

The process of landscape evaluation Introduction to the 2nd special AGEE issue of the concerted action: “The landscape and nature production capacity of organic/sustainable types of agriculture”

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Abstract

In an EU concerted action a checklist with criteria for the development of sustainable rural landscape was created. The idea of the concerted action was to bring together experts from various disciplines involved in management of the countryside. They represented disciplines from β , γ and α oriented sciences, ranging from environmentalists over sociologists to cultural geographers. They were all asked to list their (discipline's) criteria and parameters for a sustainable management of the landscape. From all these criteria and parameters a checklist has been established. This checklist is presented in this paper, accompanied by an explanation of its basic concept that draws upon Maslow, its context, its methodology and its use. Finally summaries are presented of the ways the checklist, in various stages of its development, has been used in several European country countrysides. It can be concluded that the checklist is a useful tool for valuing the contribution of farms viz. farming systems to the regional development and the sustainability of the landscape. It was found that organic farms included in the sample of our research often performed rather well in that perspective as compared to the non-organic farms in that region. ©2000 Elsevier Science B.V. All rights reserved.

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1. Introduction

The work shown here comes forth out of the need for an integrated set of criteria for the assessment of landscape quality and rural development. Up to now, many agro-environmental regulations have been fo-

cused on the improvements of single aspects or issues. Thus, there was a build-in danger of derailment, as it was difficult to specify the context wherein those regulations remained beneficial (see for example per head of sheep payments). But when is a certain development positive for a region or farm as a whole? And how can all the aspects be valued in relation to one another? In the European Union (EU) this question is increasingly relevant because its Common Agricultural Policy has been broadened from warranting food safety to supporting the landscape qualities of the

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rural areas (Fischler, 1996). To assure that (European) funding serves this purpose, it is necessary to have a tool to evaluate the sustainability of the rural area and (European) regulations. In an EU-Concerted action (1993–1997) a checklist was developed, which can be of help by evaluating the sustainability of the rural area. Because of the central role that agriculture plays in rural development, special attention is given to agriculture and the landscapes generated by agriculture.

Ten times over the last 4 years, in 10 places in Europe, a multidisciplinary group of landscape experts and agronomists studied the role of agriculture in the cultural landscape and rural development. They visited farms from Norway to Portugal and from Crete to Scotland, evaluated the ecology and visual characteristics, talked to the farmer(s) to get an impression of the socio-economic situation, and tried to make a general overview of the qualities of the visited farms and their role in the region. Often local experts and stakeholders in the field of rural development or agronomy were present to discuss the outcome. Their presence was also a start of the dissemination of the results of the concerted action here described. Now, at the end of the concerted action we present the final results of this process in this special issue.

This paper gives a framework for the understanding of the papers in this special issue. Therefore, some considerations are made on the role of validation schemes, the ideas behind the research process (theory) and on the way we worked as a group (method of the concerted action). Also an overview of the papers and some final results of the concerted action are presented, with special reference to the landscape performance of organic types of agriculture.

Landscape values in the approach of the concerted action reported on are conceived as the values a landscape has for the various users of and actors in that landscape, covering the range from pure users to those professionally involved in its maintenance and development. Those values range from its values for food, fibre and energy production to its values for recreation, but include its values for in-situ biodiversity conservation and environmental protection. From the concerted action reported on, it seems well possible to have land-use systems that combine many of these values, in contrast to earlier opinions among the participants that they are inevitably mutually exclusive.

In the first special issue based on our concerted action (*Agriculture, Ecosystems and Environment* (AGEE) vol. 63, nos. 2,3) a first overview of our work was given. The focus was on the problem statement and a first set of tryouts of the method by the participants of the concerted action. Now, in this second special issue, we elaborate on this earlier work. First of all a final description of the checklist's criteria and parameters is given, together with options for the use of the method. Then the authors contributing to this special issue report on the results of using the improved version of the checklist as presented.

2. Aim and steps of the presented concerted action on landscape value assessment

In most European landscapes agriculture is (still) the main driving factor. The role of agriculture in the landscape is threefold:

1. Physical (β realm): creation of landscape. Over millennia agriculture has created a huge diversity of landscape types (Meeus, 1990)
2. Social (γ realm): organisation of management. Most of the organisations in the rural areas have their root in agriculture. These organisations, together with new ones like environmental groups, are points of impact for changes in the direction of sustainability. An interesting Dutch example here is WCL Waterland (Valuable Man-made Landscape Waterland) (Duyff and Schrandt, 1995), which is an organisation that has a double goal: to keep the cultural landscape managed by supporting (the income of) farmers.
3. Cultural (α realm): The history of people, their roots and identity can be read in the landscape. It reminds people of their common goals and values. Next to this the agricultural landscape has created a point of reference for people, from which they see and value the world (Seel, 1991).

It is our aim to derive a system of (interrelated) criteria, to serve as an instrument for the assessment of the agro-landscape as a whole. Hereby the above mentioned physical-, social-, and cultural-dimensions should be integrated in a consistent and transparent way (Stobbelaar and Van Mansvelt, 1997).

