

Assessing Sustainability Perspectives in Rural Innovation Projects Using Q-Methodology

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Abstract

In this article we investigate the different perspectives of sustainable agriculture held by participants of a Dutch innovation programme called TransForum. Using Q-methodology we have systematically elicited individual perspectives on agricultural innovation and extracted their common elements. We have compared these perspectives with existing discourses of rural and sustainable development. Our results show that the use of technology and the agricultural production function of rural landscapes are among the two most contested elements between perspectives. The more radical perspectives reject technology and support a multifunctional landscape in the countryside, while the prosaic perspectives do the complete opposite with a positive attitude towards technology and a preference of the use of the countryside for agricultural production alone. Surprisingly, there is no ecological modernisation perspective of sustainable agriculture. In this article we propose the concept of 'metropolitan agriculture' to fill this void.

Introduction

Agricultural practices in The Netherlands have come under more and more pressure from a range of different sources: space claims from the urban population, economic pressures from trade liberalisation and increasing attention to protect animal welfare and prevent environmental degradation. This has resulted in calls for a fundamental break from current practices towards more sustainable forms of agriculture (van der Ploeg *et al.* 2004; Van Latesteijn *et al.* 2008). Guiding visions of long-term sustainability goals are of great importance in this transition process as they can inhibit or spur the acceptance of innovation (Beers *et al.* 2010). Given the inherent difficulty in steering innovation and transition, transition theory emphasises the importance of initiating a whole range of innovation projects, each with different

visions of sustainability. This 'basket of images' as Loorbach and Rotmans (2006, p. 200) have called it, can contain complementing but also contradiction or competing visions.

In this article we investigate an innovation programme to see what is actually inside such a basket when it comes to transitions towards a more sustainable agricultural sector. What visions can be discerned and how do these visions differ from or overlap with each other? More importantly, where do they differ from existing societal discourses on rurality and sustainable agriculture? Investigating these front runners can provide some insight into the direction in which modern agriculture is heading.

This article starts with an overview of existing discourses on rurality and sustainable development. Subsequently we introduce the Dutch innovation programme of TransForum and its working method. We discuss Q-methodology as our particular method of choice to investigate the perspectives of participants in TransForum's innovative projects. Boonstra (2006, p. 147) has referred to this method as 'a methodological middle-ground' that introduces a quantitative component into interpretive approaches such as a discourse analysis. Q-methodology allows us to systematically compare perspectives and link them to existing societal discourses. In the discussion we present these results and their meaning for innovations and sustainable agriculture in general. The article ends with the conclusions.

Discourse analysis of sustainable development and sustainable agriculture

In this article we use discourse analysis to investigate the visions for rural development and sustainable agriculture. The concept of discourse is conceptualised differently in different research traditions. Van den Brink and Metze (2006) make a useful distinction between discourse as a 'frame of reference' and discourse as 'language in use'. The first perspective studies discourse as an individual belief system that is more or less stable. The perspective that studies discourses as 'language in use' takes another perspective: meaning is given to social and physical phenomena through a set of identifiable practices (Hajer 1995).

In this article we use the first perspective and 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, p. 56). This definition therefore excludes actual practices and takes the individual as a basis for investigation.

Discourse analysis has been particularly useful in analysing the visions that underlie the different definitions and approaches to sustainable development. Sustainable development has been analysed as a particular environmental discourse closely related to ecological modernisation theory (Hajer 1995; Dryzek 1997). The application of Q-methodology in a number of studies that involve different aspects of sustainability showed, however, that sustainability discourses are no longer limited to ecological modernisation alone, as other environmental discourses have also incorporated the concept of sustainability (Barry and Proops 1999; Steelman and Maguire 1999;

Table 1: *Classification of sustainability discourses (adapted from Dryzek 1997, p. 14)*

	Attitude towards industrialisation	
	Radical	Reformist
Place of environment		
Imaginative	Green radicalism	Ecological modernisation
Prosaic	Survivalism	Problem solving

Addams and Proops 2000; Sweden 2006). The criteria that Dryzek (1997) uses to distinguish environmental discourses are therefore equally applicable to these discourses, see Table 1.

Sustainability discourses can be classified firstly by how they view industrialisation and secondly by how they place the environment in the current political context. The attitude towards the industrialist discourse can be either 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 health of the current earth system 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 a sustainability discourse is concerned with the place of the environment in the political-economic realm. Prosaic discourses see environmental problems as requiring action but not a completely new kind of society. In contrast, imaginative discourses seek to completely redefine the current situation. The environment is brought into the heart of society rather than being seen as an external source of problems. Existing societal structures are subject of debate and win-win solutions are sought to change institutions.

Following Zografos we will base our analysis of general rurality discourses on the work of Jaap Frouws, who distinguished three particular agricultural and rural discourses: the agri-ruralist discourse, the utilitarian discourse and the hedonist discourse (Frouws 1998). These three rurality discourses also provide three distinct visions of agriculture and sustainable rural development. The discourses may therefore all agree that there is a need for a transition towards a sustainable agricultural sector in The Netherlands, while disagreeing on what this entails (Hermans *et al.* 2009). In Table 2 an overview of these different rurality discourses and how they incorporate sustainability is presented. In the remainder of this article we investigate what elements of these rurality discourses can be found in the innovation projects of TransForum.

