



Baseline Report

**Biodiversity in standards and labels
for the food sector**

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INTRODUCTION

This Baseline Report summarizes the results of a screening of 54 regional, national and international standards for the food sector and requirements of food companies for their supply chain. The screening has been realized within the European initiative „Biodiversity in Standards and Labels of the Food Sector“, supported by the European Commission. The report provides a comprehensive overview on how protection of biodiversity is currently addressed in standards and company requirements. The policies of standards and companies as well as their criteria and requirements have been evaluated regarding effectiveness for biodiversity protection, their emphasis within the standard or company certification schemes and their transparency and verifiability. The screening was based on the results of research studies and practical experiences.

Besides the results, the Baseline Report contains conclusions – indicating the need and the potential to improve the biodiversity performance of standards and company requirements. The conclusions were formulated by a multidisciplinary expert team.

Who should read the document and why?

The main target group are persons responsible for the revision of standard schemes and for the elaboration or revision of „Sourcing Guidelines“ of food companies. The Baseline Report helps to compare the own standard or requirements with the current average of standards and guidelines in the market. Product managers and quality managers of food companies as well as the coordinators of sustainability strategies/policies will gain an insight on which aspects of biodiversity protection are more effectively addressed by standards and which not. This is also relevant information for

experts involved in topics related to agriculture/food industry and biodiversity (farm assessors, certifiers of food standards, scientific institutes, environmental NGOs, administrations for agriculture or for nature protection etc.).

Associations of the food sector, agricultural cooperatives and associations may also benefit from the report. The potential for improvement identified in the Baseline Report indicates which aspects of biodiversity should be more effectively addressed in order to reduce negative impacts and contribute more substantially to halt the loss of biodiversity.

Next steps

The results of the Baseline Report will be used as input for the elaboration of recommendations for standard organizations and food companies on how to improve their criteria with relevance for biodiversity. Representatives of standard organizations and companies, certifiers, scientific institutes, environmental NGOs and agricultural and environmental administrations will be involved in this task.

The process starts in June 2017 and will result in a document on „Recommendations to improve the biodiversity performance of standards and companies requirements in the food sector“ – expected by November 2017.

If you are interested in participating in the elaboration of the recommendations, please contact the project coordinator in your country!

PROJECT OVERVIEW

The loss of biodiversity is one of the biggest challenges of our times. Human activities are driving species loss 1000 times faster than it would have been under natural succession circumstances. Many ecosystems, which provide us essential resources, are at a risk of collapsing. The conservation and sustainable use of biodiversity is not simply an environmental issue but it is a key requirement for our nutrition, production processes, services and the overall quality of life. In combination with the agricultural sector, food producers and retailers have a great impact on biodiversity. Unfortunately, biodiversity protection is not among of the main interests yet. In general, the interactions between human activity and biodiversity are complex. Due to this complexity, reducing the negative effects on nature in the complete supply chain of a food product - from cradle to shelf - poses a challenge.

Standards and labels for the food industry help qualify certain attributes of a product and the process of production itself. They guide consumers with information about the quality of products, their environmental and social footprint and impact on nature.

Project Objectives

The main objective is to improve the biodiversity performance of standards and labels within the food industry, a) by supporting standard-setting organisations to include efficient biodiversity criteria into their schemes; and b) by motivating food processing companies and retailers to include biodiversity criteria into their sourcing guidelines. This is achieved through

- » Trainings for certifiers and auditors as well as product and quality managers in companies
- » Development and implementation of a cross-standard monitoring system for biodiversity
- » Dissemination of results and information to the food sector and standard-setting organisations

A European-wide initiative on “Biodiversity in Standards and Labels of the Food Sector” will continue to work on the topic beyond the lifetime of the project post 2020.

Actions and means involved

54 standards and company guidelines or codes of conduct have been evaluated for their biodiversity criteria. The results and conclusions are summarized in this baseline report. The next step is the elaboration of recommendations for the improvement of standard policies and criteria as well as requirements of companies regarding their supply chain. These recommendations will be prepared in cooperation with standard organisations, companies, certifiers, NGOs and other experts and are going to be shared with more than 400 standards with relevance for the European market. The project team is keen to advise interested standard organisations

and companies in the revision of their criteria. In addition, an Easy Guide will be published on biodiversity criteria in standards, labels and corporate guidelines in Spanish, French, Portuguese, English and German. The Easy Guide will provide information about basic requirements, which standards should fulfil (e.g. definition of terms, coverage of all aspects of drivers for biodiversity loss, etc.) and examples for good biodiversity criteria in standards.

With the help of a newly developed Biodiversity Performance Tool (BPT), the current situation (baseline) and the further development for biodiversity protection on farms can be analysed. Through pilot projects involving farms in cereal cultivation (Germany), tomato cultivation (Spain), olive production (Spain), grasslands used for meat and dairy production (Portugal and France), the BPT as well as biodiversity measures will be tested.

Finally, a cross-standard monitoring-system and database will be set up tracking the biodiversity performance at farm level. Standard-setting and label organisations will be invited to join the common monitoring approach. Using this database, agricultural standard organisations and companies will be able to monitor the positive effects and will have a solid basis to improve their criteria and measures.

The project includes a wide range of dissemination activities towards all actors within the food sector in Europe, but also the European Union (DG Agriculture and DG Environment), national programmes related to the food sector, international organisations and programmes and the units responsible for green public procurement (food/catering) within the administrations.

With the creation of a sector-specific initiative “Biodiversity Performance in the Food Sector”, the food sector should assure the continuation of the activities. One of the aims of this initiative is to raise the biodiversity performance within the whole food sector by using commonly accepted and implemented priority criteria for biodiversity. Another task will be the continuous monitoring and publication of regular monitoring reports.

The project has been endorsed as „Core Initiative“ of the Programme on Sustainable Food Systems of the 10-Year Framework of Programmes on Sustainable Consumption and Production (UNEP /FAO).

See:

<http://www.scpclearinghouse.org/sustainable-food-system/core-initiatives-sfs-programme>

European Project Team:



The project is supported by the EU LIFE Programme:

With the support of:

Recognised as a:



We appreciate the support of our partner standards and companies:



Good Food, Good Life



always
inspiring more...



THE FOOD INDUSTRY - IMPACTS & DEPENDENCIES ON BIODIVERSITY

A Negative Global Trend: Biodiversity Loss

Numerous studies have documented the dramatic progression of biodiversity loss. The WWF's Living Planet Index, the Zoological Society of London and the Global Footprint Network all describe the extinction of species occurring in oceans, freshwater bodies and terrestrial ecosystems. From 1970 to 2012 the WWF's Living Planet Index shows a 58% overall decline in vertebrate population abundance. Population sizes of vertebrate species have, on average, dropped by more than half in less than 50 years. The data shows an average annual decline of 2 per cent and there is no sign yet that this development is going to stop.

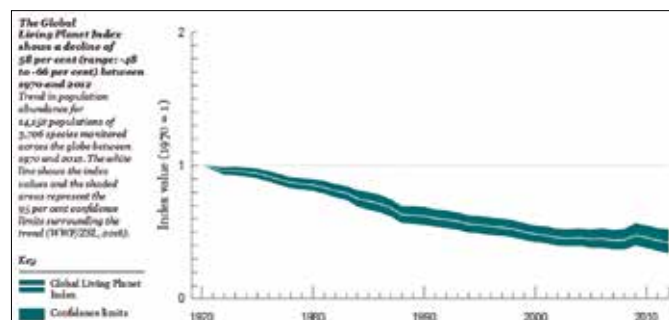


Figure 1: WWF „Global Living Planet Index 2016“.

“In the EU, only 17 % of habitats and species and 11 % of key ecosystems protected under EU legislation are in a favorable state. This is in spite of action taken to combat biodiversity loss, particularly since the EU 2010 biodiversity target was set in 2001. The benefits of these actions have been outweighed by continued and growing pressures on Europe's biodiversity: land-use change, over-exploitation of biodiversity and its components, the spread of invasive alien species, pollution and climate change have either remained constant or are increasing. Indirect drivers, such as population growth, limited awareness about biodiversity and the fact that the economic value of biodiversity is not reflected in decision making are also taking a heavy toll on biodiversity.” (EU Biodiversity Strategy to 2020).

According to the COMMISSION STAFF WORKING PAPER “IMPACT ASSESSMENT”, an accompanying document to the EU Biodiversity Strategy to 2020, the main drivers for biodiversity loss are:

- » **Habitat loss due to land use change and fragmentation**, including through conversion of grassland into arable land, land abandonment, urban sprawl, and rapidly expanding transport infrastructure and energy networks; 70% of species are threatened by the loss of their habitats, in particular farmland birds have declined by 20 to 25% since 1990; The EU is one of the most fragmented regions in the world, with fragmentation of 30% of EU-27 land moderately high to very high due to urban sprawl and infrastructure development related to transport and energy.

Fragmentation affects the connectivity and health of ecosystems and their ability to provide services.

- » **Pollution.** 26% of species are threatened by pesticides and fertilizers such as nitrates and phosphates (IUCN).
- » **Overexploitation** of forests¹, oceans, rivers and soils; 30% of species are threatened by overexploitation; 88% of stocks are fished beyond maximum sustainable yield.
- » **Invasive alien species.** 22% of species are threatened by invasive alien species. The introduction of alien species has led to several species going extinct.
- » **Climate change.** Shifts in habitats and species distribution due to climate change are being observed. Climate change interacts and often exacerbates other threats.

These pressures are either constant or increasing in intensity. In particular, invasive alien species remain a threat, and are predicted to carry on increasing exponentially. Climate change impacts are only beginning to emerge, and degraded ecosystems have a reduced capacity to respond to future changes.

Based on the list above it can be noted that agriculture is a major contributor to biodiversity loss.

The WWF's Living Planet Index (LPI) 2016 database contains threat information for 33% of its declining terrestrial populations (n=703). Habitat loss and degradation are the most common threats to terrestrial populations in the LPI database, followed by overexploitation. Other threats can vary in importance according to taxonomic group.

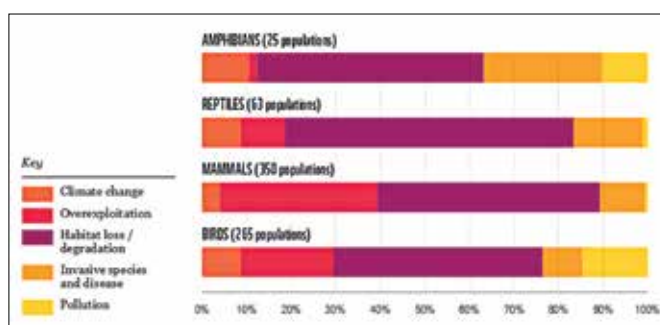


Figure 2: WWF „Global Living Planet Index 2016: Taxonomic differences in threat frequency for 703 declining terrestrial populations“.