To reach the above mentioned aim we need to develop:

1. Criteria for the development of sustainable landscapes based on explicit targets. These targets, criteria and parameters were published in Van Mansvelt (1997), and are updated in Table 1. The criteria can be applied across Europe. The parameters linked with these criteria have to be adjusted locally.
2. A method of application. These criteria can be applied in several ways, but the method as it is used by the participants of the concerted action in the past 4 years is described in Chapter 4.
3. Examples of how the method works. Several try-outs have been made in a range of European countries. Some of them were described in Van Mansvelt and Stobbelaar (1997) others are described in this volume: 5.1. focusing on methodological aspects, 5.2. applying the complete scheme, 5.3. focusing on the environment, 5.4. focusing on the economic issues and 5.5. focusing on the cultural environment.
4. Entrance into policy. Next to applications on local level, support for the criteria has to be found on national and EU level.

3. Theory of the concerted action on landscape value assessment

3.1. *On the complementarity of interdisciplinary holism and disciplinary reductionism*

To apply the checklist in the way it is meant, it is important to be very clear about the status of such terms as parameters, values, criteria and targets. This particularly so in the context of the holistic approach that complements the reductionist approach, which characterises the methodology of this work. As Whitby and Ollerenshaw (1998) state: “An holistic approach is the only one which can offer secure underpinning for effective environmental policies. Holism asserts that complex systems have attributes that will only be understood by examining them as such, rather than by analysing the attributes separately.” As much as knowledge on all details is important for the reductionist approach, and reductionism for the knowledge on all fine details, so is holism important for the knowledge on any object as a whole. The whole or Holon to which all details belong, and from which they are

derived by analyses of a certain (chosen) aspect of that Holon. Now the definition of the whole that is researched, assessed or analysed, is a crucial part of such scientific endeavours as just mentioned.

The advantage of such an approach is, according to Vos and Stortelder (1992), that the holistic part of the study makes it possible to study coherent ‘larger’ units with properties that emerge from those of the separate components. On the other hand the analytical part gives the opportunity to explain the occurrence of the larger units in an analytical reduction of the causes.

Thus, along this line of arguments, there is a sequence of:

1. Targets that need to be specified in several criteria to be assessable.
2. Criteria that need several specific parameters to be assessed.
3. Parameters that need several magnitudes set to serve validation of the assessed object.
4. Data that allow assessment of the criteria on their compliance to the targets as set.

In this sequence (1. Targets to 4. Data) specificity and concreteness increase, to end in usually much appreciated hard facts. This although the choice of that specific data that is to represent the whole is of an inevitably soft or paradigmatic character. So for example, the desirability of 10 or 15 tonne/ha of wheat, or that of $10\text{--}12 \times 10^3$ l of milk per cow per year, can only be appreciated in a very particular context of interrelated considerations. Such production levels may be deemed good for the short time financial household economy of the farmer. However, they may have a bad impact on the long time soil fertility and species diversity on the farmers land, and thus be depreciated in a perspective of sustainable management (van Mansvelt and Mulder, 1993). This need for contextualisation also holds for terms like the need for money for ‘the’ farmers, the need for food for ‘the’ people, the need for efficient feed-conversion, the maximal production of ‘the’ cow’s physiology and so on. It also holds for the production of any other single commodity in the landscape. The more an object is singled out to become technologically transparent and open for modelling, the more difficult it becomes to keep an eye on its multifunctional links with the context from which it has been singled out.

The functional context for landscape values that is meant here, can be a natural one (β sciences) but,

Table 1
Criteria for the development of sustainable rural landscape management

Quality of the (a)biotic environment		Quality of the social environment		Quality of the cultural environment	
1. Environment	2. Ecology	3. Economy	4. Sociology	5. Psychology	6. Physiognomy/cultural geography
Resource conditions	Biological relationships	Flows of finances and services	Participation procedures	Subjective regional landscape appreciation	Objective regional landscape identity
1.1 Clean environment. Fertile and resilient soil. Water quality. Air quality. Wild fire control	2.1 Bio-diversity. Flora and fauna species' diversity. Bio-topo diversity. Ecosystems' diversity	3.1 Good farming should pay-off	4.1 Well-being in the area	5.1 Compliance to the natural environment	6.1 Diversity of landscape components
1.2 Food and fibre sufficiency and quality. Nationally sufficient and regionally sustainable levels of food and fibre production. Good food and fibre quality to match sufficient quantities	2.2 Ecological coherence. Vertical coherence: on site. Horizontal coherence: in the landscape. Cyclical coherence: in time	3.2 Green economy	4.2 Permanent education of farmers	5.2 Good use of the landscape's potential utility	6.2 Coherence among landscape elements
1.3 Regional carrying capacity	2.3 Eco-regulation	3.3 Regional autonomy	4.3 Access to participation Farmer's involvement in activities outside the farm Outsiders' involvement in farm activities	5.3 Presence of naturalness	6.3 Continuity of land-use and spatial arrangement
1.4 Economic and efficient use of resources	2.4 Animal welfare		4.4 Accessibility of the landscape	5.4 A rich and fair offer of sensory qualities, such as colours, smells and sounds	
1.5 Sustainable, site-adapted and regionally specific production systems				5.5 Experiences of unity, like for example: completeness, wholeness and spaciousness	
				5.6 Experienced historicity	
				5.7 Presence of cyclical developments, for example growth cycles and the seasons	
				5.8 Careful management of the landscape, for example at the level of maintenance	

as is increasingly acknowledged, should as well be a socio-economic (γ sciences), and a cultural (α sciences) one.

