

# Nurturing agroforestry systems in temperate regions: an analysis of discourses for an enabling environment in Flanders, Belgium

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**Abstract:** In Flanders, the northern region of Belgium, agroforestry systems are increasingly recognized as a multi-functional land use that can balance the production of commodities with non-material outputs such as environmental protection and landscape amenities. Yet, the uptake of agroforestry among farmers remains relatively low despite policy incentives such as a subsidy program covering 80% of the establishment costs. To study this implementation gap, transition literature was consulted which states that the transition from conventional to more diversified farming systems depends on a fundamental change in not only the structures and practices, but also the cultures of a societal system. Whereas actors and stakeholders may hold a wide range of viewpoints regarding agroforestry (e.g. the form, the feasibility and the desirability), policy initiatives typically only address one form of agroforestry. This could be a reason that current incentive programs are not very effective. Therefore in this paper we focus on cultures of a societal system, and describe a study design using Q-methodology to examine the different narratives and discourses on agroforestry in Flanders. Furthermore, general discourses and narratives on agriculture and agricultural policy are related to the identified perspectives on agroforestry. This is important since different general discourses on agriculture will create different meanings and interpretations of agroforestry and this can help identify an enabling environment for agroforestry in terms of research, policy, market and economic conditions.

**Keywords:** temperate agroforestry, discourses, narratives, cultures, Q-methodology, policy

## 1. Introduction

Although the term 'agroforestry systems' is relatively new and is often linked to tropical regions, the practice of cultivating trees and crops in the same field is also a traditional form of land use in north western Europe (Herzog, 1998). In Flanders, the northern region of Belgium, examples of traditional integrated land use systems include poplar or willow rows at the border of agricultural parcels and standard fruit orchards with grazing livestock. However, through scale enlargement and agricultural intensification many of the trees on and between agricultural plots have disappeared and as such, traditional forms of agroforestry have declined in the Flemish agricultural landscape (Nerlich et al., 2012). However in recent decades, agroforestry systems have been increasingly recognized as a multifunctional land use approach balancing the production of commodities (such as food, feed, fuel and fibre) with non-material outputs such as environmental protection and landscape amenities (Smith et al., 2012).

Because agroforestry is increasingly recognized as a sustainable agricultural land use system, able to address current problems in European agriculture related to climate change and dependence on fossil energy and mineral resources, it is currently supported through both pillars of the Common Agricultural Policy (CAP). The Flemish government chose to include this in Flemish agricultural policy and in 2011 set up a subsidy program that included a

payment of 80% of establishment costs. These agroforestry parcels, planted with the subsidy program, are furthermore eligible as Ecological Focus Area with a weighting of 1, which means that the surface area of agroforestry parcels counts as greening area at the full rate. Although these measures on first sight seem to be strong incentives for agroforestry implementation in Flanders, farmers' interests in agroforestry remains limited. Between 2011 and 2015, about 100 ha of agroforestry were planted (compared to a target to plant 250 ha of agroforestry by the end of 2013 in the 2007-2013 Rural Development program).

This suggests that supporting the shift from conventional to more sustainable and diversified practices in agriculture is neither simple nor obvious. Therefore in 2014 a large interdisciplinary research project was initiated in Flanders, with the name 'Agroforestry in Flanders, an economically viable answer to the demand for agroecological production methods?' The aim of this five-year project is to (1) develop feasible and productive agroforestry systems suited for the Flemish context and (2) identify the requirements of an enabling environment that supports the development of this land-use system. The project recognizes that, in order to nurture agroforestry systems two kinds of changes are necessary, i.e. (1) multi-domain and (2) multi-level changes, which are closely interlinked. The former refers to the fact that not only farmers but all actors and stakeholders from other relevant domains have to be consulted and taken into account when studying the shift to more sustainable farming systems. The latter refers to the structures-cultures-practices triplet put forward by Rotmans (2006) and van Raak (2009) in transition literature. It considers structures and cultures as system level parameters describing the functioning of the societal systems, whereas practices mediate between them and the underlying level of the actors. In this context a transition is considered a fundamental change in the structures, cultures and practices of a societal system, profoundly changing the way it functions. A summary description of the levels according to Haan and Rotmans (2011) would be:

