



**SOLINSA**  
Support of Learning and Innovation  
Networks for Sustainable Agriculture

Agricultural Knowledge Systems In Transition :  
Towards a more effective and efficient support of Learning  
and Innovation Networks for Sustainable Agriculture

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# **WP4 Analytical Characteristics Report: Perspectives of Sustainable Agriculture**

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## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION.....</b>	<b>1</b>
<b>2</b>	<b>UNDERSTANDING CONCEPTS OF SUSTAINABLE AGRICULTURE .....</b>	<b>1</b>
<b>3</b>	<b>METHODOLOGY.....</b>	<b>5</b>
<b>4</b>	<b>RESULTS .....</b>	<b>12</b>
4.1	Interpretation of component scores .....	12
4.1.1	<b>Component 1: Alternative Advocates.....</b>	<b>13</b>
4.1.2	<b>Component 2: Sustainable Food Production .....</b>	<b>14</b>
4.1.3	<b>Component 3: Autonomous Rural Development .....</b>	<b>15</b>
4.1.4	<b>Component 4: Latvian Fruit.....</b>	<b>16</b>
4.1.5	<b>Component 5: Care Farmers .....</b>	<b>17</b>
4.1.6	<b>Component 6: Farmer Survival First .....</b>	<b>19</b>
4.2	Main overlap and differences between perspectives .....	20
4.3	Diversity of perspectives within LINSAs.....	22
4.4	Categorising LINSAs perspectives on sustainable agriculture.....	22
<b>5</b>	<b>DISCUSSION.....</b>	<b>26</b>
<b>6</b>	<b>CONCLUSIONS.....</b>	<b>27</b>
	<b>REFERENCES.....</b>	<b>28</b>
	<b>APPENDIX A: SHORT OVERVIEW OF SUSTAINABLE AGRICULTURE PERSPECTIVES PER LINSAs.....</b>	<b>30</b>
	<b>APPENDIX B TECHNICAL DETAILS OF THE SET-UP AND ANALYSIS OF Q METHODOLOGY STUDY .....</b>	<b>38</b>

## LIST OF FIGURES

Figure 1: Response grid .....	6
Figure 2: Overview of differences and overlap between LINSA perspectives.....	21
Figure 3: Categorisation of LINSA sustainability perspectives.....	24

## LIST OF TABLES

Table 1: Classification of sustainability discourses .....	3
Table 2: Classification of rurality discourses.....	4
Table 3: Overview of Q-sorts .....	7
Table 4: Typology of respondents .....	7
Table 5: Overview of statement scores per component.....	9
Table 6: Correlations between component scores (z-scores).....	20
Table 7: Classification of discourses on sustainable agriculture.....	23

## ABBREVIATIONS USED

<b>LINSA</b>	Learning and Innovation Networks for Sustainable Agriculture
<b>E B&amp;H</b>	Brighton and Hove Food Partnership, England
<b>E Perm</b>	Permaculture Community (Permaculture Association and the Land Project), England
<b>EU organ</b>	The European Organic Data network
<b>F RAD</b>	Réseau Agriculture Durable – Network for a Sustainable Agriculture, France
<b>F Charter</b>	Charter of Good Agricultural Practices in Livestock production, France
<b>G Women</b>	Bavarian Rural Women’s Association, Germany
<b>G DLG</b>	German Agricultural Association, Germany
<b>H G7</b>	G7 (Local Food Council of Gödöllő), Hungary
<b>H Nat</b>	The NATURAMA Alliance, Hungary
<b>I CVR</b>	Consorzio Vacche Rosse, Italy
<b>I Crisop</b>	Association for Solidary Economy Crisoperla, Italy
<b>L Biogas</b>	Biogas Production Network, Latvia
<b>L Fruit</b>	Fruit Growing Network, Latvia
<b>N Care</b>	Cooperative Boer en Zorg: Care Farmers in the Netherlands
<b>N Dairy</b>	Sustainable Dairy Farming, Netherlands
<b>S ACDF</b>	Association for the development of fodder production, Switzerland
<b>S Naturli</b>	Naturli Co-operative Cheese production, Switzerland
<b>Other Abbreviations</b>	
<b>NoP</b>	Network of Practice
<b>CoP</b>	Community of Practice
<b>AKS</b>	Agricultural Knowledge System
<b>AKIS</b>	Agricultural Knowledge and Innovation System
<b>SME</b>	Small or Medium Sized Enterprise
<b>NGO</b>	Non-Governmental Organisation

# 1 INTRODUCTION

The aim of this report is to investigate the different perspectives on sustainable agriculture and rural development that exist in some typical innovation networks working on different aspects of sustainable agriculture. These ‘Learning and Innovation Networks for Sustainable Agriculture’ (LINSA) operate on the principle of knowledge sharing and learning between farmers and other stakeholders and they can include farmers, consumers, NGOs, experts and local administrations, looking for alternative ways to produce food and contribute to rural sustainable development.

The SOLINSA project, (Support of Learning Innovation Networks for Sustainable Agriculture) aims to identify effective and efficient approaches for the support of successful LINSAs as drivers of transition towards Agricultural Innovation Systems for sustainable agriculture and rural development. How do such networks develop and operate in practice and how can policy instruments, financial arrangements, research, extension and education support them effectively? Within the SOLINSA project, eleven partner organisations located in eight different European countries (England, France, Germany, Hungary, Italy, Latvia, the Netherlands and Switzerland) have taken up the challenge to find some of the answers to this question by investigating 17 LINSAs.

This report is part of the Working Package 4 of the SOLINSA project in which these 17 case studies have been analysed and synthesised on different analytical characteristics: origin and function, scale, network integration, level of innovation, level of learning, governance and finally perspectives of sustainable agriculture. This report is limited to the analysis of one of these characteristics the different perspectives of sustainable agriculture in the LINSAs. The analysis and synthesis of the other LINSA characteristics can be found in the WP4 Synthesis Report (Deliverable 4.2a) and the WP 4 Analytical Characteristics Report (Deliverable 4.2b)

## 2 UNDERSTANDING CONCEPTS OF SUSTAINABLE AGRICULTURE

The concepts of sustainable development and rurality and their combination as either ‘sustainable rural development’ or ‘sustainable agriculture’ have a long history in the literature. In fact agriculture and food were prominently featured in the famous report ‘Our Common Future’ by the Brundtland Commission that popularised the concept of sustainable development (World Commission on Environment and Development, 1988).

Even though the concept of sustainable development has been taken more and more as one of the guiding frameworks for (international) policy, its operationalization into measurable units and concepts has remained problematic. Over the years the number of definitions and views on the subject has mushroomed (Robinson, 2004, Mebratu, 1998). There are two opposing views on the concept of sustainable development, views that are not unique to the sustainability debate but reflect a deeper division in social sciences regarding the role and place of science and knowledge in modern society. It is the debate between a deterministic and a more constructivist approach towards science. In the deterministic view, science tells

us something about the true nature of the real world. According to this view, questions of sustainability deal with our biophysical reality and the limits it poses to human activities (Meadows et al., 1992, Hueting and Reijnders, 2004). The other view is a more constructivist approach: scientific understanding is to a large degree socially constructed. Especially when it comes to complex sustainability problems as global warming it is difficult, if not impossible, to completely separate scientific knowledge from value judgements and political choices (Latour, 1993). According to this perspective, sustainability problems are socially constructed, and as a result of that, they are intrinsically subjective.

Applying the concept of sustainability to agriculture and rural development has met with the same problems. Although the concepts of ‘sustainable rural development’ or ‘sustainable agriculture’ may seem the same, in fact they each refer to a completely different set of ideas about agriculture and rural development, nature and landscape conservation and the role of the actors involved: farmers, citizens, government and others. It has therefore proven very difficult to come up with a single definition, let alone operationalization of these concepts that apply to all circumstances and all contexts.

Given the widely varying approaches and contexts of the different LINSAs that have been studied within the SOLINSA project a single definition and operationalization that does justice to the different social, geographical, institutional, environmental and economic contexts of the different LINSAs seems impossible to come up with. As Appendix A clearly illustrates, all 17 LINSAs have worked from a different view on sustainability: some more implicitly, others have an explicit view of sustainable agriculture that acts as a guiding vision. However, in all cases, their views depend on their own local context and its historical geographical development, the sector the LINSA is operating in and the specific actor networks that make up the LINSA.

We have therefore chosen to take the constructivist perspective, using discourse analysis to investigate the different perspectives and values lying behind the different definitions and comparing them in a systematic way. Here, we will define a discourse as the shared language groups of people have in common, or formulated differently: ‘*a discourse is an organised set of social representations, the terms through which people understand, explain and articulate the complex social and physical environment in which they are immersed*’ (Frouws 1998).

As a starting point for our analysis we take the work of John Dryzek (1997) who analysed the concept of sustainable development as a particular environmental discourse (see Table 1).

**Table 1: Classification of sustainability discourses**

		Attitude towards industrialisation	
		<i>Radical</i>	<i>Reformist</i>
Place of the environment	Imaginative (integrated)	“Green radicalism”	“Ecological modernisation”
	Prosaic (separated)	“Survivalism”	“Problem solving”

(adapted from Dryzek, 1997, page 14)

Dryzek’s classification of environmental discourses is based on two elements: (1) the extent of departure from the (dominant) industrialist thinking and (2) the type of assessment of the political-economic situation.

The departure from the industrialist discourse can be reformist or radical. The first means that only some of the negative aspects of industrialisation need to be fixed or mitigated, while the second is based on the belief that the current earth system’s health is precarious and the limits to the earth’s ecological carrying capacity have already been crossed, requiring a large-scale intervention. The second dimension of Dryzek’s classification is concerned with perceptions of the political-economic situation and the place of the environment therein. Prosaic discourses see environmental problems as things that require action; however they do not require a new kind of society. In contrast, imaginative discourses seek to completely redefine the current situation. Environmental problems are seen as an intrinsic problem of the way modern societies are organised and in order to solve these complex environmental problems, the structure of society as a whole has to be re-organised. Existing societal structures are subject of debate and win-win solutions are sought to change them. In Dryzek’s original classification, sustainability was labelled as an environmental discourse that seeks imaginative solutions to environmental and societal problems, without completely rejecting the industrial structure of modern society. Nowadays the sustainability cloak has been claimed by the three other environmental discourses. In fact, the distinctions that Dryzek makes are equally applicable to these broader sustainability discourses as well and these distinctions therefore remain useful.

The concepts of the countryside, rural development and agriculture have also been studied using discourse analysis. Jaap Frouws distinguished three very broad agricultural and rural discourses: the ‘agri-ruralist discourse’, the ‘utilitarian discourse’ and the ‘hedonist discourse’ (Frouws, 1998). In Table 2 an overview of these different rurality discourses.

**Table 2: Classification of rurality discourses**

	<b>Ontology</b>	<b>Agency</b>	<b>Motivation</b>	<b>Natural relationships</b>
	<i>What entities exist / are focused on ?</i>	<i>Who has the principal capacity to act?</i>	<i>Primary reasons for action?</i>	<i>Primary relationship between entities</i>
<b>Agri-ruralist</b>	Farmers (and their family)	Agricultural sector and the state	Traditional values	Farmer as custodian of nature and landscape
<b>Utilitarianist</b>	Consumers and producers	Market parties: Enterprises and local governments	Material self-interest	Market relations, Nature and landscape only as production values
<b>Hedonist</b>	Tourists, city dwellers, animals	People in networks	Pleasure seeking, self-fulfilment	Nature and biodiversity have intrinsic value.  Mutual agreement

*(adapted from Frouws, 1998)*

These three rurality discourses also provide three distinct visions of sustainable agriculture and sustainable rural development; a vision that more or less reflected their original starting point. The discourses may therefore all agree that there is a need for a more sustainable agricultural sector, while disagreeing on what this entails (Hermans et al., 2009).

In the remainder of this report we will use the general sustainability discourses of Dryzek with the three agricultural and rural discourses identified by Jaap Frouws as a basis to analyse the different discourses on sustainable agriculture and rural development that characterises each LINSAs .

### 3 METHODOLOGY

In order to rise above the particularities of the different LINSAs contexts and come up with a systematic characterisation of the discourses of sustainable agriculture and rural development, we have used Q-methodology. Q-methodology is an increasingly popular method to systematically elicit individual perspectives and to analyse the overlap and differences between them using factor analysis (Brown, 1980, McKeown and Thomas, 1988).