It may be obvious that the more these wider contexts are overseen or neglected, the faster the technological progress can proceed on the so called ‘commodities’. That are: products singled out of their wider production contexts (social, ecological, cultural) because of their high profitability. This single commodity production gave rise to mono-cropping, intensive (off-soil) production of animals and vegetables. These modern production systems are widely held accountable for landscape degradation all over Europe and abroad (Vos and Stortelder, 1992; Van Mansvelt and Mulder, 1993; Potter, 1997). It seems that the time needed for environmental problems to arise decreases in some proportion to the increase of single commodity production, together with a proportional increase of the time needed to restore the lost values. From these considerations, the following scheme can be abstracted (Fig. 2).

With this scheme in mind, the checklist (Table 1) can be more easily understood in its multi-scaled and inter-disciplinary character. When further on the checklist items, concepts and examples, theory and practice, larger and smaller scales in time and space will be addressed, the scheme as shown here might clarify how these paragraphs can be understood.

3.2. *Designing valuation schemes*

The sequence of targets up to assessment data, shown in the previous paragraph, needs to be set in a discussion on the values of the one level for the higher level. Such a valuing of information from a lower level can be done in two ways. On the one hand using social scientific methods like the contingent valuation method (e.g. Harvey et al., 1988) or interviews (e.g. Coeterier, 1987; Van Haperen and Van Herpen, 1997), and on the other hand using expert judgements, based on explicitly described criteria. Such criteria are for example described by the Scottish Natural Heritage (1993). In this concerted action, the expert judgement approach was developed and implemented, with a high emphasis on the interdisciplinarity of the experts invited. This approach provided us with the oppor-

tunity to create a thorough overview on landscape values. Later on these values can be linked with the appreciation of society viz. a stratified selection of relevant people that are actively involved in the landscape planning and management (Bosshard, 2000).

Expert judgement of the rural area using more than the normally used criteria has two mayor advantages.

1. It provides a more precise description of the impact of certain measurements on the rural landscape and community than single parameter measurements.
2. The criteria for sustainable development could raise a discussion among stakeholders in the region about their ideals and visions on sustainability and their compatibility with one and other (cross compliance of criteria). An example of this approach can be found in Roe et al. (1997). The checklist serves as an ‘eye-opener’ and starting point for discussions. Due this open-end character it avoids the rigidness of discussions on for example ‘natuurdoeltypen’ (target type for nature) in The Netherlands, where all the Dutch nature reserves should aim at certain target types (e.g. Haartsen, 1995; Van Rijen, 1995; Van Bolhuis, 1995).

However, valuation in science is a sensitive matter. It often appears to be subjective among those that did not participate in the process of standard setting. In all fields of science (implicit) schemes of valuation are used (e.g. bio-diversity is good; higher yields are necessary). Normally an inter-subjective system is founded through years of discussion, so in the end the ethical dimension of the discussion is not consciously perceived anymore. New sciences like landscape research, still have to go this route, and there the discussion on the subjectivity/objectivity of valuation is ongoing. Our contribution to this discussion is being as explicit as possible in our goals and criteria (see also Van Mansvelt and Van der Lubbe, 1998). For all the quantitative parameters it is important to be aware of their source in normative validation of the relevant facts and interactions. Number of species per surface unit, amounts of nutrients per volume of feed, food, ground water, surface water or manure: they all have their meaning only and alone within a wide context of adjacent considerations and namely intentions (goals, targets). So, here it is strongly recommended to make the objectives for which the measurements

are intended, a constant issue of all dialogues on landscape management.

3.3. Setting criteria

Criteria in the system as proposed figure on the level between targets and parameters (Fig. 2.). They are still so general that they can be applied across Europe. The set of criteria was laid out on the basis of a balance between a theoretical framework and standards set via locally applied criteria. Elsewhere in this volume Bosshard sketches the history of the organic labelling and indicates that the label could not be fully developed without a very close link with practice. In fact, a group of pioneer farmers formulated the standards themselves and is, via a transparent structure, still involved in the updating of the standards.

3.4. Weighing of parameters

One of the issues that recurred several times is the weighing of the parameters and/or criteria. The necessity of weighing depends on the use of the valuation. It may be necessary when quantitative data are to be used, but as Andreoli and Tellarini (2000) found out, for the final valuation of a farm it is neither necessary nor interesting to weigh parameters. The overall conclusion in both the cases is the same. Especially when the checklist is used as a tool to find the farm or landscape's strengths and weaknesses, only indications are needed.