Relationship between agriculture and biodiversity

Food security and agricultural intensification

The main task for global agriculture is to provide a proper and safe diet to everyone (food security) in order to ensure stable livelihoods. The fast-growing world population has increased the need for higher food production and distribution. In addition, consump-

tion patterns in industrialized countries and emerging economies are intensifying leading to an even more globalized food market. These trends have led to the vast exploitation of agricultural land and highly intensive production systems.

The consequences of these societal trends are dramatic for biodiversity: changes in land-use and destruction of primary ecosystems, over-exploitation and pollution of water and soils as well as the introduction of non-native invasive species. Intensive production systems result in genetic erosion of agricultural biodiversity. The genetic diversity of crops and livestock are currently decreasing in general and within species. Within the world's progressive homogenization of production methods, regional and site-specific breeds and cultivars are increasingly replaced and crossed out in favour of market-compliant ones that produce higher yields. Only 30 plant species are used to produce 95% of vegetable calories globally¹. Wheat, rice and corn alone account for more than 50% of all plant calories produced globally (source: http://www.bfn.de/0313_agrobiodiv.html).

Moreover, ecosystems that border on intensive agricultural land are also affected (through water use, nutrient surplus and associated eutrophication, entry of pesticides in soil, water and roads). "The ecosystem-based assets of natural capital evolved to be self-sustaining. But increased human pressure on ecosystems and species – such as conversion of natural habitat to agriculture, overexploitation of fisheries, pollution of freshwater by industries, urbanization and unsustainable farming and fishing practices – is diminishing natural capital at a faster rate than it can be replenished (EEA, 2013²). [...] The most important driver of deforestation is expanding agriculture – including commercial livestock and major crops such as palm oil and soy (Gibbs et al., 2010³; Hosonuma et al.⁴, 2012; Kissinger et al., 2012⁵)." (WWF's Living Planet Report 2016).

In the current FAO Food Wastage Food Print, agriculture is defined as one of the main influencing factors that threaten biodiversity worldwide. "Farming, including conversion of wild lands and intensification, is a major threat for biodiversity worldwide. (...) Threats to biodiversity are considerably higher in developing countries than in developed countries: on average, crops are responsible for 44 percent of all species threats in developed countries, compared with 72 percent in developing countries (<http://www.fao.org/docrep/018/i3347e/i3347e.pdf>)."

The impact of food consumption and production on ecosystems and biodiversity is described in the interim report TEEB for Food & Agriculture (2015): "It is estimated that 52 per cent of land used for agriculture worldwide is moderately or severely affected by land degradation and desertification. Eutrophication has contributed to the creation of over 400 oceanic dead zones worldwide, primarily concentrated in Europe, eastern and southern US, and Southeast Asia. In total, these zones cover a total area of 245,000 square kilometres, or more than half the size of California. Agriculture

is thought to cause around 70 per cent of the projected loss of terrestrial biodiversity. In particular, the expansion of cropland into grasslands, savannahs and forests contributes to this loss.

Agriculture also makes positive contributions to nature, if well managed. Sowing crops that bloom in different periods may increase wild insect populations. In Sweden, bumble-bee reproduction was improved in landscapes with both late-season flowering red clover and early-season mass-flowering crops. As a result, an adequate proportion of cropland in heterogeneous landscapes can be beneficial to some wild fauna taxa if appropriate crop management practices are adopted."

Agriculture and Biodiversity in Europe

The relationship between European agriculture and biodiversity has two sides. On one hand, agriculture is important for the conservation of biodiversity because the presence of many species and habitats is closely linked to agricultural land-use. With over 47% or 210 million hectares of arable and grassland areas, almost half of the surface in Europe (EU-27) is used for agriculture. Approximately 50% of European species are dependent on agricultural habitats. From an ecological perspective, the changes in farming practices are therefore of great importance to flora and fauna in agricultural areas and their adjacent habitats. In the past, agriculture significantly contributed to increasing the diversity of landscapes and species in Europe. Originally, the European continent was dominated by forest, but because of agricultural use, fields, pastures, orchards and cultivated landscapes (such as meadows) were created.

On the other hand, agriculture is one of the main drivers of biodiversity loss because of the reasons listed above. Recently, intensification and specialization has led to a restructuring of the agricultural landscape and the loss of (semi-natural) habitats. Due to changed management practices over the last 50 years in particular, the advancing mechanization of agriculture has led to a considerable decline of biodiversity on agricultural land. With decades of lasting land-use intensification, the relationship between agriculture and biodiversity has fundamentally changed.

Intensive farming, the introduction of invasive species, infrastructure development and fragmentation of natural habitats, and the increasing area of fallow land in unfavourable parts of lower mountain areas, have caused a massive loss of biodiversity. In addition, climate change is increasingly contributing to changes in the local flora and fauna. The IUCN Red List of endangered plant and animal species counts intensive agriculture as one of the main causes of biodiversity loss in the cultural landscape. The use of pesticides, synthetic nitrogen fertilizers, land consolidation, drainage and the use of heavy machinery have contributed to the dramatic decline of biodiversity.

2. EEA. 2013: Assessment of Global Megatrends, an Update. European Environment Agency, Copenhagen, Denmark.

3. Gibbs, H.K., Ruesch, A.S., Achard, F., Clayton, M.K., Holmgren, P., Ramankutty, N. and J.A. Foley. 2010. Tropical forests were the primary sources of new agricultural land in the 1980s and 1990s.

Proceedings of the National Academy of Sciences, 107(38): 16732–16737. Doi: 10.1073/pnas.0910275107.

4. Hosonuma, N., Herold, M., De Sy, V., De Fries, R.S., Brockhaus, M., Verchot, L., Angelsen, A., and E. Romijn. 2012. An assessment of deforestation and forest degradation drivers in developing countries. Environmental Research Letters, 7: 044009. Doi: 10.1088/1748-9326/7/4/044009.

5. Kissinger, G., Herold, M. and V. De Sy. 2012. Drivers of Deforestation and Forest Degradation: A Synthesis Report for REDD+ Policymakers. Lexeme Consulting, Vancouver, Canada.

METHODOLOGY - SCREENING OF FOOD STANDARDS & REQUIREMENTS OF COMPANIES

4.1 Selection of standards and labels

There are more than 400 standards with relevance for the European market and an unknown number of requirements of sourcing guidelines for suppliers of the food companies and retailers in the

EU. It would have exceeded the project's budget to screen them all. The project team selected 54 standards and company requirements, covering all different types of standards and the most relevant global commodities.

Table 1: Distribution of screened standards and company requirements. Please note: some standards and requirements are included in various categories. Annex 1 provides a list of all standards and requirements screened.

STANDARDS AND COMPANY REQUIREMENTS OVERVIEW	
TYPE OF STANDARD	N° SCREENED
Public body quality standards	6
Private association quality standards	37
Company standards /guidelines	11
SCOPE	
Regional	13
National	19
European /international	22
TYPE OF PRODUCTION	
Meat production	14
Dairy production	8
Cereals /legumes	8
Palm oil	1
Vegetables production	6
Fruit production	3
Aquaculture	2
Forestry products (wood, cork etc.)	2
All production type	14
SYSTEM OF PRODUCTION	
Organic production	7
Non-organic	47
Fair Trade / Social standards	4

Some of the selected standards are published by the same standard organisation, which address different product groups such as crops, meat production or aquaculture. This is the reason why the total number of screened standards is 54 whereas the total number of standard organisations is 36 (as basis for the graph and description in Chapter 5.1. Biodiversity in policies of standards and companies).

Two standards for aquaculture have been screened in order to have an impression of how biodiversity protection is handled in this product group. But as the criteria for aquaculture are not comparable with those for crops and livestock, they have not been included in the evaluation of criteria.

4.2 Screening Methodology

As the LIFE Program is not a research program, the screening of the standards and companies requirements was not carried out as a scientific study, but based on the long term practical experience of the project partners and the lessons learned of numerous studies and pilot projects carried out in the European Union. The dominant focus of the screening was biodiversity protection.

The screening matrix elaborated for this purpose is divided into three parts:

- » Information about the standard/companies requirements
- » Standard/company policy and relation to biodiversity
- » Standard/company criteria and their relevance for the main drivers of loss of biodiversity

The matrix was completed for each standard or company based on the criteria published on the internet and additional information provided by the standards and companies upon request. Apart from using the results as input for this baseline report, the individual screening results have been shared with the standards and companies with the invitation to discuss the results and elaborate on first recommendations. This dialogue with standards and companies is an ongoing process.

The scope of the screening was on national and international standards, regional (quality) standards, private labels and requirements of companies for the supply chain (e.g. sourcing guidelines, procurement rules).

Standard or company policy: It was analysed if standard organisations and companies are referring to the following issues:

- » Does the standard contain definitions of (aspects of) biodiversity?
- » Do they focus only on certain ecosystems?
- » Are there references to the mitigation hierarchy?
- » Does the standard refer to No-Net-Loss or Net-Gain of biodiversity?
- » Does the standard refer to international conventions with relevance to biodiversity?

Standard criteria or company requirements: Criteria/requirements with relevance for the following main causes of the loss of biodiversity were identified:

- » Destruction/degradation of ecosystems and threats to species
- » Overexploitation of natural resources
- » Loss of genetic diversity
- » Invasive species
- » Contamination
- » Climate change

Also identified have been criteria/requirements which are relevant to:

- » Active protection of species
- » Active support of agro-biodiversity

Important remarks:

- » Criteria with relevance to avoid contamination: The focus of the screening was on contamination of water, contamination of soil and waste management (e.g. storage and recycling of pesticide container).
- » Criteria with relevance to avoid climate change: For the screening exercise of this report criteria addressing climate change have been limited to „land use for biomass energy production. „Use of fertilizers“ and „crop rotation“ are included within the driver of “Overexploitation of natural resources”. With this, three important components of the contribution of agriculture to climate change are covered. Other components of climate change were not covered since they were not considered as directly related to the performance in the theme of biodiversity (although they might have an indirect effect).

Screening matrix

For each driver of loss of biodiversity, important agricultural aspects have been specified in order to have a more detailed cluster for the baseline report and the recommendations. Furthermore the matrix includes key aspects to assess the criteria and requirements.

Key aspects to assess the criteria and requirements

The assessment of each criteria and requirement was made considering its Weighting, Effectiveness, Transparency and Verifiability, which were all given scores.

