SPSD II

SUSTAINABLE AGRICULTURE: AN INTEGRATED APPROACH FOR COMMUNICATION BETWEEN SCIENTISTS AND STAKEHOLDERS

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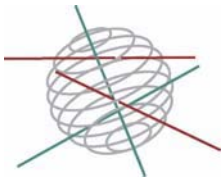
SUPPORTING ACTIONS

BETWEEN SCIENTISTS AND STAKEHOLDERS

SCIENTIFIC SUPPORT PLAN FOR A SUSTAINABLE DEVELOPMENT POLICY
(SPSD II)



Part 3:
Supporting actions – "Clusters"

FINAL REPORT

SUSTAINABLE AGRICULTURE: AN INTEGRATED APPROACH FOR COMMUNICATION BETWEEN SCIENTISTS AND STAKEHOLDERS

OA/12

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Content

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1 Objectives of the project

For scientific research to be valuable for society, its results have to be brought forward and connected to other fields of knowledge and experience. The overall objective of the project was to cluster various perspectives on the research of sustainability in agriculture and to build bridges towards the stakeholders in the field of food production and consumption. Therefore the project organised a platform for researchers and stakeholders to discuss the possibility of linking and integrating their research results and methods, to develop workable knowledge or instruments for stakeholders and policy-makers.

This cluster project is based on the research done in three SPSD projects, where SPSD stands for the second multi-annual Scientific support Plan for Sustainable Development policy, a master plan to support sustainable development, run by the Belgian Science Policy. The three research projects (SAFE – BIO – MULTI, see further) provided the input to three workshops, spanning a learning curve from benevolent interest in each others work to active exploration of common ground, leading to the contents of a small booklet. That booklet created the upbeat to a conference where all findings were presented to a wider audience.

Researching sustainability in agriculture remains to day a pressing item. The question for sustainable agriculture in a sustainable society falls in the midst of a battle for the mouths, minds and markets. In 250 years our world has changed from one dominated by farming and agriculture to one dominated by global agribusiness and commodity styles in food and beverages. Consumption has taken the lead through major branded food manufacturers, food retailing and food services.

However one values this state of things, it is clear that some serious problems are looming at the horizon, while some are already manifestly among us. Considering all this, some questions deserve to be raised. What are the most effective approaches to intervention? Which are the cheapest, or the dearest? How can governments be persuaded to take action in the public interest? How can the enormous vested interests - from companies to campaign groups - be encouraged to engage in transformations that may turn out to be major shifts in perspective and approach?

The current project tries to answer some of these questions by integrating technical, economic and social issues. The added value of the project is twofold:

- at the level of individual research projects: the project builds a platform in which researchers of different fields of expertise can meet and discuss their research on parts of sustainable agriculture. The topic of sustainability is so comprehensive that no research action itself can encompass all problems at hand. By combining different research projects, much more of the topic can be studied.
- at the level of practical results: by discussing with and translating research results towards stakeholders, the practical relevancy of research results about sustainable agricultural systems and their implications for action by stakeholders will be more clear and more focused. It will also enhance discussion about policy and institutional changes required.

Because of the complexity of the idea of sustainability (economic, social, ecologic, individual, holistic etc.) an integrated approach between technical, economic and social sciences is needed. A lot of projects financed by SPSD, work on partial elements of sustainability. As you will read further on, all three individual projects try to respond to partial problems linked to sustainable agriculture and food production: from a pure technical point of view (such as indicating norms and standards that are required for safe use of pesticides or nutrients) over a more system approach trying to detect relevant indicators of sustainable agriculture and their use at farm level, to the strategies used by farmers in responding to pressures either within peri-urban regions, either from the market (e.g. in the case of organic beef production). Totally different approaches are used such as measurements at product, field or farm level, surveys or actor oriented research methods. One of the aims of this cluster project is to provide a platform to the researchers within these projects to think about the integration of research results and methodologies in the framework of practical action of involved stakeholders and policy makers.

On the other hand, the cluster project also aims at confronting the work of the scientists with relevant policy makers and other stakeholders. Both literature (inter alias Hisschemöller et al., 2001; Hoppe, 2002; In 't Veld, 2000; Kreie, 2000; Porter, 1995; Stone, 2001) as well as the daily practice show that there is

still a big gap between research and policy making, in particular with respect to sustainable food production and consumption. It is also clear that arriving at sustainable systems is not only a matter of norms and standards, but needs careful analysis of how stakeholders react on them and which kind of incentives can be used to change their behavior. There exists a gap between technical information and its use or influence on behavior. Therefore reflection is needed in how far technical and scientific knowledge is used by stakeholders and in how far it helps them in taking decisions. This shows the high need for bridging the gap by translating research results and confronting researchers with practical policy making. A kind of communication facilitator is required for researchers to understand the questions of policy makers and vice versa for policy makers to understand the results of often highly advanced research models and system approaches. Therefore, a second objective within this cluster project is to offer such communication channel so that both the research projects can benefit from the relevant policy questions and that policy stakeholders can better understand the practical relevancy and policy consequences of the research results.

By providing a platform of discussion between researchers and between researchers and relevant stakeholders, this project bridges the gap between the often linear framework of technical sciences and the complex mental frameworks explaining reaction and behavior of stakeholders.

2 Methodology

As already mentioned; this cluster project is based on the integration of three SPSD projects. Each project considers some part of sustainable agricultural development in it's own way. Each project also leads to policy implications and recommendations. The integration of these three projects is the main objective of the cluster project. By integrating, the project partners want to build a platform to transfer the knowledge they collected, towards other researcher as well as towards policy makers and stakeholders. In literature different models for knowledge transfer can be found. The so-called rational or linear mode (in which formulation of norms and standards are based on technical scientific knowledge) is not working because this model takes the reactions of the stakeholders concerned insufficiently into account, in particular when it concerns sustainability problems which require changes in practices both from producers and consumers. The role of social science models lies more in revealing these behavioral aspects when proposing policies for sustainability in the food sector. Therefore the combination of technical and social aspects of institutional and behavioral changes, need to be communicated and discussed among technical and social scientists but also with the end users of the knowledge produced. Such knowledge transfer however requires meeting platforms between producers and end users of knowledge and scientific information (Hoppe, 2002).

Given the objectives stated above, the platform created for scientists to discuss and communicate their research results both among each other as with policy makers and the general public, consists of three actions:

1. discussion workshops to discuss research results and possible policy consequences;
2. publication of a booklet for a larger audience on the main aspects of sustainable food production and consumption and what changes would be required;
3. an open conference on which results and findings are presented and debated with main stakeholders and delegates from pressure groups and other interested organizations.

Under heading 1, the intention is mainly to discuss research results among the team members involved and to confront these results with a small number of relevant stakeholders (mainly people already involved in the different steering committees but also other relevant policy stakeholders). For this purpose once a year during the three years project a discussion day is organized on which results of the different research teams are presented. To increase the policy relevancy a professional discussion opener is provided who challenges the research teams to explain what consequences their results may have for the evolution of food production and consumption in future, what the relevant policy problems are and what might be possible solutions. Our aim is also to have by this an interaction between more technical oriented research and socio-economic research teams who often look from a different angle to the same problem.
The three workshops or discussion platforms are centered around different (sub-)topics such as: the usefulness of sustainability indicators, the relevance of system analysis and modeling for policy making with regard to sustainable agriculture, sustainability and institutional change, scientific knowledge and behavior of stakeholders. These are only examples as the final subject of each workshop is decided after consultation of both the research teams involved as the interested stakeholders and are described further in this report.

Under heading 2, the revealed main items of interest for a larger audience with respect to the problems of sustainable food production and consumption coming out of the discussions in the workshops, are collected in a booklet. The booklet is conceived in such a way that it can be read by an interested audience. Focus is on the implications of the research finding for the future development of our food production and consumption system. When relevant, results are illustrated by speaking examples or cases.

Under heading 3, a conference is organized (in the third year) with as objective confronting Belgian researchers in an open debate with policy makers about possible future actions for sustainable food production and consumption at national and international level. To give the conference an international dimension, researchers from other countries are invited to participate in the event.

In conclusion, this project tries to bridge the existing gap between different research efforts, disciplines and methods on the one hand and between researchers and stakeholders on the other hand. To a certain extent this can be seen as an extension of the action oriented research method applied in the organic beef project (CP/19) because by asking the right questions both to researchers and stakeholders, a learning process is created from which both researchers and stakeholders will benefit. The project therefore mainly wants to create such common learning and discussion platform to increase the relevancy of the many research efforts done, including an important communication effort to translate research results toward an interesting public.

3 Background

The cluster project is based on three SPSDII projects which are described below. In each project, scientists from different fields tried to work together and study some part of sustainable agriculture. Each project has followed a specific method, studied a certain part of sustainability and researched some group of farmers. Because of the many differences in approach, methodology, objectives and results of each project, they make an excellent case for bridging the existing research gap between different researchers of a same subject.

3.1 SAFE – project: Framework for assessing sustainability levels in Belgian agricultural systems

Research partners:

Prof. dr. MATHIJS E.
Prof. dr. MUYS B.
Prof. dr. HERMY M.
Prof. dr. VANCLOOSTER M.
Prof. dr. BIELDERS C.
Prof. dr. PEETERS A.

Description of the project:

3.1.1 Objectives

Throughout history and especially during the last century, mankind has created technological innovations (e.g. machinery, chemicals, genetic improvements) to increase levels of agricultural production. However, negative impacts of these developments were rarely or not sufficiently considered. Nowadays, evidence suggests that the actual production modes may not be sustainable, i.e. that farming systems may jeopardize their production function in the long term. Indeed, there is legitimate concern that intensifying agricultural practices, but also successive European Common Agricultural Policy and World Trade Organisation reforms, may have long term consequences on the expected level of goods and services provided by the agricultural sector, the economic viability of farms and the availability and quality of natural resources. The major objective of SAFE is to design a generic and holistic tool for evaluating quantitatively sustainability levels in Belgian agricultural systems.

3.1.2 Theoretical and methodological frame

SAFE's backbone is a coherent core list of 87 sustainability indicators. This list covers environmental, economic and social issues. The list of sustainability indicators is part of a hierarchical framework of Pillars (3), Principles (18), and Criteria (45) providing a holistic structure in which to describe the functioning of an agricultural system:

- For the *Environmental Pillar*, principles and criteria have been defined at the level of each individual resource (air, water, soil, energy, biodiversity) as well as at the level of the ecosystem itself (ecosystem integrity). For the different resources, a consistent set of principles and criteria have been derived by considering two main ecosystem functions: a buffer function against damaging effects and a stock or supply regulation function which describes the 'availability' of a resource both in terms of its quantity and quality.
- For the *Economic Pillar*, only a single function was needed to evaluate the economic viability.
- For the *Social Pillar*, four aspects have been taken into account: food security and safety, quality of life, social acceptability and cultural acceptability.