Methodology

Case description: the innovation programme of TransForum

TransForum is a Dutch innovation programme that ran between 2004 and the end of 2010. During that time, TransForum set up over 30 innovation projects covering a wide range of topics in which participants could try out new ideas, learn from them

Table 2: Overview of rurality discourses (adapted from Frouws 1998 and Hermans et al. 2009)

	Ontology	Agency	Motivation	Natural relationships	Sustainability issues
	What entities focused on?	Who has principal capacity to act?	Primary reasons for action?	Primary relationship between entities	
Agri-ruralist	Farmers and their family	Agricultural sector and the state	Traditional values	Farmer as custodian of nature and landscape	Long term continuity of family farm
Utilitarian	Consumers and producers	Market actors: Enterprises and local governments	Material self-interest	Market relations, Nature and landscape only as production values	Industrial ecology; integration of production chains
Hedonist	Tourists, city dwellers, animals	People in networks	Pleasure seeking, self fulfilment	Nature and biodiversity have intrinsic value. Mutual agreement	Animal welfare; Landscape conservationism;

and work together to overcome obstacles to system innovation. TransForum's aim was to contribute to a more sustainable Dutch agricultural sector by triggering transitions (Veldkamp *et al.* 2009). TransForum viewed sustainable development not as an end state, but as a process that is not linked to any particular technological practice or vision. Practical innovation projects were therefore selected for funding more on the basis of the range of stakeholders involved and less on the triple bottom line considerations of sustainability: people, planet and profit (Elkington 1998).

The overall innovation strategy of TransForum promoted a bottom-up vision of innovation: all projects could be characterised as learning-by-doing and doing-by-learning. Practical problems and the ideas of entrepreneurs were the drivers of the innovation process, but practice and research also closely collaborated in the innovative projects and scientific knowledge was used in a number of ways. First of all, scientific knowledge was used directly in practical projects to contribute to addressing specific knowledge gaps by formulating and answering specific research questions in the context of an innovative project. Secondly, the process of innovation itself was made an object of research. Several scientific programmes ran in parallel with the practical innovation projects and used their experiences to gather scientific insights on inventions, innovation and transitions. The practice projects therefore did not aim only to generate practical knowledge but were also used to study new methods for co-operation and knowledge generation with stakeholders in general.

Method: Q-methodology

Q-methodology is an increasingly popular method to elicit individual perspectives systematically and to analyse the overlap and differences between them using quantitative correlation analysis. Although most uses of Q-methodology limit themselves to identifying the groups and their shared perspective, the method also allows us to test hypotheses in a more quantitative way (Brown 1980; McKeown and Thomas 1988).

Q-methodology differs in important ways from the more common social science methodologies that measure attitudes through surveys and questionnaires. The first difference is that the concepts do not depend on previously constructed scales that measure some predetermined traits of respondents in the way in which surveys and questionnaires are usually constructed. This means that in Q-methodology the respondents are doing the measuring, instead of being measured. Participants are thus allowed to 'to speak for themselves' by performing a Q-sort (Dryzek and Berezikian 1993, p. 49). At the same time it acknowledges two issues that are rarely raised in surveys and questionnaires: firstly that the same words or phrases may actually mean different things to different individuals and secondly, that most people understand certain statements in the context of other statements that are included in a questionnaire. Finally, Q-methodology is based on the principle that subjective points of view are communicable and that they are recognisable as such. Previte *et al.* (2007) argue that these characteristics make this method especially suitable as a research tool for contemporary rural researchers since it acknowledges the multiple versions of reality that are experienced by the various actors involved in the countryside.

Early applications of Q-methodology in rural research at first focused specifically on identifying the different perspectives of groups of farmers, for instance, identifying

their different goals 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. Q-methodology is therefore not completely unknown in the field of rural studies. However, since this method does not (yet) belong to the standard tool of many social scientists, we describe the seven different steps that it takes to execute a Q-methodology study in more detail in the following sections.

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, we first conducted interviews with seven representatives of TransForum projects and three agriculture innovation projects that were not directly linked to TransForum. The interviews were conducted using a semi-structured interviewing format with six main topics for discussion:

- The future of the agricultural sector in The Netherlands
- The current situation and interviewees' analysis of the most important problems
- The definition of sustainable agriculture and the criteria for operationalising this definition
- The role of the government in sustainable agriculture
- The role of research and technology for sustainable agriculture
- Co-operation between the different actors in the project.

The questions were not strictly adhered to, but functioned more or less as a checklist for all relevant topics to be covered in the discussion. The interviews were conducted by two different individuals separately. Interviews took place between June 2007 and March 2008 and took between an hour and an hour and a half. The interviews were segmented and statements were categorised and labelled according to their topic.

This collection of statements was enriched with two more sources:

- The results of a workshop on sustainable agriculture organised by TransForum.
- The reports of a number of workshops with representatives of the different agricultural sectors (Borgstein *et al.* 2007; Brassier *et al.* 2007).

The result was a concourse of over 400 statements, at which point no new categories were found and the collection process was halted.