A question linked to the previous one is: should the criteria be prioritised? This could be done according to the goal of the users. Only one thing must be borne in mind: in both design and valuation, the cross-values are the most important. Scientists and landscape designers should ask themselves: which are the strengthening combinations, what tools/ideas have multiple benefit? The papers in this volume will show some of these cross-values; measurements or landscape elements that score on different criteria across the checklist. This also shows how the columns are linked: They are connected in practice, the subject of study is always the same, but looked upon from different viewpoints viz. disciplines.

3.5. On the complexity of the checklist

Several times during meetings with representatives from practice it was at first argued that the checklist looks too difficult to be run completely. However, our experience is that a multidisciplinary group of landscape experts (provided they understand the theory) in combination with local key-persons (who know the local situation), can give a good insight in the strengths and weaknesses of the studied object in about 3 days at the maximum. The calculations of MacNaeidhe and Culleton (in this volume) support this conclusion.

3.6. Political and other uses of the checklist

If criteria are too generally applied they do not fit the local situation and can even harm sustainable development (contra-productive) (Potter, 1997). A good example of a guideline that is misused in this way is the EU sheep subsidy. The expert group visited landscapes in Spain (Cordoba) that looked like a desert because they were extremely overgrazed by sheep (Fig. 1). These animals were fed by imported fodder, which was only economical feasible because the sheep were subsidised. So, the sheep were not kept for reasons of real market demand, but only to cash the per head subventions. Moreover, the sheep were largely kept by rich landowners living in the city, and less by the small



Fig. 1. Overexploited landscape of a latifundista (large landowner's) sheep farm in the neighbourhood of Cordoba (Spain). Overgrazed by excessive numbers of sheep that were bought to cash in on EU sheep subsidies, originally meant to support small farmers in marginal areas.

Table 2

Examples of possible uses of the checklist, by possible user-groups viz. groups of actors involved in (sustainable) landscape management

Uses for users	Politicians and administration	Advice and extension	Research	Education	Farmers	NGO's/interest groups
Checklist	Payment control of sustainability schemes	Relevant (rural) landscape issues	Ongoing updating and refining	Teaching and Examination	Regional codes of good practice, farm validation	Checking institutional planning
Design framework	Identify and validate land use and agriculture	Consistent programming and planning	Interdisciplinary methodology design	Curriculum design	Farm design, development and management	Choosing priorities and synergies in planning
Strategic planning	Policy targets for sustainable land use	Translation to farming practices	Unifying concept's development	Strategic planning of Education	Farmers' association's strategic planning	Integrating own objectives with other groups'
Communication	Discussions among interest groups/stakeholders	Awareness raising in planning and management	Interdisciplinary research projects	Interconnection of teaching topics	Communication with other land-users/interest groups	Communication with farmers and other interest groups
Financing	Grants and cross compliant income support	Farmers financing services	Efficient and appropriate payments	Educational financing	Income diversification	Lobbying for the financing of sustainable land-use.

farmers for whose income support the subvention was meant (Van Mansvelt and Stobbelaar, 1996).

It is widely accepted that generic regulations like those given in the Common Agricultural Policy (CAP) of the EU should be adapted regionally, because general guidelines can nor do take into account the regional differences in problems and solutions. New systems should be more flexible and effective in the same time. With general goals for (regional) development to be set on the EU level (like bio-diversity or minimum income) but the instruments to reach the goals to be developed locally. This obviously needs co-ordinated agreements on what type of measures should be targeted for adoption in any given region, and how best to design and deliver the scheme to farmers in order to gain widespread acceptance, while still providing society with value for money (Kaule and Morgan, 1997). So, a balance is needed between a top-down approach wherein the criteria are set, and a bottom up approach, wherein the local situation can express itself. The general targets and aims, like in our approach, needs completion and or implementation by locally discussed and accepted parameters (and parameter values).

Standards could also be set differently for different groups, e.g., for types of agriculture (see Section 6). It was discussed that, although organic farms do fairly

well, the standards for organic agriculture could be set more stringent and made to include landscape issues if they want to continue to play a leading role in rural development (Stobbelaar et al., 1998).

European policy is looking for ways to extend agricultural policy to landscape and nature. Here a lay out for funding new developments will be presented.

In the last year of the concerted action, during the meeting in Crete, in which the regional and international experts participated, Remmers and Stobbelaar (1997) initiated an extra workshop which created an outline of possible uses and users of the checklist. Based on that outline Table 2 is derived, that indicates in keywords the possible uses each of the possible users can make of the checklist. Obviously, the list is only meant as indicative and should in no way be taken as limiting either in types of uses or in kind of users. The potential uses and user-groups as mentioned in Table 2 can be located at various scales and levels, viz.: international, national, regional and local.

During the discussions about possible uses and users, also possibilities for funding landscape management along the lines of the checklist have been looked for. There are two different strategies to fund landscape management, viz.: target funding and procedure funding.