Early applications of Q-methodology in rural research focused on identifying the different perspectives of groups of farmers, for instance identifying their different goal and management styles (Fairweather and Keating, 1994) or their views on environmental issues (Davies and Hodge, 2007). Later, the perspectives of other rural actors were also included. Zografos (2007) investigated rurality discourses using Q-methodology in Scotland, focusing specifically on actors in the network of Scottish Developments Trusts. In Appendix B a full account of the methodology is available where the different steps and research decisions will be explained. In the following sections we will limit our discussion to the most important characteristics of the set-up of the study and the interpretation of its results.

A selection of 50 statements was made dealing with different aspects of agriculture, rural development and sustainability (for an overview see Table 4). It is important to note however, that some of the LINSAs operate on the intersection of different sectors, for instance the Dutch Care Farmers LINSAs who combine agriculture and health care. Their view of sustainability is likely to be broader than just the agriculture and rural development statements that have been included in the Q-sample. This is a disadvantage of the study, but this is unavoidable if the goal is to compare different perspectives with each other.

Respondents were asked to sort these 50 statements on a grid containing 50 cells (Figure 1), ranging from -4 (most) disagree with to +4 (most) agree with. This activity is called Q-sorting and the result of this activity is called a Q-sort. As is common in Q-methodology the grid forces respondents to sort the statements in a fixed distribution: allowing the least amount of statements (2) in the most extreme categories (in this case +4 and -4) in order to find the statements that characterise the perspective the most. Administering the statements has been done in two different ways. Some SOLINSA researchers opted for setting-up their Q-sort over the internet using the FlashQ programme (Hackert and Braehler, 2007), while others have done a manual Q-sort with the statements printed on paper cards. Data gathering took place between May and August 2013.



**Table 3: Overview of Q-sorts**

LINSA	Method used	Total respondents	Female	Av. Age
S ACDF	FlashQ	5	1	47
S Natürli	Manual	6	5	NA
F Charter	FlashQ	5	2	35
E B&H	Manual	5	2	58
E Perm	Manual	5	2	40
H G7	FlashQ	5	2	40
H Nat	FlashQ	5	4	39
N Care	Manual	7	1	52
N Dairy	Manual	10	0	46
L Fruit	Manual	5	3	NA
I Crisp	FlashQ	6	4	48
EU organ	Manual	5	2	37
<b>TOTAL</b>		<b>69</b>	<b>27</b>	<b>44</b>

Within a LINSA different groups collaborate and they are mutually engaged with common goals for sustainable agriculture and rural development - cooperating, sharing resources and co-producing new knowledge by creating conditions for communication. A LINSA is therefore typically composed of different people who represent different types of organisations. Respondents were thus categorised according to the type of organisation that they represent within the LINSA (see Table 4). The classification was very broad and not very exact, but the idea is that if a certain category of respondents can be found to share a common perspective, the information on their background can already help to make an interpretation of their shared view.

**Table 4: Typology of respondents**

Researcher	Farmer	Consultant	Broker/ extension worker	Civil servant	SME	NGO	Schools	Farmer union
15	19	7	12	12	6	6	6	1

*Respondents could be placed in more than one category.*

Data analysis was performed using PQMethod (version 2.33) and R (version 3.0.0; (R Development Core Team, 2008). The first program is specifically designed to analyse data generated by Q-sorts (Schmolck, 2012). A principle component analysis (PCA) was executed to rearrange the data by identifying components and ranking them according to the amount of variance that they explain of the original data. The subsequent data reduction is done by

choosing an appropriate number of components to retain for further analysis and discarding the rest. For pragmatic reasons we based our decision on a number of criteria, such as the resulting correlations between the final z-scores (not too high), the amount of variability explained (as high as possible), the number of 'defining sorts' for each component (as high as possible) and the amount of respondents whose view is not captured in any component (as low as possible). This resulted in the inclusion of six components for further analysis.

The Q-sorts of the people who load significantly on a specific component were used to calculate a weighted average for the statements. The higher the load of a person's Q-sort, the heavier it was counted in the weighted average. Since not all components contain the same number of significant respondents, the statement factors are normalised by calculation of a standard z-score for the purpose of comparing them. Table 5 presents the resulting z-scores for all the 50 statements together with their corresponding position on the response grid (from -4 to +4) for each of the six components.

**Table 5: Overview of statement scores per component**

No.	Statement	PC 1		PC 2		PC 3		PC 4		PC 5		PC 6	
		z-score		z-score		z-score		z-score		z-score		z-score	
st.1	The prospects of the agricultural sector are good. Farming is a worthwhile lifestyle - you are your own master	-0.009	0	1.118	2	-0.131	0	0.654	1	0.417	1	<b>-1.792</b>	<b>-4</b>
st.2	Farms nowadays cannot survive with the actual product prices. Farmers need to develop other activities, or even get a second job.	-0.241	-1	<b>-1.732</b>	<b>-4</b>	-0.589	-1	-0.828	-1	-0.075	0	<b>1.686</b>	<b>3</b>
st.3	Government should steer more clearly between different goals. There is a need for a unifying vision, and more decisive decision making.	0.265	0	0.415	1	0.335	0	<b>-1.361</b>	<b>-3</b>	<b>-0.848</b>	<b>-2</b>	-0.038	0
st.4	There are always new regulations and it's not possible to comply to all of them. Administrative work requires more and more energy.	0.088	0	-0.030	0	1.289	3	0.282	0	1.345	3	1.363	3
st.5	The biggest problem is that the perception of consumers does not correspond with the reality of agricultural production.	-0.212	-1	0.000	0	0.021	0	1.465	3	<b>0.616</b>	<b>1</b>	1.948	4
st.6	Transparency of production is important. You should be able to visit a farm at all times.	<b>-0.097</b>	<b>0</b>	0.631	1	-1.376	-2	1.072	3	<b>-0.484</b>	<b>-1</b>	-1.742	-4
st.7	The competitiveness of farmers could be enhanced by certificates, e.g. for sustainable production.	-0.299	-1	0.178	0	-0.219	-1	<b>-1.997</b>	<b>-4</b>	0.327	0	<b>-1.406</b>	<b>-3</b>
st.8	Diversification and part-time farming stabilize the agricultural sector and increase the attractiveness of rural areas	0.213	0	-0.924	-2	<b>1.290</b>	<b>3</b>	0.499	1	0.347	0	-0.981	-2
st.9	You don't want to depend completely on foreign countries for your national food production.	1.570	3	1.626	4	1.027	2	<b>-0.860</b>	<b>-1</b>	1.220	2	1.515	3
st.10	You cannot always apply new technologies directly to local conditions, you have to adjust a lot	0.915	2	0.654	1	<b>-0.194</b>	<b>-1</b>	<b>1.675</b>	<b>3</b>	0.611	1	0.724	1
st.11	Intelligent management can partly substitute the need for new technologies	0.945	2	1.219	2	-0.177	-1	-0.697	-1	0.855	2	-0.193	-1
st.12	It will become more and more difficult to find new niches for agricultural products	-1.292	-3	-0.413	-1	-1.440	-3	<b>1.008</b>	<b>2</b>	-0.472	-1	-1.097	-2
st.13	Consumers want animals reared to a high welfare standard and grown in a happy environment.	-0.169	0	0.481	1	0.780	1	<b>-1.675</b>	<b>-3</b>	-0.431	-1	0.451	1
st.14	Retailers have a lot of power, but they still have a very limited interest in sustainability.	0.911	2	-0.346	-1	0.489	1	0.561	1	<b>1.704</b>	<b>4</b>	-0.145	0
st.15	Sustainability means that your child is eager to take over the farm.	-1.076	-2	-0.814	-2	<b>-1.924</b>	<b>-4</b>	-0.902	-2	<b>0.669</b>	<b>2</b>	-1.363	-3
st.16	The long term perspective is the most important, even if that goes -for the moment- at the expense of profits.	1.590	4	1.466	3	0.008	0	-0.228	-1	<b>-0.772</b>	<b>-2</b>	-0.183	0
st.17	Sustainability is connected with stewardship, you have to treat everything with respect.	<b>2.131</b>	<b>4</b>	1.095	2	0.968	2	0.482	1	1.062	2	-1.273	-2
st.18	There is no future in bulk production. Farmers should be motivated to produce quality instead of quantity.	0.032	0	-1.578	-3	1.041	2	0.261	0	-1.889	-3	0.928	2
st.19	Government should ensure 'a level playing field' and then leave entrepreneurs alone.	-1.236	-2	-1.090	-2	-0.022	0	0.207	0	0.448	1	-0.882	-2

**Table 4: Overview of statement scores per component (continued)**

st.20	Local entrepreneurs engage in innovative projects because of the urgent economic situation in rural regions. State support hereby is not needed.	-1.540	-3	-1.043	-2	-1.780	-3	-0.982	-2	-1.283	-3	-0.495	-1
st.21	Management and entrepreneurial skills are lacking in the primary sector.	<b>-0.679</b>	<b>-1</b>	-1.365	-3	-1.409	-2	<b>-0.243</b>	<b>-1</b>	-1.717	-3	<b>1.300</b>	<b>3</b>
st.22	We have to seek our prospects in creating economies of scale. The basic principle remains efficiently using labour and mechanisation.	<b>-1.628</b>	<b>-3</b>	0.763	2	0.135	0	0.702	2	<b>-0.888</b>	<b>-2</b>	0.312	0
st.23	Innovation should take place by using the synergies between agriculture and other sectors	0.485	1	1.270	3	1.422	3	-0.067	0	0.586	1	-0.530	-1
st.24	Linking consumers and producers directly, for instance through farmers markets, is one of the best ways to improve local food supply.	<b>1.404</b>	<b>3</b>	-0.393	-1	0.705	1	0.141	0	-0.078	0	0.762	2
st.25	One of the most important ambition is the re-enforcement of the agricultural sector for global competition.	-1.705	-3	<b>-0.025</b>	<b>0</b>	-1.442	-3	-1.597	-3	-1.136	-2	-0.780	-1
st.26	New technology will increase productivity and competitiveness on the world market.	<b>-1.192</b>	<b>-2</b>	<b>1.097</b>	<b>2</b>	-0.140	0	-0.115	-1	-0.183	0	<b>0.493</b>	<b>1</b>
st.27	internet based networks (Facebook, twitter, e-mail lists) will be important instruments for data exchange	0.321	1	-0.168	0	-0.147	0	-0.834	-1	0.612	1	-0.513	-1
st.28	There will be a selection of agricultural activities by spatial efficiency: land prices will be leading.	<b>-1.014</b>	<b>-2</b>	0.012	0	-0.209	-1	0.083	0	-0.619	-1	<b>1.035</b>	<b>2</b>
st.29	Demand in the organic sector will continue to grow at a higher rate than in other food sectors	0.363	1	-1.507	-3	-0.413	-1	-1.134	-2	-0.267	-1	0.433	1
st.30	The key for sustainability lies with consumers.	-0.192	0	-0.160	0	-0.179	-1	<b>0.591</b>	<b>1</b>	<b>1.889</b>	<b>4</b>	<b>-0.799</b>	<b>-2</b>
st.31	Whatever sustainability ambitions are formulated, in all cases cost price will be the most important aspect.	-1.957	-4	0.612	1	-1.846	-3	<b>0.077</b>	<b>0</b>	0.995	2	<b>1.977</b>	<b>4</b>
st.32	Certificates of sustainable production can replace some of the existing environmental laws and regulations	<b>-0.509</b>	<b>-1</b>	0.590	1	<b>-2.034</b>	<b>-4</b>	<b>-1.294</b>	<b>-2</b>	0.542	1	<b>-0.070</b>	<b>0</b>
st.33	Innovation is an integral part of sustainable production because it can improve ecological, economic, or social effects)	1.204	2	1.805	4	1.509	4	<b>-0.917</b>	<b>-2</b>	0.617	1	0.985	2
st.34	Medium-sized and diversified local operations are beneficial, because they provide employment and development of human resources	1.040	2	0.274	0	0.522	1	0.940	2	0.126	0	0.154	0
st.35	Change is needed in agriculture, otherwise agriculture may disappear.	-0.326	-1	-1.055	-2	-0.781	-2	<b>0.670</b>	<b>2</b>	<b>-2.390</b>	<b>-4</b>	-0.629	-1
st.36	Funding mechanisms are made for big projects and don't help the smaller ones	-0.319	-1	-1.246	-3	-0.879	-2	-0.441	-1	-0.009	0	-0.179	0
st.37	Government should actively protect regional brands, otherwise imported goods are being sold as if they were locally produced	-0.114	0	-0.373	-1	0.901	1	1.420	3	-0.594	-1	0.970	2
st.38	Big cities don't pay enough attention to their own backyard, the countryside.	0.465	1	0.321	1	0.364	1	0.091	0	-0.083	0	0.121	0
st.39	There is little trust and co-operation between actors in rural development.	-0.196	-1	-0.829	-2	-0.107	0	0.035	0	-0.637	-2	-1.165	-2