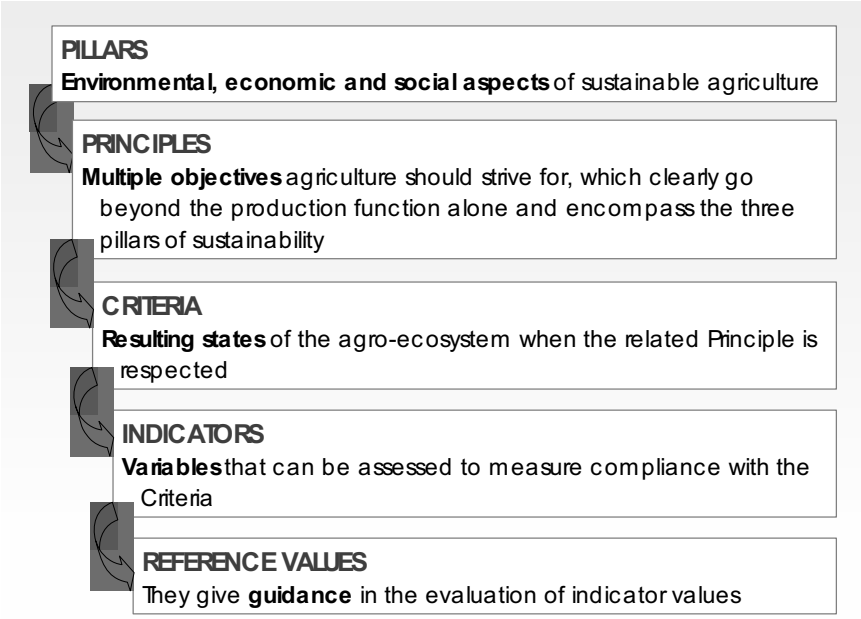


Figure 1 The hierarchical structure of the SAFE framework.

The list of sustainability indicators is the result of a standardized selection procedure that requires as input the knowledge and experience of more than 25 Belgian experts.
In order to perform a sustainability assessment with SAFE in a farm, three things have to be done. Data for the calculation of indicators is collected in the farm or derived from existing databases. Indicators are calculated for the farm. And the indicators are confronted with their respective reference values and progressively integrated in an overall sustainability index ($SI_{overall} = 1/3 * (SI_{environmental} + SI_{economic} + SI_{social})$).
So far, within the project the SAFE tool has been tested on 4 farms.

3.1.3 Results

All the results of this project have been assembled in the final report of the project (Peeters et al., 2005).

3.2 BIO – project: How can organic farming contribute to sustainable production and consumption patterns?

Research partners:

M. STILMANT D.
Prof. dr. MORMONT M.
Prof. dr. VAN HUYLENBROECK G.

Description of the project:

3.2.1 Context and objectives

Our approach to sustainable development differs from a normative approach (based on objectives, criteria, and indicators) by embracing a dynamic approach that strives to understand which "simultaneous" changes should or might occur that lead towards sustainability. We do not at all reject a normative approach, but are trying to offer a complementary way to understand how the changes can occur. Identifying the impact of pollution generated by vehicles' engines e.g. can lead to the setting of

emission standards, but does not necessarily say how the engines must be adjusted to meet these new requirements. Our approach is more a social learning involved in sustainability one.

Organic agriculture – in this case organic cattle farming – appears at first glance to have a number of serious advantages in terms of sustainability, since it bans certain practices that are usually considered to be harmful (such as pesticides and man-made fertilisers) and favours others (such as a link to the soil). However, organic cattle farming and beef production is also subject to economic and commercial pressures that orient its development. In particular, this agricultural sector has expanded recently and entered the playing field of mass distribution. The support given to the reconversion of holdings under the EU's CAP has also attracted new producers to the business. These economic and commercial pressures have led to the development of new production chains. These are the subject of our research project.

One of these chains was studied in detail using an intervention-research model in which the researchers participated – through intervention and knowledge generation – in the search for satisfactory new solutions together with the players themselves. The **central objective** of this research was thus methodological, namely, to develop a research method in partnership with the players to redirect practices as to achieve sustainable production and consumption patterns.

Moreover, organic cattle farming has largely been developed on the basis of existing reference systems concerning animal husbandry techniques (breed, fattening and finishing methods, and product quality definition) that do not necessarily correspond to the sector's norms (e.g. rejection of systematic calving by caesareans) or consumers' demands. This has given rise to tensions that crystallised around the choice of the cattle breed.

The research's **objective** can thus be defined as an attempt to redefine an organic beef production chain that meets the requirements of sustainability. Sustainability in this context is defined as both the maintenance of a production/marketing system and the satisfaction of social/societal and environmental requirements.

3.2.2 Theoretical and methodological frame

A production-marketing-consumption chain is a set of norms, standards and practices that are interrelated in a complex way. It coheres and functions on the basis of a reference system. That is: a set of beliefs, knowledge and images, shared and/or distributed amongst the participants in the chain. Nevertheless, its coherence is only partial and leaves room for the possibility of changes and adaptations that are, moreover, continual. Some changes may be implemented in the chain without radically changing the way it functions, whereas others may entail significant changes on other levels. In our specific case, complying with the ban on systematic reliance on delivering calves by caesareans entailed a change of breed that itself would lead to changes in the farming techniques, even in the quality of the product, and thus required changes in consumers' demands. From a theoretical standpoint, we thus followed an approach in which we accepted certain technical or economic determiners, but also a non-deterministic approach to the extent that we postulated possible partial changes or sequences of changes that could reconfigure a chain.

From a methodological point of view we wanted to refrain from settling solutions or prioritising research questions ahead of time. We thus had to define, with the chain's players (or at least those who accepted to take part), the most relevant issues that could serve as starting points for proposing both new ways of organising the chain and research questions. The underlying working hypothesis was that modifying the relationships between stakeholders would lead to modification of their knowledge (or the questions about knowledge) and, inversely, that the knowledge modification would transform the stakeholders'relationships with each other.

3.2.3 Results

All the results of this project have been assembled in the final report of the project (Stilmant et al., 2006).

3.3 MULTI – project: Development strategies for a multifunctional agriculture in peri-urban areas

Research partners:

Prof. dr. VAN HECKE E.
Prof. dr. MEERT H.
Prof. dr. VAN HUYLENBROECK G.

Description of the project:

3.3.1 Context and objectives

The project was based on the following observed changes in Belgian agriculture:

1. Belgium is characterised by a high degree of urbanisation. As a result, agriculture in Belgium suffers a number of structural handicaps in comparison with other areas, such as the high degree of land fragmentation or, high land prices. Moreover, the legislation as regards to environmental protection, animal well-being and other possible negative impacts of agriculture is stricter, e.g. reflected in additional requirements in the area of town and country planning. This makes peri-urban agriculture less competitive for mass production or supplying cheap raw material for the industry.
2. On the other hand there is an increased interest in the urbanisation of open space, the contact with nature and the rural way of life. The contemporary citizen has other expectations of the remaining open space. The countryside evolves more and more from a production space to a consumer space, in which citizens are searching for leisure, diversion and recreation. The open space becomes an essential component in the liveability of urbanised areas. On one hand this results in competition for the available resources, while on the other hand it also offers opportunities for sectors supplying these functions.
3. The less favourable conditions for agriculture regarding mass production in peri-urban areas, in comparison with more rural areas, makes it necessary for agriculture in urbanising areas to search for new outlet possibilities, and so profit from the presence of a large concentration of citizens and consumers and from their new expectations regarding food products (more variety and better quality) and other outputs expected from the country side.

The above tendencies present the outlines of what some call "new agriculture", namely a food production which depends, more than in the past, on the fulfilling of social expectations and functions and which by means of innovation, diversification and broadening, tries to meet the new consumption requirements. More and more citizens and social actors are aware of the fact that agriculture plays an essential role in a sustainable society, and contributes to the liveability and viability of urbanising areas. In other words, sustainable agriculture has not only something to do with the preservation of agriculture production (by means of more ecological production systems) but also with the degree to which the sector is able to meet the new social expectations regarding the country side. The aim of the project was to examine the expectations of agriculture in peri-urban areas, to analyse whether agriculture, is able within the peri-urban context to meet these expectations and to assess the role of (local) policy in supporting the new functions of agriculture.

3.3.2 Theoretical and methodological frame

The research concentrated on the peri-urban area surrounding Brussels, where all gradations of urbanisation (from conurbation over suburbs to residential areas) can be found. The case study also allowed to take into account the differences concerning regional policy, given that this Brussels peri-urban area is partly under influence of the Flemish and Walloon region. Data were collected from farmers (1106 respondents), citizens from the fringe around Brussels and from the metropolitan district of Brussels (in total 1313 respondents) as well as from the municipalities (48) on the local situation and policies.

Function expectations
After an analysis of the historical role and evolution of the agrarian sector in Belgium with emphasis on the differences between peri-urban and rural areas, the first objective of the research focused on the influence of the urban environment on agriculture and on the functions expected by society from agriculture. Through interviews with all relevant actors in peri-urban areas these expectations and their evolution have been described and the importance of the demand evaluated.

Function fulfillment
Next, the jointness between the production of agricultural commodities and the expected non-commodities was analysed. Through different research methods it was investigated how agriculture is responding to the expectations from society and how individual farms try to adapt to the expectations of the non rural population in peri-urban zones. It is also studied in how far this leads to new income sources and with what kind of constraints farmers in peri-urban zones are confronted with when developing new forms of agriculture.

Function development
The new income sources are analysed and their strengths and weaknesses studied. Their relation with the peri-urban situation is analysed as well as their future potential. This potential is linked to different socio-economic and spatial factors such as purchase power in the nearby urban zone, the accessibility of the area, the historical evolution, the recreational value of the zone and so on.

Function support
The final objective of the project has been to analyse policies to support the development of agriculture in peri-urban zones. Efficiency and effectiveness of policies promoting the multifunctional role of agriculture were evaluated. The shift from a production oriented income support toward a more area specific rural development policy is critically analysed. Further implementation of environmental policies may reduce the viability of farming in peri-urban areas (license policy e.g.) while spatial restrictions have a negative influence on land prices. But on the other hand the proximity of the city may also be a source of innovative power which can result in new forms of agriculture nearby the city if correct incentives are given.

3.3.3 Results

All the results of this project have been assembled in the final report of the project (Van Huylenbroeck et al., 2005).

4 Results of the cluster project

The above described projects were combined into this cluster project. The results of the cluster project can be divided into three items, based on the three different methodological approaches in the research: organizing workshops, writing a book and closing with a conference.

4.1 Workshops

The first approach to creating a knowledge platform on sustainable development in general and for agriculture in particular consisted of organizing workshops with the project partners and stakeholders. The objectives of the workshops were:

a. share results from the project amongst researchers;
b. discuss these results and their relevance openly to generate new/integrative insights;
c. identify relevant SD-policy questions/problems and ways to approach or address them;
d. explore possible implications for SD policy and international adaptation;
e. present implications of research projects and processes.

The next figure shows how the three SPSD projects gave an input for the three workshops. Each workshop confronted the project results on the theme of the workshops and identified the implications for sustainable food production and consumption that are important for the different policy areas. The implications reflect concerns and issues important to the stakeholders. The stakeholders were invited to actively contribute in subgroup debates.