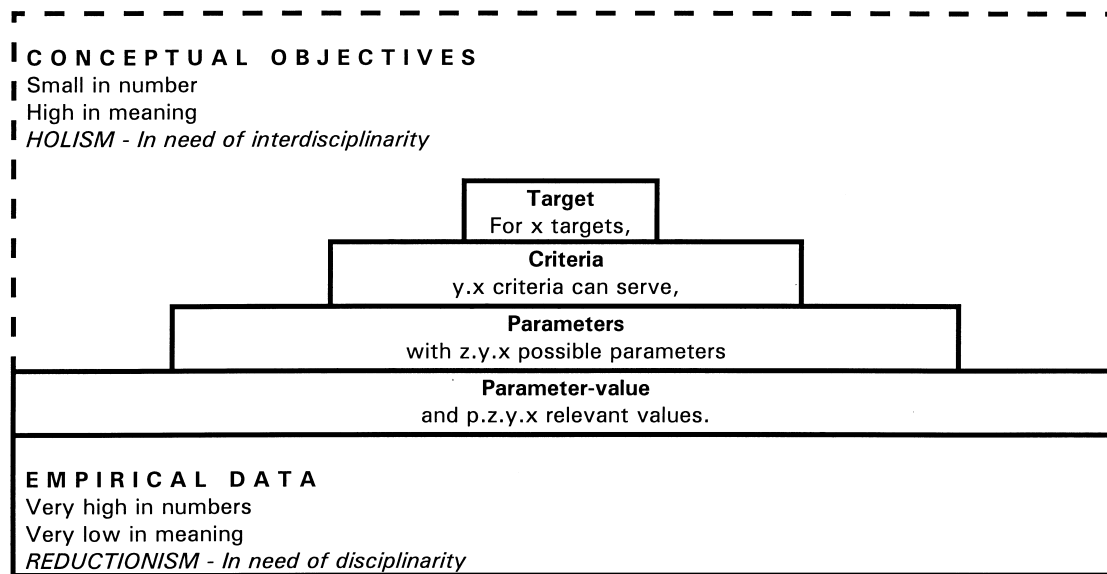


Fig. 2. Scheme of the relationship between targets, criteria, parameters and the preferred values (the scheme is of a general nature, here meant to be applied on the landscape values).

3.6.1. Target funding

- Funding of agro-landscape production, which develops and/or maintains features of the specific local or regional qualities that are characteristic for the landscape's identity.
- Funding of farmers through income support, adding up the loss in income from a reduction of food-sales caused by the world-wide open market and the exteriorisation of costs of environmental protection and landscape maintenance.

Here, target funding is to focus on targets at a sufficiently general level of integration to warrant its appropriate efficiency.

3.6.2. Procedure funding

- Funding of Non Government Organisations (NGO's) of local farmers, land-users and all other relevant groups of stakeholders involved in and committed to sustainable landscape and land-use planning (environmentalists, nature conservationists, etc.). This strategy raises local awareness of the real multifunctionality of the landscape and enhances participation in this issue. Thus funding of NGO groups contributes in two ways for the empowerment of the rural population.

- Funding of pilot conversion projects for sustainable land-use and landscape management. This is important to show how feasible strategies for these targets can be implemented in a way that meets the targets and fits to the local conditions of the criteria and parameters of the checklist, in that particular region and at that particular scale.

For all such funding programs, the criteria and parameters of the checklist can be used in general and specified with the knowledge of a local expert panel, to warrant appropriate application. The local panel should further consist of disciplinary experts with supra-regional expertise, peremptory to warrant that the data of the region are considered appropriately in their context, there and on the next scale in the hierarchy of systems (Fig. 2). To decide on the relevance of stakeholders to be invited in planning and decision-making on the landscape's future, it seems crucial to look for a fair balance between give and take or between rights and duties, in a perspective of proportionality. Thereby, an acceptable balance between individual liberty and common fraternity or between freedom and responsibility should be sought after in an atmosphere of equal rights. Definitely aware of the arbitrariness of the landscape criteria for decision-making as presented here, it seems that

making them explicit, discussing them openly with all the stakeholders involved, seems a promising option to arrive at a sufficient degree of transparency and acceptability of the decisions. This is of crucial importance to warrant their appropriate application in practice (Volker, 1997; Bosshard et al., 1997).

4. Method of the concerted action on landscape value assessment

4.1. Groupwork in the regions

The proposed landscape validation system is dynamic, it can set different goals, and use different tools according to the local values and problems. However, the group of participants of the concerted action developed a specific way to use the checklist, which was improved during the four years of its co-operation. The main focus was on the contribution of the farm to the (broadly defined) landscape quality (see Box 1. for an example of its use on a broader landscape level). The following steps were taken:

Box 1.: The Checklist's use on a wider landscape scale

As an example of the wider use of the system, an evaluation of the role of nature development in landscape development is given. The discussion on nature development is very polarised, especially in the Netherlands (e.g., Achterhuis, 1998). Some say radically no to it, others are very much in favour. However, when linking nature development with criteria for its application, its role can become clearer (the numbers refer to the checklist, Table 1):

1. No (large scale) nature development on spots with a high culture historical value (Section 6 expression of time-cultural heritage) and/or ecological value (2). Especially these sites are endangered, because they are relatively cheap (uninteresting for agriculture) so they can easily be bought for nature development.
2. To fit nature development into the landscape structure, that is to say, to keep intact as much as possible the cultural historical structures on a higher landscape level (Section 6 coherence among landscape components).
3. Nature development has to contribute to regional development (Section 3.3).