Step 2: Setting up the Q-sort

A concourse of 400 statements is too large to let respondents react to and usually a smaller number between 30 and 64 statements is deemed to be an appropriate size of

Table 3: *Concourse matrix with amount of statements selected in each category*

	Agri-ruralist	Utilitarian	Hedonist
Current situation	1	1	1
Main problem	3	3	3
Solutions	2	2	2
Trends	1	1	1
Government role	1	1	1
Technology	1	1	1
Vision	2	1	2
Sustainable agriculture	5	4	3
Total statements	16	14	14

statements that respondents can still cope with. The selection of statements from the concourse is therefore 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 own earlier study (Hermans *et al.* 2009) linking these three discourses to sustainability issues. Table 3 shows the concourse matrix and its categories. The numbers refer to the number of statements selected for each category. Not all categories were equally present in the concourse, especially regarding sustainability, and this left fewer statements in a specific category compared with the other two discourses. Covering all possible topics was more important to us than forcing an equal amount of statements over the discourse elements.

Step 3: Selection of respondents

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 breadth of possible perspectives captured in the sample. In our study the respondents originated from a broad spectrum of TransForum projects, as Table 4 shows. Although not all innovative projects were covered (some had already finished by the time we started our study), in most projects at least one person was included in the sample and the coverage of the innovative projects makes the assumption that no important perspectives are missing fair. Some people are involved in more than one innovative project, which explains the difference between the number of respondents (36) and the total number of people in Table 4.

Step 4: Ranking the statements by respondents: the Q-sort

The respondents were asked to sort the 44 statements on a grid containing 44 cells, ranging from -4 (most) disagree with to +4 (most) agree with (see Figure 1). As is common in Q-methodology the grid forces respondents to sort the statements in a

Table 4: *Response per innovative project*

Project	Respondents	Response %
The Sjalon	3	100.0
Greencare	3	100.0
Greenport Venlo	3	100.0
Healthy with Oats	2	66.7
Northern Frisian Woods	6	54.5
Flor-i-log orchestration	2	50.0
Sustainability in Retail	2	50.0
Regional food chains	2	50.0
New Mixed Farm	6	46.2
Scientific monitors	4	44.4
Healthy Pip-fruit chain	2	33.3
Laying Hen Husbandry	1	33.3
Dairy Adventure	1	20.0
New markets and vital coalitions South Limburg	2	16.7
Brackish agriculture on Texel	1	Unknown
Biopark Gent-Terneuzen	1	Unknown
SynErgie	0	0.0
Everything About Food	0	0.0
Calendula	0	0.0
Overall	41	47.7

(Most) disagree with					(Most) agree with			
-4	-3	-2	-1	0	+1	+2	+3	+4
3	3	5	7	8	7	5	3	3

Figure 1: *Response grid*

fixed distribution: allowing the least amount of statements (three) in the most extreme categories (in this case +4 and -4) in order to find the statements that characterise the perspective the most.

The Q-sort was performed online with the use of the FlashQ software (version 1.0) (Hackert and Braehler 2007), a shareware programme freely available on the Internet. The statements were randomised for each participant separately.

Step 5: Factor analysis

Data analysis was performed using PQMethod (version 2.11) and SPSS (version 16.0). The first programme is specifically designed to analyse data generated by Q-sorts (Schmolck 2002). A principle component analysis was executed to rearrange the data by identifying and ordering 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 and discarding the rest. Brown (1980) gives an overview of various criteria that can be used to help with the decision on the amount of components to retain. Applying this range of criteria on our dataset showed that the number of relevant components varies with the criteria used, with a minimum of two, the result of parallel analysis (O'Connor 2000), and a maximum of eleven (eigenvalues exceeding 1). We decided for a pragmatic combination of criteria based in part also on an analysis of what additional information an additional component offered. This led us to include four factors.

The four factors combined explain 47 per cent of the total variance. Factors 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[†] (at $P < 0.01$, significance level 0.389). Of the 36 Q-sorts entered, 33 were found to load significantly on at least one factor. Three individuals did not load on any factor. Five individuals loaded on more than one factor and this is consistent with the theoretical notion that people can have a nuanced view that combines different elements of two or more discourses (see Table 5).

Of the five confounded loadings, two were confounded between factor A and factor C, and 2 were confounded between factor B and factor D, the remaining one scored significantly on factor A and negatively on factor D. This is consistent with the correlations scores between the factors depicted in Table 6. High correlations were found between factors A and C ($r = 0.56$) and between factors B and D ($r = 0.49$), indicating that there is some overlap between these visions.

Table 5: *Number of loaders and variances of the four factors*

	Factor A	Factor B	Factor C	Factor D
Respondents loading (N)	14	10	8	6
Variance explained (after rotation) (%)	17	12	10	8

Table 6: *Correlations between factor scores*

	Factor A	Factor B	Factor C	Factor D
Factor A	1	0.22	0.56	0.03
Factor B	0.22	1	0.25	0.49
Factor C	0.56	0.25	1	0.11
Factor D	0.03	0.49	0.11	1

Step 6: Interpretation of factor scores

The Q-sorts of the people who significantly loaded on a specific factor were used to calculate a weighted average for the statements. The higher the load of an individual's Q-sort, the heavier we counted it in the weighted average. Since not all factors contain the same number of respondents, the statement factors are normalised by calculation of a standard z-score for the purpose of comparing them. Table 7 presents these z-scores for each statement together with their corresponding position on the response grid (from -4 to $+4$).