**Table 4: Overview of statement scores per component (continued)**

st.40	Landscape has a value that you should try to market.	<b>-0.696</b>	<b>-2</b>	0.196	0	0.617	1	0.485	1	<b>1.224</b>	<b>3</b>	<b>-1.539</b>	<b>-3</b>
st.41	Recreation and tourism are very important. A good relationship between cities and rural areas will generate new chances.	0.763	2	0.635	1	0.940	2	0.571	1	1.186	2	<b>-0.106</b>	<b>0</b>
st.42	For the preservation of rural values, more resources and more autonomy should be given to the rural communities.	0.692	1	-0.338	-1	<b>1.723</b>	<b>4</b>	0.907	2	-0.559	-1	-0.125	0
st.43	The ambition for the future has to be increasing animal welfare in husbandry.	0.498	1	-0.349	-1	0.388	1	<b>-1.684</b>	<b>-4</b>	-0.331	-1	-0.581	-1
st.44	You can't solve all problems with new technology.	1.434	3	1.319	3	0.967	2	<b>1.992</b>	<b>4</b>	1.446	3	1.237	2
st.45	With land shrinkage there is a push towards intensification, which can be dangerous.	0.612	1	-0.374	-1	-0.487	-1	<b>2.191</b>	<b>4</b>	<b>-1.427</b>	<b>-3</b>	0.661	1
st.46	Regional branding will play a more important role in the future	0.146	0	-0.215	0	<b>1.404</b>	<b>3</b>	0.352	1	-0.129	0	0.633	1
st.47	Sustainability can be improved through relationship between farmers and consumers.	1.235	3	0.696	2	1.021	2	<b>0.024</b>	<b>0</b>	1.255	3	0.665	1
st.48	Organic production cannot fulfil the demand for food, neither now nor in the future	<b>-2.242</b>	<b>-4</b>	<b>1.475</b>	<b>3</b>	<b>-1.341</b>	<b>-2</b>	<b>0.779</b>	<b>2</b>	<b>0.154</b>	<b>0</b>	<b>-0.759</b>	<b>-1</b>
st.49	Scale increases and being sustainable is a contradiction	-0.868	-2	<b>-2.878</b>	<b>-4</b>	-0.777	-2	-1.056	-2	<b>-2.016</b>	<b>-4</b>	-1.421	-3
st.50	The interests of women are still underrepresented in the agricultural sector	0.485	1	-0.705	-1	0.178	0	-1.303	-3	-0.936	-2	0.435	1

*First column gives the z-score; second column gives the corresponding position the statement receives on the response grid. Bold numbers indicate a 'distinguishing statement'*

## 4 RESULTS

### 4.1 Interpretation of component scores

Using the information from Table 5 we have reconstructed the six Q-sorts that typify the six different perspectives and the positions the 50 statements take on the response grid for each of them. Below, the typical sorting of the statements for each of the six components will be analysed and the “distinguishing statements”. A distinguishing statement indicates that these statements are placed at a unique position on the sorting grid, compared to the other five components (at the  $p < 0.05$  level). These statements are thus the most indicative of the unique perspective captured in the component. However, it is important to note that the other statements also contain information that is useful for the interpretation of the factor scores, even though they may also be present in the other perspectives to a certain extent. We used both the distinguishing statements and any relevant other statements for the interpretation of the component scores.

It is important to note that the six components not only provide information on the sorting of the statements within each perspective, but also give the origin of the respondents (that were used to calculate the weighted average for each component). This information also provides useful information that helps with the interpretation of the components.

Each component will thus be described below based on its composition and the typical sorting of the 50 statements of the grid. To be able to follow our interpretation we will refer to the specific statement that was included in the Q-sort by giving its number in brackets. Often we will interpret a particular statement in conjunction with some other statements that are placed in the vicinity of the statement. It is possible therefore entirely that the interpretation of the meaning of the same statement differs per component. A concept interpretation of the different components was discussed at the SOLINSA project meeting in Riga (September 2013). At this meeting the components were labelled as well. Some of the individual components were later discussed with some of the SOLINSA researchers most familiar with the LINSA and the respondents that make up a certain component. Based on their observations, the interpretations were further refined.

### 4.1.1 Component 1: Alternative Advocates

		-4	-3	-2	-1	0	+1	+2	+3	+4	
<b>Composition:</b>		48	25	19	21	30	27	41	47	17	
E Perm	5	31	22	26	32	13	29	14	24	16	
EU Organ	4		20	15	35	37	38	10	44		
E B&H	5		12	28	36	6	50	11	9		
I Crisop	6			49	7	1	23	34			
N Care	3			40	2	18	43	33			
N Dairy	4				5	4	45				
S Natürli	2				39	46	42				
H G7	3					8					
H Nat	1					3					
S ADCF	2										
<i>Negative: N-Dairy</i>	1										

*See Table 5 for the corresponding statement for each number; yellow numbers indicate a "distinguishing statement"*

This component represents the largest number of respondents (36 in total) who come from 10 of the 12 participating LINSAs. All the English respondents from E Perm LINSAs and the E B&H LINSAs as well as all the respondents for the Italian Crisoperla LINSAs and most of the respondents from the EU Organic Data Network load significantly on this component.

#### *Interpretation of the typical Q-sort*

When we look at the statements that score very high in this perspective, we already get a clear view what the people who share this perspective find important: a long term view (16), personal stewardship and 'treating everything with respect' (17). Relationships are important: direct contact between (local) consumers and producers (on farmers markets) is a good idea (24, 47). It is about multifunctional/ small scale farming within local circumstances (34). Retailers will have to become more involved, they can do more to promote local produce (14). All these issues come together in respondents (strong) preference for organic agriculture (48).

Economies of scale (22), technology (44, 26) and/ or land prices (28) are not the most important issues that will guide the direction of agriculture in the future and this perspective also does not care about short term issues like productivity and (global) competitiveness (25, 26), cost price (31). Respondents thus seem to reject the utilitarian market discourse as a solution, hence their negative evaluation about the 'market value of landscapes' (40) and the limited role of the government as only a market regulator (19).

They hold a somewhat critical view of technology and innovation. New technology cannot solve all problems (44), however innovation can help sustainability if it smartly combines the People, Planet, Profit approach (33). Intelligent management can partly substitute the need for new technology (11) but it has to be adapted to local circumstances (10).

It seems that this perspective is a typical 'artisanal farmers' perspective'. A negative way to formulate this is to say they are more like gardeners than farmers: they do not associate themselves with the typical 'farming as a life

style' idea (1) nor with the idea of family farms (15). Moreover production issues like transparency of production (6), production certificates (32) and management skills (21) that are associated with more industrial types of agricultural production; are not recognized in this perspective. Somewhat surprising is the low/indifferent scores of animal welfare issues (13, 43) but this could be explained by the fact that the LINSAs most represented in this component are less likely to keep livestock.

### 4.1.2 Component 2: Sustainable Food Production

		-4	-3	-2	-1	0	+1	+2	+3	+4
Composition:		49	18	19	50	46	38	47	23	9
N Dairy	6	2	29	35	12	27	3	22	44	33
F Charter	2		21	20	24	30	13	17	16	
S Natürli:	1		36	8	45	4	32	26	48	
N Care	1			39	37	25	31	1		
S ADCF	1			15	43	5	6	11		
E B&H	1				14	28	41			
I Crisop	1				42	7	10			
Negative: H-G7:	2					40				
						34				

*See Table 5 for the corresponding statement for each number; yellow numbers indicate a "distinguishing statement"*

This is the second largest component representing 15 LINSAs respondents; half of whom are associated with the Dutch sustainable dairy LINSAs. The others are evenly distributed over the different LINSAs. Some respondents affiliated with a research institute or university can also be found here. Two of the Hungarian participants from the G-7 LINSAs are loading negatively, indicating that they actually reject this perspective.

#### *Interpretation of the typical Q-sort*

Innovation and food production take central stage in this perspective. Innovation is an integral part of sustainable production because it can improve economic, ecologic or social effects at the same time (33 & 23). However, the emphasis lies on the words 'production' and 'scale' (22, 49). Bulk production is not viewed negatively (18). In general technology is viewed positively, although within some limits (11, 26). Technology can improve productivity and competitiveness on the world market (26) and that is important because dependency on other countries should be avoided (9). At the same time organic agriculture is rejected as well: firstly because it just cannot produce enough food (48), and secondly its market prospects seem fairly limited (29).

These respondents have a lot of (self) confidence and are not afraid of the future: from their point of view both the current situation (2) as well as the prospects of the sector are good (1). Problems finding new niches (12) neither the need to further strengthen the sector are recognized (25) as concerns. Change is therefore not really necessary (35).

Sustainability is connected to personal stewardship (17) and to the long term perspective of their farm, which is considered to be very important (16).

These respondents are first and foremost concerned with food production; the importance of cities (38), landscape (40), regional branding (46), are not acknowledged. Interestingly, consumers are not an issue either. All statements dealing with consumers (transparency: 6, 5, 14; retailers: 30, 24) are placed in one of the ‘neutral’ categories. Animal welfare is also not an issue (13, 43). Multifunctional agriculture is not really an option, while diversification, getting a second job, is viewed rather negatively (8).

### 4.1.3 Component 3: Autonomous Rural Development

		-4	-3	-2	-1	0	+1	+2	+3	+4
Composition:		15	12	49	11	3	37	18	23	42
S Natürli	2	32	25	35	30	50	13	9	46	33
H Nat	2		20	36	10	22	24	47	8	
EU Organ	1		31	48	28	5	40	17	4	
S ADCF	1			6	7	16	34	44		
F Charter	1			21	29	19	14	41		
N Care	1				45	39	43			
I Crisop.	1				2	1	38			
H G7	1									
Negative: H - Nat	1					26				
						27				

*See Table 5 for the corresponding statements for each number; yellow numbers indicate a "distinguishing statement"*

This component has 11 respondents loading significantly on it; half of whom are from the Swiss and Hungarian LINSAs. It is interesting that although two people of the Hungarian Naturama LINSA score significantly positive on this factor, there is still one person of the same LINSA who rejects this perspective.

#### *Interpretation of the typical Q-sort*

Statement 42 highlights the core of this perspective: it is about regional and rural development. There is a belief that more autonomy should be given to regions and that regional branding is an important trend for the future (46). The rules and regulations of the national government do not seem to fit the region: it is impossible to comply to all these regulations (4) and therefore the autonomy of the region is stressed. Views on the role of government are therefore mixed: on the one hand government regulations are a burden. However, there is a small role for the protection of regional brands (37). Other government roles (3, 19) are not recognised. In this regard, a very low score for the certification issues (32) can be related to their negative associations with regulations, regardless whether they come from the government or not.

Neither the farmer nor their families take central stage (15) . Farmers are just one of the regional partners, but the concept of sustainability and innovation demand the involvement of other sectors (23), in addition to consumers (47)

and tourists (41). Respondents have an integral view of sustainability that combines the ecological, economic and socio-cultural aspects (33). Diversification and part-time farming are not looked at from the perspective of the farmer, but from the perspective of the region, They can be important solutions because they can benefit a region (8). Organic agriculture can be an important tool, but it is not seen as important as the “Alternative Advocates” of component 1 have it.