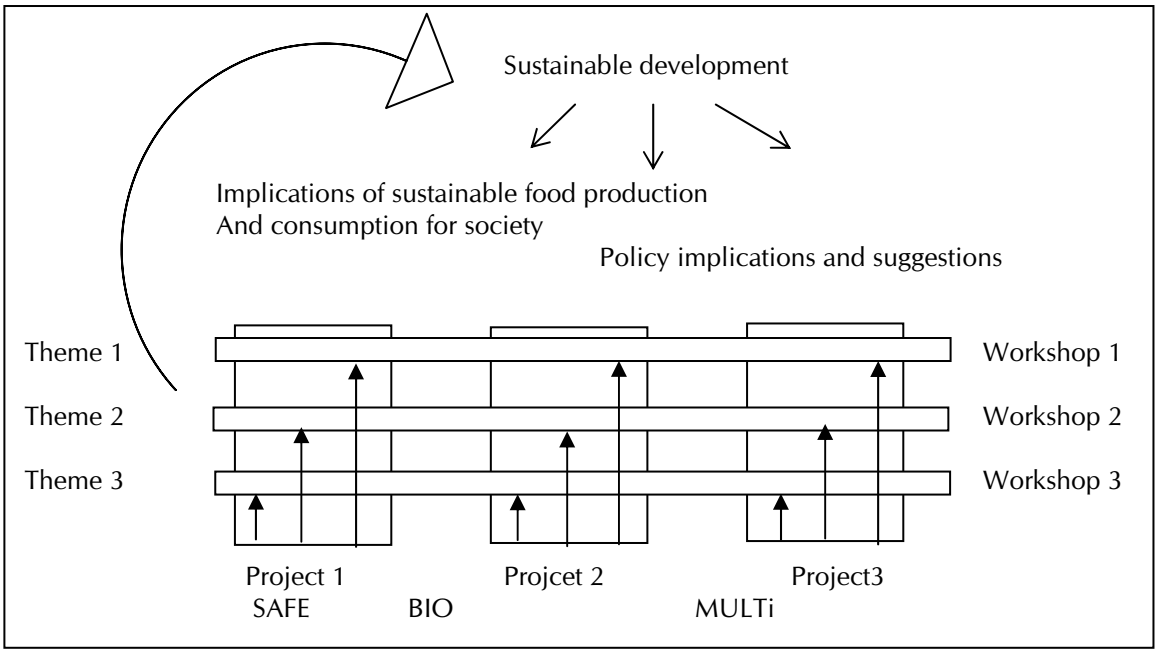


Figure 2 Integrating the three projects through 3 workshops

The **first workshop** dealt with issues on the "Role of agriculture in society and what it does to sustainable development" and was organized on January 27th 2005 in Brussels. Firstly a more general debate on sustainable development was held while later on the focus shifted to the implication of sustainable food production and consumption for society as shown in figure 3.

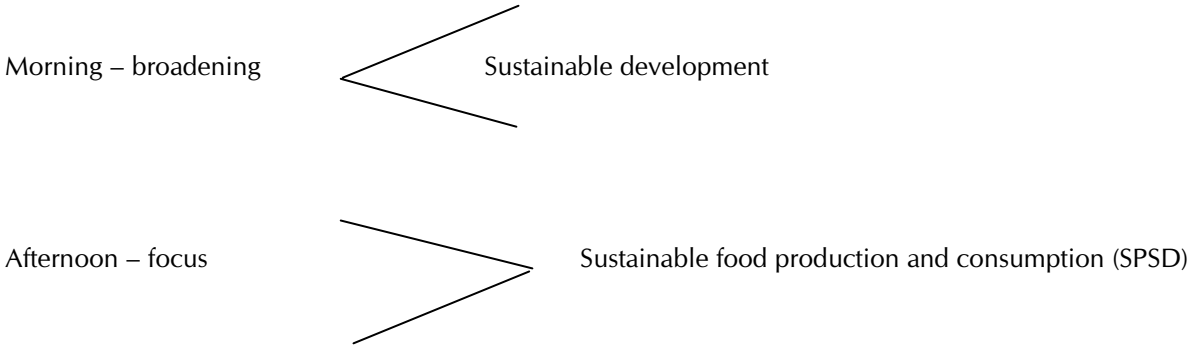


Figure 3 First workshop approach

Each of the projects gave an input of about 10 slides. The format was provided to the researchers of the three projects. The presentations had to be clear and bring statements or hypotheses that can be discussed in the subgroup discussion. Each presentation gave a brief overview of the work done in the SPSD project:.

1. what does the project consider as the role for agriculture?
2. followed by statements on the consequences for saying that agriculture is sustainable or not,
3. with implications for issues and new questions and themes to be addressed.

The three lists of issues (by each SPSD project) are the input for the subgroup discussions.

The pre-work for each project team included reflecting on the issues to be discussed. One person of the team was asked to present. The presentations could be based on a (a) holistic approach, (b) socio-economic approach, or (c) socio-technical approach.

During the discussion of new emerging issues and questions, the following issues were raised:

1. *concerning SAFE*

There can be conflicting objectives in the indicators. This is said to be inherent to sustainable development since this is an optimizing exercise or depends on moral values. The economic value should also take account of externalities as criteria. The questions were raised: "what is optimal?" and "optimal to whom?".

2. *concerning BIO*

Is organic agriculture a social learning process or about finding a new optimum system? There is asymmetric information between different actors in the chain of organic agriculture. Who gets the burden of the risks involved in bio-agriculture?

3. *concerning all three projects*

- There are three perspectives and three functions (economical, sociological an ecological) and the question remains: how do we value these functions ?
- Different scales have been used: sustainability at local, regional or global scale. Therefore it won't be possible to find one solution.
- To compare farm sustainability the sustainability index should be calculated twice and then be related to the agricultural practices.
- All three projects use different epistemological and methodological approaches: the SAFE project gives the ideal system, the BIO-project explores the real system and the MULTi-project explores and gives information on the ideal system.

During the afternoon, the participants discussed, in smaller groups, on sustainable food production and consumption. The subgroup discussions allowed for issues and questions to emerge that were not addressed by each project.

Amongst others, the following issues were raised:
- is there a need for an operational definition of SD;
- is biodiversity a public good;
- what is the economic viability of SD (who pays for it);
- are markets with regulations the only way to ensure sustainability;
- which information should be given to the consumer, at what time and how
- how can consumers and farmers be convinced about sustainable agriculture;
- a debate on biodiversity, on the willingness to pay and on creating awareness is needed.

To be able to reach some kind of SD, one should act on the following identified challenges:
- How to deal with part-whole dilemmas?
- How to organize prioritization and policy formulation?
- Which instruments are available or desirable?
- What and how to communicate to enable informed choices by citizens and/or consumers?
- How to make existing methodologies more coherent and operational?
- How to organize productive multi-stakeholders dialogue?

The issues brought about by stakeholders have been taken into account to provide input to the second and third workshops.

Amongst the many themes suggested by the participants of the first workshop, the following theme was chosen for the **second workshop**, which was held on May 10th 2005 in Brussels: "Bridging – From research to Policy-implications & recommendations".

The objective of this second workshop was again not to formulate a vision for sustainable agriculture, but to reflect on what we can learn about SD by looking at agriculture. Three projects means three perspectives on this: what can we learn and what are their implications for research, policies, actions. The following recommendations were formulated by:

1. *SAFE –project*

The research leads to a well-defined hierarchical framework and therefore the lack of common language in a multidisciplinary team is overcome by using common definitions. The SAFE framework is recommended as an ideal way to align ideas & definitions in such a multi-disciplinary issue as agricultural sustainability.

Time, knowledge & human resources were too scarce to cover all tackled challenges (e.g. social issues). Development & routine application of a tool for measuring sustainability requires many different competences and a large amount of work. Therefore, an agricultural sustainability platform is needed: a multi-disciplinary team (general & specific knowledge) for further research & application in this field and consultation of external experts.

The sustainability indicators were selected in a participatory way (experts' opinions) and it was found that Input from external experts/stakeholders is very useful for selecting indicators but difficult to synthesize. Therefore, rather than simply receiving individual opinions, one should organize further live discussions between experts to come to an agreement (Delphi method).

A test run of the SAFE tool on data from 4 farms over 2 years has been done. However, a sample population of 4 test sites and sample records over 2 years is not sufficient to evaluate sustainability. Therefore time and space integration is needed for correct interpretation of a sustainability assessment.

The integration procedure of the indicators leads to questions about what the meaning is of aggregated sustainability indices, who should weight them and how and which reference values should be used in the aggregation process. It is therefore recommended to further elaborate the integration process.

Results of sustainability assessments are a snapshot in time of the state of the farms, and interrelations between Pillars, Principles and Criteria were not investigated within the project. Therefore, with SAFE as a backbone, future efforts should focus on the interrelations between different sustainability components.

2. BIO-project

Six different policy recommendations were suggested by the BIO-project team.

- The project proposes to use intervention research and a holistic approach. Not only farmers should be incorporated in research, but also the distribution chain. Therefore it is important to identify the strategy of the supermarket and the person responsible for it. However, getting information on the chain is sometimes difficult because of a credibility problem. Furthermore, it is not easy to identify the boundaries of this chain system (which distributors to include).
- The social uncertainty should be managed. This uncertainty creates a difference between supply and demand. There seems to be a conflict between the market (acting) and sustainability (thinking). It is up to the distribution sector to decide how to act under the existence of social uncertainty and how to include this aspect into their strategy.
- There should be, at least a partial, shift from the consumer question to the food chain question. Because of the discrepancy between acting and thinking about sustainability, a sector only focusing on consumer questions might not be sustainable.
- Both local and global issues should be considered. This issue coincides with results of the Multi-project, in which a distinction is made between urban, peri-urban and rural farming. Looking at agriculture only in a global perspective, will loose this distinction, while looking at agriculture at a local level might disable generalizations of conclusions. A balance between local and global should be reached.
- There should be a permanent panel of consumers in order to establish sustainable consumption. By doing so, stakeholders are used to create solutions. Consumers should be involved in social networks and in the creation of e.g. labels. Furthermore, the contact between farmers and consumers should be expanded and exploited.
- Scientific data are not yet user friendly and should be adapted. This lack of data makes it impossible to discuss with consumers. There are always different users for one good and each consumer chooses one specific good from a range of products. Without knowing who these consumers are or what there preferences are, it is impossible for the distribution chain to adapt their strategy.

In order for policy to deal with the mentioned problems, they need to be involved in life long learning. It is not enough to increase or maintain the budget that can be spend on sustainable development, but that money should also be managed correctly. Furthermore, the correct level of action should be chosen. Nowadays, territorial projects are often transferred to the regional level because of a lack of knowledge at the local level. This impedes efficient policy implications. Also the 'translation' of European policy to the regional level and to the local level often creates problems or inadequacies.

From the discussion it became clear that a major issue at chain level is how to manage tensions among chain participants and how to deal with their various interests.