To facilitate the interpretation, the most distinguishing statements of each factor are calculated. These are statements of a factor that are placed on a significantly different location on the Q-sort grid (calculated at the $P < 0.05$ level). These statements are thus the most indicative of the unique perspective captured by the factor. 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 factor scores below.

Factor A: progressive farmers

Socially accepted agriculture with a long-term perspective. The importance of societal acceptance of agricultural activities is the first defining aspect of this perspective (statement [st] 12). Criticisms of past agricultural practices with the intensification and ongoing mechanisation are recognised and embraced (st 22). The negative perception of consumers is therefore well deserved, especially considering the lack of attention for animal welfare, which should be a priority (st 38). These measures are not considered to be distorting market competition as the rejection of st 19 indicates. Market considerations are generally not viewed positively in this perspective (sts 27 and 24).

Solutions are sought in broadening agricultural activities to increase societal acceptance: the possibilities of organic farming (st 28), the development of new product-market combinations (st 5), and recreation and tourism (st 36) are all valued positively. Technology is regarded ambiguously, since it can be blamed for the bad image of the sector and development of new technology is not positive *per se* (st 40). Again, social acceptance is key here, new technology should be beneficial for increasing societal acceptance of the sector (st 14).

Table 7: Statement scores for each factor

N	Discourse	Statement	Factor A		Factor B		Factor C		Factor D	
			Q-sort score	z-score	Q-sort score	z-score	Q-sort score	z-score	Q-sort score	z-score
1	A	Agriculture and horticulture have perspective in Dutch society.	0	0.113	2	1.162	4	1.934	1	0.512
2	A	The biggest problem is that the perception of consumers does not correspond with reality.	-2	-1.054	3	1.269	1	0.676	2	0.631
3	A	The problem with many Dutch agricultural products is that they are located at the bottom of the market, where competition is possible only on price and volume.	0	0.268	-1	-0.406	-1	-0.561	2	0.798
4	A	The Dutch agricultural sector lacks a director and a clear direction at the moment.	-1	-0.37	0	0.299	-3	-1.361	1	0.48
5	A	New product-market combinations, such as the combination of discovery of nature and care farms, are rising.	3	1.424	-1	-0.233	3	1.112	-2	-0.822
6	A	In this highly developed market you, as a producer, have to equip your products with surplus value.	2	0.992	4	1.527	2	1.016	2	0.664
7	A	Openness of production is important. You should be able to visit a farm at all times.	0	0.196	-2	-0.802	0	-0.008	-1	-0.272
8	A	You have to gain credit to be allowed to operate an agricultural business, not only by working for the consumer, but also for the landscape and society as a whole.	3	1.27	-2	-0.973	3	1.246	3	1.482
9	A	You don't want to depend completely on foreign countries for your food production.	1	0.611	1	0.553	2	0.962	0	0.307
10	A	The thinking in large agribusiness parks on big industrial estates is going too far.	-1	-0.327	-4	-1.836	0	0.169	-2	-0.768
11	A	Government should steer more clearly between different goals. There is a need for more vision and more decisive decision-making.	2	0.659	1	0.585	-1	-0.527	2	0.754
12	A	The long term perspective is the most important, even if it takes place – for the moment – at the expense of profits.	4	1.783	1	0.475	0	0.054	-1	-0.619
13	A	Sustainability means that your child is eager to take over the farm.	-1	-0.751	-3	-1.205	-1	-0.901	-4	-1.598
14	A	Sustainable agriculture should solve a number of technical problems and at the same time work on societal acceptance.	2	0.817	3	1.371	0	0.167	1	0.529
15	A	Sustainability is connected with stewardship: you have to treat everything with respect.	4	1.592	4	1.468	0	0.177	0	-0.192
16	A	Retailers have a lot of power, but unfortunately they still have a very limited interest in sustainability.	1	0.615	0	0.148	1	0.371	-2	-0.731
17	U	It's questionable whether we should produce something like wheat in The Netherlands. Space has become too limited for that.	-1	-0.7	-3	-1.501	-1	-0.609	-4	-1.838
18	U	There is a lot of artisanal knowledge available in the primary sector, but entrepreneurial skills lack.	-2	-0.867	-3	-1.485	0	0.257	3	1.285
19	U	An important bottleneck is comprised of competition distorting measures, such as welfare measures, prescriptions of means and production licenses.	-4	-1.899	-1	-0.67	-2	-1.119	-2	-1.054
20	U	The agricultural sector has depended on the family farm mode of production for too long.	-2	-0.782	0	0.176	-2	-1.019	0	0.011
21	U	There will be a selection of agricultural activities by spatial efficiency. Land prices will be leading.	-1	-0.498	0	-0.129	-1	-0.447	1	0.309
22	U	We have to seek our perspective in creating economies of scale. The basic relationship remains the efficient use of labour and mechanisation.	-3	-1.094	1	0.511	-4	-1.636	3	0.901