The other most significant distinctions between the Alternative Advocates and the Autonomous Rural Developers stems from the difference between their perspective on farming and farms and on the broader rural development perspective. There is a personal commitment to sustainability from the Alternative Advocates who stress the importance of a long term perspective, especially at the scale of the farm. For the Rural Developers this is not an issue, because they are more interested in the regional scale.

#### 4.1.4 Component 4: Latvian Fruit

		-4	-3	-2	-1	0	+1	+2	+3	+4
		43	50	15	26	4	1	12	10	45
		7	3	33	16	18	30	34	5	44
Composition:			25	20	21	19	41	42	37	
L Fruit	4		13	49	36	24	14	48	6	
S Natürli	1			29	11	38	8	22		
Negative: EU- Organ	1			32	2	28	40	35		
					27	31	17			
					9	39	46			
						47				
						23				

*See Table 5 for the corresponding statements for each number; yellow numbers indicate a “distinguishing statement”*

This is the fairly unique perspective that is made up mostly by the respondents from Latvian Fruit LINSAs.

##### *Interpretation of the typical Q-sort*

The competition for scarce resources, in this case land, is of particular concern for them. Their sector is in a tough spot: finding new niches is difficult (12) and change is necessary (35). However, organic agriculture is not really a solution (48, 29). The perspective emphasises local conditions (10) and regional brands (37) as potential solutions. They seem to be proud of rural values and the farmer’s life style (1) focussing on the primary sector. Other statements that favour the local and regional level also receive a positive evaluation: the preservation of rural values and regional autonomy (42) and medium sized and diversified SME for the stability of the regional economy (34). However this does not mean that scale increases are viewed negatively; on the contrary: economies of scale, labour and mechanisation are the realities of agricultural production and remain important (22, 49), at least on the national level because global competition is not the ambition (25)

Issues that have to do with the potential collaboration with other sectors (23, 47) or directly linking consumers and producers (24), trust (39), the potential role of big cities (38) landscape (40), recreation and tourism (41) are not really recognised. Diversification (8) is also not an issue.

Consumers are viewed ambivalently. One of the main problems is the distorted image consumers have of the reality of agriculture production (5). Openness and transparency of production (6) is therefore important. This does not only apply to consumers, but also about keeping controlling health plant authorities and retail chains happy and the production processes transparent with regard to quality and health. The role for consumers in sustainability is not really recognised (30). It seems that in this perspective consumers are seen as behaving with a lot of hypocrisy, especially when it comes to the issue of animal welfare (13). A possible explanation of the low scores for the issue of animal welfare (13,43) is that they are seen as emblematic for consumers who do not really understand the reality of agricultural production (5). Animal welfare can seem like an exaggerated, 'fake' concern, because consumers care mostly for low prices and do not have enough recognition of the labour behind growing a local fruit variety.

Overall, many of the statements about sustainability issues are not recognised (16, 47, 30, 31). Innovation is not really embraced as an opportunity (33, 26, 23, 44) which can be related to the type of 'retro-innovation' they are pursuing within their LINSAs. They are not against innovation as such, but it is not the only path to sustainability. Other, more organisational/institutional changes like certificates are really viewed with a lot of suspicion and this is a result of some bad experiences with the introduction of new certificates that did not catch on. They were not good for competition and not good for sustainability (32, 7).

#### 4.1.5 Component 5: Care Farmers

		-4	-3	-2	-1	0	+1	+2	+3	+4
		49	45	39	29	8	33	9	44	30
		35	21	16	43	7	5	41	4	14
			18	3	13	48	27	17	47	
Composition:			20	22	12	34	10	31	40	
N Care	4									
E B&H	1			50	6	36	23	11		
N Dairy	2			25	42	2	32	15		
EU Organ	1				37	24	19			
Negative: I Crisop	1				28	38	1			
						46				
							26			

See Table 5 for the corresponding statements for each number; yellow numbers indicate a "distinguishing statement"

This component consists of 9 persons: some of them are farmers, but there are also some respondents affiliated with a research institute, a consultancy agency and an NGO. This component can be expected to capture a Dutch perspective

because 6 persons originate from one of the two Dutch LINSAs. The respondents of the Dutch Care Farmer LINSA are especially well represented in this component.

#### *Interpretation of the typical Q-sort*

This is not a perspective that deals directly with agricultural production. Statements that are somewhat related to issues of food production fall into the category of -1, 0 and +1 on the sorting grid and therefore don't play an important role in this perspective. Typical issues like consumer perception of production (5), organic production of food (48), transparency (6), competitiveness of farmers (7), product prices (2) and difficulty to find new niches (12) can be found there. At the same time, the perspective is not really concerned with regional development, these statements also fall into the neutral categories: diversified countryside (34), local farmers markets (24), role for cities (38); regional branding (46, 37) and regional autonomy (42). Finally, technology and innovation are not the central pillars of this perspective either: (33) innovation is part of sustainable production; (27) internet; (10) adaptation to local conditions of technology, (23) innovation by synergies with other sectors are not acknowledged.

There is a strong focus on entrepreneurship and business considerations: management and entrepreneurial skills are not lacking (21), cost price is very important (31) and so are profits (statement 16: "the long term is important even if that goes for the moment before profits" gets a negative score). Their farms are still operated as a family business: children eventually taking over the farm are important (15) and women form an integral part of the farm; their interests are therefore not underrepresented (50).

This perspective makes the most sense if you look at it from the viewpoint of a care farmer. Care farms do not operate on the principles of scale that normally rule agricultural production. Labour intensification is therefore not really an important issue: whether or not you have 10 or 12 patients working on your farm will not affect 'labour productivity' (22). The same logic applies to 'land shrinkage' (45). These rules do not apply on a care farm. On a personal level scale increases of the care farm are not viewed negatively: You can offer good care and good agricultural products independent on the size of your (care) farm (49). However, at the same time these characteristics of the farms mean that care farms cannot properly compete for the attention of the consumer and the supermarket. It seems they have a problem getting their products recognised in the market as something special. Consumers and supermarkets are therefore very important (30, 14) to realise their (sustainability) ambitions. A solution could be the direct connection between farmers and consumers (47), for instance through tourism (41).

There is a personal commitment to sustainable production: sustainability is connected to stewardship and treating everything –and everyone- with respect (17). Statements that can be related to the operation of the care farm are therefore also often important: The landscape is part of the care function and therefore important (40). Health regulations, financing and administration are a big concern (4).

### 4.1.6 Component 6: Farmer Survival First

			-4	-3	-2	-1	0	+1	+2	+3	+4
			6	15	30	11	22	10	44	2	31
			1	7	19	20	34	47	28	9	5
Composition:				49	8	27	38	45	33	4	
F Charter	2			40	12	23	3	46	37	21	
S ADCF	2				39	43	32	26	18		
Negative:					17	35	41	13	24		
N Dairy	1					48	42	50			
H G7	1					25	14	29			
							36				
							16				

*See Table 5 for the corresponding statements for each number; yellow numbers indicate a "distinguishing statement"*

Two of the LINSAs from Switzerland and France make up half of this component. They are linked to the fodder producers (S ADCF) and dairy and suckling farmers (S Natürli).

#### *Interpretation of the typical Q-sort*

This is a perspective that deals with production. Diversification offers no solution (8), neither is the potential for synergy with other sectors for innovation recognised (23). They seem to operate in a typical production landscapes that nobody cares about; the landscape does not represent a value you can market (40). Recreation and tourism (41), and the potential of large cities (3), are also not recognised as having potential and this could indicate their location in peripheral areas. Issues like the preservation of rural values and regional autonomy (42) and organic agriculture (48, 29) are looked at with a rather neutral view.

Production is the reason of existence of the farmers involved in this perspective. The scale is rather national: they do not want to be dependent on foreign countries (9) and the government should actively protect the market from foreign imposters. What they do care about is product prices (2) and cost prices (31). At the same time competitiveness is important, although competition at global markets is not the ambition (25).

The administrative burden is heavy enough as it is (4) and maybe government should do something about it (19). They believe that competitiveness cannot be enhanced by introducing more and more environmental laws (even as certificates) (7).

They want to live from their production and increasing land prices are therefore a concern (28). Future prospects are not looking good (1), especially for bulk products (18). In order to solve this problem, farmers should become more entrepreneurial (21). That way, finding new niches for agricultural products will not be a problem (12).

They are not attached to the farming lifestyle (1) and there is no sense of a personal commitment to sustainability that can be found by other respondents who are directly involved in farming: statement 17 about stewardship is viewed rather negatively.

The relationship with consumers is problematic though: respondents consider that consumers have little understanding of what it takes to be a farmer (5). The key for sustainability lies therefore not with them (30). However, transparency of production is definitely not the answer (6). The nature of modern agriculture does not allow this. But it is clear that new relationships between consumers and producers are necessary and farmers' markets could be a potential option (24) and there is also an interest on other local/ regional scale. It seems that respondents know everybody that matters (also politically) at this scale and that there is trust and cooperation between the (traditional) actors in rural areas (39).

## 4.2 Main overlap and differences between perspectives

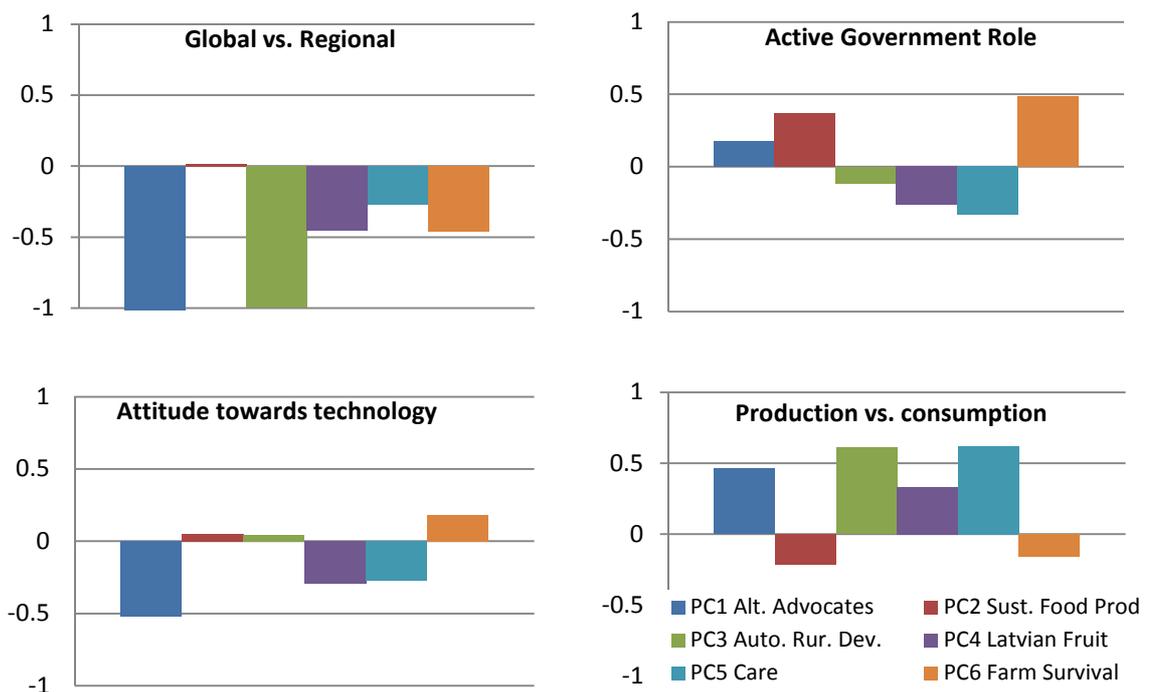
Identifying six perspectives has made it possible to show the overlap in some of the perspectives. For instance, PC1 (the Alternative Advocates) and PC3 (the Autonomous Rural Development) perspectives are highly correlated (0.651, see Table 6). The two components where Dutch farmers form an important part of the composition PC2 (Sustainable Food Production) and PC5 (Care Farmers) also have a high correlation (0.5). However, there are also a lot of differences between the six perspectives and these differences go beyond the different sectoral, cultural and geographical contexts of the LINSAs. Instead these differences reflect a difference in values and identities when it comes to the issue of sustainable agriculture and rural development.