3. MULTI-project

The analysis clearly showed that local policies can make a difference in the uptake of multifunctionality and diversification. The more concern by policy makers for various aspects the higher the response by the farmer in becoming multifunctional. It was concluded that the local policy level can make a difference and is highly underestimated as institutional level. Therefore, local level policy should be more actively used to increase the sustainability of farming.

The research suggested that when a municipality has a deputy major for agriculture, an agricultural council and farmers involved in spatial and nature planning, it's local policy will be more focused on different aspects of promotion and services for farming. It was seen that agricultural organisations might have a significant impact on local level policy, influencing traditional as well as multifunctional farming. Therefore, the actual involvement of farmers in policy decisions should not be neglected when trying to support sustainable farming.

The study furthermore revealed that farmers in peri-urban areas have different needs and opportunities than more rural farmers. They also follow different developing strategies. Farmers also have a positive contribution to urban development. The impact of the city on farming is not yet very well understood nor

included in rural development policies. Hence, there is a need to develop specific targeted policies for peri-urban areas based on the premise that farming contributes to the sustainability of urbanised areas.

The project came to the conclusion that 1 out of 3 inhabitants has once bought a product directly at a farm, 1 out of 5 inhabitants expresses their willingness to buy if direct sale at a farm was available, 15% of the respondents buys regularly at a farmer's market, 1 out of 3 inhabitants expresses their willingness to buy at a farmer's market, if there was one in their environment, 80% choose products of which the source is known etc. There is an obvious and potential interest in buying directly at a farm. The most mentioned motivations for buying directly are the freshness and the quality of the farming products and the known origin. Therefore the government should stimulate initiatives that shorten the food distribution chain. This contributes to a greater awareness of the origin and the quality of food. The reduction of the transport costs also contributes to the ecological dimension of sustainability.

Another result was that 1 out of 2 inhabitants has no personal contact with farmers, others only exceptionally, nevertheless 1 out of 10 inhabitants has been to an open door on the farm in their own region, 4 out of 5 inhabitants don't know any farms where they offer guided tours or excursions and a majority believes that farmers are underestimated in our society. A lot of respondents don't know a farmer personally and they are ill-informed about the farm life. Concepts as farmer's market, 'Foodteam', organisations of vegetable baskets and farm tourism are not commonly known. Hence, the government should stimulate and subsidise civil society initiatives that try to concretise the link between production and consumption of food through easily accessible projects (such as open doors, rural classes etcetera). Basic knowledge about agriculture in all his durability dimensions (also social justice and the link with the Third World) becomes a final attainment level of (primary) education.

Lastly, 1 out of 2 inhabitants of the urban periphery and the commuter zone acknowledges the advantage of having agriculture in their home town such as:

- the possibility of direct purchase of farming produce (35,8%);
- open space, pleasant environment (27,9%);
- beautiful landscape, wonderful sceneries, diversity and peaceful environment (19,3%).
-

A stiff concession policy complicates the development of a multifunctional agriculture according to the interviewed farmers. Farming goes far beyond the traditional production. Both the consumers and the citizens expect a multifunctional role of agriculture. The social demand for a more sustainable and multifunctional farming, present in the peri-urban area, creates new opportunities for the peri-urban agriculture. Concerning town planning: the agricultural area in peri-urban areas should be more explicitly defined in terms of an agrarian multifunctional countryside (in other words, they should supply a larger flexibility for non-food-production activities).

After sharing the research results of the three projects, the ideas put forward have been discussed as well as their relevance to generate new/integrative insights. Relevant SD-policy questions/problems and ways to approach/address them were identified. Possible implications for SD-Policy and institutional adaptation were explored. The participants were asked to discuss on what they observed across the projects in terms of

- challenges, issues or problems regarding sustainable agriculture or SD;
- implications for government policy and/or other stakeholders in the food supply chain;
- new solutions or approaches.

Some challenges that occurred out of the discussions were: complexity should be dealt with in a multi-level integrated way, multi-stakeholders should be involved in any process, the social dimension of sustainability should not be neglected etc.

Amongst the implications for policy and other stakeholders the following issues were mentioned:

- local level policy should be strengthened, also in rural areas;
- local processes for consultation on the goal of sustainability in a global perspective should be organised;
- subsidiarity should be implemented;

- high level policy should only set targets, the local level should get the room to manoeuvre;
- information and exchange in a chain perspective should be accessible;
- a common language and common understanding should be reached amongst different stakeholders.

As new solutions or approaches, the key-persons suggested that research should go beyond projects towards processes. Incompleteness should be used as a base hypothesis. Research should look for a local basis of networks of legitimacies for sustainable developments. We should move from sector to territorial approaches (as f.ex. the Leader approach). The local capacity for planning should be strengthened. Measurement devices should not look for the absolute truth, but should be supported by dialogue.

Furthermore, the participants were asked to reflect on the meaning of all the above for a more Sustainable Food Production & Consumption, in terms of:
- required capabilities or knowledge and
- topics to be addressed in public debate.

The need for a shared dynamic understanding of sustainable agriculture, the capability or willingness to create a common language and understanding (between actors of SD and members of a project) and the need for both specialists and generalists and go between (someone who could switch from one issue to the other, from one level of organisation to the other) were felt to be essential required capabilities. Other requests include communicators, the knowledge on how to build and maintain social capital in rural areas, leadership and management and awareness.

In view of the third workshop the following items were selected as topics for public debate:

- role of agriculture in society;
- role of agriculture in urbanised context;
- how to preserve open space;
- willingness to support sustainable development versus modern agriculture;
- the kind of agriculture we want to give money to;
- the value of food and
- the concept of sustainable food consumption.

The theme of the **third workshop** was "coherent policy actions, local food systems as organizing principle and research on sustainability" and was organized on December 15th in Brussels.

Talking about coherence

The SAFE project led to two contributions. How can we look at sustainable development and how can we measure it? All three projects use some kind of life cycle approach and define that there is a clear need for a hierarchical structure and a need to define goal, scope, time. In other words: there is a need to define system boundaries.
The BIO project adds to this that the boundaries should not be a priori set and that a process approach might be used to complement an analytic, reductionistic approach to define sustainable development.
The MULTI project also adds another dimension, the territorial dimension, showing that agriculture is not only about producing food, but contributes to local coherence, viability and identity.

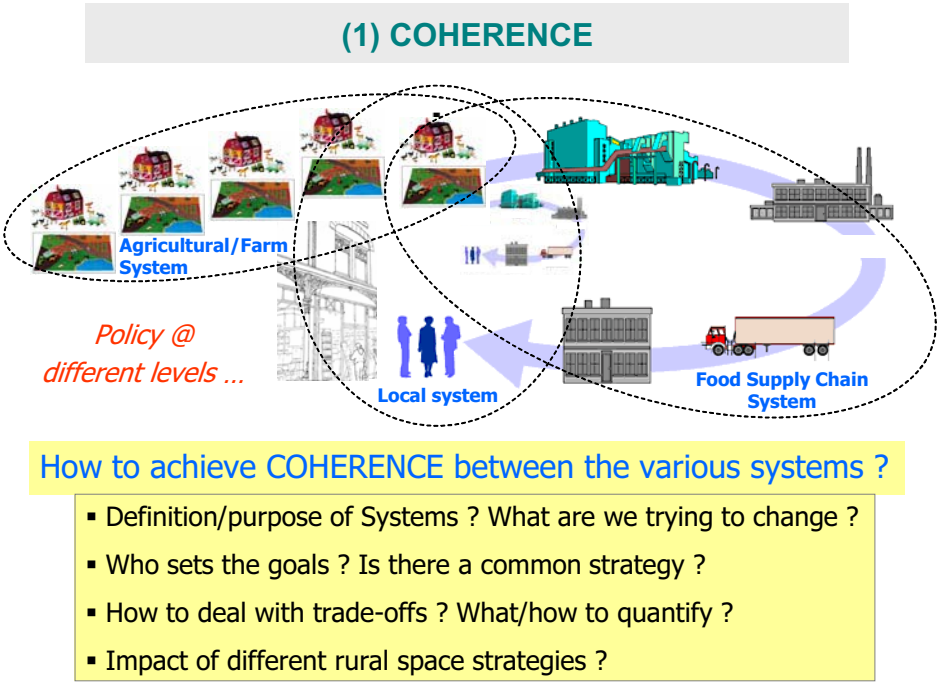


Figure 4 Coherence

The question is then whether coherence should be included as an indicator for sustainable development? In the SAFE project coherence is only added in a policy stage. At this level, it should be decided what weights to give to each indicator, however, the two other projects show that this may be too late.
Sustainable development is in fact all about minimizing tensions (in time, space and among different stakeholders). Although tensions lead to innovations and should therefore not all be resolved, in the end, some tensions should be diminished because of these innovations, while other tensions might arise.
What tensions do we talk about? That depends on who sets the goals. For example people suffering from famine will worry less about sustainable development than rich, educated people in the Brussels region. This will influence the notion of sustainable development, and make sustainable development a context specific and social thing. This does not mean that measurement is useless, but that the weights will differ according to space, time and people.

Talking about organising change

Change can be stimulated through various means:

- by increasing the systems capacity to learn, to accumulate knowledge etc. This is best done by self organisation;
- by linking the local level to global issues;
- by bringing together different stakeholders (not just the farmers);
- by creating sustainability platforms (fora for dialogue);
- by using the terms *locality* or *territoriality* instead of local food systems (on producer side);
- by accomplishing the market mechanism with a system for non-food products, like certification, labels for sustainability, etc. (on consumer side).

The value perceived by consumers is different in different localities and therefore these last two items are linked and should both be used as leverages.

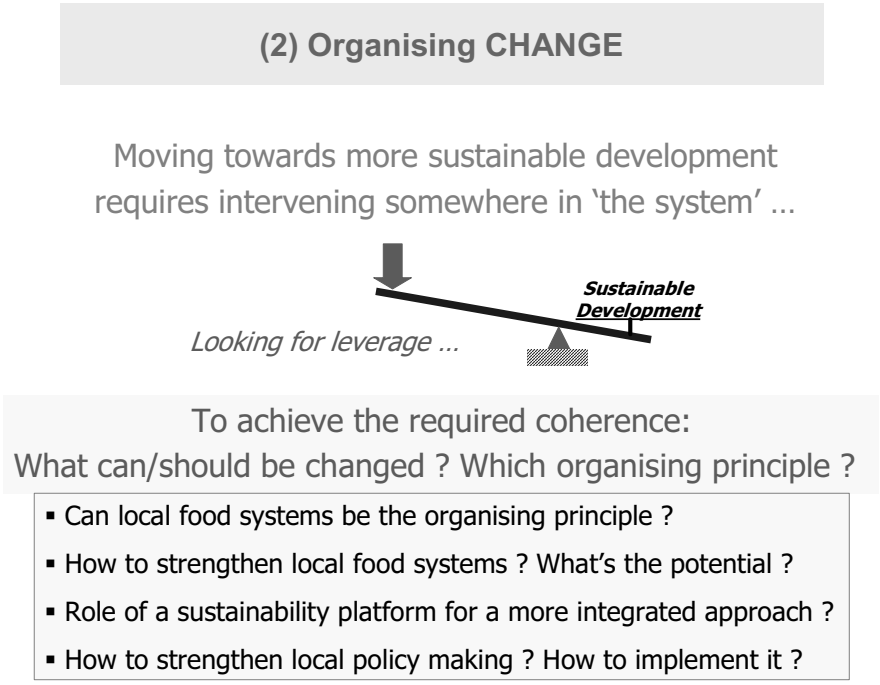


Figure 5 Organising change

Several thoughts were generated concerning some of these topics:
The existing sustainability platforms do not incorporate all stakeholders and leave room for improvement as they are sometimes quite linear and unidirectional.
How to define locality, territory? It should include the product and the social system e.g. breeding buffaloes in Wallonia may not be acceptable, as it might be necessary to support the production of products a region is good at.
One could talk about a 'food shed'. But who defines the territory of this food shed: the consumers, the producers or both? From how far can products be transported before 'costing' too much? In general it was concluded that sustainability is different from local production, because of the previous mentioned social context it is impossible to compare the sustainability value of e.g. going to 3 farms by car to buy local produce with food transported from the other end of the world by boat but bought by going to a supermarket by bicycle.