Weighting (Kind of criterion):

A criterion may be a mandatory (M), an optional criterion (O) or a recommendation (R).

If according to the assessor a weighting should be changed, this recommendation will be included.

Effectiveness:

evaluated is the potential effect of the criterion on biodiversity protection:

- 1 Very effective because of the high positive effect on the biodiversity aspect
- 2 Effective because of the average positive effect on the biodiversity aspect
- 3 Less effective because of the low positive effect on the biodiversity aspect
- 4 No evaluation possible

Transparency:

evaluated is whether a criterion is clearly defined or can be interpreted

- 1 Criterion is clear defined and the certified organisation has clear instructions for implementation
- 2 Criterion can be interpreted

Verifiability:

evaluated is the verifiability of the criterion

- 1 Implementation of criterion can be checked easily as indicators or methods are available
- 2 Implementation of criterion is verifiable to a limited extent, as only documents and written evidence is required
- 3 No assessment possible
- 4 Verification needs special expertise of the auditor

RESULTS OF SCREENING

5.1 Biodiversity in the policy of standard organisations and companies

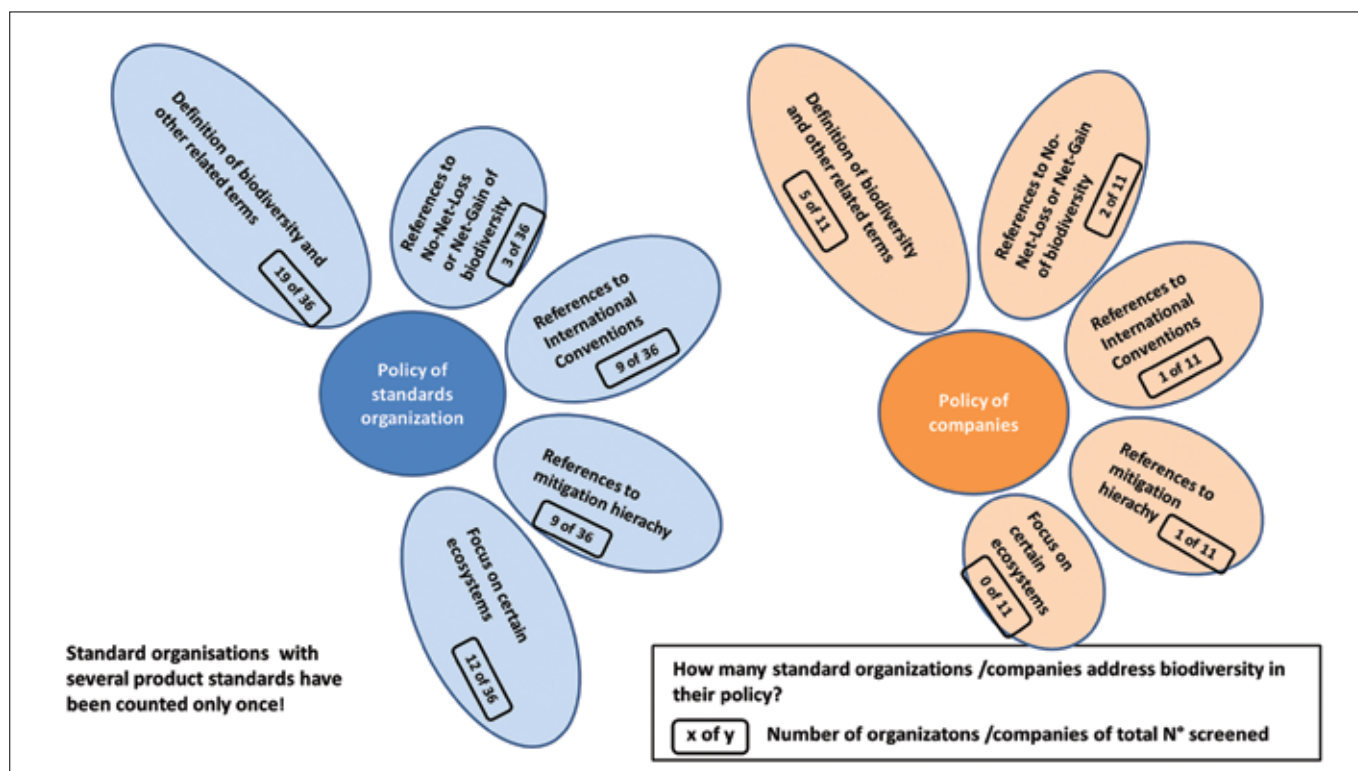


Figure 3: Standard organisations and company policies: how biodiversity is addressed

Biodiversity in the policy of standard organisations

In order to assess in how far the concept of biodiversity forms an integral part within standard organisations, their policies have been screened on the following key aspects:

- » Definition of (aspects of) biodiversity and other related terms
- » Focus on certain ecosystems
- » References to the mitigation hierarchy
- » References to No-Net Loss or Net Gain of Biodiversity
- » References to international conventions with relevance to biodiversity

More than half (19) of the screened standard organisations (36) define terms related to biodiversity used in the standards. Mostly, they define the terms 'biodiversity', 'protected areas' and 'high conservation value areas'. Only very few standard organisations provide a complete glossary of the terms used and related to biodiversity. Seventeen standard organisations do not explain the used terms or do so only vaguely.

Twelve standard organisations focus on the protection of certain ecosystems such as aquatic ecosystems, rain forests, savannas or Montados/Dehesas (traditional agroforestry systems in Portugal/Spain) – mainly because the commodities certified are related to regions with a high concentration of those ecosystems. Twenty-four standard organisations do not differentiate and refer to ecosystems/habitats in general, mainly because the certified products are produced in all types of regions.

Only 9 of 36 standard organisations underline the mitigation hierarchy (first to avoid, second to minimize and third to compensate negative impacts) in their policy and/or criteria.

One quarter of the standard organisations (9/36) include a reference to at least one international convention related to biodiversity. Mostly mentioned are the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on Biological Diversity (CBD).

The concepts of No-Net-Loss or even Net-Gain biodiversity are slowly but steadily included into European and national strategies. And they are also of increasing importance in some economic sectors (e.g. extractive industry). The concept of no-net-loss has

gained some track in recent years, driven by its inclusion in Action 7 of the EU Biodiversity Strategy (“...ensure no net loss of biodiversity and ecosystem services”). Both concepts are still very rarely found in the policy of food standard organisations: only 3 out of 36 screened standards include a no-net-loss of biodiversity approach in their policy.

Biodiversity in the policy of companies

In order to assess how far the concept of biodiversity forms an integral part within company requirements, their policies have been screened on the following key aspects:

- » Definition of (aspects of) biodiversity and other related terms
- » Focus on certain ecosystems
- » References to the mitigation hierarchy
- » References to no-net-loss or net-gain of biodiversity
- » References to international conventions with relevance to biodiversity

Five of the eleven screened (5/11) company requirements define terms related to biodiversity used in the standards. None of the companies provides a complete glossary of the terms used and related to biodiversity. Six companies do not define the terms included in the requirements or sourcing guidelines.

None of the company requirements focus on certain ecosystems with the exception that no land use changes are allowed that lead to the destruction of primary forests. In most cases biodiversity and ecosystem protection is not at all mentioned. However, thinking positively, the aspect of ecosystem/habitat protection is subsumed under the term “sustainability”.

We found only in one out of the eleven screened company requirements (1/11) a reference to the mitigation hierarchy. Also, only one of the eleven company requirements (1/11) mentions the Convention on Biological Diversity. There is no reference to any other international convention with relevance for biodiversity.

Two of eleven screened company (2/11) requirements refer indirectly to a no-net-loss of biodiversity approach in their policy.

5.1.1 Conclusions and considerations

- ◆ Standards must ensure that definitions are provided for all terms used. To do so, they should use generally agreed definitions if available (see <http://terms.biodiversitya-z.org/> or Annex 2 for definitions used in this baseline report).
- ◆ If there is no generally agreed on definition, standards must provide their own definitions of terms.
- ◆ Taking into account that agriculture is one of the main responsible drivers for the global loss of biodiversity, standard organisations and food companies should challenge themselves and aim for a no-net-loss of biodiversity target, on their certified farms and suppliers by following the mitigation hierarchy:

avoid – reduce – compensate. This compromise is of special importance taking into account the projection for food production = increase of population/wealth and associated increase in food demand = increase of intensive agricultural production.

The Baseline and resulting conclusions and recommendations are directed to the standard organisations and food companies. They should assume the objective of No-Net-Loss and elaborate a long-term strategy for their certified farmers and suppliers as a whole to achieve this goal.

Probably for many regions it will not be possible to calculate the baseline accurately in order to proof the no-net-loss approach with scientific evidence. But if standards and companies act consequently according to the mitigation hierarchy, they will contribute significantly to the overall goal of stopping the loss of biodiversity.

Examples

Avoid: Conversion of primary forest and semi-natural areas into agricultural land is not certifiable after a certain reference year (2005 or 2007). Companies do not buy goods from farms converted from primary forest into agricultural land after these reference years. No negative impacts of certified farms and suppliers occur on protected areas and other surrounding landscapes.

Reduce: Proof via monitoring, that potential for biodiversity has been created and biodiversity is developing positively on certified farms and/or suppliers farms (Biodiversity Action Plan and implementation of “very” good agricultural practices)

Compensate: Standard organisations and companies recognize the biodiversity footprint of certified farms/suppliers and compensate adequately (e.g. by financing biodiversity corridors/protected areas next to banana plantations or other monocultures).

Other structural/policy aspects with relevance for biodiversity

By screening the 36 standard organisations and 11 companies with own requirements, we also had a look into some structural aspects with relevance for biodiversity. As the structural development of a standard or guidelines is a strategic decision, we include our observations into “policy”.

Scope of certification

- ◆ The scope of the standard organisations and company requirements screened is limited to the agricultural farm. But impacts on ecosystems and/or on fauna and flora do not stop at the border of the farm and there is a wide variety of adverse effects such as landscape fragmentation, pesticide drift, erosion or change of the groundwater regime (quantity and quality).
- ◆ Most of the standards do not include criteria regarding the avoidance of degradation or destruction of ecosystems or other negative impacts on biodiversity outside the limits of the farm or company. Standards and companies should have sound criteria to avoid those negative impacts. Furthermore, only few standard organisations/companies motivate farmers to collaborate with the neighbouring farms regarding biodiversity protection measures.

Especially aspects such as biotope corridors to connect habitats/ecological structures and the protection of species will be much more effective if all farmers of a location/region will cooperate.