**Table 6: Correlations between component scores (z-scores)**

	PC1	PC2	PC3	PC4	PC5	PC6
<b>PC1 Alternative Advocates</b>	1.00	0.29	0.65	0.13	0.31	0.17
<b>PC2 Sustainable Food Production</b>	0.29	1.00	0.25	0.15	0.50	0.08
<b>PC3 Autonomous Rural Development</b>	0.65	0.25	1.00	0.19	0.28	0.22
<b>PC4 Latvian Fruit</b>	0.13	0.15	0.19	1.00	0.14	0.13
<b>PC5 Care Farmers</b>	0.31	0.50	0.28	0.14	1.00	0.05
<b>PC6 Farmer Survival First</b>	0.17	0.08	0.22	0.13	0.05	1.00

From the descriptions of the different components it already became clear that issues like entrepreneurship, government intervention, technology, and preferred scale of operation are the main issues that the perspectives can be differentiated upon. In order to illustrate the overlap and differences between the six perspectives on these themes, the average z-score was calculated for each of the components on some typical statements dealing with these issues, (see Appendix B for a detailed overview of these calculations).

In Figure 2 the z-scores for each of these four issues are depicted. From this Figure 2 it can be concluded that that the LINSAs are in agreement on the matter of their preferred scale of production. Within almost all the LINSAs there is a great preference for the local and the regional scale of operating and the selected LINSAs all seem to operate more or less at the regional scale. For the Autonomous Rural Development perspective and the Alternative Advocates the regional scale is central to their view on sustainability. However, the other perspectives reject the global market as the scale of operations as well. The only exception is the Sustainable Food Producers, who do not focus so much on either local or global. If anything, all the LINSAs reject the utilitarian market discourse of global competition.



**Figure 2: Overview of differences and overlap between LINSAs perspectives**

The second element where the six perspectives mostly agree is the role of agriculture in the countryside. Four of the six perspectives are in favour of a kind of multifunctional agriculture that fits well in the Frouws' hedonist rurality discourse, while only two perspectives (Sustainable Food Production and

Farmer Survival First) hold a view in which the countryside is primarily geared towards agricultural production, a view that can be related to the traditional agri-ruralist discourse of farmers. The attitude towards technology seems to correlate with the view of the countryside: perspectives which favour multifunctional agriculture at the same time have a poor view of technology, with the notable exception of the Autonomous Rural Development perspective which is fairly neutral about technology. Finally the role for the government differs between perspectives. As their name already suggests, the Autonomous Rural Development perspective does not want much government interference. However, the perspective of the Latvian Fruit LINSAs and the Care Farmers have an even stronger preference for a 'laissez faire' government approach. For these two particular perspectives this preference can be explained firstly by the entrepreneurial view of these respondent and secondly by the strong government regulations that these LINSAs already have to deal with.

### 4.3 Diversity of perspectives within LINSAs

Related to this issue is the question of the consensus about sustainable agriculture and rural development within each LINSAs. As was already explained in the methodology section, it is impossible to aggregate these results to the general population of the individual LINSAs. However, it is clear that there is a group of LINSAs where there is a lot of consensus among the participants. In these LINSAs all the respondents share a perspective. Examples are the two English LINSAs, the Italian Crisoperla LINSAs, the Latvian Fruit Growers and the European LINSAs of the Organic Data Network that all show a very high amount of consensus. On the other hand, within the Hungarian Naturama LINSAs there are respondents who load positively on the Autonomous Rural Development component, but also one respondent who loads negatively, indicating that he or she actually rejects this perspective. The same applies for the Dutch Sustainable Dairy Farming LINSAs. Respondents of this LINSAs can be found distributed over many perspectives, with some respondents loading positively, while others score negatively on the same component. The difference between these two types of LINSAs can probably be explained by looking at some of the other LINSAs characteristics, for instance its size, but also its cohesion and its composition. Not all LINSAs require consensus to still be able to operate and especially within a large, diverse and loosely coupled LINSAs (such as the Dutch dairy LINSAs) different perspectives are likely to be found and the value of the collaboration is found in the combination of these different visions.

### 4.4 Categorising LINSAs perspectives on sustainable agriculture

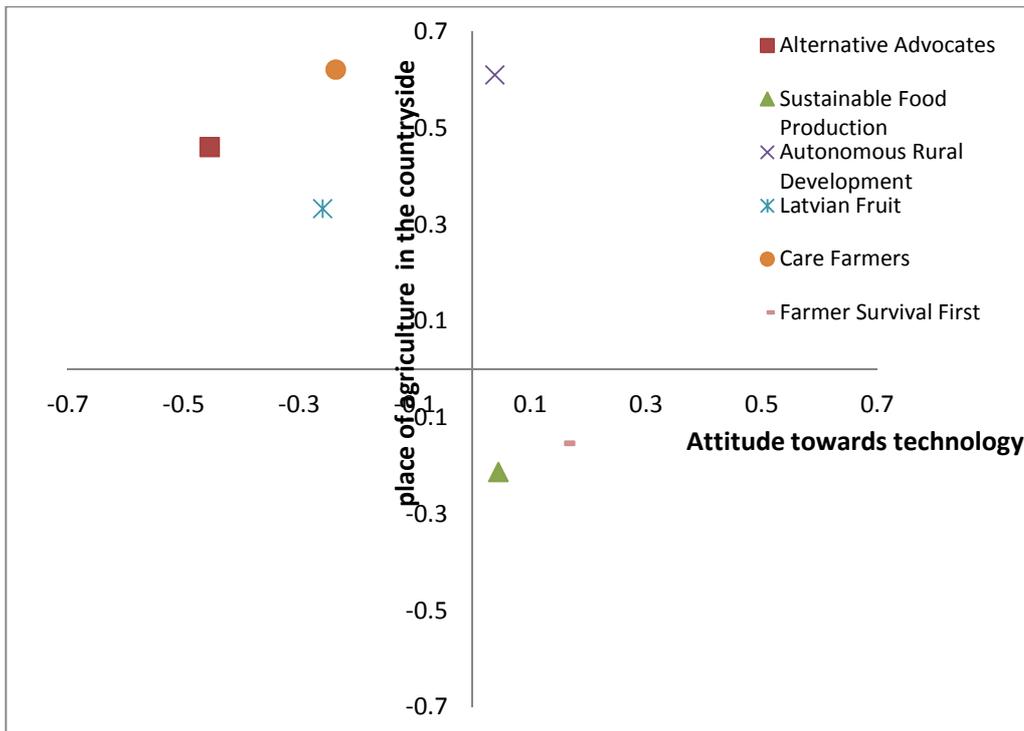
The question is now how these different perspectives fit in the more general sustainable development discourses. Based on the general typology of Dryzek (see Table 1) and the previous work of Frans Hermans, a somewhat similar

typology for the concept sustainable agriculture and rural development can be constructed (see also: Hermans et al., 2012).

On the horizontal axis the general attitude towards technology and innovation that is present within each perspective is represented. As indicated in Figure 2: some of the perspectives are quite critical of the potential technological development and innovations have for the solution of current problems. Some of the perspectives see technology as the root of the current predicament of the agricultural sector and it is therefore not helpful to look at technological development as a solution; they favour more 'low tech' solutions. The vertical axis does not look at the place of the environment within society, but instead looks at the place of agricultural production within the countryside. Similar to the argument Dryzek makes, agricultural production can be integrated within a broader view of the countryside, or it can be placed as a separate domain where farms derive their greatest value from the food/crops they produce.

**Table 7: Classification of discourses on sustainable agriculture**

		Attitude towards technology	
		<i>Negative (low tech)</i>	<i>Positive (high tech)</i>
Place of agricultural production	<i>Imaginative (integrated)</i>	"Multifunctional Agriculture"	"Metropolitan Agriculture"
	<i>Prosaic (separated)</i>	"Ecological Intensification"	"Economic Intensification"



**Figure 3: Categorisation of LINSAs sustainability perspectives**

Combining the indicators from Figure 2, we can place the six different perspectives in one of these four quadrants, (see Figure 3). Three of the six LINSAs fall in the Multifunctional Agriculture quadrant (Alternative Advocates, Care Farmers and Latvian Fruit). This is the quadrant that is critical about technological solutions to solve existing problems in agriculture and it has a broad outlook of the functions of farms and farmers in the countryside. Their view of sustainable agriculture and rural development tries to combine agricultural activities with other functions of the countryside such as recreation, tourism and landscape management.

Two of the perspectives fall into the economic intensification quadrant: Sustainable Food Production and Farmer Survival First. These two perspectives value the countryside first and foremost as a place where farmers have the place to realise their agricultural production and who are not adverse to using technology and scale increases to intensify their agricultural production. Sustainable agriculture is in this perspective related to efficiently producing food, without the negative environmental side effects: decoupling economy and ecology.

Finally there is one perspective (Autonomous Regional Development) that falls in the category of 'Metropolitan Agriculture' that combines a broad view of agricultural production with high tech solutions. These are people who do not value the countryside for food production alone: depending on the situation high-tech agricultural production can also take place in an industrial zone (glass

houses for instance), while in the vicinity of large cities other types of (multifunctional) farms might find a place. It might seem a bit strange to classify a 'Rural' Development perspective as a 'Metropolitan' discourse, however the idea here is that this discourse takes the regional characteristics (which can differ depending on the geographical context from more rural to more urban areas) and take it as basis to classify their perspective of sustainable agriculture and rural development.

## 5 DISCUSSION

Six different perspectives have been identified that each represents a different vision on sustainable agriculture and rural development. In this section we will finally discuss the representativeness of the identified perspectives outside of the investigated LINSAs within the SOLINSA project. Even though it is difficult to make any (statistically) reliable extrapolation, we think we can still give an indication of the representativeness of the perspectives in a wider context, based on the robustness of a component's perspective and the range of LINSAs that its respondents represent.

A distinction can be made between those components that represent a specific perspective closely associated with the innovative practices within a particular LINSA, for instance the Latvian Fruit perspective and the Care Farmers perspective captured in components 4 and 5. Two other components: the Alternative Advocates and the Autonomous Rural Developers, capture a more general view of a broader range of respondents that includes different LINSAs from different countries. The perspectives of the Sustainable Food Producers and the Farmer Survival First are somewhere in between: these components are somewhat broader than a single LINSA, but they are still made up of one or two dominant groups.

The Alternative Advocates and the Autonomous Rural Development Perspective are the two most robust discourses that can be found all over the participating countries. They form an important part of the alternative rurality discourse that rejects modern agricultural practices focussed solely on agricultural production. This is an important cultural undercurrent that is likely to be found in other types of bottom-up, grassroots innovation projects as well. The Sustainable Food Producers and the Farmer Survival First perspectives are likely to be found among some of the more traditional agricultural actors and sectors. There is an awareness about the importance of sustainability issues, but these are still defined very much in terms of agricultural production. Finally, the Latvian Fruit Growers and the Care Farmers perspectives are more or less limited to a specific small group of respondents. These perspectives could only be interpreted by referring to either a very specific set of practices, or a local context. This makes it unlikely that they can be found elsewhere outside these LINSAs.

## 6 CONCLUSIONS

Sustainable agriculture and sustainable rural development are contested concepts that hold different meanings to different people depending on the specific context they find themselves in. In order to investigate the different perspectives on the concept of sustainable agriculture within the SOLINSA project and place them within a comparative framework, Q-methodology was used.

Six different perspectives have been identified: Alternative Advocates, Sustainable Food Production, Autonomous Rural Development, Latvian Fruit, Care Farmers, Farmer Survival First. The six different perspectives are united in their opposition to the utilitarian rurality discourse that emphasises competition on global markets, but they differ on issues like entrepreneurship, personal responsibility for sustainability, the role of the government, and technology as a potential solution.

From the six perspectives, the Alternative Advocates represent the widest range of LINSAs respondents: there are respondents from 10 of the 12 investigated LINSAs who subscribe to this view. This is also the perspective that is the most radical in its rejection of the productivist, technological discourse of mainstream agriculture. The perspectives of Care Farmers, Latvian Fruit growers and Autonomous Rural Developers offer slightly alternative sustainability perspectives that are based on a different emphasis of the importance of multifunctional countryside and the potential role of technology.

The perspective of the Sustainable Food Producers and the Farmer Survival First are more in line with the conventional agricultural mainstream in the sense that they still value the countryside for agricultural production and do not reject technological intensification of that production. Their sustainability perspective can be characterised by a focus on efficiently producing food and at the same time reducing the negative environmental pressures associated with that production.

