well – these groups tend to be less educated, most likely they are less aware of food related threats, and it is more difficult for people from these groups have lower opportunities to choose.
Exposure & Sensitiveness	<p>The problem is more pronounced because its cause lay outside the food supply systems. Furthermore, public discussions cannot agree how the problem should be interpreted. On the one hand, commentators agree that the most poor is a vulnerable group that should receive assistance. On the other hand, some actors claims that direct assistance would only deepen the problem. These actors suggest that the poor is used to social support and thus are just exploiting the system.</p> <p>Recent economic crisis have increased the economic inequality that even before the crisis was one of the highest in Europe. This has strengthened the communication gap between the different layers of society.</p> <p>Finally, most of discussions related to food quality are located in the part of society that is wealthier.</p>
Assets	<p>Food redistribution systems are a significant asset to overcome the vulnerability. Free school meals are one more instrument that can help to overcome the consequences of this vulnerability. Other social support systems play significant role as well.</p> <p>Additionally, access to allotment gardens and strong ties between rural and urban population is a significant support to overcome food insecurity.</p>
Groups	Poor in general, unemployed, single parents, homeless people, often – rural population
Activities	Consumption choices
Outcomes	In some groups raises stresses associated with food. In some groups raises food related health problems

Vulnerability 6: Insufficient requirements for product labelling

Name	Insufficient requirements for product labelling
Description	This vulnerability represents consumer inability to make informed decision. The media discussion identifies line of limitations current labeling system has. Media criticizes that product content descriptions are too small, that same ingredients can be called in various ways, some contents are masked under generalizations, etc. Furthermore, some articles claim that retailers might cheat with some parts of labelling (for example with expiration date).
Hazards	Insufficient labelling reduces possibility to make informed food decisions. In might be a way how harmful ingredients are masked.
Mechanisms	Even when consumers are educated, there are limitations that might reduce their possibilities to make informed food decisions. In most cases this represents the fact that labelling system has not caught up with consumer interest in product content. However, in some cases the problems with labelling emerge from deliberate deception.
Exposure & Sensitiveness	Producer lobby, limited controlling abilities
Assets	Controlling institutions, NGOs following the labelling practices, raising consumer awareness
Groups	All consumers
Activities	Government control over labelling activities. Additionally – private food labels.
Outcomes	Inbaility to choose the best products.

Vulnerability 7: Poorly planned land distribution

Name	Poorly planned land distribution
Description	This vulnerability represents difficulties to access land. Amount of agriculture land has diminished in last decades.
Hazards	Several hazards can be mentioned here: <ul style="list-style-type: none"> - over-exploitation of agricultural lands (erosion of lands) - shortage of agriculture lands
Mechanisms	There are several mechanisms – as uncritical policy supporting certain cultrue might reduce farmers access to land to cultivate other cultures. Or subsidies supporting certain land use practices might reduce such access. Or dominance of few big framers may reduce the possibilities of all surrounding small farmers.
Exposure & Sensitiveness	The exposure to this threat is cyclical. Often the problem originates in poor policy planning.
Assets	-
Groups	All farmers
Activities	Farming.
Outcomes	Mainly influences food availability

Vulnerability 8: Technologization of food production process

Name	Technologization of food production process
Description	<p>Technologization of food production process is perceived contradictory. There is significant discussion about the benefits greater use of possibilities offered by contemporary science could offer. Meanwhile, along the discussion about the benefits there is a fear of possibilities and unknown consequences technologies might cause. Media is keener to discuss the threats technologies pose.</p> <p>Media suggest that it is impossible to predict health consequences of the new products (GMO holds a significant part in this discussion). Furthermore, media suggest that the products originating from laboratories may lack nutritional value. Thus, although these products are significantly cheaper, they may not serve the purpose to healthy feed the population.</p>
Hazards	This vulnerability is mainly associated with potentially harmful contents of industrial food. However, the vulnerability is also strongly related to unhealthy diets and un-balanced nutritious intake.
Mechanisms	Search for cheaper and tastier products lead to full exploitation of possibilities offered by science. Thus, enterprises search for the way how to compete and how new products could be introduced yet in this process they are losing the main reason behind why people buy food – food nutritious content.
Exposure & Sensitiveness	FN system is highly exposed to this threat because it is common believe that technologization is a way to success and higher competitiveness. Furthermore, even in our analysis oppositional hazard were found that suggested that food industry is not efficient in adapting newest technological solutions.
Assets	Long tradition of local producers, family farms, emerging alternative food chains
Groups	All consumers

Activities	Influences production process
Outcomes	Mainly influencing access to certain products. However, have strong influence on utilization as well.