4. The situating and development of the natural area has to be a democratic decision (Section 4.2), and a contribution to the psychological development of the inhabitants of the area (Section 5.1). A good instrument to guide this process are landscape images (e.g. Jones and Emmelin, 1994; Hendriks et al., 2000). These criteria do not intend to abolish nature development in valuable cultural landscapes. On the contrary: nature development in cultural landscapes can very well be implemented on ecotope level (Londo, 1997), instead of landscape level. This small scale type of nature development can even strengthen the (cultural historical) values of an old agricultural landscape (see Hendriks et al., 2000).

1. Analysis of the values and constraints in the region
2. Development of a guiding image (leitbild) for the region
3. Matching of the visited farm(s) with this guiding image
4. Making of a design to improve the situation on farm level

In order to analyse the values and constraints in the area local key persons were asked to give an introduction. Next to this a tour of the region was absolutely necessary to really get in touch with the area. Preliminary solutions were given for the problems of the region (guiding image). Also the targets were made explicit, in order to know how the different parameters had to be judged. By explicating targets and the guiding image, which shows an ideal situation for the area, we made our judgements intersubjective; the process became imitable.

On the basis of these experiences the farm(s) are studied in more detail. First there was always a farm walk, with the farmer explaining the farm's situation. As and when needed to study particular elements on the farm more visits followed. Subsequently, the farm was compared with the values and constraints of the region and matched with the guiding image for that particular region to see its compatibility viz. its positive or negative contribution to that local identity (Hendriks et al., 2000). To have more reference on farm level, sometimes two farms in a region were studied, preferably an organic and a non-organic ('conventional') farm. This last option provided information regarding the 'problem solving capacity' of the different farming systems compared. Usually,

the working group, composed of the standing team of international experts, extended per case with regional experts, split up into a (a)biotic-environment group (β aspects), a social-environment group (γ aspects) and cultural-environment group (α aspects). These three groups started to elaborate on their own set of criteria. The results of all the three groups were presented and discussed in plenary sessions, where discrepancies and synergies between the groups' results were assessed. In the cases where two farms were screened their (overall) scores per group were compared and combined where relevant.

The last step is to give recommendations for landscape improvement to the farmers (manager in charge). This should preferably be done in the form of a new design for the farm and/or politics. The effect of this last step has not been (fully) proved yet, because it needs a step out of science and a new approach to reach policy makers viz. the farmers.

During the 4 years of this concerted action, the four steps process led to a series of adaptation of the criteria. While working on a case study, the criteria was to show their usability. Sometimes new criteria were needed, or new parameters could be added. This iterative process led to the final checklist as shown in Table 1.

The contribution of farms to the landscape quality was the central issue in the method applied by the participants of the concerted action. However, the system can also be used to evaluate or design landscape on a regional level. A first try-out of an expert judgement on regional level can be found in Stobbelaar et al. (2000). Also see Box 1.

The last year of the Concerted Action was used to fine tune the system and to communicate it with experts, policymakers, farmers and the EU. This was done during the subgroup meetings with local experts and authorities, and for a general public on the WLO Congress in Bergen (The Netherlands). In Italy the

system is part of a course and in Switzerland an analogue research was carried out (Bosshard, 2000). A book has been published, in which an overview of the results and experiences of the concerted action is given (Van Mansvelt and Van der Lubbe, 1998).

4.2. Farms in their landscape

A farm unit is very often not continuous, in other words it consists of separate plots, especially in the southern European countries (land heritage system). This could become a problem for the implementation of the method, as many plots would be too small for a sound validation (e.g. Kuiper, 2000). However, the individual plots of all the farmers of a locality, contribute to the landscape unit they are part of. They should do so preferably in favour of ecological, social and cultural landscape values. The farm or farm plot identity should fit into and contribute to the local landscape identity. Moreover, the situation becomes more interesting and of a potentially higher value where farmers have the courage and/or get incentives to work together in a common landscape development management plan (farmer's association and co-operation). The Cretan example stipulates that an ecological infrastructure on a meso-scale, of all plots of many farmers, make a landscape, whereas such a structure on a micro scale, built by just one farmer on its 1 ha plot, does only make little sense (see Stobbelaar et al., 2000).