- *Structures*: the formal, physical, legal and economic aspects involved in restricting and enabling practices,
- *Cultures*: the cognitive, discursive, normative and ideological aspects of functioning involved in the sense-making of practices,
- *Practices*: the routines, habits, formalisms, procedures and protocols by which actors, (which can include individuals, organizations, and companies) maintain the functioning of the societal system.

A stakeholder analysis that was executed in the summer and autumn of 2015 in the context of the project resulted not only in the identification of 15 stakeholder groups with respect to agroforestry systems but also gave a lot of clues with respect to structures, cultures and practices enabling or hindering the upscaling of agroforestry. This stakeholder analysis is thus a start point to research the different levels of the described triplet more in detail, focusing in this paper more on the cultures-level. The stakeholder analysis suggested that between different actors a range of different viewpoints exist on different aspects such as the form, the feasibility, the desirability and the opportunities of agroforestry in Flanders. These could be one of the reasons that current incentives schemes are not very effective, since they focus on and address only one perspective on agroforestry, whereas a wide range of existing viewpoints exists. In this paper we therefore elaborate on a study design making use of Q-methodology to research the different viewpoints on agroecology in Flanders.

## **2. Discourses in agriculture and agricultural policy**

In the context of this research: perspectives, narratives, viewpoints, cultures and discourses relate to the same thing i.e. the way people are seeing or talking about something, and which reflects underlying worldviews and paradigms (Barry & Proops, 1999). More formally we consider here the interpretation of Frouws (1998) who defined discourses as "an organized

set of social representations, the terms through which people understand, explain and articulate the complex, social and physical environment in which they are immersed". Until now, discourse analysis has been particularly useful in analysing the visions that underlie the different definitions and approaches to farming and sustainable development in agriculture. As such a range of articles has been published about, for example, rurality perspectives of agricultural stakeholders (Frouws, 1998), farmer management styles (Fairweather & Keating, 1994), and environmental perspectives of farmers (Davies & Hodge, 2006).

Since general opinions about agricultural food production and policy also have an important influence on the view on specific agricultural practices such as agroforestry, it is also very useful to look at some general discourses more in detail. Two general narratives with respect to agriculture and sustainable food production are given by Freibauer et al. (2011). They distinguish between the productivity narrative and the sufficiency narrative. Although both narratives endorse the fact that world population is growing, the two narratives relate it to different problems and solutions (Freibauer et al., 2011):

1. *Productivity narrative*: world population will increase whereas agricultural productivity is slowing down because of resource constraints and climate change. Hence, there is a serious threat that food demands will not be met in 2050, leading to hunger and political instability. New technologies, in particular, can boost productivity by addressing resource scarcities and environmental problems. Therefore investment in research and development, and increased technology adoption by farmers are the solutions to focus on.
2. *Sufficiency narrative*: World population will increase, which will lead to serious environmental problems, resulting in massive health problems, poverty and conflict. More than science, solutions have to be sought in behavioural and structural change in food systems and supply chains. Government also has a role to play by addressing environmental externalities and the disruptive effects of trade.

Both narratives start from the same identification of challenges (increasing world population, scarcity of resources), but are very distinct from each other when it comes to the definition of the problems and processes underlying these challenges and hence also the potential solutions. Therefore both narratives shape how people evaluate what is seen as a desirable evolution of agricultural production systems, and what types of research, technology, markets and policy should surround and facilitate this evolution. The productivity paradigm starts from the observation that food production must drastically increase and – since the resources to do so are becoming scarce and food production causes environmental externalities – it focuses on producing more with less, thus improving the (eco-)efficiency of current production methods. The sufficiency paradigm also starts from the observation that a large number of people have no access to enough food and that this number may drastically increase under the status quo, but unlike the productivity paradigm which looks for causes and solution in the production of food, the sufficiency narrative focuses more on distribution of food, food systems, and consumption patterns. According to this paradigm, the challenge is not to produce enough food, but to produce and market it in such a way that it reaches those that are most needy. This involves the recognition that in some areas of the world, there is already enough food and that the challenge is to produce the same amount of food, but in a socially and ecologically better way.