Vulnerability 9: Instability of global food markets (global food relations)

Name	Instability of global food markets (global food relations)
Description	<p>The vulnerability is mainly covering long debate about the trade relations to Russia. References to other global food market issues are rare. The discussion mainly covers questions concerning the development of local enterprises – Russia is seen as a major trade market of Latvia's goods. Russia is seen as a market that can help to strengthen local producers. However, its frequent mood shifts makes it quite unpredictable. Therefore, it is also seen as a possible threat to the strengthening of local producers.</p> <p>Apart from the major discussion about Russia's regional importance there are few other issues mentioned. And even when mentioned, there is absence of ongoing discussion. Thus even global markets are primary seen as a supplementary way how to discuss local. For example, global milk chains are discussed as an threat to local milk producers and opportunity to local farmers, global grain chains are discussed in the context of biggest grain co-ops, etc.</p>
Hazards	Trade bans is one of the most visible hazards discussed in media.
Mechanisms	Due to trade bans local producers are unable to access lucrative market.
Exposure & Sensitiveness	Historical ties with Russia are an aspect that strengthens the vulnerability. Furthermore, current ethnical split of population also encourages enterprises to collaborate with Russia (and vice versa).
Assets	<p>One often mentioned suggestion how enterprises should overcome the vulnerability is to search for new trade markets. Furthermore, current political ties with Western countries are presented as a mechanism splitting the ties with Russia.</p> <p>Finally, some groups suggest that over globalization poses some threats to local consumers. As indicated by separate small actors – producers' interest in big foreign markets leads to low quality products in small local markets. Thus, these actors hope that less possibilities in global market would force the producers and distributors to pay more attention to quality of products and services offered to local buyers (the comment was given to describe the offer available to rural population).</p>
Groups	Big producers, rural population
Activities	Reduced possibilities to export - thus reduced competitiveness of local entrepreneurs. This leads to overexposure to foreign products and possible bankruptcy of local enterprises. Yet – as was described under assets, it may lead to totally different outcomes.
Outcomes	Local producers might go bankrupt.

Vulnerability 10: Prevalence of animal diseases

Name	Prevalence of animal diseases
Description	<p>The vulnerability has been raised in the context of African swine fever. Media analyses the efficiency of states reaction to the disease, calculates the consequences of the fever and describes the overall trends of the spread of the fever.</p> <p>There are several main perspectives taken in these articles: first, the swine fever is discussed from the perspective of human health and healthy food; second; the media discusses future</p>

	possibilities of food producers and safety of food system; third, the media analyses states efficiency when dealing with these issues.
Hazards	Exposure to animal diseases.
Mechanisms	In media this is presented as an unpredictable vulnerability.
Exposure & Sensitiveness	Everybody might be highly exposed.
Assets	Experience and functional controlling institutions
Groups	Farmers, whole population
Activities	Competition for land
Outcomes	Farmers have difficulties when searching for agricultural land

Vulnerability 11: Climate changes caused by global warming

Name	Climate changes caused by global warming
Description	<p>Global warming is a contradictory field of discussions. On the one hand, global warming is seen as a source of climate instability and future loss of land. Furthermore, although just vaguely and inconsistently, media illustrates international reactions to global warming and reference global agreements on the matter. However, these discussions are abstract and distant. On the opposite side to these grim predictions lays rather romanticized vision of future where watermelons are grown in Latvia and where wine production could flourish. Thus the threat is recognized. Yet it is also seen as an opportunity.</p> <p>Finally, there is practically absent discussion about the causes of global warming.</p>
Hazards	Some hazards include unpredictable weather conditions, erosion of land, new regulations for production and agricultural practices need to adapt the species grown in the area.
Mechanisms	<p>Global recognition of the warming forces to adopt stricter regulations regulating agricultural and production processes. This may result in higher prices of the products.</p> <p>Global warming causes sudden weather changes changing the normal weather conditions. This influences yields and production practices of wanted species and may cause the need to search for new species.</p>
Exposure & Sensitiveness	Changes in climate might change characteristics of the seasons and this will cause changes in flora.
Assets	Quite extensive knowledge, what might change.
Groups	All of the society
Activities	Possible loss of productivity
Outcomes	Need to adapt to new environment.

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