- ◆ Many standards still allow a partial certification. From the biodiversity point of view it makes no sense if in a part of the farm biodiversity is protected meanwhile in another part negative impacts on biodiversity occur. If it is possible to certify a part of the company, the standard should require a basic set of biodiversity related criteria to be implemented in the whole farm – including in the non-certified operating branches.

Monitoring on farm

- ◆ In most standards the determination of the starting point (baseline) is not required. However, a record of the status quo is needed for the implementation of criteria such as the development of biodiversity action plans, conservation plans, water management plans etc. In addition, the positive effect of criteria can only be assessed if a baseline is determined and monitoring takes place.
- ◆ The question is how detailed the description of the actual situation should be, in order to become meaningful while at the same time not overwhelming the farmer. Standards/companies should require the mapping of the habitats on the farm and adjacent areas as a minimum. Farms in or adjacent to protected areas or High Conservation Value Areas should also describe animal and plant species, which have been classified by the national administration as a protected species and/or have been listed on the IUCN Red List.
- ◆ The impacts of measures on biodiversity are typically to be determined only in the medium or long-term. In addition, other factors play a role that cannot be influenced by the farmer. Long-term monitoring is therefore a necessity. Standard organisations/companies should implement a monitoring system with key data and indicators on farm level as well as on regional level.

Monitoring at landscape level

- ◆ Monitoring the impact on biodiversity is a challenge for all standard organisations and therefore a task that organisations and companies should implement together. A shared monitoring system at regional scale that is maintained by a conjunction of standards/companies would be more meaningful and cost effective.
- ◆ Only a functioning monitoring system can prove that certified farms contribute to the conservation of biodiversity. It should be in the interest of standard organisations and food companies to provide this evidence. Positive results can be used to raise the profile of standards and companies (e.g. request of financial support for the implementation of standards; information in sustainability reports, legal compliance, etc.)

Continuous improvement

Certified farms in principle have two ways to improve their biodiversity performance: reducing negative impacts by implementing

“Very good agriculture practices” and with a biodiversity management focusing on the active protection of existing biodiversity and the creation of potential for the establishment of more biodiversity (habitats, species, agro-biodiversity, etc.).

The principle of continuous improvement is the basis for all management system standards (e.g. ISO 14001, EMAS, ISO 9000). Some standards assessed include the requirement of continuous improvement into their schemes. We found the following approach:

- ◆ Every year the certified farm needs to comply with more ambitious criteria (1 – 4 years)

Some standards /companies request management plans including monitoring for the use of fertilizers, pesticides or water. This is the first important step to promote a continuous improvement, e.g. by increasing the application of alternative measures (biological or physical) for pest control.

For some biodiversity related aspects, criteria with maximum or minimum values useful. Examples:

- ◆ Minimum percentage of ecological structures beyond the legal requirements
- ◆ Minimum width of buffer zones
- ◆ Minimum number of shade trees per hectare
- ◆ Maximum number of livestock per hectare
- ◆ Maximum nitrogen balance: kg/N per hectare and year

Criteria would be even more effective if standards would accompany these maximum or minimum values with benchmarks illustrating the best result, which has been achieved by a number of farms in the region and within a certain production system. The achievement of these benchmarks by farms should be rewarded by extra points or another incentive.

For other biodiversity related aspects – especially the ones which should be part of a biodiversity action plan such as creation of habitats, connection via biotope corridors or species protection – continuous improvement as a mandatory requirement makes a lot of sense. Standards should ask for the baseline description and request a continuous improvement in quantity (e.g. hectare of ecological structures or kilometres of biotope corridors) as well as in quality (e.g. increase of species of wild plants along the margins of the field).

Need of investment into capacity building and accompaniment

Over the last years companies and standard organisations have developed precise documents including criteria and measures for ensuring a higher level of sustainability in the supply chain. However, there is a significant gap between the content of the documents and the practical implementation, especially when no active support is given to the farmers who are finally responsible for implementing the measures. It is important not to confuse external audits (independent control from a third party for checking that the assessments are aligned with the standard rules and methodology) and the external

support we refer to. The external support may include for example specific training on certain issues, regular visits, working groups, different channels for mutual feedback and the aim to accompany farmers in understanding the measures as well as their agronomic and environmental benefits, to solve practical doubts and avoid misinterpretation, to overcome difficulties during implementation of measures, to propose alternatives when the strict implementation of the measure is not feasible. A close contact with producers increases the verifiability of some measures or allows including new measures with high environmental benefits that can only be checked via farm inspection. Finally, this active support to farmers is a good way to show that there is a real commitment from companies and standards for delivering the best results and not just transferring responsibilities to others, as sustainability and the promotion of biodiversity are shared responsibilities along the supply chain. The promotion of such support entails costs for companies and standards as they promote such initiatives for their own interest and to meet consumers'

demand but the investment on human and economic resources would also increase the quality and consistency of their work.

5.2 Biodiversity in the criteria of standards and company requirements

An assessment of the criteria was undertaken based on the screening matrix. Not all criteria could be clearly assigned to specific causes of biodiversity loss. If a criterion fitted several causes of biodiversity loss, the criterion was assigned to all aspects but only counted at the most relevant one.

This second part of the analysis focuses on the allocation of criteria within the drivers of biodiversity loss. A total number of 1263 criteria with relevance to biodiversity were found. The following table provides an overview of how many criteria per driver have been assessed.

Table 2: Number of criteria found in standards and company requirements distributed by driver of loss of biodiversity

Driver of loss of biodiversity	Destruction	Overexploitation	Protection of species and Invasive species	Land use for bioenergy (Climate change)	Loss of genetic diversity	Management
N° of criteria	190	727	114	8	76	148

5.2.1 Overview on drivers of loss of biodiversity currently addressed by the screened standards and company requirements

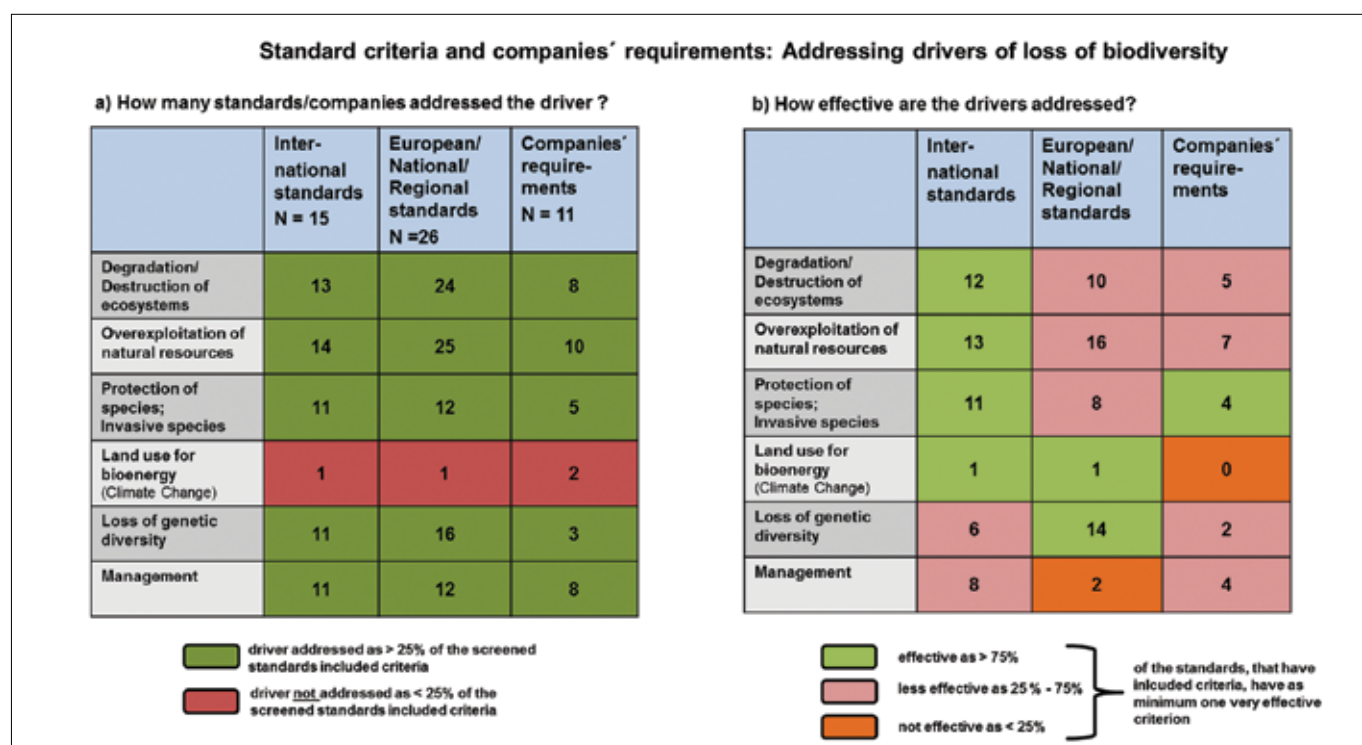


Figure 4 shows an overview on how many standards and companies address the main drivers of loss of biodiversity (left table) and if they do so how effectively they address these drivers (right table).

Annex 1 provides a list of all standard organization and companies screened. Basically, the screened standards can be divided into international and European/national/regional standards. Nearly all standards, independently of whether they have an international, European or regional approach, as well as most of the companies, are not addressing the aspect “Land use for biomass energy production” within the driver “Climate Change”. For all other drivers and also for the category “Management”, standards and companies do implement criteria.

As already mentioned above, one screening aspect was to assess the effectiveness of the criterion regarding biodiversity protection. A driver, in turn, was determined to be addressed effective if more than 75% of the standards/requirements, that included criteria, have as a minimum one very effective criterion (right table, green column). If it is less than 75% but more than 25% than the driver

was addressed less effective and if it is less than 25% than the driver was addressed as not effective (right table, orange column).

International standards addressed most of the drivers effectively. Only in the category “Loss of genetic diversity” and “Management” the standards included less effective criteria. We found a different situation at the European/national/regional level and at companies. In both cases the majority of standards/requirements included criteria, which have been less effective regarding the protection of biodiversity. In addition, the criteria within the category “Management” at European/national/regional level and those within the driver “Land use for bioenergy” in companies’ requirements have been addressed not effective. Only the drivers “Loss of genetic diversity” and “Land use for biomass energy production” have been addressed with effective criteria by standards on European/national/regional level. Companies’ requirements include only effective criteria for “Protection of species”.