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# APPENDIX A: SHORT OVERVIEW OF SUSTAINABLE AGRICULTURE PERSPECTIVES PER LINSA

## Introduction

In this appendix we will give a short overview of the different sustainability perspectives that each LINSA is working on. We have two reasons for this: Firstly the analysis of the outcomes of the Q-methodology study does not always cover the more extended perspective a LINSA can have. Secondly, not all the LINSAs were covered in the Q-methodology study. In order to show the range of different ideas on sustainable agriculture and rural development we will shortly describe the individual LINSA perspective on sustainable agriculture and rural development in their original context.

### **Brighton & Hove Food Partnership (B&H - England)**

The Brighton and Hove Food Partnership (BHFP) is a 'network of networks' concerned to develop localised food systems in an urban area in a holistic sustainable context. The BHFP mission is to: *“Work across the community to strengthen the growth and development of a localised food system which promotes social equity, economic prosperity, environmental sustainability, global fair-trade and the health and well-being of all residents.”* (BHFP Food Strategy 2006 and 2012)

Many involved in BHFP do not see food, in sustainability terms, in isolation from its systemic context. It was felt to be inextricably linked to waste, energy, transport, physical and mental health, equity, fair trade and environmental quality, for example, and so it could not be developed outside of this more holistic context. The food chain is just one part of the sustainability equation and should be fully integrated with it. Sustainability perspective is very much incorporated in everything that BHFP does. Its food strategy and projects are interlinked with Sustainable Community Strategy for Brighton and Hove.

### **Permaculture Community – (Perm - England)**

Permaculture practitioners and many people associated with permaculture do not use terms sustainability, sustainable development in relation to their work/practices a lot. Permaculture is seen by many as a much wider concept going beyond sustainability. It is about “sustainable” lifestyles in a rather complex way. Permaculture has been defined broadly as a design system for creating sustainable human environments. Permaculture combines three key aspects:

1. an ethical framework
2. understandings of how nature works, and
3. a design approach

This unique combination is then used to support the creation of sustainable,

agriculturally productive, non-polluting and healthy settlements. The word 'permaculture' comes from 'permanent agriculture' and 'permanent culture' - it is about living lightly on the planet, and making sure that we can sustain human activities for many generations to come, in harmony with nature. Permanence is not about everything staying the same. It's about stability, about deepening soils and cleaner water, thriving communities in self-reliant regions, biodiverse agriculture and social justice, peace and abundance. (PA web site 2013)

### **Organic Data Network (Organ - Europe)**

This organic market data network emerged to enable access to relevant organic market data. It was established by a core groups of members who formed the OrganicDataNetwork project. Stakeholders are invited to participate in the network formation.

Sustainability does not feature in the discourse of the Organic Data Network at all, but an implicit connection exists as the result of the network's stated goal of encouraging organic agriculture and the explicit link between organic agriculture and sustainability. If we understand sustainable agriculture as a system that sustains biodiversity and soil fertility through a blending of innovation and traditional local knowledge, sustainability can be seen as fundamental to organic farming (Stockdale et al. 2001). The arguments against the sustainability of organic agriculture, in that it may not be sustainable in some socio-economical environments, such as where a population is growing at a high rate, and food security is a critical issue (ISF, 2013), do not appear to apply in the European context in which the network operates. The Organic Data Network is clearly innovative in their practice, and especially in their goals, but the links to sustainable agriculture are therefore indirect.

### **Network for Sustainable Agriculture (RAD - France)**

RAD - Réseau Agriculture Durable has worked for about 20 years. Today, 3000 farmers (2000 farms) develop new practices (soil protection, low input farming systems, direct marketing) within 29 local groups. The network is a link among the groups and promotes the innovative know-how built by the innovative farmers of the groups. The RAD exists because some farmers wanted to produce with fewer inputs and be less dependent to import. Sustainable agriculture is completely the guiding vision of this network: better environmental friendly practices, better conditions of living. Scale increases and being sustainable can be associated to a contradiction. There can't be a future for bulk production.

They base their knowledge on sharing experiment within the network. They like to use new technologies (internet based networks) in order to foster this sharing. The link with the consumer is also really important: some farmers sell their products directly on the farm. Most of the farmers are willing to open their farm.

According to this network, the government should dedicate more subsidies for farmers who work on developing new environmental friendly practices. In fact, money is needed in order to facilitate the implementation of experiments on individual farms. Especially the time spent to explain and valorise the work done on the farms should be paid.

### **Charter for Good Agricultural Practices in Livestock production (Charter - France)**

The Charter is a top down scheme to encourage farmers to adopt good practice following the mad cow disease epidemic, with state funding of the facilitation and advisory activities. Elected farmers, advisors and the facilitators involved in the Scheme (about 3000 people), with about 110,000 farmers involved in the Charters. Sustainable agriculture is not the key-element of the Charter; it is one aspect among others. Farm's sustainability comes with better environment, wellbeing, but also with better working conditions and better prices for the farmers. For the farmers involved in the Charter, production must be linked with good remuneration, but lately farmers are dealing with lots of economic difficulties. Moreover farmers have to deal with more and more responsibilities regarding food safety and administrative work, which do not leave lot of time to focus on sustainability aspects.

The content of the Charter (set of practices for cattle production) continuously evolves by taking into account more and more points related to sustainability and environment. One of the main goals of the Charter is in fact to follow social expectations, in order to re-establish a trustworthy link between production and consumption. Incremental changes can be made among all farmers, as the Charter involves 67 % of farmers in France. It is important for the farmers to evolve with new technologies, but farmers do claim the importance of family-scale farms.

### **Bavarian Rural Women's Association (Women-Germany)**

The Women's Group stands for family farming, diversification and income combination, as well as for the whole set of social questions. Most of the farms are conventional farms, often it is part-time farming, and very often the farm generation turnover is not clear. LINSAs understanding sustainability as: giving support or learning opportunities in inter-familiar communication and conflict resolution, to open up income alternatives and to train especially women to plan own businesses on the farm (green tourism, direct marketing, green class rooms etc.).

Regarding young farmers, developing long term business strategies, the LINSAs supports women to find own role models, own income perspectives, as well as own social insurances.

Considering the public within the consumer-producer dialogue, the Women's Group is always rethinking on how to get involved into internal and public discourses about e.g. plant and animal production, landscape conservation or water protection. Guiding principle is a further development of modern and economically oriented farms with a good embedment into nature and society. They try to integrate the technical perspectives, the perspectives of all people, living and/or working on farms, and the consumer perspectives. Result of this is networking with a wide range of non-agricultural groups, who are in touch with agricultural topics.

Regarding rural development, the LINSAs conducts many cross-sector activities, mainly in the health sector. Health-campaigns like cancer, dementia or gastro diseases are being stimulated and promoted (due to their experience with more-

generation households and care activities). The LINSAs use their good standing in society (and that nobody else takes it over) picking up such topics and to motivate people to take over responsibility for their own health. This is relevant for a sustainable rural development in the context of an ageing society.

### **German Agricultural Association (DLG-Germany)**

Based on the UN Brundtland-Report (1987), the Agenda 21 of Rio (1992) and the German Environmental Audit (Umweltgutachten, 1994), the DLG started to take up the topic of sustainability in a colloquium (“Agriculture 2000 – economic and environmentally safe – clear goal, controversial way”) in December 1994. As the German Federal Environmental Agency took up the discussion more seriously in 1997 with its study “Sustainable Germany – Ways to a long-lasting environmentally sound development”, the topic gained much more weight. This was one of the main reasons why the DLG also took up the topic more intensively and started a new colloquium series in 1998 (“Guiding principle ‘Sustainable Agriculture’ – Which ways are constructive”). In German agriculture there was consensus about the goal of reaching a sustainable agriculture but there was a discourse about how to reach it. The DLG stands for sustainability in the whole agriculture and against organic agriculture as the only sustainable way of production. This highlights the DLG as an organisation as it represents more the conventional agriculture in Germany. Further special topics around sustainability were highlighted in the context of major DLG events in the early 2000s. From 2001 until 2010 the DLG was part of the Council for a Sustainable Development of the German Government and by this received information about new developments and trends immediately making it possible to feed debates of principles of the agricultural sector. From 2005-2008 the DLG developed in co-operation with public research institutions its Sustainability Standard which is considered to be the first and broadest of its kind in Germany.

- For the DLG there exist five factors for a sustainable economy:
- The assurance of the economic viability of the agricultural enterprise
- The assurance of livelihood for the following generations
- The prevention of environmental pollution
- The societal responsibility for food supply and quality
- The responsibility for these points on a global level

### **Local Food Council of Gödöllő (G7 - Hungary)**

G7 is an informal network of local organisations, entrepreneurs and citizens in Gödöllő, a small town near Budapest, hosting the largest agricultural university of Hungary. The main objective of the organisation is to achieve a more sustainable and healthy food system for the town. They intend to realise this through: (1) acting as information brokers – organising events, disseminating information and building databases, connecting producers, customers, organisations, entrepreneurs who want to support food sovereignty and sustainability; (2) acting in the political domain, building social support and negotiating with local authorities for a local sustainable food strategy.

Sustainability for G7 mainly concerns the local food system. Though Gödöllő is situated in an area of high level agricultural and horticultural production, these products are not available in the town, since their normal market is the capital. G7 intends to change this situation, through shortening the food chain (introducing local products in the local market, food stores, public kitchens). On the other hand, certain members of G7 act in other areas of sustainability, such as waste management, consciousness raising, sustainability research, etc.

### **The NATURAMA Alliance (Nat - Hungary)**

The NATURAMA Alliance is a loose, informal network of networks, thus 9 Hungarian LEADER Local Action Groups (LAGs). Created through a transdisciplinary action research project in 2009, - NATURAMA soon became a self-maintaining domestic network, with a strong transnational interest. Its main aim – creating knowledge, learning from each other and from best practices in the EU – is in line with the LEADER method, however, Hungarian AKS did not support such activities. NATURAMA keeps regular meetings, organised study tours, ran shared development projects, organised big events and provided expertise on various levels of rural policy making and implementation.

Environmental sustainability is not in the focus of the organisation, however, member organisations all have nature reserves or national parks and one of their concerns is to harmonise the objectives of rural development and nature conservation (that often means a conflicting relationship in Hungary). NATURAMA is mainly concerned with sustainable rural development, meaning social and economic sustainability, protection of cultural heritage, social networks, etc.

### **Consorzio Vacche Rosse (CVR - Italy)**

The LINSA Consorzio Vacche Rosse (CVR – Red Cows Consortium) is composed of dairy farmers, dairy processors and others. The local farmers and processors have been able in the last years to rediscover Vacca Rossa Breed and to valorise the specific Parmigiano Reggiano cheese produced by milk's breed.

In the LINSA the concept of sustainability has a technical and economic connotation. The preservation of local animal biodiversity was the driver for the development of the LINSA because some breeders at that time seen a commercial opportunity from that. Technology and research are crucial to innovation towards more sustainable farming/breeding systems, more than peer to peer exchange. Technical innovation bring to more efficient farming system into an ecological and economic perspective, this is the main concept related to sustainability.

### **Association for Solidary Economy, Crisoperla (Crisop Italy)**

This is an association (network) of organic farmers, fishers, agronomists, consumers' associations, Solidary – Based Purchase Groups (GAS) and small food artisans. It aims to promote and valorise small, organic products and to encourage direct relationships among producers and consumers. It is located mainly in Tuscany. Gastronomic initiatives and conferences and workshops are regularly organised about the theme of sustainability.

Sustainability within Crisoperla is strictly linked to innovation and organic farming. The concept of innovation is far from the technical connotation but more related to relationships, (peer) exchange with others and observation: it is by interacting, observing and exchanging that innovation can be generated, in order to better practice organic farming.

### **Biogas Production Network (Biogas -Latvia)**

This organisation is concerned with renewable energy production, technical and organizational innovation, renewable energy associations, farmers engagement, and knowledge brokering. In the Latvian Biogas LINSa sustainability is a contested idea. Although biogas production was initially (politically) linked to environmental goals (reducing agricultural waste, producing renewable energy), implementation showed divergent practices. A proportion of large-scale biogas producers and investors view it only from the business angle, as a source of state-guaranteed profit. Another set of ideas is characteristic of medium- and small-sized farmer-producers and also biogas researchers, for whom biodiversity, waste management and optimal use of local (own) resources is an important consideration. Currently the two sets of ideas exist in parallel.