23	U	There is no future in bulk production. In The Netherlands you have to try to manage the supply chains abroad.	1	0.327	1	0.527	-3	-1.349	-1	-0.441
24	U	One of the most important ambitions is the preservation and the re-enforcement of the agricultural sector for global competition.	-3	-1.616	0	-0.016	-4	-1.681	0	0.002
25	U	New technology will increase productivity and competitiveness on the world market.	0	-0.181	2	0.968	-2	-0.977	4	1.869
26	U	Government should formulate criteria and conditions and give entrepreneurs their room.	1	0.503	2	1.201	1	0.938	4	2.023
27	U	Whatever sustainability ambitions are formulated, in all cases cost price will be the most important aspect.	-4	-1.828	1	0.549	-2	-0.924	1	0.619
28	U	An organic production method can never produce enough food for everybody.	-4	-1.973	3	1.241	2	0.937	1	0.441
29	U	The key for sustainability lies with consumers.	-2	-0.816	-1	-0.446	0	0.174	-1	-0.628
30	U	Sustainability means that the same output is generated with less input of harmful means and methods. The level of technology should therefore increase.	-1	-0.545	2	1.136	-2	-1.03	4	2.137
31	H	The Dutch agricultural sector is in crisis and should radically alter its course.	-2	-0.882	-2	-0.874	-3	-1.571	-1	-0.431
32	H	The big cities don't pay enough attention to their own backyard; the countryside.	1	0.468	-1	-0.643	1	0.435	-2	-0.723
33	H	There is a devastation of the landscape going on.	-1	-0.66	-4	-2.077	-1	-0.243	-4	-1.959
34	H	There is an overly organised institutional infrastructure in the agricultural sector. That makes implementing new things difficult.	0	-0.105	2	0.993	3	1.219	0	0.155
35	H	There will be an increasing demand for regional products because consumers have more confidence in regional producers.	0	0.222	-1	-0.735	1	0.689	-3	-1.333
36	H	Recreation and tourism are very important. A good relationship between cities and rural areas will generate new chances.	2	0.912	0	0.036	4	1.311	-1	-0.384
37	H	Landscape has a value that you should try to market.	1	0.485	-1	-0.785	2	0.956	2	0.825
38	H	The ambition for the future has to be increasing animal welfare in husbandry.	2	1.11	0	-0.159	0	-0.219	0	-0.062
39	H	The goal is to develop a strong region, not only economically but also socially.	4	1.852	0	0.146	4	1.605	1	0.568
40	H	You can't solve all problems with new technology.	3	1.307	1	0.78	1	0.785	-3	-1.608
41	H	Government should deploy more projects with small actors.	0	-0.04	-2	-0.915	-1	-0.894	-3	-1.52
42	H	Sustainability means caring for the quality of the landscape for coming generations.	0	0.305	-2	-1.033	1	0.628	0	0.236
43	H	It's pointless to start a discussion on the seasonality of agricultural products. Those are attainments of consumers.	-3	-1.223	-4	-1.62	-4	-1.721	-1	-0.473
44	H	Sustainable agriculture should have a modern design that bridges the contrast between industrial and organic farming.	1	0.38	4	1.425	2	0.979	0	-0.083

Notes: discourse: A: agri-ruralist; U: utilitarian; H: hedonist.
 Bold Q-sort scores and z-scores indicate a distinguishing statement: it received a significantly different score (at $P < 0.05$) for this factor compared to the other factors.

This perspective has a strong commitment to the farming lifestyle and this is linked to a sense of personal responsibility, the notion of stewardship (st 15) and the region in which they themselves operate (st 39). Farmers are considered to be good entrepreneurs who can be trusted to solve their own problems (statement 18). The role of the government is to set clear rules and limitations and let the sector go about its business (statement 26).

Factor B: conservative farmers

The countryside is first and foremost for agricultural production. Practical business thinking and technology are the central elements of this perspective. The countryside is first and foremost intended as the agricultural production space it always was. It is not meant as a recreational space for the urban population (st 32), and the high-tech production environment of modern agriculture does not allow for much openness (st 7). Almost all statements that deal with the role of landscape in the countryside are viewed negatively: (st 33, st 37 and st 42).

There is an awareness of the problems that can occur when the social acceptability of the sector and its production methods declines (st 44 and st 14). Consumers have a bad image of the sector and this is perceived as a problem (st 2). Whereas the perspective captured by factor A is engaging society and its diversifying demands on the agricultural sector, the perspective in Factor B is about the exact opposite: the first instinct is to turn away from society (st 8). Instead legitimacy is sought through a strong economic performance of the sector (st 6). The role of modern agriculture is to produce cheap and plentiful food for global markets. Technology is compatible with this view: it raises productivity and can at the same time reduce environmental pressures (st 25). Large-scale agribusiness parks in the countryside are the future of the sector (st 11). Other modes of production that are not compatible with this vision are not viewed positively: (sts 28, 5 and 35).

There is a practical farmer's perspective present here: personal responsibility is important and the attention to cost prices is an inevitable part of the daily routine (st 27). There is a certain amount of trust in the future of the sector (st 1). There are enough chances in the market and farmers generally have the entrepreneurial skills to make use of these chances (st 18). The role of the government is to set the rules and criteria and then give the entrepreneurs their freedom (st 26).