5.2.2 Distribution of biodiversity aspects addressed within the driver “Degradation/destruction of ecosystems”

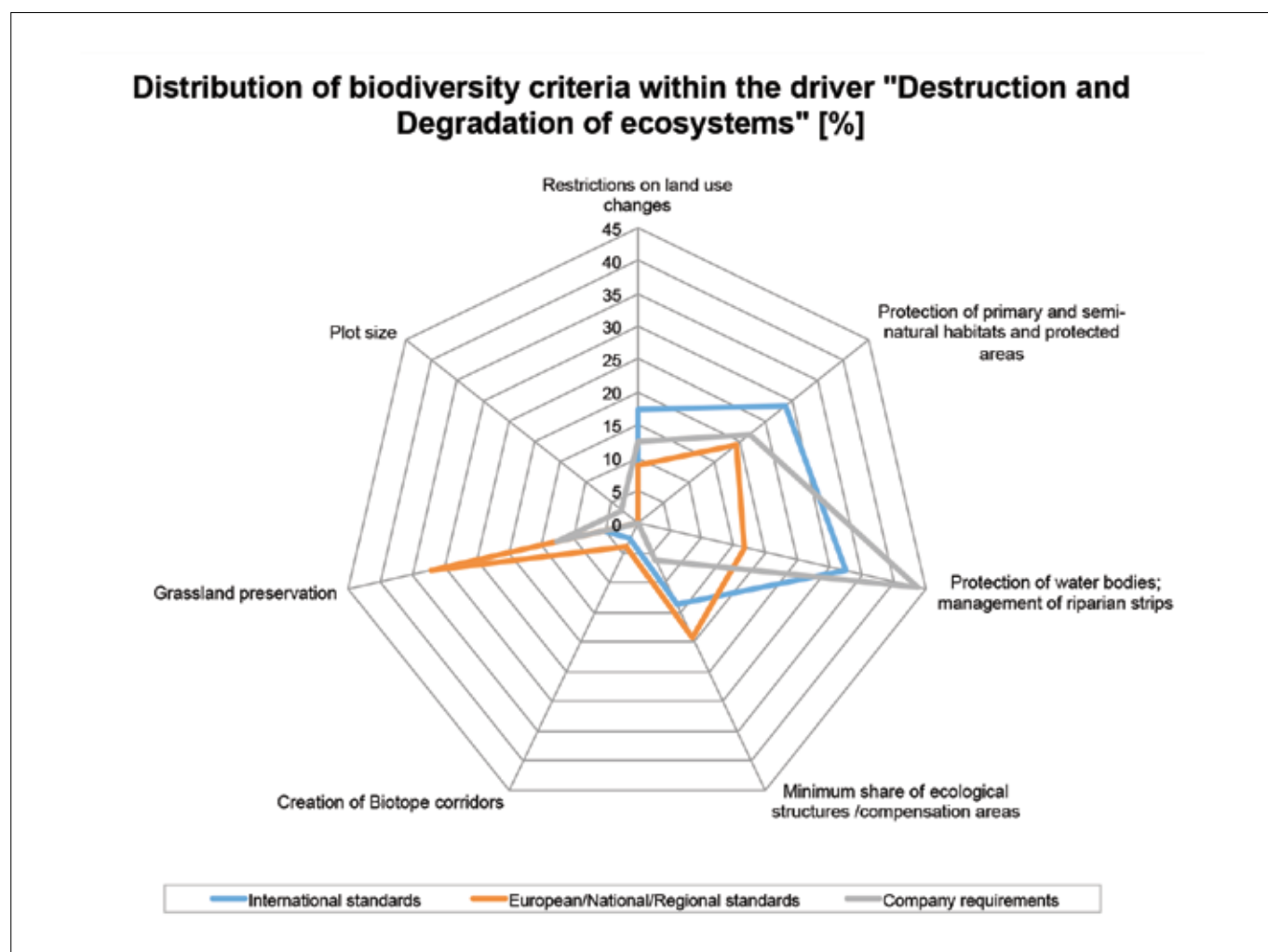


Figure 5 Distribution of criteria found in standard and company requirements on the driver “Destruction and degradation of ecosystems”

For the **international standards** the breakdown of the driver for biodiversity loss "Destruction and degradation of ecosystems" (figure 5) shows that the main part of criteria fall in the two categories Protection of water bodies; Management of riparian strips (33%) and Protection of primary and semi-natural habitats and protected areas (29%) that make out roughly two thirds of the entire set of criteria within this driver. Fewer can be listed in the categories Restrictions on land use changes (18%) and Minimum share of ecological structures/compensation areas (14%). Aspects such as Permanent grassland preservation, Extensive management, Abandonment of grassland (5%), and Creation of Biotope corridors (3%) are hardly considered by the standards. The aspect Plot size is not considered at all. [N International standards = 15; N criteria = 80]

In contrast stands the distribution of aspects within the same driver for the **European, national and regional standards**. Here the bulk of criteria are located within the aspect of Permanent grassland preservation, Extensive management, Abandonment of grassland (32%). It has to be mentioned here though that this peak is explained by the inclusion of dedicated cattle standards that provide the majority of related criteria. Aspects of Protection of primary and semi-natural habitats and protected areas (19%), Minimum share of ecological structures/compensation areas (19%) and Protection of water bodies; Management of riparian strips (17%) are equipollently addressed. The taillight is represented by the aspects of Restrictions on land use changes (9%) and Creation of biotope corridors (4%), which are only marginally considered. The aspect Plot size is not considered at all. [N European/national/regional standards = 26; N criteria = 78]

For the distribution of biodiversity criteria in **company standards** the aspect of Protection of water bodies; Management of riparian strips (44%) predominates, followed by Protection of primary and semi-natural habitats and protected areas (22%). Equally represented are the aspects of Permanent grassland preservation, Extensive management, Abandonment of grassland and Restrictions on land use changes (13% respectively). Hardly addressed is the aspect of Minimum share of ecological structures/compensation areas (6%) and Plot size (3%) whereas Creation of biotope corridors is not addressed at all within company standards. [N Company requirements = 11; N criteria = 32]

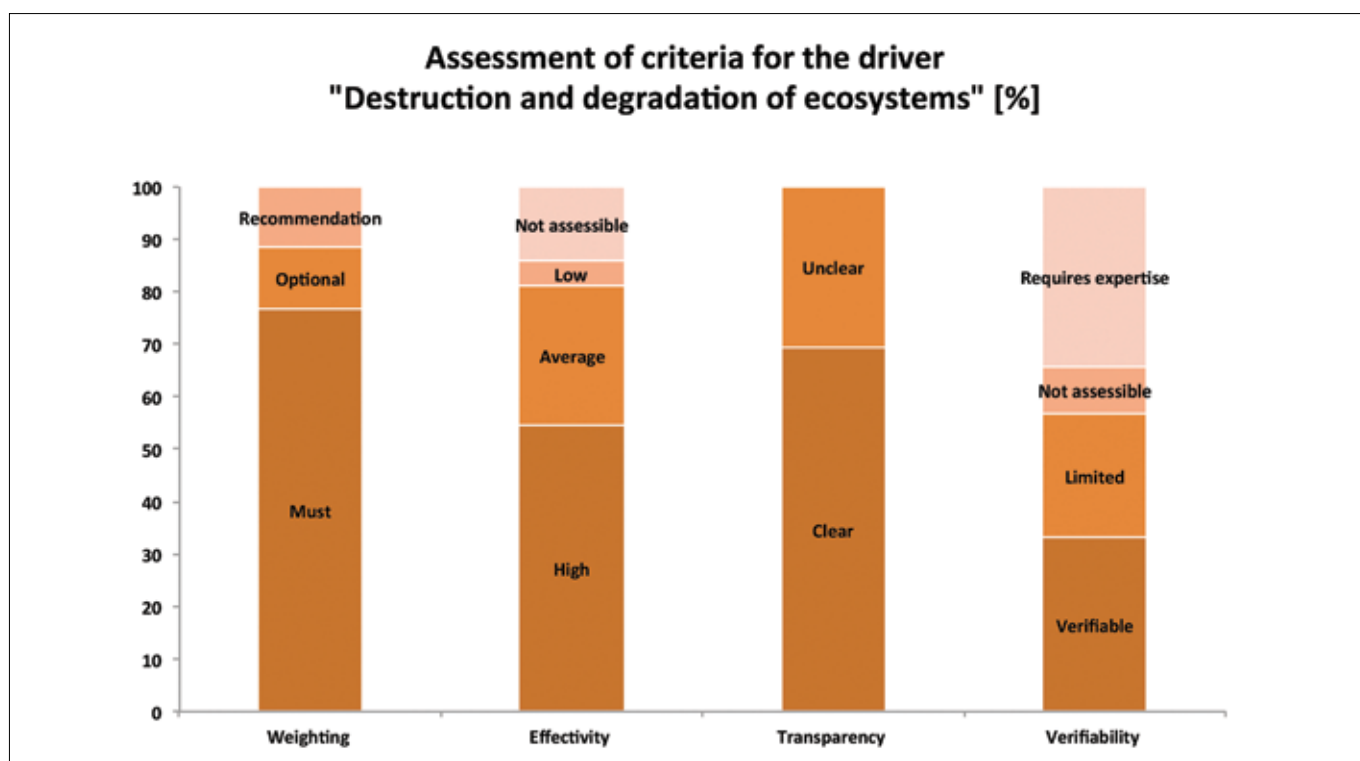


Figure 6 Assessment of criteria found in standard and company requirements on the driver "Destruction and degradation of ecosystems"

Figure 6 shows that the majority of the 190 criteria within this driver of biodiversity loss “Destruction and degradation of ecosystems” are compulsory among all types of standards. This result regarding the weighting aspect of criteria is similar among all drivers. From a standard point of view this makes sense, since a standard with many non-compulsory criteria can be considered as weak and redundant. Optional criteria or recommendations occur in most cases by intent where the standards grants certain flexibility to farmers or addresses a rather new, upcoming aspect in policy

or research. Also regarding the aspect of transparency there is a general trend which shows that two thirds of criteria are clearly formulated and leave little room for interpretation.

More than half of the assessed criteria of this driver are considered as highly effective in relation to their relevance for biodiversity protection/preservation whereas only roughly one third can be easily verified. Here the majority of criteria require special expertise from the auditor in order to be verified.