Furthermore Potter and Tilzey (2005) also defined three agricultural policy and market discourses, which structure the selection and operationalization of policy measures and markets within the agro-food domain:

1. *Neoliberal discourse*: agricultural practices are evaluated along the standards of the global competitive market economy with a focus on economic growth. Therefore farmers

are considered real entrepreneurs who have to differentiate, capture value and pursue new opportunities.

2. *Neo-mercantilist discourse*: agricultural development is associated both with protectionism as with a socio-economic solidarity. Rather than an entrepreneur, farmers are considered policy takers which serve national interests by ensuring food security.
3. *Strong multifunctionality*: agriculture has a key factor to play in integrating social and ecological processes, which should result in an economically viable agricultural sector. The existing power relationships within the agricultural sector should be rebalanced with a more important role for civil society

These narratives, paradigms or discourses must be seen as a combination of ideas, opinions and perspectives that give rise to a certain direction of policy frameworks and measures, because they shape what is thought to be the right thing, the problem definition and formulation and what are regarded as good solutions. Erjavec and Erjavec (2009) showed that the neo-liberal discourse was gaining increasing importance, even though elements of the other two competing discourses were sometimes used in communications by the EU Agricultural Commissioner to different audiences.

None of the above discourses have a one-on-one relationship with agriculture and agricultural policy. Dibden et al. (2009), for instance, showed that agricultural policy makers in the EU and Australia were both supporting a type of agriculture driven by the productivity narrative. However, while the EU, although gradually moving towards the neo-liberal stance, incorporated several aspects driven by the neo-mercantilist position (trade barriers, heavily subsidized agricultural sector), Australia has employed instruments driven by a purely neo-liberal position (unsubsidized highly productive agriculture).

These general discourses about agriculture and agricultural policy will be merged with perspectives about agroforestry in this study. The motivation for this is the growing recognition that the different discourses on agriculture and agricultural policy constitute a certain rhetoric that will result in different meanings and interpretations of agricultural practices, and as such they also imply differences in the enabling environment of these practices, formed by research, policy, market and economic conditions. This suggests that in practice, stakeholders adhering to different views about agriculture and agricultural policy might hold different or even opposing perspectives about agroforestry, what is it (or should be) and if and how it should be incentivized.

### **3. Methodology**

#### **3.1 Method: Q-methodology**

Q-methodology or shorter Q-method, was primary invented and developed by William Stephenson in the 1930s to assist in the examination of human subjectivity (Brown, 1980). Today Q-method usually implies factor analysis or quantitative correlation analysis, and this to unravel different perspectives on a particular subject and to measure the overlap and difference between them (Hermans et al., 2012). As such Q-methodology possesses both quantitative and qualitative dimensions (Ellingsen et al., 2010) which makes it an increasing popular method to identify different groups and their shared perspectives and to test hypotheses about existing viewpoints in a more quantitative way (Hermans et al., 2012).

Q-method differs from the more commonly known surveys and questionnaires to elicit different discourses. First of all surveys and questions ask respondents to express their opinions on isolated statements, whereas Q-methodology identifies respondents' views on a statement in the light of all other statements presented (Cuppen et al., 2010; Dryzek & Berejikian, 1993). In this way it addresses the fact that the same words or phrases may mean different things to different people, and that statements are generally understood in the

context of other statements included in the questionnaire of survey (Hermans et al., 2015). Though, in comparison to surveys and questionnaires, which can easily measure the level of support for certain viewpoints, Q-method is more appropriate to give an overview of the plurality of the different discourses that exist (Cuppen et al., 2010).