### **Fruit Growing Network (Fruit - Latvia)**

Originally this was a purely agricultural network for sustainable land use but recently it has become an increasingly multifunctional network. It takes part in knowledge brokering, research between farmers and industry collaboration and research driven innovation. They form an active cooperative of commercial growers, with multiple links with AKIS, decision-makers, retail chains. They are successful precisely because they are self-reliant (hence no wish for more government involvement), because they have multiple connections (so it is not a huge issue), they are interested in restoring the traditional value of local grown fruit (thus technological innovation is not at the forefront of their concerns); and consumers cannot be relied on as promoters of sustainability, since they need educating first - to appreciate the labour that goes into growing an apple in Latvia as opposed to Chile for instance.

Their take on sustainability (shared by many in the Linsa is that sustainability is related to being local and thus more healthy, and doing agriculture in a way that balances production needs and not harming the natural resources (=integrated way of growing). The manner of integrated growing itself produces sustainability outcomes and is recognised by the LINSa members as doing that. This manner of growing is supported by certain financial instruments, and initially - more so by the research community; however now it fits well with ideas of "ordinary fruit-growers" and feels "natural".

### **Cooperative Boer en Zorg: Care Farmers in the Netherlands (Care- The Netherlands)**

The cooperative recognizes that sustainability is a complex issue but does not give a clear definition. Within the LINSa it is stressed that the concept of sustainability is a local matter that should take shape on the care farms themselves. Sustainability at farm level often deals with issues like nature and landscape conservation that care farms are responsible for, organic production techniques that do not use artificial fertilizers and pesticides, or issues like the

production of sustainable / renewable energy: bioenergy, wind energy and so on farms. Individual farmers are responsible to act sustainably in a way that best suits their location, the style of production and their clients.

From a theoretical perspective it is clear that the services that care farms provide: not only for their clients but for society as well, fall under the 'people' heading of the 'people, planet, profit' conceptualisation of sustainable development. However this idea has not yet really been worked out yet in their communication about the concept of care farming.

### **Sustainable Dairy Farming (Dairy- The Netherlands)**

This network is organised around a very specific conceptualisation of the concept of sustainable agriculture. They use the idea of low-external input farming as a method to work on the both the environmental and economic performance of dairy farms. This method is especially geared towards sustainable practices on the farm level and it tries to take an alternative path towards sustainability that lies in between organic agriculture ('following the prescriptions from the organic certification board SKAL to the letter'), and conventional dairy farming ('following the environmental legislation of the Nitrate Directive to the letter').

The approach focusses on an integral sustainability assessment that is expressed by their slogan derived from the triple P approach: "happy cows, happy people and happy planet" that combines attention for animal welfare, the long term financial perspective for the farmers and the natural environment dairy farming takes part in. Through the calculation of mineral flows through the farm and the certification of the low external input farming approach people in the network try to formalise their working method and make it more acceptable for policy makers.

Within the LINSAs we can identify two opposing sustainability perspectives: there is a group of people who use low-external input farming as a means to extensify their production (the pioneers of the method), but the method is also increasingly popular to intensify production, under the heading of 'sustainable intensification'.

### **Association for the development of fodder production (ADCF - Switzerland)**

In 1991, the strategic guidelines for fodder production in Switzerland by the Association for the development of fodder production (ADCF) were first published: *"Fodder production in Switzerland attempts to embrace the widest range of needs existing in each farm for the livestock with fodder produced on its own surfaces. The fodder production management is adjusted to specific local conditions, to spare the environment and to seek the best possible economic outcome"*. In the ADCF's vision, sustainability is not formally and explicitly mentioned. Nevertheless the three pillars of People, Planet and Profit underpinning the current concept of sustainability can be identified: economic and environmental aspects are clearly addressed whereas the social component appears in the background using "specific local conditions". At the farm level combining sustainability's objectives is a way to improve

independence. Local and regional actions taken on improving fodder autonomy can play a substantial role in stimulating and fostering sustainability at national level. Afterwards international developments have confirmed this emerging trend. Sustainable agriculture is part of the vision of this learning and innovative network but implicitly. The word "sustainability" is almost not used as a boundary word; the role of multifunctionality which is embodied in the Swiss Constitution is much more used with production of adequate food for the population, preservation of natural resources and productive agricultural land, maintenance of an open and mixed landscape and a decentralized settlement pattern throughout the country.

### **Natürli (Switzerland)**

The LINSa Natürli primarily focuses on economic sustainability. When asked about the relation between the initiative and the sustainable development of the region, LINSa members answer that once economic sustainability is given for the farms and the cheese dairies of the region, the traditional structures can be conserved and this relates to social and ecological sustainability because the mountainous region thus does not get deserted and the traditional milk production is close to nature. Broader views on sustainability differ slightly among the different members of the network. Some, as for example the local politicians, have an open view and consider sustainability as something global concerning all aspects of life. Milk producers rather think about their own farm and consider sustainability as something enabling their offspring to carry on the (natural) farming in a way they did. Almost all agreed on the importance of regional production for sustainable agriculture and they consider Swiss agriculture as quite advanced in terms of sustainability. Furthermore, an ever growing gap between the increasing urban population and the farming in the countryside is perceived as detrimental for sustainable agriculture. The images urban citizens have of an idyllic close-to-nature agriculture does not meet reality, especially not to the prices asked for on the market. Thus producers and processors find it difficult to accept the high expectations concerning ecological conservation and animal welfare coming from people who have never seen real agriculture.

## APPENDIX B TECHNICAL DETAILS OF THE SET-UP AND ANALYSIS OF Q METHODOLOGY STUDY

Performing a Q-methodology study typically consists of a number of different steps that will be described in this appendix.

### ***Step 1: Generating the communication concourse***

The first step is the construction of a concourse: this should be a collection of all possible statements about the issue at hand. The collected set of statements should be both diverse and comprehensive: it should capture the complete range of perspectives that different groups of stakeholders might have. For the concourse on sustainable agriculture and rural development, we used the earlier work on discourses of sustainable agriculture in the Netherlands using Q-methodology (see Hermans et al 2009) as a basis. The statements were enriched with statements of each of the different LINSAs taken from interviews or observed/overheard during one of the SOLINSA workshops with the LINSAs.

### ***Step 2: Set-up of the Q-sort***

This large pool of statements was subsequently reduced to a more appropriate size, (which lies somewhere between 30 and 64 statements). The selection of statements from the concourse is an important activity in Q-methodology. McKeown and Thomas (1988) make a distinction between structured and unstructured sampling of statements from the concourse. For our study we used a structured sampling matrix that was built on the three rurality discourses identified by Frouws (1998) and the earlier studies of Hermans et al. (2009) and Zografos (2007). The sampling matrix is depicted in Table B.1. For each of the cells in the Table at least 2 statements were selected for inclusion in the final Q-sort.

**Table B.1: Sampling matrix**

	Agri-ruralist	Utilitarian	Hedonist
Current situation			
Problem			
Solutions			
Trends			
Government			
Technology			
Vision for future			
Sustainability			

**Step 3 and 4: Selection of respondents and performing the Q-sorts**

In contrast to regular survey methods, the quality of a Q-methodology study depends less on the size of the sample of respondents and more on the inclusion of all possible perspectives that is captured in the sample. For each LINSAs a minimum of 5 respondents were selected with a central or influential position. The idea is that the visions of these persons are also the most important driver of the LINSAs.

In total 69 people have performed a Q-sort; 28 of whom women. Figure B.1 gives some background of the respondents. It shows that the average age of respondents was relatively high (44 years). However not all the LINSAs registered the age of their respondents. The youngest person was 22 (N Dairy) and the oldest person was 75 (E B&H).

The amount of time people needed varied greatly, with an average time to complete the Q-sorts of 32 minutes. The second histogram (on the right side) shows the time the people needed to complete the internet version of the FlashQ programme. The people who did the Q-sorts manually usually did not time their respondents (with exception of the respondents of the Netherlands and England), so the figure is based mostly on the FlashQ programme. Most people were capable of doing the Q-sort within half an hour (33) but the distribution is typically long-tailed with 18 people taking more than half an hour of whom 5 persons taking even longer than an hour.

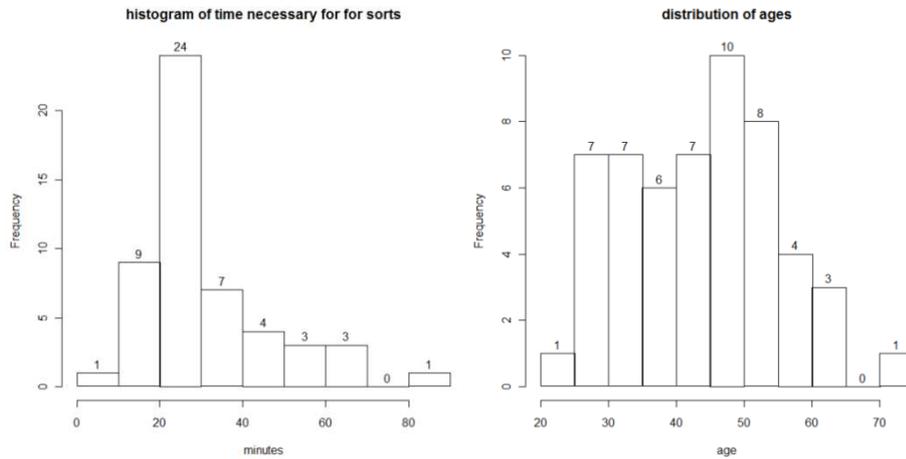


Figure B.1 histograms of respondent ages and time necessary to do the sort

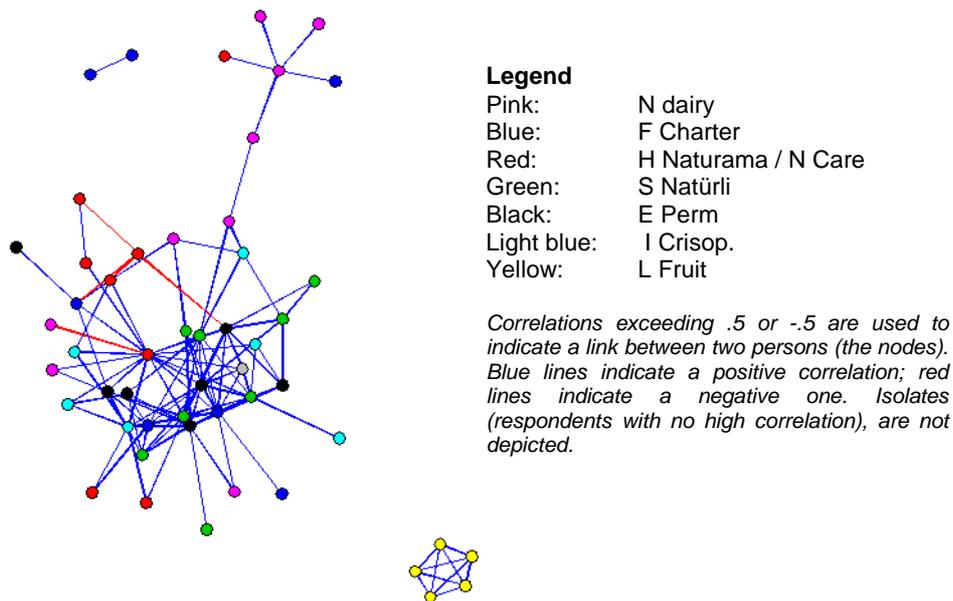
### Step 5: Data analysis

#### Correlations between Q-sorts

The first step of doing the Q-methodology is calculating the correlation matrix of the Q-sorts. In contrast to 'normal' statistical techniques, in Q-methodology it is not the traits of the different cases (the value respondents have given the different statements) but the cases (respondents) themselves between which the correlations are calculated. This results in a correlation matrix of 69x69 respondents. We can think of these people with high correlations forming some sort of a 'belief network', or 'discourse network': they share an opinion on a number of sustainability statements.