5.2.3 Distribution of biodiversity aspects addressed within the driver “Overexploitation of natural resources”

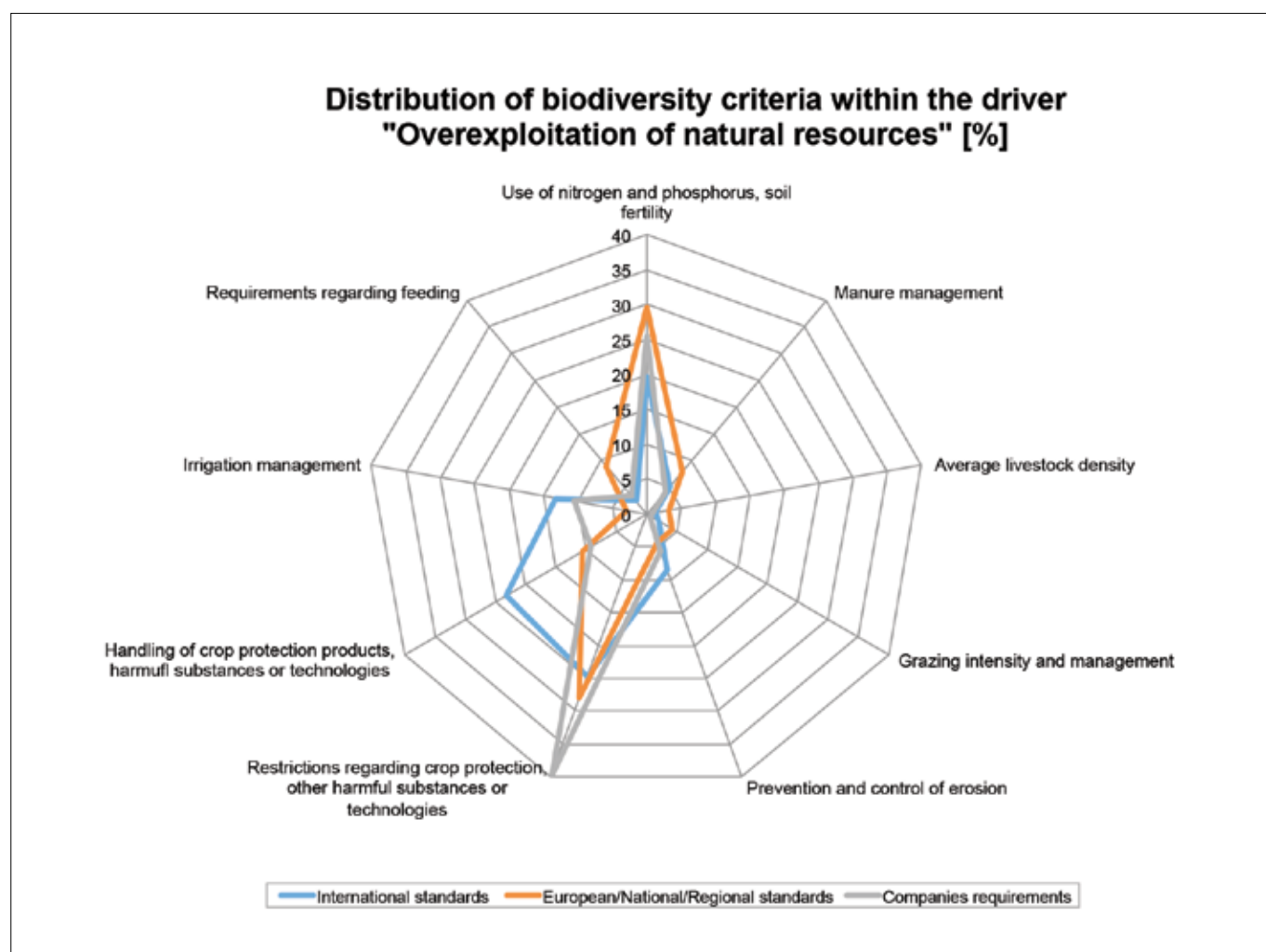


Figure 7 Distribution of criteria found in standard and company requirements on the driver „Overexploitation of natural resources“

The distribution of criteria for the **international standards** in this driver of “Overexploitation of natural resources” (figure 7) dominates in the three aspects of Restrictions regarding crop protection, other harmful substances or technologies (25%), Handling of crop protection products, harmful substances or technologies (23%), Use of nitrogen and phosphorus, soil fertility (20%). Less strong coverage of criteria is shown in the aspects of Irrigation management (13%). Furthermore Prevention and control of erosion (8%) Manure management (5%) are only marginally considered. Hardly addressed are the aspects of Requirements regarding feeding (2%), Grazing intensity and management (2%) and Average livestock density (1%). [N International standards = 15; N criteria = 250]

For **European, national and regional standards** the bulk of criteria fall within the two aspects Use of nitrogen and phosphorus, soil fertility (29%), Restrictions regarding crop protection, other harmful substances or technologies (28%). Less strong but evident coverage of criteria is shown in the aspect of Handling of crop protection products, harmful substances or technologies (11%). Aspects such as Requirements regarding feeding (9%), Manure management (8%) and are marginally considered. Hardly addressed are the aspects of Prevention and control of erosion (4%), Grazing intensity and management (4%), Average livestock density (3%) and Irrigation management (3%). [N European/national/regional standards = 26; N criteria = 336]

The distribution of criteria for **company requirements** is similar to the distribution of criteria within the international standards but show a lower amplitude due to the lower amount of criteria. Here the bulk of criteria also fall within the two aspects Restrictions regarding crop protection, other harmful substances or technologies (40%) and Use of nitrogen and phosphorus, soil fertility (26%). Less strong but evident coverage of criteria is shown in the aspects of Irrigation Management (11%), and Handling of crop protection products, harmful substances or technologies (9%). The Prevention and control of erosion (6%), Manure management (4%) and Requirements regarding feeding (4%) are marginally considered. Hardly addressed are the aspects of Grazing intensity and management (1%) and Average livestock density (1%). [N Company requirements = 11; N criteria = 141]

The low number of references regarding criteria such as the ‘average livestock density’ and the ‘grazing intensity and management’ is misleading. Expectations regarding these criteria are only reasonable when considering the sub-sample of standards and labels that focus on farms where animal production takes place. If we consider those then these criteria become more representative. In fact,

limits to the livestock density in the farm are among the most common requirements in the context of animal production in extensive regimes, both when it comes to standards or labels as to when it refers to agri-environmental support schemes. Within this baseline report, only three standards were included that focus specifically on cattle.

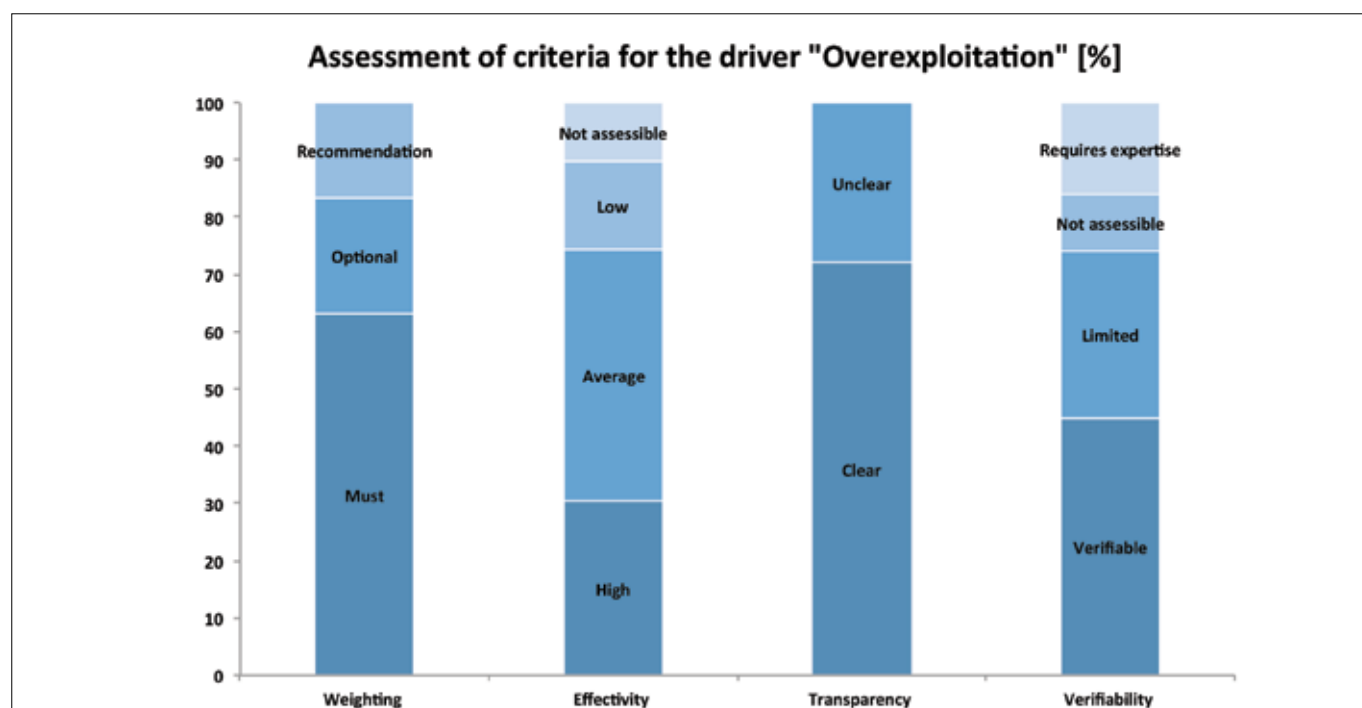


Figure 8 Assessment of criteria found in standard and company requirements on the driver „Overexploitation of natural resources“

In figure 8, which addresses the driver of “Overexploitation of natural resources” it is striking that less than a third of criteria is assessed as highly effective with the majority of criteria considered

under average effectivity. The verifiability of criteria here requires less expertise by the auditor/certification body but a good third on the other hand requires only a written evidence for fulfillment.