A Q-method exists of six general steps. In this and the next section the two first steps in executing a Q-method are explained more in detail. The other steps will be implemented in the near future and are explained more briefly.

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

The first step in a Q-study is to identify the concourse, which refers to the communication about a certain issue, here agroforestry. In general the concourse takes the form of a collection of statements which should capture the full range of viewpoints and perspectives that different stakeholders might have (Hermans et al., 2015).

In this study, the concourse about the potential for agroforestry to become a common farming system in Flanders was created using a combination of several sources. First, we consulted the literature about agroforestry adoption and its wider framing as an agro-ecological farming practice. Therefore we consulted literature about agroforestry, its feasibility in Belgium (e.g. Borremans et al., under review) and literature about agro-ecological transitions (e.g. Duru et al., 2015). Furthermore, we consulted academic literature and non-academic reports about discourses about farming and agricultural policy. The motivation for this is the growing recognition that the adoption potential of a farming system such as agroforestry does not just depend on tangible barriers and drivers related to the practice itself and to farm and farmer characteristics, but also on the enabling environment, formed by research, policy, market and economic conditions, including the general narratives on agriculture held by influential stakeholders and institutions that determine and define the structures and practices put in place. This step in the development of the communication concourse was of deductive nature, meaning that we had a predefined idea that these perspectives may be important and related to the perspectives about agroforestry. Second, we undertook an extensive stakeholder analysis to identify a diverse range of opinions on agroforestry. The stakeholder analysis took place from June to December 2015. Selection of the respondents was firstly based of expert knowledge and participation in previous agroforestry activities. New respondents were then selected through a snowball sampling technique. In total 25 interviews were carried out with the help of interview guides containing questions structured around four themes:

- (1) knowledge, feasibility and desirability, and barriers and enabling factors;
- (2) impact of agroforestry development on the stakeholder
- (3) influence of the stakeholder on agroforestry development
- (4) other important stakeholders and their characteristics.

After the interviews, in November 2015, two focus groups were organized in which 16 people participated. The specific goal of the focus groups was to explore more in depth stakeholders' thoughts and opinions, and uncover new information as respondents now had the possibility to react on and discuss with each other. Therefore the focus groups were composed as diverse as possible, with an equal distribution of the respondents among the different identified stakeholder categories. The distribution of the 36 respondents that participated in the interviews and focus groups over the different identified stakeholder groups is presented in Table 1. In the end the stakeholder analysis led to the identification of 6 broad groups of stakeholders, but because the stakeholders within a stakeholder groups still had a lot of difference with respect to interests in and influence on agroforestry, they were subdivided in 17 smaller, more uniform stakeholder groups (Borremans et al., under review).

Table 1. Distribution of respondents over the different identified stakeholder categories

Stakeholder group	SH subgroups	Nr. of respondents		
<b>Agriculture</b>	Farmer organizations	5	9	36
	Farmers	4		
<b>Government</b>	European government	0	5	
	Flemish government	5		
	Local government	0		
<b>Research</b>	Euraf-network	0	5	
	Flemish research institutions	3		
	Practical centres	2		
<b>Civil society organizations</b>	Environmental organizations	6	11	
	Landscape organizations	3		
	Transition agriculture organizations	2		
<b>Suppliers and buyers</b>	Suppliers	2	5	
	Buyers	3		
	Processors, supermarkets	0		
<b>Society</b>	Local residents	0	1	
	Landowners	1		
	Consumers	0		

The collected qualitative data were transcribed as soon as possible and afterwards processed and analysed in Nvivo11. For generating the communication concourse all the transcriptions were explored once more. To triangulate the results of this analysis, some secondary sources, such as a range of articles that were published in regional agricultural journals, were examined. This second method to construct the communication concourse was inductive, as we used exploratory qualitative research to identify all possible perspectives about agroforestry. This led to a communication concourse of more than 300 statements.