Concerning possibilities of labels, there was consensus that until now the sustainability labels have not been successful, partly because there are too many different labels and because they are not well known. There is a need for less labels with higher recognition. However, there was discussion on the appropriate scale. On a local scale there can be e.g. one label per region, supporting local production while on a global scale there may be room for a few labels in the world, well known and standardized. As both use a different notion of sustainability and will attract other people, they may both have their place in creating more awareness and sustainable consumption.

Talking about organising research

In research, uncertainty should be accepted, e.g. on fixing the boundaries and on predicting research results. This might increase the cost of research (by making research risky, which makes it difficult to decide on resource allocation) and it might influence the results. Therefore the following changes should be made:

- Use more fuzzy logic;
- Do more research on the fundamentals (what is sustainable development?);
- Combining quantitative with more in depth, qualitative research (like case study research, which might lead to social learning on sustainable development);

- Associate farmers and other stakeholders in the research;
- Give actual results to all actors and to reflect on ways how to do this;
- Create cooperation and platforms between researchers.

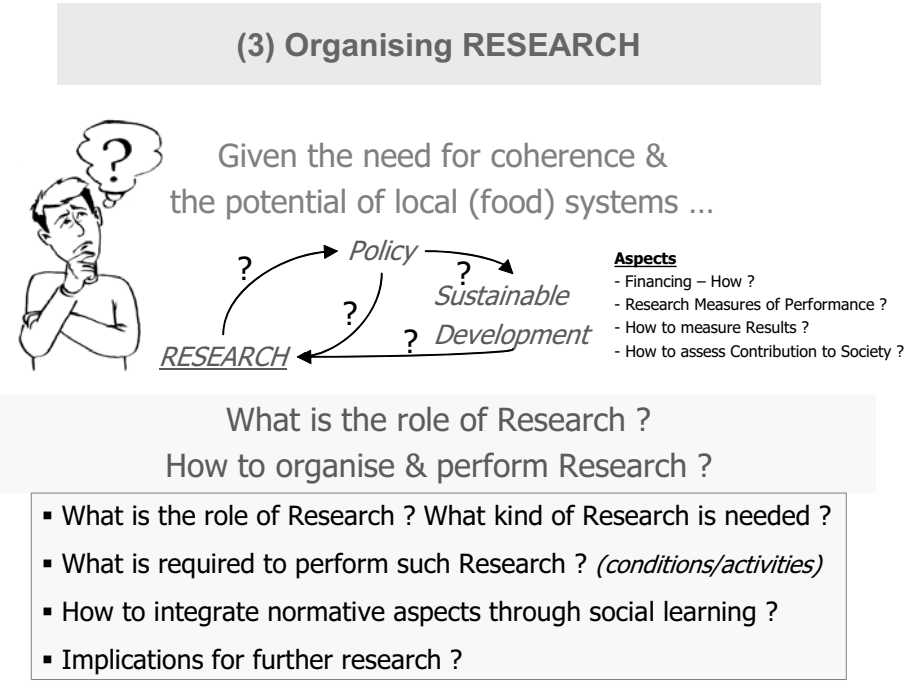


Figure 6 Organising research

There is also a need for other indicators to evaluate the results of research (on the impact on stakeholders as well as on what the researchers learned).
There should be more room for inventions, spin-offs, new things in social sciences.
Diversity should be dealt with.

Inspired by these thoughts, some recommendations were formulated for further actions towards better understanding and better dialogue:
- Engage with stakeholders in forums or other platforms;
- Stimulate and engage in interdisciplinary research;
- Accept uncertainty in research outputs;
- Stimulate self-organisation;
- Organize multi-disciplinary research enabled by policy;
- Support collaboration between projects – coherence – sustainability platform;
- Develop a sustainable quality label at EU level by the government or NGOs;
- Organize cluster meetings & projects;
- Build multidisciplinary research institutes;
- Instigate more fundamental research and develop instrumental tools;
- Develop a more territorial approach to rural development;
- Look for actions that researchers can do;
- Look for social engagement, from niche to mainstream applications.

The stakeholders invited to each workshop, covered:
- regional balance;
- provincial balance;
- government, NGOs, private sectors and
- gender balance.

People were invited as experts and as 'key-persons' in their field.

The three workshops led to the following completion of the former figure (Figure 2).

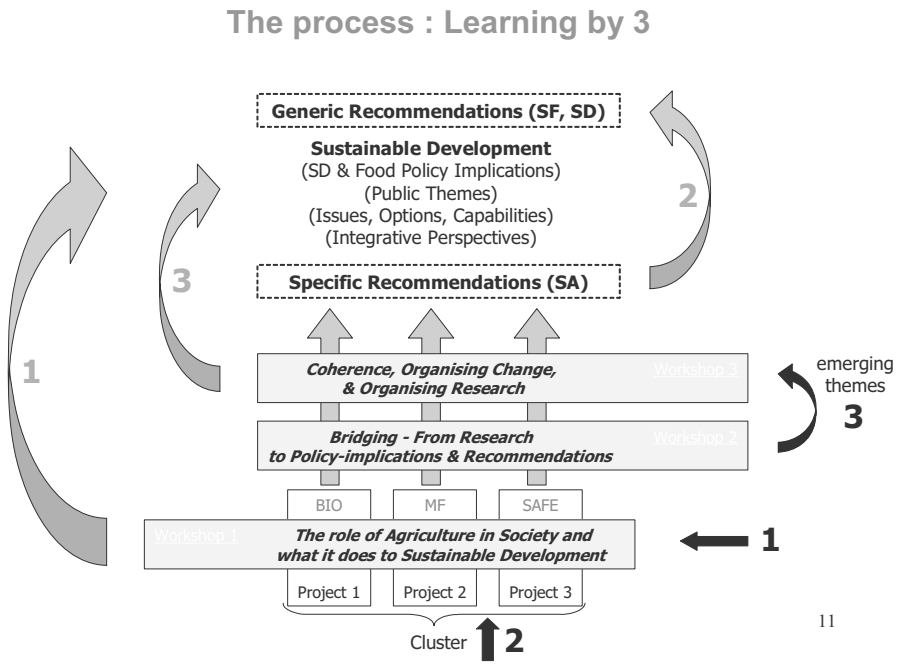


Figure 7 Final integration of the three projects in the workshops

Looking back at three intensive workshops, some things are clear. For one, agriculture is a multifaceted thing. Some call it the new paradigm in agriculture, seeing agriculture as multifunctional. Although this may be nothing new, it is definitely getting more attention as it is being discovered as an important and valuable perspective. By definition, it is therefore something that is many things at once and can be looked at from many different viewpoints.
That opens up the questions: What is the meaning of the different approaches? And how can they be integrated?
For sustainability the same story holds true. It is a multifaceted phenomenon that can and should be studied from "field to plate". It extends far into all reaches of society interacting with other fields of human endeavour such as mobility, energy, employment, etc.

This leads to areas of unavoidable but also fruitful tension between technical and social solutions, between global and local levels, between people in their roles of citizens and of consumers, between science and policy, between the different approaches of various research projects, all struggling for attention and impact.
Clearly, this is a learning process in a fast evolving field. Everybody realizes that what is important now can be gone tomorrow, and the research efforts have to try to follow.

On one thing, all scientists were like minded: science is there to deliver the evidence on which policy should be based. This evidence should be based on a variety of sharp methodologies, leading to an operational definition of sustainable development.

The workshops of the cluster project led to some learning points.
Sustainability in society and agriculture is complex and studying it is difficult. This topic is at the periphery of our professional world, touching on many other facets of the world. But we scientists will have to deliver the frameworks for understanding and evaluation, in which ethics, health and environment are integrated.

Sustainability is not an end point, it is not something which you obtain after which you can proceed to some other point on the agenda. Dilemma's and uncertainties are part of the process. Maybe it is this: sustainability *is* the process of learning that never stops. That perspective will demand new attitudes, tools and knowledge from all concerned, scientists as well as policy makers.

4.2 Publication

The second method for building a knowledge platform, led to the publication of the results of the individual projects as well as those of the workshops held in the former step. At this moment it should be mentioned that each individual project has written a final report, which can be obtained after contacting the Federal Science Policy (www.belspo.be), and which also serves the general idea of the cluster project, namely to transfer knowledge between researchers and between researchers and policy makers.

The objectives of the short cluster publication were to:

a. represent/ document research results comprehensively;
b. reflect the on going debate and
c. stimulate debate.

The publication was not meant to be a synthetic description of the debates of the workshops but rather reflect the on-going debate, while posing open questions. The publication was written before the conference and served to stimulate debate. A ghostwriter was hired to summarise the discussions and outcomes of the workshops. The report addresses a wider audience, and includes an executive summary, while answering relevant questions of stakeholders. It was written in an understandable language. The target audience includes amongst others, different administrations involved, politicians, NGOs, and Belgian representatives at international organisations.
The reference for the book is: Van Huylenbroeck, G., *Research and the Real World, Learning about Sustainability in Agriculture and Society*, Federal Science Policy, Gent, 36 pp. The book can be obtained after contacting Valerie Vandermeulen, Vakgroep Landbouweconomie, University of Gent, Coupure Links 653, 9000 Gent, valerie.vandermeulen@ugent.be.

The book was based on two aspects: the results of the workshops and position papers that were written by the project partners after the first two workshops and discussed during the third workshop.

The position papers, for each project, started each time with a description of the context and objectives followed by the theoretical and methodological frame. Next, the research results were given. In view of this final report of the cluster project, the consequences for sustainable development of each project are given.