5.2.4 Distribution of biodiversity aspects addressed within the driver “Protection of species” and “Invasive alien species”

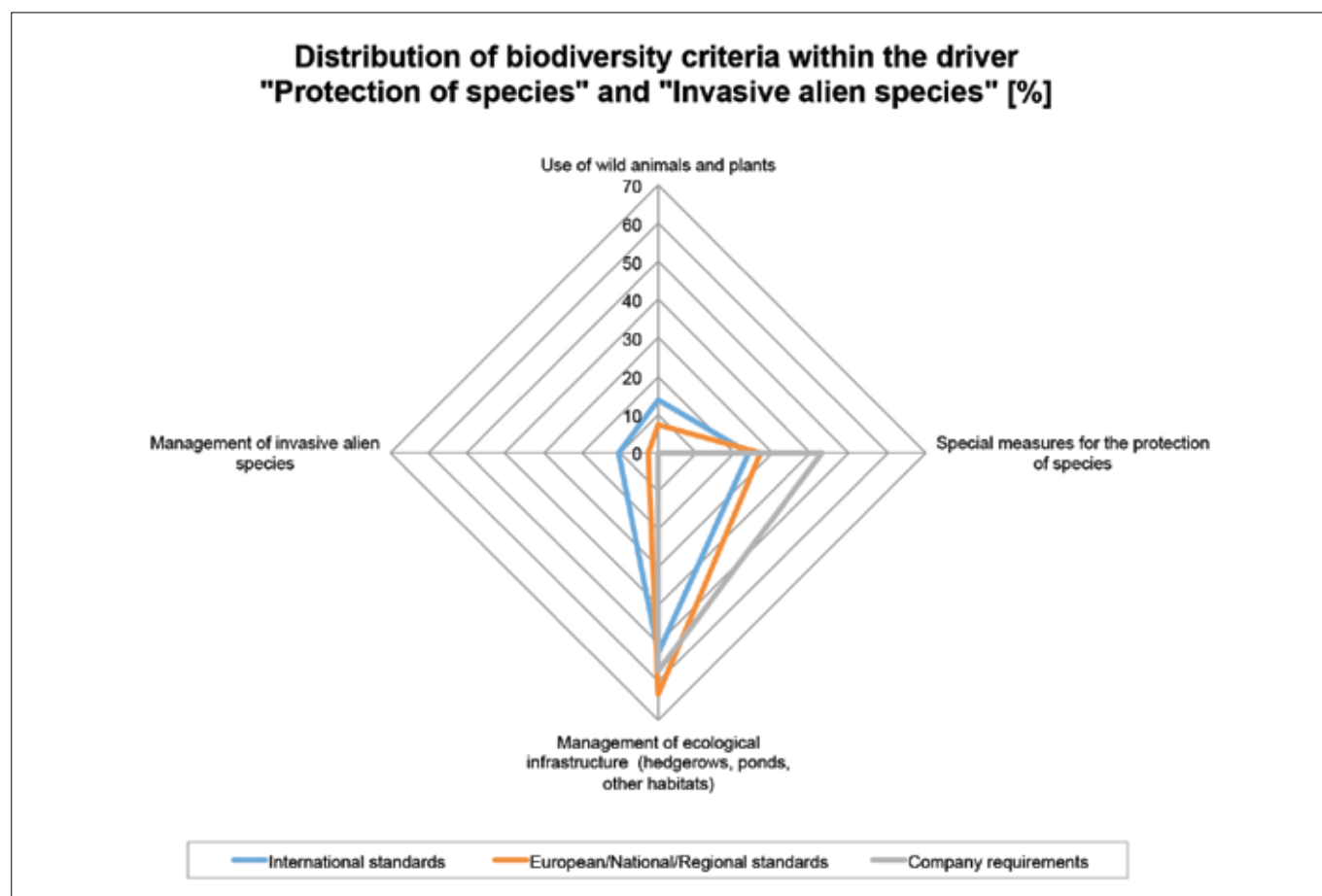


Figure 9 Distribution of criteria found in standard and company requirements on the driver „Protection of species” and “Invasive alien species”

The distribution of criteria for driver of “Protection of species” (figure 9) is similarly pronounced among all standard types with

decreasing amplitude from international to the European, national and regional and company requirements.

For the **international standards** the distribution dominates in the aspect of Management of ecological infrastructure (53%) followed by Special measures for the protection of species (24%). Less strongly but equally addressed are the aspects of Use of wild animals and plants (14%) as well as Management of invasive alien species (10%). [N International standards = 15; N criteria = 59]

For the European, **national and regional standards** the distribution also dominates in the aspect of Management of ecological infrastructure (63%) followed by Special measures for the protection of species (27%). Marginally addressed are the aspects of Use of wild animals and plants (7%) and Management of invasive alien species (2%). [N European/national/regional standards = 26; N criteria = 41]

For the **company requirements** the distribution is dominated as well by the aspect of Management of ecological infrastructure (57%) followed by Special measures for the protection of species (43%). Not at all addressed are the aspects of Use of wild animals and plants (0%) as well as Management of invasive alien species (0%). [N Company requirements = 11; N criteria = 14]

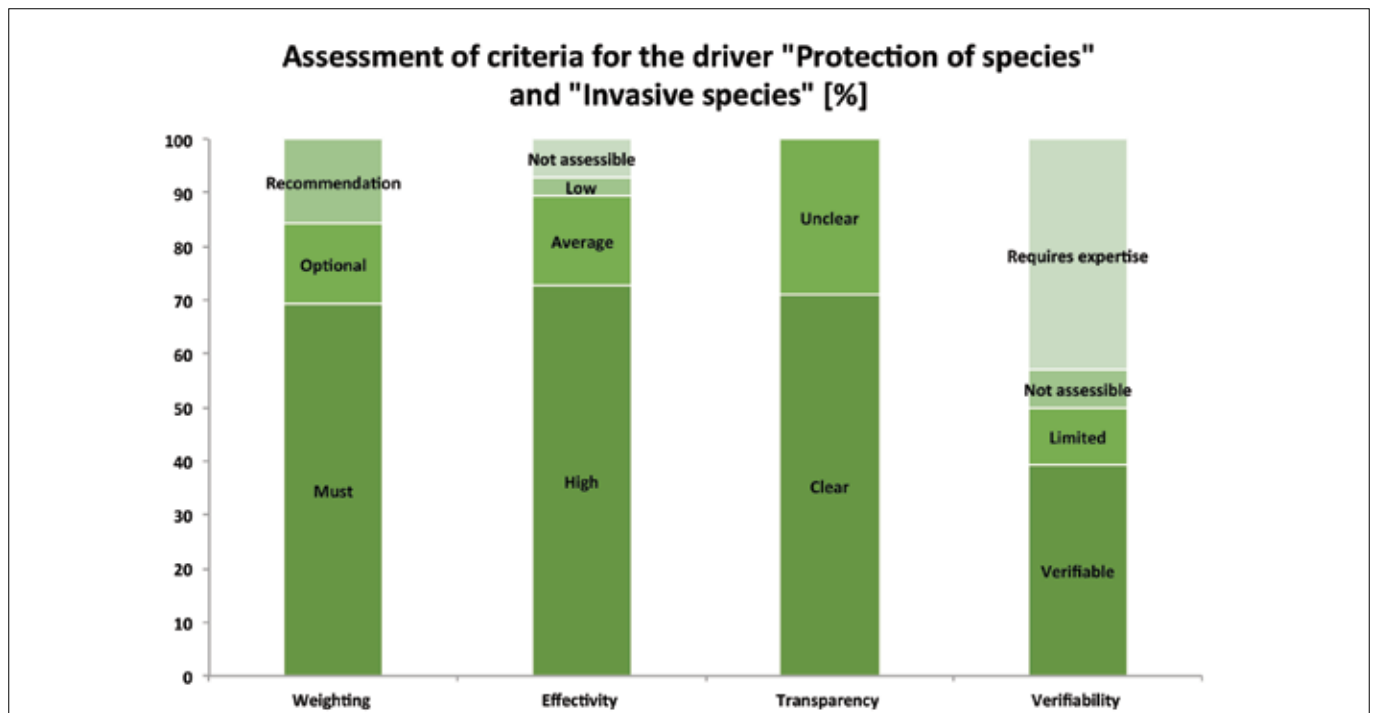


Figure 10 Assessment of criteria found in standard and company requirements on the drivers „Protection of species“ and „Invasive species“

In figure 10, which addresses the drivers „Protection of species“ and „Invasive species“ one can see that the majority of criteria is assessed as highly effective whereas the verifiability requires

special expertise for half of the criteria. This can be explained by the necessity of botanical and veterinarian skills that these criteria often imply.

5.2.5 Distribution of biodiversity aspects addressed within the driver “Loss of genetic diversity”

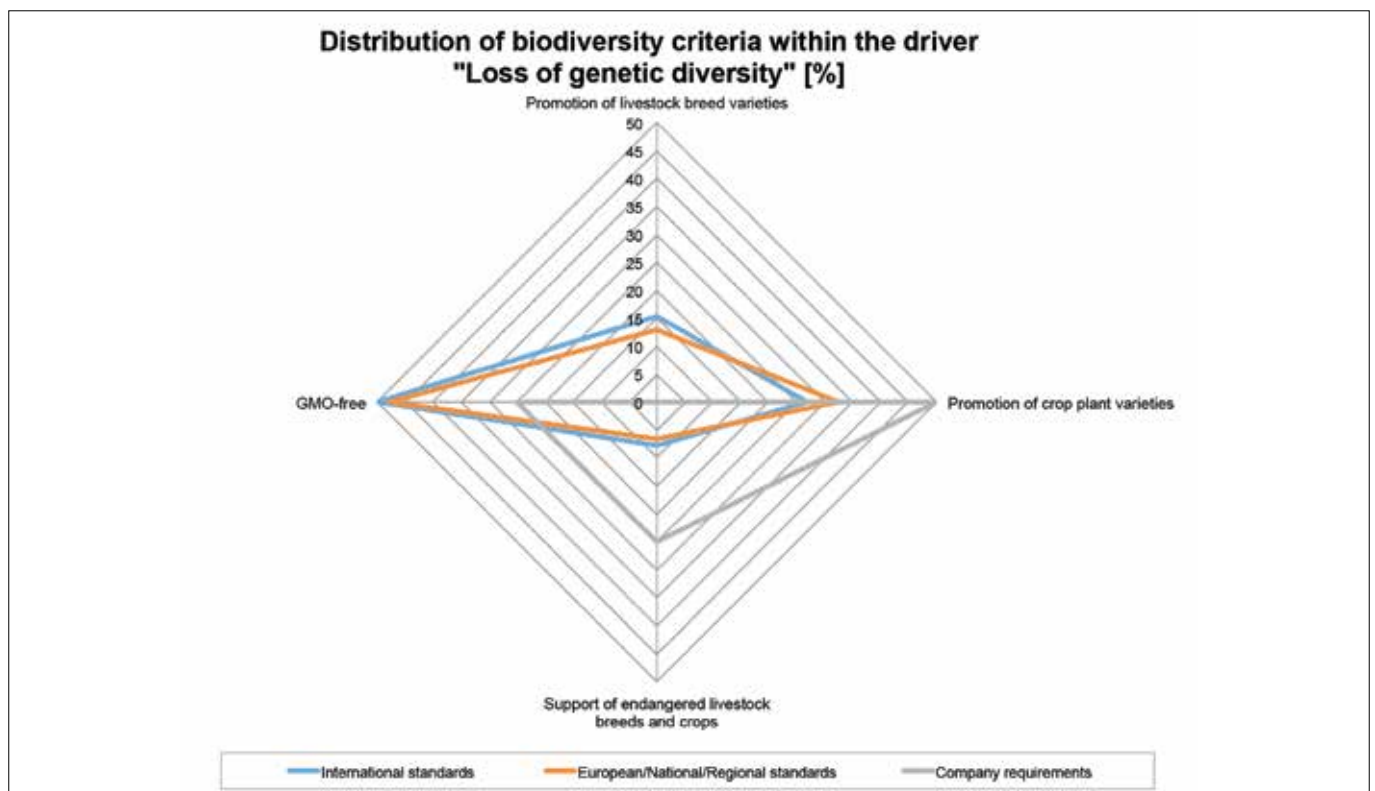


Figure 11 Distribution of criteria found in standard and company requirements on the driver “Loss of genetic diversity”