### 3.3 Step 2: Setting up the Q-sort

Since a concourse of hundreds of statements is too large to present to participants in the Q-study, a group of 30-60 statements has to be chosen from the concourse, which is considered sufficient to elicit the different existing point of views (Hermans et al., 2012). For selecting the final group of statements, i.e. the Q-set, two different approaches exist (Paige & Morin, 2014). When no predefined theory exists about the subject of interest an inductive or unstructured approach should be used. In this case, the selection of the final Q-set is based on the different themes that emerge from the communication concourse. When a deductive approach is chosen, the selection of the final Q-set depends on theoretical considerations, i.e. relevant concepts derived from a theory or framework.

In this study design the two different approaches are combined. An inductive approach was used to select statements relating to agroforestry, its definition and different forms, its feasibility and the factors and actors influencing its breakthrough. These statements were primarily drawn from the interviews and focus groups and selection was done (1) based on the level of dissensus that was expected and (2) ensuring that all diverse opinions were represented. A deductive approach was used to add statements that related to the diverse narratives held about agriculture (efficiency, sufficiency) and agricultural policy and markets (neo-liberalism, neomercantilism, multifunctionality). Statements were constructed, as described above, based on an analysis of peer-reviewed papers and reports. In this step, statements were selected to represent the whole diversity of different paradigms.

Table 2: Statements selected in the Q-set

Perspectives on agroforestry as a production system (type, scale, definition)	1	In the case of agroforestry, an extra layer, which is the tree component, is slid into your agricultural system with as little impact as possible on the crops
	2	Agroforestry means achieving the highest productivity in function of the circumstances of the plot
	3	Only if it concerns extensive grazed livestock systems are there opportunities for agroforestry systems in Flanders
	4	If you are starting with agroforestry, you must dare to choose poplar; you must dare to choose for species with a high yield
	5	Implementing agroforestry solely with wood production as a motive is naive
	6	Standard fruit orchards are too labour intensive to be economically viable
	7	Agroforestry is only useful on less valuable plots that are too small, too wet or too far away
	8	The larger your plot, the more interesting and profitable agroforestry becomes
	9	The correct arrangement of the plot and modern GPS technology allows the farmer to use his agricultural machines in an optimal way
	10	The agricultural business model in Flanders is aimed at scale enlargement and the combination scale enlargement - agroforestry does not fit
Perspectives on the economic, financial and market aspects of agroforestry	11	As long as the profitability of such a farming system is not clear, agroforestry has few opportunities in Flanders
	12	Trees on the farm have completely lost their functionality
	13	Trees reduce the value of agricultural land considerably
	14	Agroforestry is not intended to give hobby-farmers an occupation, it really must be profitable and economically viable
	15	The consumer does not want to pay extra for products originating from more sustainable farming systems
	16	A dynamic where agroforestry could jump on is really the story of farm sales, urban agriculture and community supported agriculture
	17	The added value of agroforestry is that it allows farmers to strengthen their product specificity
Perspectives on the institutional aspects of agroforestry	18	A subsidy serves to compensate the farmer for the application of a social advantageous but a not very profitable farming system
	19	Due to inconsistencies in agricultural policy which changes year after year, farmers don't dare to get involved with agroforestry
	20	The development of agroforestry is very much restrained by the tension between the agricultural and the nature sector
	21	The current evolutions in agriculture, such as seasonal tenancy and the hiring of contractors, rather counteract agroforestry development
	22	The successive crises in agriculture will lead to a transition to other more diversified farm business models with more opportunities for agroforestry
	23	The government should not impose excessive restrictions on how agroforestry is implemented and should pursue a more flexible policy
	24	A law should never be able to come into effect which prohibits harvesting trees planted in an agroforestry system
	25	The fact that agroforestry plots in Flanders are eligible as ecological focus area, may persuade farmers to opt for agroforestry
	26	The subsidy program should not just be linked to the trees, but to the farm business model and production plan that are completely adjusted to agroforestry implementation