1. SAFE –project

1. Agricultural sustainability is an **ill-defined concept** that covers many different issues related to environmental, economic and social sciences. In addition, research projects on sustainable development are often based on multi-disciplinary teams, which sometimes define identical concepts differently or even have other 'languages'.
Therefore, it is necessary to define the concept of agricultural sustainability using common and transversal definitions for its components. Preferably, this definition mode should also be operational: it should offer a sound basis for the coherent and easy formulation of sustainability indicators and their corresponding reference values.
In the future, we recommend the use of the Principles, Criteria and Indicators (PC&I) hierarchical framework as a means to define a common definition for agricultural sustainability components. Indeed, this framework is an ideal tool to structure ideas and definitions for such a multi-disciplinary and fuzzy theme as agricultural sustainability. This framework will offer a common language and thus a potential

means to better communicate between scientists, decision makers and citizens/consumers. On the other hand, it can also be used as a common basis for other research in similar domains.

2. **Time, knowledge and human resources were too scarce** – despite the multi-disciplinary character of the team – to cover all tackled challenges (e.g. social issues, integration of indicators, standardisation ensuring the practicability of the tool, data collection for a high number of farms,…).
The development and routine application of an agricultural sustainability assessment tool requires many different competences and a tremendous amount of work. This should not be considered as an easy obstacle to overcome and certainly requires further and continuous investigation. By now, many countries have been involved in similar projects for many years.
Depending on government priorities, we would recommend the creation of an agricultural sustainability platform that would consist in a multi-disciplinary team with general (leadership, coordination and communication) and specific knowledge (strong environmental, social, economic, technical and informatics background), in collaboration with external experts for the validation of practical tools.

3. In the project, the selection of sustainability indicators was performed in a participatory way (integration of expert opinions). Indeed, **input from external experts/stakeholders is very useful** for selecting indicators. However, it is also very difficult to synthesise. On the other hand, experts often mention the difficulty of being knowledgeable regarding 'all' water issues or 'all' economic issues.
Rather than simply receiving individual opinions, it would be more efficient to organize further live discussions between experts to come to an agreement (Delphi method). This possibility made experts very enthusiastic. In addition and to a certain extent, more fragmented expert panels should also be considered, in function of their respective disciplines.

4. An integration procedure of indicators was developed. From the confrontation of indicator values in a farm with identified reference values, indicators are transformed in **sustainability indices** (SI: [0□1]). Then, these indices are progressively aggregated across the levels of the framework until the final formulation of $SI_{overall}$, $SI_{environment}$, SI_{social} & $SI_{economy}$.
The integration of indicators has raised many questions:
- What is the meaning of aggregated SIs?
- Who should weight and how?
- Which reference values should be used in the aggregation process?

Further elaboration of the integration process is required, especially concerning the identification of reference values and the definition of weights between sustainability issues. Again, this is no easy task but methods exist that allow reaching these objectives.

5. The results of sustainability assessments in the four farms are only a snapshot in time of the state of the farms. Therefore, interrelations through time between Pillars, Principles and Criteria were not investigated within the project.
With SAFE as a backbone, **future efforts** should focus on the interrelations between different sustainability components because of the increasing need to deal with different sustainability issues in a more integrated manner. Indeed, care should be taken not to replace one type of unsustainability by another when implementing specific political measures.

6. There is a difficulty **to validate** the conceptual framework and the core list of indicators. Optimal set of core indicators should evolve as monitoring strategies, technologies and performances evolve.

2. BIO-project

The implications of this research for a sustainable development policy are of three types:

1. for public policy:
priority should be given to learning about opportunities.

We believe that we can make a case for the idea that public policy must complement normative and normalising approaches to sustainability (criteria, indicators and standards) with collective learning approaches within the various chains of activity as to turn their development paths in the right direction.

This method is all the more justified because the choices made in the various links of the chain, from the stock farmer's technical choices to the consumer's choices, are strongly interdependent. Moreover, an important conclusion of this research emphasises the importance of taking consumers' demands for products with specific quality traits into account.
These learning approaches are possible only if organisational forms allow them to be built. This means introducing criteria of fairness in these organisations, given that equity is the root of sufficient trust between players. There is thus a necessary link between social norms and learning capacity.

2. for the sector:
the chains' coherence and outfitting with reference systems.

An important conclusion of our research is that the organic stock farming sector is much less "equipped" with standards, knowledge and images, in the eyes of the farmers and consumers alike, than the conventional sector. This draws attention to the importance that must be given to constructing specific technical references for the organic or other new developed chains and the fact that these technical references (in the broad sense) must serve to show the sustainability of these production patterns both inside the chain and to the outside world (consumers and public authorities). It is thus vital for the chain to move from a situation in which it borrows many of its technical references from the conventional sector to that of a more independent reference system.

3. for research:
the reformulation of the scientific and technical questions.

Our research was not able, in the allotted time span, to answer all of the scientific and technical questions that we pinpointed. However, it shows that -if sustainability is to be achieved- it will without any doubt be necessary to challenge certain conventional paradigms. For example, in the case of parasitism, switching from curative to preventive action will mean switching from an approach based on the individual animal's health to a herd health paradigm. Considerable work must therefore be done to reconstruct some of the technical and scientific problems of stock farming...and only interdisciplinary work can do that.

3. MULTI-project

The most important conclusion from the research is the increasing appreciation for the contribution of agriculture in protecting and maintaining open areas, water storage, landscape en bio-diversity and the growing awareness among the urban population of the importance of the presence of farming in peri-urban zones (and most parts of Belgium belong to this) for the liveability of urban areas. Sustainable development goes beyond the sole prevention of negative impacts of agriculture, but must also recognise the positive impacts of these sectors and appreciate them. This leads to the following recommendations concerning:

1. Town and country planning
- Agriculture must remain possible as an economic activity in an urbanising environment.
- When judging the use of natural resources (in the first place, land) also non-marketable outputs must be taken into account as they may have positive economic spill-over effects for other sectors and society.

Agriculture must not only get the space but also the freedom to respond to the new social expectations. New forms of agriculture related activities must be possible and stimulated.

2. Local embeddedness and accompanying policy measures
- If we accept that sustainable agriculture is about taking into account regional differentiated expectations of the local society, the local population should be involved in the discussions about the most appropriate development model for the local farming sector (including its role in the local food industry, environment and nature conservation, water management and so on).
- This model can then be integrated in a local covenant signed between local governing boards and the local food and rural facility suppliers. Monitoring by means of indicators (cf the SAFE framework) can then make it possible to examine the extent to which the objectives (e.g. in the area of environmental

requirements and public goods) have been reached and if the accompanying policy measures have been effective.
The local level must get the necessary financial and policy levers to support such a local potentiality based developing model.

3. Local food- or rural (countryside) chains
- Modern agricultural companies cannot survive purely on the basis of a local market. By means of conjunction of local strengths and support, products originating from the local production model can be given an identity that may allow these products to be sold in longer chains (chain advancement).
- Efforts have to be made in order to set up such sub regional food- and countryside product chains (local coordination centres) and to promote them. One way to realise this, could be a coherent policy regarding regional products and promotion.

4.3 Conference

The last method to create a knowledge platform used in this cluster project was a conference organised with the following objectives:

- to identify national and international implications for sustainable food production and consumption of/for the society;
- to provide an international perspective and
- to stimulate communication between participants : policy makers, scientists, administrators, environmentalists, NGO's, international representatives…

This conference was based on the previous two methods; namely the workshops and the booklet. Those items that occurred in all workshops and that were believed to be important for sustainable development by all participants were withheld as being building stones for the conference program (see further). The booklet that was written, was used as background information for discussions at the conference and it gave all participants the possibility to read more in detail about the individual projects as well as the cluster project during and after the conference. The workshops more often focused on bridging the gap between different research efforts, disciplines and methods, while the conference aimed at bridging the gap between researchers and stakeholders (e.g. policy makers).

The conference, Sustainable Agriculture: an Integrated Approach, was held on May 18th 2006 and took place at the Royal Flemish Academy of Belgium for Science and Art in Brussels. Many people were invited, from different organisations, policy levels, research departments etc. The list of people attending (around 110 participants) therefore was impressive (see appendix). Each participant received a copy of the book and the print outs of the presentations.
Program (see also next page)

The conference had four parts:

- lessons learned from the research and cluster workshops
- guest speaker on sustainability in society (Tom Veldkamp)
- workshops on three different subjects
- guest speaker on transdisciplinary research (Bernard Hubert)

Results
The first part, on lessons learned from the research, has been described extensively in earlier parts of this final report. The focus is therefore put on the guest speakers and the results of the workshops.

Towards more sustainable development of Dutch agriculture by prof. dr. ir. Veldkamp

Prof. Veldkamp is one of the scientific coordinators of TransForum Agro&Groen, a rather large research and action program in the Netherlands on innovation for the agricultural sector and in which connections between science and practical initiatives are searched. His presentation was a good example of how a broad 'scientific' experiment on Mode 2 research is possible.

Professor Veldkamp describes how innovation (a new value proposition that is realised by means of a unique value chain) and transition (the realisation of innovation) is occurring in nowadays Dutch agriculture. The Netherlands have a strong agrifood sector driven by increasing productivity through specialisation. However, due to the ever more visible negative external effects, the support of the public is falling.

Therefore, the opportunities for agriculture as a private sector lay in focusing more on added value, dealing with stricter environmental and animal welfare standards and creating new activities in rural areas. This calls for unconventional innovations, inspired by practice. These innovations are based on developments in knowledge, which has always been a traditional proponent of innovation. In recent years, there has been a super-specialisation of knowledge, bonuses have been given for development in the 'own' discipline, integrating knowledge and knowledge assembly have been lost etc. System innovations, namely those kinds of innovations the Netherlands tries to reach, call for interdisciplinary and trans-disciplinary knowledge. A new approach is needed with practice determining the innovation agenda and a good distribution and embedding of knowledge in businesses and science. TransForum tries to put this new approach into practice.

TransForum has the ambition to play a role in the transition towards sustainable development in agriculture and rural areas. It wants to develop relevant and new knowledge with the involvement of stakeholders at all stages of the transition process. TransForum builds a link between government authorities, the private sector, knowledge institutions and NGO's.

Time	Module	Activities
9.30	Arrivals	Registration Coffee
10.00	Introduction CONFERENCE	By Alain Wouters
10.10	Introduction of the CLUSTER PROJECT	By Guido Van Huylenbroeck
10.25	Lessons learned from the research & cluster workshops	By H. Meert, X. Sauvenier, P. Stassart
11.25	Introduction to GUEST SPEAKER	A statement about how complex sustainability is in society and agriculture
11.30	KEYNOTE SPEAKER **Tom Veldkamp**	Sustainability: a multifaceted thing Transforum, The Netherlands
12.10	Explaining the continuation of the day	Introducing the themes of the workshops
12.15	Lunch + Presentation Poster	A sandwich lunch with the possibility to look at the posters.
13.35		People go to their subgroup
13.45	3 Workshops in Parallel	Each question is introduced by a practical example or testimony (by witness).
	SG - Workshop 1	Towards a sustainability-certification system for agriculture ? *witness: Berty van Hensbergen*
	SG - Workshop 2	Locality/territoriality as a principle towards sustainability ? *witness: Hugo Vleugels*
	SG - Workshop 3	Sustainability expectations of citizens and consumers and possibilities of farmers to respond? *witness: Mélanie Louviaux*
15.15	Coffee Break	
15.30	Workshop Conclusions	By reporters of the workshops.
15.45	Introduction to GUEST SPEAKER	Together with a statement about the need for another type of research
15.50	KEYNOTE SPEAKER **B. Hubert**	Transdisciplinary research for sustainability INRA, France
16.30	CONCLUSIONS	by the president of Belgian Science Policy, P. Mettens
16.45	End	Reception offered by the cluster project

Figure 8 Program of the Conference, May 18th, Brussels

Three different kinds of projects (see Figure 9) help reaching that goal. Innovative practical projects build the basis by developing and implementing concrete innovations. In a second step, scientific projects try to work up experience into new strategies for innovation in the agrifood sector. The third kind of projects, knowledge projects, gives new knowledge and experience a lasting place among users.