5. On the content of this volume

5.1. Introduction

In Table 3 an overview is given of the fields that are covered by the papers in this volume. If a paper is mentioned in the table on farm level, this implies that

Table 3

Overview of the focuses of the papers as presented in this special issue. The overview is structured according to the landscape scale or level of the paper and the types of environments particularly addressed in these papers

Column/level	(a)biotic environment	Social environment	Cultural environment	Basic studies
Farm level	Rossi et al. MacNaeidhe et al. Stobbelaar et al. Van Elsen	Rossi et al. MacNaeidhe et al. Stobbelaar et al. Tellarini et al.	Rossi et al. MacNaeidhe et al. Stobbelaar et al. Clemetsen et al. Kuiper Hendriks et al.	Stobbelaar & Van Mansvelt Bosshard Andreoli et al.
Regional level	Pauwels	Pauwels	Pauwels	Stobbelaar and Van Mansvelt Antrop

the study gives an answer on the question of how farms are embedded in a region and what they contribute to that region. If papers are mentioned on regional level, than the author(s) evaluate the regional characteristics. Names of authors are mentioned several times if they evaluate on more than one level or part of the checklist.

The emphasis of the participants work is on the farm level, however, in its regional context. This is due to our research questions. In AGEE 63 (vol. 2,3) most of the contributions were aimed at the ecological and/or cultural environment. Now also more papers that include issues of the social realm are presented.

Every author sets his/her own priorities in the way the criteria are treated and also sometimes own definitions of criteria are used. Although this makes the work more difficult to understand, it shows that the concerted action inspired the participants to elaborate on the criteria and to use them in research. Because of the same reason, in all the papers all the four steps mentioned in paragraph 4 are not taken in depth. Also: the authors in this volume use different versions of the scheme because they started writing in different phases of the process.

5.2. Methodological papers

5.2.1. Antrop

According to the author a holistic view on landscape is absolutely necessary, because the elements of a landscape can only be understood within the context of the whole. This idea has consequences for both the landscape analysis and planning; these have to be done in an integrative way, taking into account the criteria mentioned in the checklist, with special emphasis on ecology, psychology and physiognomy. In his contribution Antrop makes links between the tradition of landscape research and the concerted action checklist approach.

5.2.2. Bosshard

The author criticises and elaborates on the framework of the concerted action, starting from epistemology down to practise. Therefore, Bosshard presents a theoretical framework and methodology by which land-use can be judged on its sustainability. In this context, the checklist with landscape criteria can serve as a complete toolbox for sustainability projects. The

checklist helps to find unconventional solutions and new project perspectives. The outcome of the project is not 'objective and everlasting' true, but developed in and for a concrete cultural and local context.

5.2.3. Andreoli and Tellarini

In this contribution the question is raised as to how to achieve an overall judgement in a research that generated a multitude of often mixed data (quantitative and qualitative), like what happens when using the checklist as a comparative validation tool. To achieve an overall judgement it is deemed necessary to express all criteria in one kind of unit (here utility), and then usually to weigh them. The authors propose the use of several combined ranking methods to provide a 'cross-checked' evaluation, capable of indicating which farm types or style of farming should be discouraged or supported. However, it can also be used for providing guidelines to the decision makers.

5.3. Assessments of the complete scheme

5.3.1. Rossi and Nota

The authors give a full implementation of the scheme (version 3) on an expert judgement base. Two organic farms in two Tuscan landscapes are evaluated in comparison with their surroundings. Both the area's (one more than the other) lack landscape qualities according to used criteria. Both organic farms perform (much) better than the surrounding farms.

5.3.2. MacNaeidhe and Culleton

MacNaeidhe and Culleton apply all the (86) parameters derived from the checklist (version 5) on four Irish farms (two organic, two conventional). They show that it is possible to use this method with rather limited time-costs. A clear distinction could be made between the farms. The organic farms have a higher overall score than the conventional. At the moment, conventional farms are also getting involved in landscape development but for them, according to the authors, due to high animal stocking rates and the application of fertilisers, real quality increase will be difficult.

5.3.3. *Stobbelaar, Kuiper, Van Mansvelt, Kabourakis*

The checklist is applied on two organic olive farms in the Messara region on Crete. The agricultural landscape in the area is dominated by conventional olive growing. The comparison between the two organic farms is used to find reasons for (not) contributing to the landscape quality. Next to this the problem solving capacity of these farms for the regional landscape is researched. Therefore, it can be concluded that, owing mainly to the scattered character of most of the organic farms, the landscape quality is not as high as it can be, but at the same time the organic farms already have a higher landscape quality than the surrounding conventional farm landscape.

5.3.4. *Pauwels*

The use of minor rural road networks is a neglected part in the discussion on landscape sustainability. Their importance, next to facilitating transport possibilities, lies in the ecological quality of the verges (ecological networks), accessibility (for recreants and inhabitants) and cultural values (amenity and history). Pauwels gives an overview of the causes of the decrease in quality of minor rural road networks. Following this, recommendations are formulated to improve the quality of the road verges.

5.4. *Assessment of the (a)biotic environment*

5.4.1. *Van Elsen*

Seeing organic agriculture as one of the ways to sustainability, Van Elsen examines this type of farming on its ecological benefits, with special attention to species diversity of the weed flora. Organic farms show a substantial higher amount and abundance of (endangered) species, but due to the economic pressure these vegetations are also under pressure in organic farming. Van Elsen, therefore, pleads for the introduction of a guiding image, which could bring back more of the original integrative thinking in organic agriculture. The guiding image he presents can be supported by the checklist shown in Table 1.