Factor C: regional development professionals

Rural development for the region, by the region. The countryside and not farmers take central stage in this perspective. The future of the countryside looks very bright (sts 1 and 31) because it holds a lot of promise for new product-market combinations that can be connected with new regional activities: care farms (st 5) recreation and tourism (st 36), and attention for landscape (st 37). These new functions also create new market opportunities, and they contribute to regional development.

Farmers are just one of the actors that have a stake in these developments. However, practical agrarian considerations like long-term profitability or personal

stewardship are either absent or evaluated negatively (sts 12 and 27), making this a more academic perspective. In fact farmers themselves, and especially their representative organisations, are seen as an opposing force for the necessary changes (st 34). The perspective favours a bottom-up approach and it rejects central steering (st 4) and government intervention in general (sts 11 and 41). It could be summarised as development for the region by the region (st 39) and it rejects any international dimensions: international competition on global markets and the management of international production chains is viewed very negatively (sts 23 and 24).

This perspective is the most negative in its evaluation of the contribution that technology can make. Technology is part of the problem, not part of the solution (sts 30 and 40).

Factor D: entrepreneurs

Large-scale industrial development. The perspective is firmly focused on the international market and the two main elements of this perspective are economies of scale and technology development. The current problem with Dutch agriculture is the place in the production chain of primary producers that forces farmers to compete on price and volume (st 3). A further focus on the primary agrarian production process is inevitable and the means to do this are by increasing the scale of production and further technology intensification (sts 22, 40 and 25). The added advantage of technology development is that it makes it possible to decrease environmental pressure at the same time (st 30). Regional and small-scale production does not offer any opportunities for global competition (sts 5 and 35). Small market actors cannot survive in the global market and it is therefore pointless for the government to facilitate them in any way (st 41).

Factor D captures a strong entrepreneurial mentality. These farmers are entrepreneurs who produce for the world market and they do not deal directly with consumers. It is therefore the entrepreneur and not the consumer who is leading developments (sts 29 and 43). Retailers are not that important either: they will sell anything if it is financially rewarding (st 16). Social acceptance is not a major issue in this perspective. Consumers have a dim view of the sector but that is not that important as factor B makes it out to be (st 2). As long as you stay within the laws and rules of the government you should be able to do whatever you like (st 26).

Results

The results of the Q-methodology study show four distinct perspectives on the future of the agrarian sector present in the different innovative projects of TransForum. To answer our question how these perspective differ from general societal discourses on rurality and sustainable development, we will compare these outcomes quantitatively with the rurality discourses and secondly with the more general sustainability discourses (cf. Brown 1980, pages 246–247, McKeown and Thomas 1988, pages 43 and 72).

Comparison with rurality discourses

In Figure 2 the average z-scores on the different discourse statements have been plotted. It shows that some perspectives have more in common with certain discourses than with others. The large size of the error bars is based in part on the fact that the sample size is relatively small for each discourse. However, it also indicates that some statements of a discourse are strongly rejected, and this is where the perspectives deviate from the original discourses. Progressive farmers score highest on the agri-ruralist discourse, while the entrepreneurial perspective has the highest score on the utilitarian discourse. The hedonist and the utilitarian discourse each have strong proponents and opponents. Progressive farmers and rural development professionals score significantly negative on the utilitarian discourse, making this discourse the most controversial one. The hedonist discourse is rejected most strongly by the entrepreneurial perspective.

Figure 2 shows that all four perspectives have at least something in common with the former agri-ruralist discourse. This can be explained by the fact that discourse was once the dominant discourse in The Netherlands. However, this discourse is now under pressure of two emerging discourses, or to put it in other words: 'It seems that the agri-ruralist discourse is stuck in the middle, with the possibility of dissolving into the other two over time' (Hermans *et al.* 2009, p. 58). As such, the four perspectives actually show this split. The progressive farmers and the rural development professionals mix elements of the agri-ruralist and hedonist discourse,

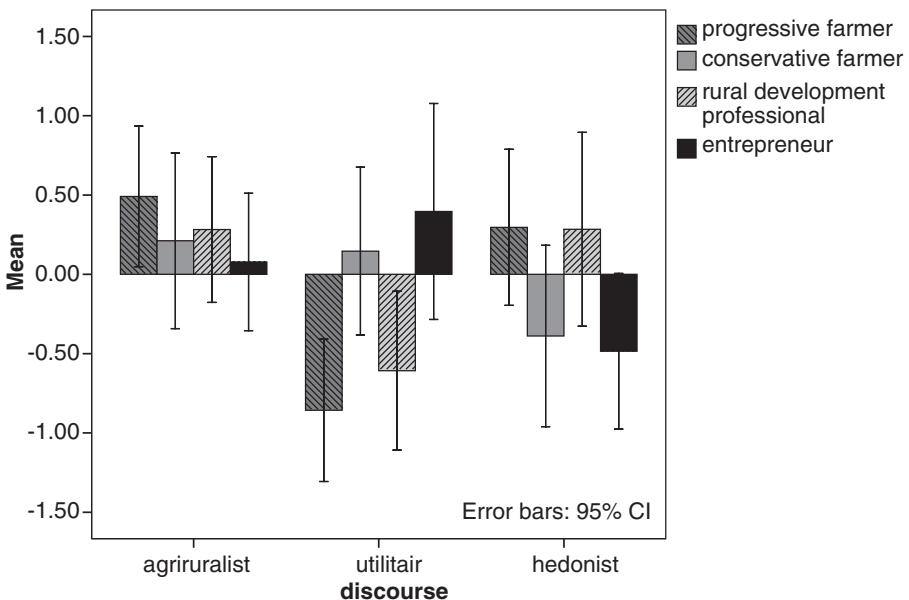


Figure 2: Average normalised scores on discourse statements

while the conservative farmers and entrepreneurs take elements from the agri-ruralist discourse and the utilitarian discourse.