	27	Farmers should get a higher fee if the trees they plant imply a higher value for society
Perspectives on the socio-ecological aspects of agroforestry	28	The benefits of agroforestry are primarily directed to society rather than to the farmer himself
	29	Not every additional tree planted in farmland also has an ecological or scenic value
	30	A farmer who is innovative, is often viewed with suspicion by his colleagues
	31	A farmer who is 60, will be more reluctant to plant trees than a farmer who is 30
	32	It is not the role of the farmer to experiment with trees
	33	Agroforestry in the sense of rows of tall trees, have a negative impact on wildlife
	34	Trees do not protect against crop diseases, on the contrary, they lead to shade and moisture which makes crops more prone to fungi
	35	Agroforestry in itself is a very nice system, but its benefits are applicable only in the tropics and regions such as southern France
Perspectives on agriculture	36	The whole story about PAS, IHD and Natura 2000 has exacerbated the crisis in agriculture
	37	The most important feature of agricultural innovations should be its effect on productivity of food production
	38	To meet the challenges in the future, it is necessary that farmers should try to produce more food with less inputs
	39	The agricultural sector should try to produce better products, with more care for the social and ecological impact, rather than more
	40	A subsidy programs serves to start up the conversion to more sustainable agricultural systems, until the market takes over
	41	Farmers receive too little benefits when concluding management agreements or implementing agro-environment measures
	42	Land sparing (improving food productivity per hectare of land at (ecological) costs so more land can be saved for nature conservation and biodiversity) is to be preferred over land sharing (providing both food products and public goods such as biodiversity on the same plot of land, with a possible lower food production per hectare)
Perspectives on agricultural policy	43	The agricultural sector should compete in the free global market, just as any other sector
	44	Farming is different from other sectors, and hence should be protected from the market by governments
	45	The liberalized and globalized market is not working for agriculture
	46	The production of food and the production of other things such as a nice landscape, rural tourism, good environmental conditions should be separated: only food production on farm land, everything else somewhere else
	47	Farmers are not only producers of food, but also stewards of the land and must take into account the environment

### 3.4 Further steps

The third step consists of selecting the respondents. In Q-methodology, in contrast to R-methodology (e.g., regular survey methods), the quality depends less on sample size and representativeness, but larger on the extent to which the whole diversity of possible perspectives are captured by the sample. In our study, the respondents will be drawn from the six stakeholder groups defined in Table 1. Afterwards the selected respondents will be asked to rank-order the statements according to a forced normal distribution, with different positions

ranging from least to most 'according to my point of view'. In this way it allows to find a small number of statements in the extreme categories which characterize the different perspectives the most. This fourth step can be done during an interview, in which the normal distribution is printed on a large sheet of paper and the statements on small cards, or it can be performed online with special software such as the FlashQ software (Hermans et al., 2012). The fifth step encompasses a principal component analysis to rearrange the data by identifying and ordering components and ranking them according to the amount of variance that they explain from the original data. Subsequently a data reduction step will take place by choosing the right amount of components and discarding the rest. The sixth last step consists of an interpretation of the factor scores. Therefore a number of 'ideal Q-sorts' are produced, which will represent the different perspectives or discourses, and around which those Q-sorts which come closest to these ideals are listed. In the end, the different perspectives are interpreted and described, which is facilitated by identifying the most distinguishing statements of the different perspectives (Cuppen et al., 2010; Hermans et al., 2012)

#### 4. Expected results

The expected results of this study are the identification of – idealized – Q-sorts, which represent a model discourse indicating the perspectives held regarding agroforestry and how they are related with broader perspectives concerning agriculture and agricultural policy. Further, the results can potentially indicate which perspectives are more common among which stakeholder groups. Using this, implications can be drawn regarding the feasibility of agroforestry, its barriers and drivers and how they relate to broader narratives about agriculture and policy. We expect to identify different perspectives regarding agroforestry – and thus different pathways to transform farming systems into agroforestry systems, depending on peoples' perspectives regarding agriculture and policy.

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