5.5. *Assessment of the social environment*

5.5.1. *Tellarini and Caporali*

In this paper the farm is described as a flow system of energy and/or monetary values. A multitude of

Agro-ecosystem Performance Indicators is set out and tested on two farms in Italy. They show that energy and monetary flows are not (completely) linked: the most energy efficient farm does not reach the highest monetary value. Thus, the economic system that is in charge at the moment, forces farm(ers) into the direction of non-sustainable land(scape) management.

5.6. *Assessment of the cultural environment*

5.6.1. *Clemetsen and Van Laar*

Clemetsen and Van Laar compare the landscape features on two organic farms with the surrounding fjord landscape of Western Norway. Their focus is on the cultural qualities of the landscape. They apply the cultural parameters (fifth version) on two organic farms in the Auerland fjord. There is abandonment of the area, so their main conclusion is that every farm in the fjord adds to the landscape quality by keeping the landscape open and inhabited. A second conclusion is that the more traditional farm adds more to the regional landscape quality than the modern organic farm. However, its social sustainability (income diversification) is less, which makes it more vulnerable for market changes.

5.6.2. *Kuiper*

Kuiper describes the cultural values of several organic farms through Europe, by using her experiences with these farms in the framework of the concerted action. Organic farms do contribute to landscape quality but not substantially, due to the lack of landscape guidelines for the farmers in the standards for organic agriculture. A list of questions is proposed to help the implementation of the evaluation of the cultural values of farms.

5.6.3. *Hendriks, Stobbelaar and Van Mansvelt*

The authors elaborate on the criteria for the cultural environment. Their starting point is that the visual quality of a landscape is mainly determined by four types of landscape coherences: vertical, horizontal, seasonal and historical. A crucial step is the formulation of reference images, which are matched with the features of the farms. With these tools they study the contribution of four organic and four conventional horticultural farms to the regional landscape quality.

In general, the organic farms have a better score than the conventional farms.

6. General conclusions on the concerted action, including the case studies

An European combined approach of landscape evaluation with a priori criteria scheme (top-down), that is filled-in regionally or per farm (bottom-up), gives on the one hand security that global targets can be reached, and on the other hand, flexibility to develop local identity. To start the discussion (in the region) with a group of experts in co-operation with local key-persons is very effective. The checklist as presented, created as a tool for evaluating the rural landscape development, is designed to be locally adjusted (Rossi et al., 1999; MacNaeidhe et al., 1999; Kuiper, 2000).

The above mentioned parameters of the checklist are meant to facilitate the realisation of the qualitative targets defined per issue. These targets are meant to be instrumental for the realisation of a landscape management of rural and agro-silvi-pastural areas that warrants a sustainable development for mankind and nature for next centuries. In the sense of Maslow's concept (Maslow, 1968), the primary need for the ongoing development is the motivation of humans to make sure that the biosphere is functioning well enough to keep mankind healthily nourished with water and food and sheltered with clothes, houses and heat. However, in relation to the social and cultural demands (second and third columns of the checklist), it is important to realise that over-consumption of food in general and over-consumption of animal protein in particular, burdens very heavily on the global available resources (Van Mansvelt, 1997). The same holds for the over-consumption of fossil, non-renewable energy and other limited resources. The more a society manages to shift from maximal tolerable consumption levels to minimal required consumption levels of all limited resources, especially in the monetary rich countries, the better the perspectives are for a sustainable development of landscape as the basis for human livelihood.

Several studies about the performance of organic agriculture all giving the impression that organic agriculture (in those situations) adds a higher quality to

the landscape and seems to be a way to create synergy between the various landscape values (Rossi and Nota, 2000; MacNaeidhe and Culleton, 2000; Kuiper, 2000). For those familiar with the research, theory and practices of organic agriculture, it will be clear that most of the recommendations made, most targets set and most parameters proposed in order to warrant a sustainable landscape management, are fully in line with those set in the guidelines for organic agriculture. This comes as no surprise, as the compatibility of farming practices with a long term fertile soil, healthy crops and husbandry as well as a healthy landscape and environment are at the roots of all versions or types of organic agriculture (Van Mansvelt and Mulder, 1993). However, the issues of nature and landscape production are indicated in the organic standards, but not yet fully reflected within those standards. Addition of some feasible landscape standards to the standards of organic agricultural production would be quite feasible and acceptable to show the effects of cross-compliant farming on the EU schemes of farmer income support, which are necessary to maintain and develop the European rural landscape in a sustainable way.

For real (integral) landscape development, we can not stick to farm improvement only. Regional co-operation between farmers mutually and with other relevant stakeholders (nature organisations, environmental groups, tourism branch) is absolutely necessary (Stobbelaar et al., 2000; Kuiper, 2000). To develop 'local truth' (social and cultural bound guiding image) in this process, it is important to keep local stakeholders in an area involved (Bosshard, 2000).

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