The main difference between the progressive perspective and the agri-ruralist discourse lies in the importance of social acceptance. Progressive farmers in TransForum have made a turn towards society, while conservative farmers turn to the market. Progressive farmers and rural development professionals both share some of the hedonist discourse. However, both disagree that the agricultural sector is in crisis. The main difference is that rural development professionals do not see animal welfare as a priority, while for the progressive farmers this is linked to their central point of social acceptance. Entrepreneurs score highest on the utilitarian discourse. However, they mix this with the agri-ruralist idea of a countryside intended for agricultural production.

Comparison with sustainability discourses

Here, we discuss our results in light of the existing classification of sustainability discourses. When we compared the perspectives with each other, we observed that the role of technology and the role of landscape are the most heavily contested elements among the four perspectives. For agricultural sustainability these are the two axes that replace Dryzek's two axes of industrialisation and the place of the environment. First of all, the respondents' view of technology represents the industrialist axis of Dryzek's sustainability classification. Much like the place of the environment, the role of the countryside is also strongly contested. It can be viewed as either separate, as the agrarian production landscape the conservative farmers favour, or it can be viewed in a more integrated approach, combining agricultural production with other functions like recreation and tourism. Applying these two axes gives four quadrants that discourses on sustainable agriculture can be categorised into.

We have constructed two indicators based on the average scores of each of the four factors on the statements in the Q-set that are related to either technology or the role and functioning of agricultural production and the landscape. The indicator for technology consists of the average score on statements 14, 25, 30 and (-)40 and the indicator for landscape multifunctionality is made up of the average scores on statements 5, 8, 33, 36, 37 and 42. Figure 3 shows the place of the four factors on these two axes of agricultural sustainability discourses.

Progressive farmers and rural development professionals (factors A and C) reject technological fixes, while embracing multifunctional agriculture at the same time. These two elements are strongly correlated, and in a sense rural development professionals are more radical than progressive farmers. On the other hand conservative farmers and entrepreneurs (factors B and D) are far more prosaic in their sustainability outlook: there is a belief that the rural landscape belongs to farmers and agricultural production, and that technology is a solution to sustainability problems. However, the important distinction between conservative farmers and entrepreneurs lies especially in this last argument. Both regard technology rather positively, but entrepreneurs do not claim the countryside for production. In this regard, it is also interesting to note that the people in the innovation projects that derive their inspiration from industrial symbiosis and work on integration of product chains in animal

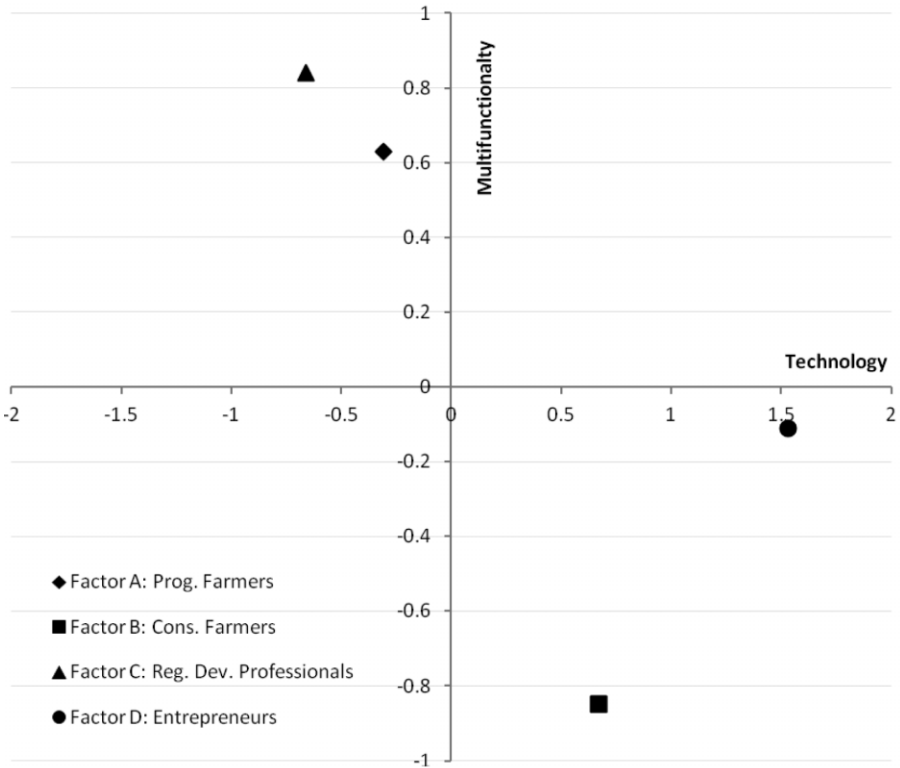


Figure 3: Average normalised scores on technology and multifunctionality statements. Cons, conservative; Prog., progressive; Reg. Dev, rural development