Until know, 35 successful, unconventional innovations have been brought to the agrifoodsector due to TransForum. A vision and strategy for trans-disciplinary and interdisciplinary innovation has been built. And some new innovation strategies have been given a lasting place among users.

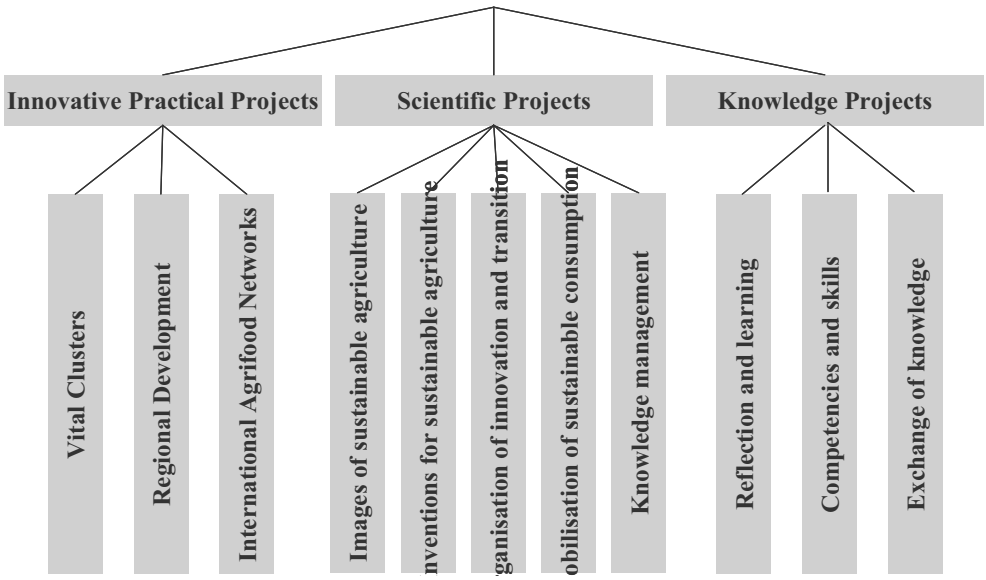


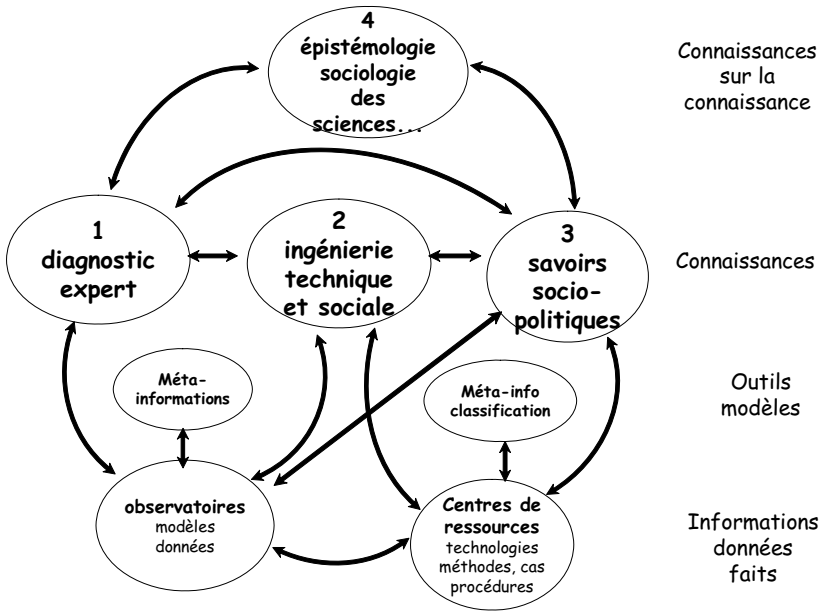
Figure 9 Working Method of TransForum

Le développement durable et la recherché transdisciplinaire by Bernard Hubert, Inra, France

Bernard Hubert, born in 1947, is Scientific Director at the Scientific Sector Society, Economy, Decision in charge of Sustainable Development issues of INRA, the French National Institute for Agricultural Research. Until 2002 he was the head of the department for research on agricultural systems and development. He was trained as an ecologist and spent ten years studying rodent ecology in West Africa before joining INRA. He was then put in charge of a research team investigating grazing systems in Mediterranean rangelands in relation to fire hazard prevention. His own work dealt with grazing management in small ruminant farming systems and with co-operation among rural activities (farming, forestry, hunting, etc.) in managing landscapes. For that, he developed research on the relations among stakeholders, forms of collective organisation and learning processes.

Mr. Hubert started his presentation by stating how sustainable development is no longer a description of potential development, but encompasses more and is a moral and political necessity. To conduct research on sustainability, integration in time and space is necessary. Economic relations have to be related to environmental changes and are at all times influenced by technology and social equity. Research and technological innovations can only work when they are accepted by the public. Therefore, a methodology of partnership has to be developed. This might mean interdependencies between policy, market, culture, and science or it might be research focused on the context of a situation in which the actors become central issues. This kind of research deals with complexity, uncertainty, variety and reflexivity. A continuum of knowledge and action needs to be build: research and knowledge building is only done when there is a need for action. Knowledge has to be produced in a certain context and at a time when action is wanted. Research will be different based on the actual stakeholders in the partnership. One such example is the CATWOE approach based on customers, actors, transformation of the system, global view, owners and the environment of systems.

Another point Mr. Hubert makes, is the need for collaboration between disciplines and the concept of heterogenic information. It becomes necessary to define specific treatable problems, by dividing a general problem into issues researched by different groups. The specificity of each group should however be inferior to the coherence of the general problem. In order to integrate results, it will become more and more important that researchers clarify their points of view according to their disciplines, methods etc. For example, Mr. Hubert describes three types of research models: the lab-model (used in agronomy, physics or biology), the field- model (used in ecology or social sciences) and the model of intervention research (used in management science or philosophy). It is pertinent that researchers and stakeholders know which model lies at the base of a certain research result. When studying sustainable development, different research areas should be combined (as shown in the following figure).



Classification du champ de la connaissance pour le développement durable : savoirs éclairants et savoirs agissants (d'après C. Brodhag, 2003)

Figure 10 How different research areas should be combined in sustainable development studies

Mr. Hubert concludes by describing the relation between agriculture and the environment as he sees it shifting during the last few years. The countryside has become more simplistic and only directed to producing for the market. This has led to unstable ecological areas and to systems used to their full capacity. Furthermore, demographic changes in agriculture have occurred and all of this has had a considerable impact on science and technology. He also believes that there has been a shift from knowledge on the field to knowledge in labs. The resilience of these systems (in how far they can cope with changes in the environment) has decreased and it is the job of researchers to develop this resilience again. They therefore have to preserve the diversity, combine different types of knowledge and create opportunities for auto-organisation.

The afternoon of the conference started of with three interactive work sessions. Each participant needed to decide which session he or she wanted to follow and was expected to participate actively in the discussion trying to find solutions for the following three problems:

- Is there a need for an agricultural sustainability label and how should this be developed?
- Can locality and territoriality be used as a principle for sustainability?
- Out of what do sustainable expectations of farmers and consumers consist and how can agriculture act on this?

For each workshop a moderator, reporter and witness were chosen.

The witnesses described their own experience concerning sustainable agriculture which immediately led to discussions.
Bertie Van Hensbergen introduced the workshop on the need for an agricultural sustainability label by presenting the case of wood labelling. Mr. Van Hensbergen works for Wildhorus Consultancies in the UK. He conducts audits in wood companies over the world on a day to day basis. One of his tasks is to build new standards with criteria and indicators for eco-certification in the wood industry. His presentation introduced a discussion on the status of eco-certification in agriculture worldwide and in Europe, on the experiences of wood labelling and how this might be transferred to agriculture and on how to cope with the multitude of food labels currently in the market.
Hugo Vleugels, consultant for the Landelijke Gilden Vlaams-Brabant (a farmers organisation) introduced the second workshop based on his experience with Leader+ projects. He is involved in short chain selling, home selling etc. in the area of Pajottenland around Brussels.
Mélanie Louviaux was the third witness and she is a researcher within the group of SEED (Socio-Economie Environnement et Développement) of the Ulg. Her main focus of research is the efficiency of public environmental policies and the different organisations around this item. She has been working on different research projects with citizens and consumers to evaluate the capacity of these organisations in revealing innovative results on sustainable development. She also investigates the methodologies on which these organisations are based.
The reporters made a short summary of these discussions and reported (plenary) to the whole audience after a short coffee break.

Because so many people attended the conference from out of different fields concerning agriculture or sustainable development, the workshops organised at the conference were very successful. By reporting on the results plenary, participants gained some insight in all three sessions and not only the one they attended. The plenary sessions were made very accessible to all participants because outprints of the presentations were given before hand and continuous translation was provided by professional interpreters. People not able to attend the conference, received the book and outprints of the conference. Therefore, the research team believes that the object of sharing results with a larger audience has been reached.

5 Conclusions and recommendations

Sustainable development is the central theme of the SPSDII program, the second Plan for scientific Support for a policy for Sustainable Development. An important part of this program is related to agriculture and the feeding sector. Durable food production and - consumption is vital for a sustainable society, because agriculture and food production have an important spatial impact and because of the important economic and social importance of the feeding sector. After all, everyone is a consumer of food products and people in Belgium spend on average 400 euro per month on nourishment. Sustainable production is therefore not only a matter of production, but also of the consumer who by means of his or her buying - and eating behaviour influences the manner of production. Besides funding research projects that focus on new, technical production techniques or on the development of new standards and their consequences on environment and public health, the Belgian Science Policy also financed a number of projects that look at sustainability in the agro sector from a more socio-scientific angle. This was the case for the current cluster project on sustainable agriculture that clusters the results of three separate projects.