Reviewing the correlation matrix reveals already a lot of overlap between certain groups of people. For instance, there are more high positive correlations than high negative correlations indicating a large consensus on certain issues.

In Figure B.2 the relations between respondents with high correlations (positive and negative correlations:  $>.5$  or  $<-.5$ ) have been plotted. The figure gives an indication of the occurrences of different groups within the respondents. We see three separate networks of respondents. The Latvian (yellow) respondents all have a very high correlation between each other, but none with other countries. Two French respondents show high correlations and there is a very big network where respondents from almost all other groups are included. However in this group there are also some people (especially from Hungary) who have negative correlations (sometimes even with the people within their own LINSAs).



**Figure B.2: discourse networks of SOLINSA respondents.**

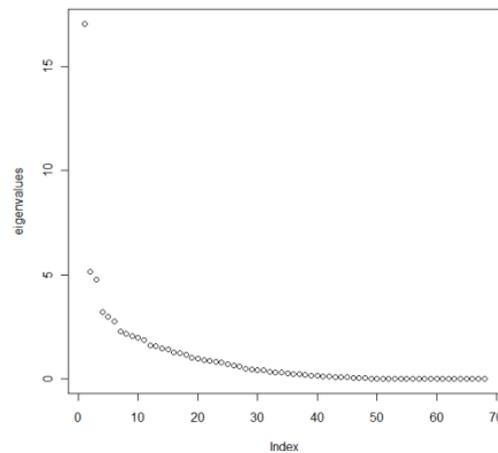
### *Principle Component Analysis*

The correlation matrix is used as a basis for the subsequent data reduction using Principle Component Analysis. Unfortunately, since we ‘only’ used 50 statements, this gives more ‘variables/ respondents’ than statements/cases and the resulting correlation matrix turns out to be not “positive definite”: the eigenvalues of the components become negative. This in turn results in some ‘funny’ differences between the PCA results of different statistical software programs (PQMethod and R). There are some numerical solutions to ‘repair’ or ‘fix’ correlation matrices who are not positive definite and we have used these ‘fixed’ correlations matrices to calculate the possible number of components to retain for further calculations in some of the more sophisticated packages R offers. However, this fixed matrix only gave differences in the 7<sup>th</sup> decimal and for all practical purposes this will not give any different results of the later Q-methodology calculations. In order to resolve the problems with the different results of the statistical packages, we have simply removed the respondent with the highest correlation factor from the dataset (a respondent from the Latvian Fruit LINSAs). The new correlation matrix (68x68) is still not positive definite, but PCA results across R and PQMethod were now consistent with each other.

### *Determining the number of components to retain for further calculation*

The next step is to decide how many components to retain. These components are the basis for the further calculations and choosing the number of components therefore also will result in the number of perspectives identified within the Q-set. However, choosing the number of components is one of the most difficult parts of doing a Principle Component Analysis, because there are no clear statistical guidelines that can help here. The three most used criteria are the Kaiser criterion (retain components with an eigenvalue > 1), drawing a

screeplot, and Horn's Parallel Analysis. The Kaiser criterion is not very helpful here because it suggests to keep 19 components and that is just too much. The screeplot suggests keeping only three components (see Figure 3). In parallel analysis a MonteCarlo simulation is used to calculate a high number of random correlation matrices and calculating the eigenvalues of these random matrices. Components are to be retained when the eigenvalue of the actual correlation matrix is higher than the eigenvalues of the random set of correlation matrices. In this case the cut-off point is six components.



**Figure B.3 Scree plot of eigenvalues**

For practical purposes we have done an iterative process where we looked at the results of the further calculations and we have taken into account the resulting correlations between the final z-scores (not too high), the amount of variability explained (as high as possible) and the number of 'defining sorts' for each component. This last measure says something about the number of respondents who have a significant load on a factor. There are two options here. The first is to only take into account the communalities of the loads and only take the respondents who not only load significantly on a component, but also have more than 50% communality on this significant factor score ("pure loads"). The second option is just to look at whether or not a person has a significant load on a component. In the second option it is possible that a person loads on more than one component, and thus holds more than one perspective ("confounded loads", or cf.)

**Table B.2: determination of number of components**

	<b>PC1</b>	<b>PC2</b>	<b>PC3</b>	<b>PC4</b>	<b>PC5</b>	<b>PC6</b>
<b>Cum %var. explained</b>	<b>25</b>	<b>32</b>	<b>39</b>	<b>44</b>	<b>48</b>	<b>52</b>
6 Factors (pure)						
No. def. sorts	26	7	5	5	3	5
Max cor. Zscores	.44	.37	.21	.37	.32	.44
6 Factors (cf @ p0.01)						
No. def. sorts	36	15	6	9	6	11
Max cor. Zscores	.65	.50	.19	.50	.22	.65
5 Factors (cf @ p0.01)						
No. def. sorts	37	13	7	21	6	
Max cor. Zscores	.74	.38	.19	.74	.24	
4 Factors (cf @ p0.01)						
No. def. sorts	38	20	12	10		
Max cor. Zscores	.53	.49	.23	.53		
4 Factors (pure)						
No. def. sorts	32	11	10	3		
Max cor. Zscores	.29	.29	.20	.07		
3 Factors (pure)						
No. def. sorts	37	13	10			
Max cor. Zscores	.3	3	.19			
3 Factors (cf @ p0.01)						
No. def. sorts	38	17	12			
Max cor. Zscores	.42	.42	.23			

There are arguments to be made for all the variants in Table B.2. As a very subjective rule we set the limit for the amount of defining sorts at six. This way a retained component is built on (approximately) 10% of the respondents. In the end we chose to start with six Factors, confounded at the significance level of  $p < 0.01$ . These six components combined explain 52% of the total variance and only 3 respondents did not load on any factor.

Components were rotated using the orthogonal varimax technique in order to minimise the number of high loadings on each factor, making the interpretation of the factors easier. The total of explained variance (communality) remains the same, but the variance per factor may change during this procedure. The

resulting factor loadings were interpreted based on their significance level<sup>1</sup> (at  $p < 0.01$ ). Of the 68 q-sorts entered, 65 were found to load significantly on at least one factor. There is one respondent who loads significantly on three components: one positive load and two negative loads. A total of 16 persons load on two components.

#### *Calculation of z-scores*

Using the respondents who load significantly on a component, z-scores are calculated. The component loadings are aggregated into a weighted average and based on this average the average score of each original statement is calculated. In order to make the statements scores comparable across the different components, normalised z-scores are calculated for each statement (see Table 5 in the main report.)

#### **Step 6: Interpretation and labelling of factor scores**

The interpretation of the different factor scores is done in the main report of regarding the sustainability perspectives of the LINSAs. A concept interpretation of the different components was discussed as the SOLINSA project meeting in Riga (September 2013). At this meeting the components were labelled as well. Individual components were discussed with some of the researchers most familiar with the LINSAs working and the respondents that make up a certain component. Based on their observations, the interpretations were further refined.

#### **Construction of indicators**

To investigate the overlap and main differences between the components, several indicators were constructed based on the different statement categories. In the tables below the average z-score for each of these indicators have been calculated.

**Table B.3: Role of Government**

No.	Statement	+/-	PC1	PC2	PC3	PC4	PC5	PC6
3	Government should steer more clearly between different goals. There is a need for a unifying vision, and more decisive decision making.	1	0.265	0.415	0.335	-1.361	-0.848	-0.038
19	Government should ensure 'a level playing field' and then leave entrepreneurs alone.	-1	1.236	1.090	0.022	-0.207	-0.448	0.882
42	For the preservation of rural values??, more resources and more autonomy should be given to the rural communities.	-1	-0.692	0.338	-1.723	-0.907	0.559	0.125
37	Government should actively protect regional brands, otherwise imported goods are being sold as if they were locally produced	1	-0.114	-0.373	0.901	1.420	-0.594	0.970
<b>Indicator</b>								
	<b>Active</b>							
	<b>Government</b>		0.174	0.367	-0.116	-0.264	-0.333	0.485
<b>Intervention</b>								

<sup>1</sup> Significance level  $p < 0.01$  calculated as:  $2,58 * \text{standard error (SE)}$ ; with  $SE = 1/\sqrt{(\text{number of statements})}$

**Table B.4: The role of the countryside: production vs. consumption**

No.	Statement	+/-	PC1	PC2	PC3	PC4	PC5	PC6
2	Farms nowadays cannot survive with the actual product prices. Farmers need to develop other activities, or even get a second job.	1	-0.241	-1.732	-0.589	-0.828	-0.075	1.686
8	Diversification and part-time farming stabilize the agricultural sector and increase the attractiveness of rural areas	1	0.213	-0.924	1.290	0.499	0.347	-0.981
25	One of the most important ambition is the re-enforcement of the agricultural sector for global competition.	-1	1.705	0.025	1.442	1.597	1.136	0.780
28	There will be a selection of agricultural activities by spatial efficiency: land prices will be leading.	-1	1.014	-0.012	0.209	-0.083	0.619	-1.035
38	Big cities don't pay enough attention to their own backyard, the countryside.	1	0.465	0.321	0.364	0.091	-0.083	0.121
40	Landscape has a value that you should try to market.	1	-0.696	0.196	0.617	0.485	1.224	-1.539
41	Recreation and tourism are very important. A good relationship between cities and rural areas will generate new chances.	1	0.763	0.635	0.940	0.571	1.186	-0.106
<b>Role of countryside: production vs. consumption</b>			<b>0.461</b>	<b>-0.213</b>	<b>0.610</b>	<b>0.333</b>	<b>0.622</b>	<b>-0.153</b>

**Table B.5: Role of Technology**

No.	Statement	+/-	PC1	PC2	PC3	PC4	PC5	PC6
10	You cannot always apply new technologies directly to local conditions, you have to adjust a lot	-1	-0.915	-0.654	0.194	-1.675	-0.611	-0.724
11	Intelligent management can partly substitute the need for new technologies	-1	-0.945	-1.219	0.177	0.697	-0.855	0.193
22	We have to seek our prospects in creating economies of scale. The basic principle remains efficiently using labour and mechanisation.	1	-1.628	0.763	0.135	0.702	-0.888	0.312
23	Innovation should take place by using the synergies between agriculture and other sectors	-1	-0.485	-1.270	-1.422	0.067	-0.586	0.530
26	New technology will increase productivity and competitiveness on the world market.	1	-1.192	1.097	-0.140	-0.115	-0.183	0.493
27	internet based networks (Facebook, twitter, e-mail lists) will be important instruments for data exchange	1	0.321	-0.168	-0.147	-0.834	0.612	-0.513
33	Innovation is an integral part of sustainable production because it can improve ecological, economic, or social effects)	1	1.204	1.805	1.509	-0.917	0.617	0.985
<b>Indicator Technology</b>			<b>-0.520</b>	<b>0.051</b>	<b>0.044</b>	<b>-0.297</b>	<b>-0.271</b>	<b>0.182</b>

**Table B.6: Regional vs. Global Scale**

No.	Statement	+/-	PC1	PC2	PC3	PC4	PC5	PC6
9	You don't want to depend completely on foreign countries for your national food production.	-1	-1.570	-1.626	-1.027	0.860	-1.220	-1.515
24	Linking consumers and producers directly, for instance through farmers markets, is one of the best ways to improve local food supply.	-1	-1.404	0.393	-0.705	-0.141	0.078	-0.762
25	One of the most important ambition is the re-enforcement of the agricultural sector for global competition.	1	-1.705	-0.025	-1.442	-1.597	-1.136	-0.780
26	New technology will increase productivity and competitiveness on the world market.	1	-1.192	1.097	-0.140	-0.115	-0.183	0.493
34	Medium-sized and diversified local operations are beneficial, because they provide employment and development of human resources	-1	-1.040	-0.274	-0.522	-0.940	-0.126	-0.154
42	For the preservation of rural values, more resources and more autonomy should be given to the rural communities.	-1	-0.692	0.338	-1.723	-0.907	0.559	0.125
46	Regional branding will play a more important role in the future	-1	-0.146	0.215	-1.404	-0.352	0.129	-0.633
<b>Indicator Regional vs. Global Scale</b>			<b>-1.107</b>	<b>0.017</b>	<b>-0.995</b>	<b>-0.456</b>	<b>-0.271</b>	<b>-0.461</b>