husbandry (in order to minimise environmental impacts for example) are part of the group of conservative farmers and not of the entrepreneurs, as one might expect (based on the large-scale preferences and generally positive attitude towards technology of the entrepreneur). Both groups use the language of economies of scale and productivity increases. However one of the integrated intensive husbandry projects of TransForum received a lot of societal opposition from locals (Termeer *et al.* 2010). The rural area for agrarian production area reflects a core value of this group and it provides an important explanation for the ‘dialogue of the deaf’ that has surrounded this project (Hinssen *et al.* 2010).

Discussion

Based on a quantitative assessment of the results of a Q-sort, we were able to compare the overlap and differences between the basket of images present in the innovation projects of TransForum and the more general societal discourses on sustainability and rurality. At this time it is impossible to predict which vision is more likely to result in

a major transition in the way agricultural produce and food in The Netherlands is produced. The nature of technological development is such that even small incremental steps might lead to a radical transition eventually (see, for instance, Geels (2005) for a historical case study and Geels and Schot (2007) for an overview of other possible transition pathways). However, the execution of a discourse analysis based on Q-methodology is a good method to ensure images that cover the most controversial issues to be included in any innovation portfolio aiming to contribute to transitions.

Based on our empirical findings we were able to come up with an adapted classification of discourses on sustainable agriculture based on the two axes of technology versus the place of agricultural production in the countryside. What is remarkable is the absence of an ecological modernisation perspective in the innovation projects of TransForum. The four perspectives we found are split between two radical perspectives that oppose technology as an option and focus on multifunctionality of agriculture, and two prosaic sustainability views that are positive about technology but want to keep the countryside solely for agricultural production. The absence of an ecological modernisation perspective is even more surprising as it is one of the underlying pillars of transition theory (Smith and Kern 2009). Although a well-known disadvantage of Q-methodology is that its findings are difficult to generalise beyond the limits of the group studied, we think that the absence of an ecological modernisation perspective is not limited to the TransForum programme but that it reflects a more general problem of current rurality discourses: there is a lack of an ecological modernisation perspective of agriculture that is not averse to technological development on the one hand, while it acknowledges the multifunctional nature of the countryside on the other.

We argue that there is a need to fill this missing quadrant of ecological modernisation in the discussions on transitions in the agricultural sector. The concept of metropolitan agriculture (Van Latesteijn *et al.* 2008; Wiskerke 2009) has the potential to operationalise this missing ecological modernisation perspective and take the edge of some of the debates on agriculture in general. In metropolitan agriculture the demands and advantages of the metropolis (for example, high population density, infrastructural hubs, technological hotspots, great variety in demands for food and landscape) are used to tailor agricultural activities (Van Latesteijn and Andeweg 2011). The activities that might result from this approach can range from care farming to eco-efficient large-scale agro-parks. Metropolitan agriculture can thus be redefined as an ecological modernisation perspective that combines technological development with metropolitan demands of a varied, multifunctional landscape.

As it stands at present, both the radical and prosaic perspectives can be limiting the potential to trigger transitions of the agricultural sector. For instance, it seems that the intensive animal husbandry sector could benefit from moving out of the countryside to industrial zones. Our results show that the farmers' strong preference to keep production in the countryside and their own view of the countryside as theirs, rather than public opinion, is the most limiting factor in realising this. On the other hand, the more radical sustainability perspectives sometimes tend to idealise the past, painting an idyllic picture of the countryside that never existed in reality (Janssen 2006). In a globalising world with food scarcity looming, such a technology-averse

focus on small-scale agriculture is unrealistic and might end up being actually counterproductive.

Conclusions

Using Q-methodology, we distinguished four distinct perspectives on sustainable agricultural and rural development in the innovation project portfolio of TransForum. A quantitative comparison between existing rurality discourses supports claims that the agri-ruralist discourse is slowly dissolving. Our results suggest that a prosaic rurality discourse that contains elements from the agri-ruralist and utilitarian discourses discourse on the one hand, and a more radical rurality discourse that is comprised of hedonistic and agri-ruralist elements on the other hand will be the two dominant discourses of the future.

The role of technology and the function of landscape in agricultural production are the two most contested elements among the four perspectives. This result enabled us to adapt the existing classification of sustainability discourses for application in rurality discourses. Currently, a perspective of ecological modernisation is missing, not only in TransForum, but also in rurality discourses in general. The challenge of the future lies in developing a new perspective that has a multifunctional view of the countryside without neglecting the possibilities that technological development has to offer the agricultural sector. The concept of metropolitan agriculture has this potential.

Notes

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¹ Significance level $P < 0.01$ calculated as: $2.58 * \text{standard error (SE)}$; with $SE = 1/\sqrt{(\text{number of statements})}$.

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