In socio-scientific studies on sustainability it is often assumed that sustainable development is a social construction in which several actors with divergent value patterns are involved. What one considers to be sustainable is not necessary so for an other person. This leads to tensions and problems and makes normative solutions invented in value-free surroundings or labs frequently unsuitable. One of the tasks of social-scientists is to examine this. Modern socio-scientific research often departs from an actor-oriented approach. This is an approach in which the different people involved in a problem and their mutual operations and relations are at issue. One then analyses how these different parties incorporate a problem such as that of sustainability in their actions. Thereby, it is tried to understand social phenomena in their full complexity and to examine how economic and social systems function and how to steer them into a more durable desired direction.

This kind of research demands another approach. One must partially abandon the traditional method of formulating hypotheses and empirically testing by means of econometric or statistic research. Sustainability problems are often so strongly influenced by their context that only in depth research can give answers. By means of in depth research on one or more cases, it can be examined how the different wheals of the `social machine' fit and which problems appear when wanting to change that system. In this way, one gets a better view on what really takes place, what the motives are to act in a certain way and which assessments people make concerning their choices. As soon as one knows this, one can search for ways to neutralise the occurring resistances or to bend them in other directions. In this kind of research it becomes necessary to surmount the specificity of certain cases and to come to some general conclusions (ground-based theory shaping).

A **first** important lesson learned coming from clustering the research projects, is that to come to more sustainability, coherence is needed between several scale levels, from the individual level (farmer, company, and consumer), over the chain level to the spatial level. An important element is the management of the tensions which appear between these scale levels. Tensions lead on the one hand to innovation, but can also work paralysing and hamper solutions. Therefore, a balance and harmonisation is needed between what in institutional economics is indicated as fixing game rules on the one hand (the institutional surroundings with its standards and laws) and leaving sufficient space for chain players to search for relations and arrangements on the other hand (or in other words to determine the way in which the game is played). Finding this balance is not simple and socio-scientific research, like the one outlined here, can produce an important surplus value.

A **second** lesson from the clustering exercise is that sustainability is a learning process in which the role of research moves from being an author of solutions to a guide for organising processes of change. Therefore researchers must together with all actors involved, formulate the problem and identify and evaluate solutions. Such research is therefore not value-free and asks researchers to balance between their role as neutral observers (necessary to be able to exceed the case study) and their involvement in the problem (necessary to be able to understand and describe the problem fully). This calls for more from the researchers then only technical knowledge. Social skills and communicating with the actors involved as well as trans-disciplinary thinking and working are only a few of the many skills required.

The **third** perspective offered by the clustering approach, concerns the organisation, evaluation and financing of this type of socio-scientific research, of which the outlines and outcomes are much more uncertain then those of traditional normative research. In this research model integration of social and technical sciences with theoretical and empirical research comes first. Such trans-disciplinary research requires other research models (in the Netherlands one speaks of a shift from mode-1 to mode-2 research) where learning processes are the main focus. This demands, however, also another evaluation of research in which besides the scientific output - measured by means of traditional output indicators - also the potential contribution to change and learning processes should be taken in consideration. Not only in sustainable agriculture the scale of measurement and interpretation of results play a role, this is also the case for targeting scientific research. Relevance and impact demand other criteria then purely theoretical research.

The above described lessons-learned show that research about research (as this cluster project did) creates much added value and that specific sector - and context-related conclusions, produce useful general results. This research is a good example of the usefulness of socio-scientific research and shows that mixed research actions and cluster projects contribute highly to a more sustainable society.

6 Output

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7 Appendix: list of participants in the conference and invitation to the conference

Name	First Name	Organisation
Aertsens	Joris	Ugent
Baert	Astrid	
Bervoets	Kathleen	Ugent
Claerbout	Sofie	Provincie Oost-Vlaanderen
Coene	Hannelore	Vredeseilanden
Cornelis	Willy	Landbouw journalist Fr
De Backer	Eline	Ugent
De Nolf	Philip	Departement Landbouw en Visserij
De Ridder	Kris	Ministerie Vlaamse Gemeenschap
De Walsche	Alma	MO*
Deboosere	Luc	Katho Bachelor Biotechnologie
Delaunoy	Catherine	UCL
Delobelle	Ilse	REO Veiling
Derden	An	Vito
Dessers	Rein	Stedula
Destain	Jean-Pierre	Inspecteur Générale Centre Wallon Recherche Agronomique
Devos	Yann	Ugent
Flaba	Joseph	Direction générale de l'Agriculture
Garreyn	Floortje	Ugent
Gobin	Anne	Bodemkundige dienst Belgie
Goreux	Francis	ASBL Cadco
Graff	Véronique	Agrobiopôle Wallon ASBL
Hendrickx	Jos	Plattelandsontwikkeling, Oxfam
Hupin	Frederique	Nitrawal ASBL
Huygens	Didier	Provincie Oost-Vlaanderen
Jaeken	Peter	PC Fruit VZW
Janssens	Barbara	Plattelandsontwikkeling VZW
Jourquin	David	Provincie Oost-Vlaanderen
Kerselaers	Eva	Ilvo
Lambrechts	Guy	ALT
Lemmer	Louis-Joan	Hasselt

Lootens	Peter	Ilvo
Maes	Filip	ING
Mathieu	Christine	Federaal Wetenschapsbeleid
Mercy	Jeroen	Stafmedewerker Landbouw
Nevens	Frank	Stedula
Philips	Sebastiaan	Provinciaal proefcentrum voor de groenteteelt
Piessens	Inge	Min Vlaamse Gemeenschap (ALT)
Renaerts	Rob	OIVO-CRIOC
Rogge	Elke	Stedula
Rosseel	Liesbet	Provincie Oost-Vlaanderen
Schoonhoven	Diane	Projectcoördinator Sterk met Melk, Brugse Ommeland en Meetjesland
Schrevens	Eddie	KUL
Smis	*Kaat*	Provincie Oost-Vlaanderen
Somerhausen	Eric	Fiwap
Toebat	Johan	Agentschap voor Natuur en Bos
Van Avermaet	Greet	KaHo Sint-Lieven
Van Bossuyt	Peter	Boerenbond
Van Essche	Katleen	Ministerie Vlaamse Gemeenschap
Van Hauwermeiren	Annelies	Stedula
Van Hauwermeiren	Saar	Bond Beter Leefmilieu
Van Heuckelom	Marc	Federaal Wetenschapsbeleid
Van Passel	Steven	Stedula
Van Weperen	Willem	Duurzame Landbouw en Plattelandsontwikkeling
Van Wingem	Jan	Gebiedsmedewerker Land-en tuinbouw Kortrijk, Roeselare, Tielt
Vanloqueren	Gaetan	Université catholoque de Louvain
Verboven	Ann	Inbo
Vervaeke	Ine	OVPG vzw
Vervaet	Nadine	Spa studiedienst
Vleugels	Peter	VLM
Vuylsteke	Anne	Ugent
Waeterloos	Evert	Ugent
Wellekens	Rosemarie	
Willems	Edith	VLM
Wustenberghs	Hilde	Ilvo
Coibion	Sauvel	Prevent Agri

Stilmant	Didier	Ministère de la Region Wallonne
Van Hecke	Etienne	Kuleuven
Vandermeulen	Valerie	Ugent
Wauters	Erwin	Kuleuven
Hubert	Bernard	INRA
Mathijs	Erik	Kuleuven
Meert	Henk	Kuleuven
Mettens	Ph	Federaal Wetenschapsbeleid
Muys	Bart	Kuleuven
Sauvenier	Xavier	ECOP-UCL
Stassart	Pierre	Université de Liège
Van Hensbergen	Berty	Wildhorus consultancies
Van Huylenbroeck	Guido	Ugent
Veldkamp	Tom	Transforum
Vleugels	Hugo	Consulent Landelijke Gilden Vlaams-Brabant
Wauters	Alain	Fair Sights

SCIENTIFIC SUPPORT PLAN FOR A SUSTAINABLE DEVELOPMENT POLICY

May 18th 2006
9.30h-16.00h

Auditorium Lacquet
Koninklijke Vlaamse Academie van België voor Wetenschappen en Kunst
Hertogsstraat 1
1000 Brussel

Sustainable Agriculture: an Integrated Approach

*We would like to invite you to a forum organized as the final step in a project on **Sustainable Agriculture: an integrated approach**. The aim is to confront in an open debate researchers with policymakers and other stakeholders in order to come up with future actions to be taken concerning sustainable food production and consumption. Your presence at this forum is contributory to the success of the project, moreover, it will provide you with state of the art information on agricultural sustainability issues. This forum also gives the opportunity to present a poster on your own research or practical projects on sustainability in agriculture and the food sector.*

This project creates an integrated approach by clustering the teams of **three projects** financed by the Federal service for Research, namely:

(a) Development strategies for a multifunctional agriculture in peri-urban areas (CP 18)
(b) How can organic farming contribute to sustainable production and consumption patterns? (CP 19)
(c) Framework for assessing sustainability levels in Belgian agricultural systems – SAFE (CP 28)

More details on these projects can be found on www.belspo.be

Dit contactforum wordt gesteund door de Koninklijke Vlaamse Academie van België voor Wetenschappen en Kunsten.

BELGIAN SCIENCE POLICY

Cluster Project on Sustainable Agriculture

The topic of **sustainable food production and consumption** needs an integrated approach between technical, economic and social sciences. Many projects financed by the Belgian Science Policy work on particular elements of sustainability. This project aims to bring together these approaches. The objective of this cluster-project is therefore to bring together researchers involved and to confront their work with the relevant policymakers and other stakeholders.

By providing a platform of discussion between researchers and stakeholders, this cluster-project wants to bridge the gap between the often normative framework of technical sciences and the conceptual frameworks explaining policy building. This bridging process is finalised by the organisation of this forum and your contribution will be off a high value.

Agenda of the conference

- Presentation of the cluster project and lessons learned from the research and workshops
- Keynote international speakers Mr. B. Hubert (INRA, France) and Mr. T. Veldkamp (Transforum Agro&Groen, The Netherlands) on integrated sustainability research
- Lunch combined with a poster session (contributions are welcome, poster size 84 x 118,8cm)
- 3 parallel workshops (as far as possible your preference will be taken into account):
  Session 1: Towards a sustainability certificate system for agriculture?
  Session 2: Locality/territoriality as a principle towards sustainability?
  Session 3: Sustainability expectations of citizens and consumers and possibilities of farmers to respond?
- Conclusion by the president of the Belgian Science Policy Mr. P. Mettens

The conference will be held in **French and Dutch** with simultaneous translations during plenary sessions.

Registration (forum is free of charge, but you need to be registered):

Please return before **May 8th** 2006 to Valerie Vandermeulen, Universiteit Gent, Vakgroep Landbouweconomie, Coupure Links 653, 9000 Gent; Valerie.Vandermeulen@ugent.be;
tel. 09 264 59 43; fax: 09/264 62 46.

Name: .....

Organisation: .....

Adress: .....E-mail: .....

0 will attend the conference on May 18th in Brussels

☐ would like to contribute **a poster** on an aspect of sustainable agriculture with the following title:

My preference for the **workshops** is as follows (please rank your choice from 1 to 3):

..... session 1 ..... session 2 ..... session 3

8 Bibliography

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