For the **international standards** the distribution within the driver “Loss of genetic diversity” (figure 11) dominates in the aspect GMO-free (50%) followed by Promotion of crop plant varieties (27%). Less strongly but still addressed are the aspects of Promotion of livestock breed varieties (15%). This can be explained by the lower number (14) of livestock specific standards screened. The Support of endangered livestock breeds and crops (8%) is referred to only marginally. [N International standards = 15; N criteria = 26]

For the **European, national and regional standards** the distribution dominates in the aspect GMO-free (48%) followed by Promotion of crop plant varieties (33%). Less strongly but still addressed are the aspects of Promotion of livestock breed varieties (13%) and Support of endangered livestock breeds and crops (7%). [N European/national/regional standards = 26; N criteria = 46]

For the **company requirements** the distribution is slightly different where the aspect of Promotion of crop plant varieties (50%) clearly dominates over GMO-free (25%) and Support of endangered livestock breeds and crops (25%). Not addressed is Promotion of livestock breed varieties (0%). [N Company requirements = 11; N criteria = 4]

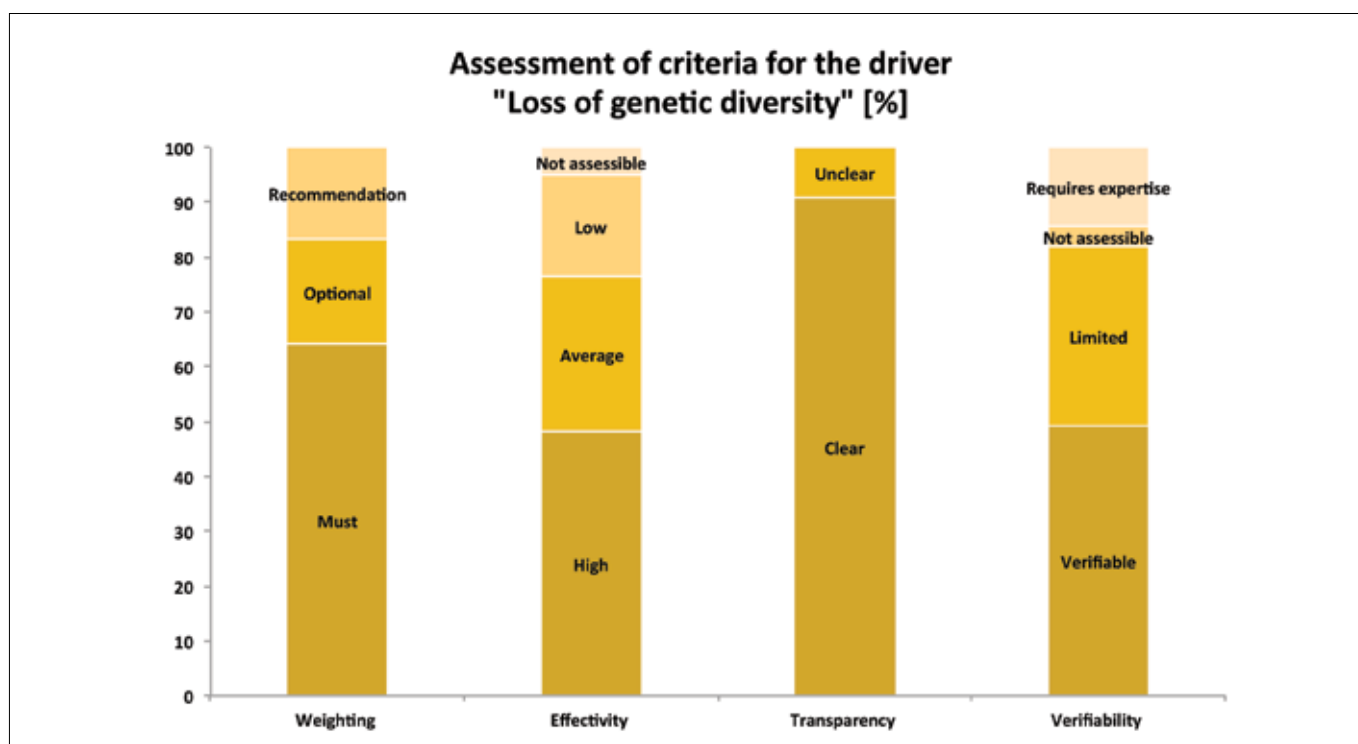


Figure 12 Assessment of criteria found in standard and company requirements on the driver „Loss of genetic diversity“

Figure 12, which shows the assessment of criteria for the driver “Loss of genetic diversity” 76 criteria have been evaluated. Here it is noticeable that there is a comparable large amount of criteria associated with a low effectivity while at the same time there is

hardly room for interpretation. Also there is little demand for special expertise by the auditor/certification body required. As a first conclusion one could assume that there is a general necessity for stronger criteria within this driver.

5.2.6 Biodiversity aspects addressed within the category “Management”

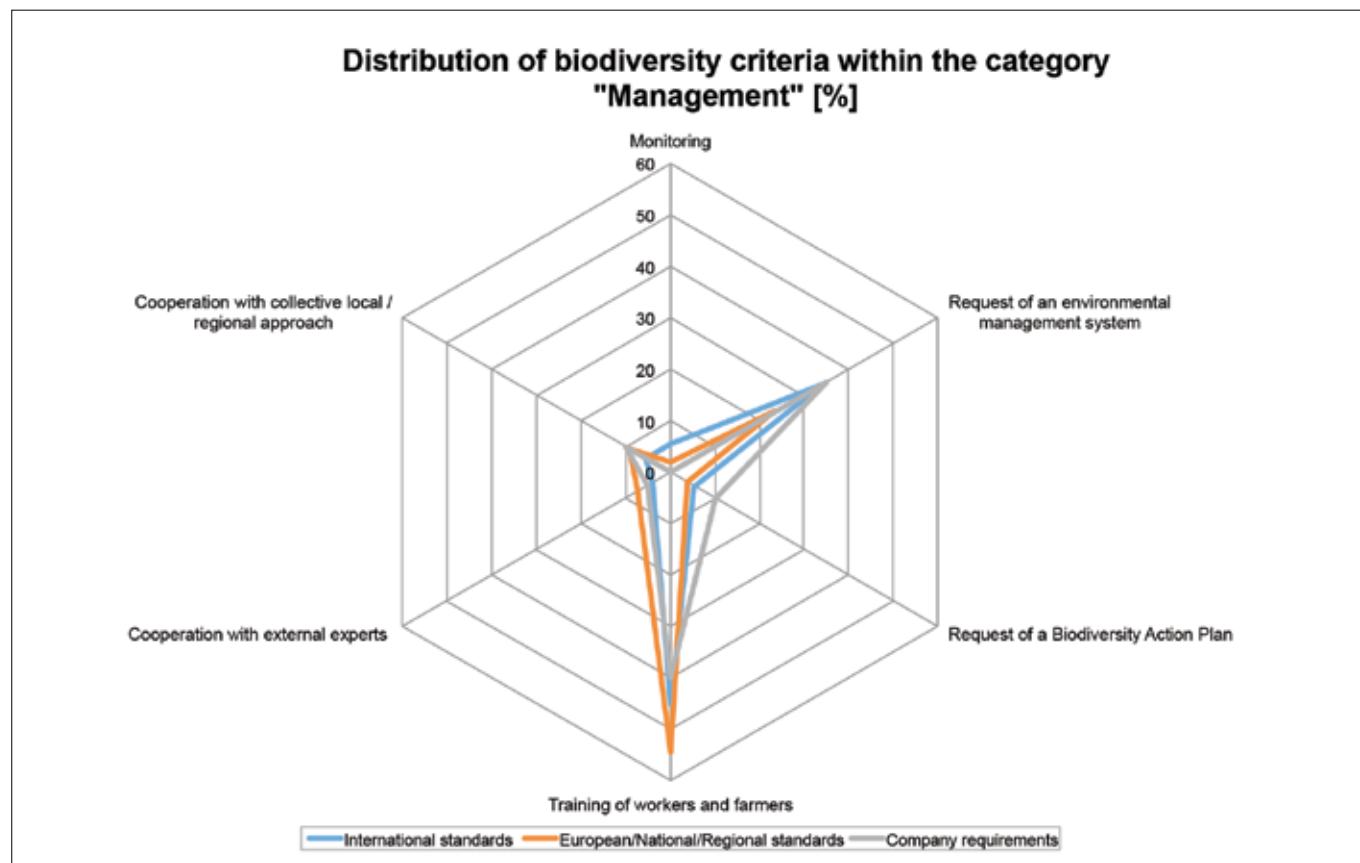


Figure 13 Distribution of criteria found in standard and company requirements on the driver „Management“

In the distribution of criteria for the driver “Management” (figure 13), a similar trend to “loss of genetic diversity” is evident among the standard types.

For the **international standards** the distribution dominates in the aspect Training of workers and farmers (45%) followed by Request of an environmental management plan (34%). Less strongly addressed are the aspects Request of a Biodiversity Action Plan (6%), Monitoring (6%), Cooperation with collective local/regional approach (6%) and Cooperation with external experts (4%). [N International standards = 15; N criteria = 73]

For the **European, national and regional standards** the distribution dominates in the aspect Training of workers and farmers (55%) followed by the Request of an environmental management system (24%). In a descending order the following aspects are only marginally addressed: Cooperation with collective local/regional approach (9%), Cooperation with external experts (7%) and Request of a Biodiversity Action Plan (4%). The aspect of Monitoring (2%) is hardly covered. [N European/national/regional standards = 26; N criteria = 55]

For the **company requirements** the distribution dominates in the aspect Training of workers and farmers (40%) followed by Request of an environmental management system (35%), Cooperation with collective local/regional approach (10%) and Request of a Biodiversity Action Plan (10%). Only marginally addressed is Cooperation with external experts (5%) whereas Monitoring (0%) is omitted. [N Companies' requirement = 11; N criteria = 20]

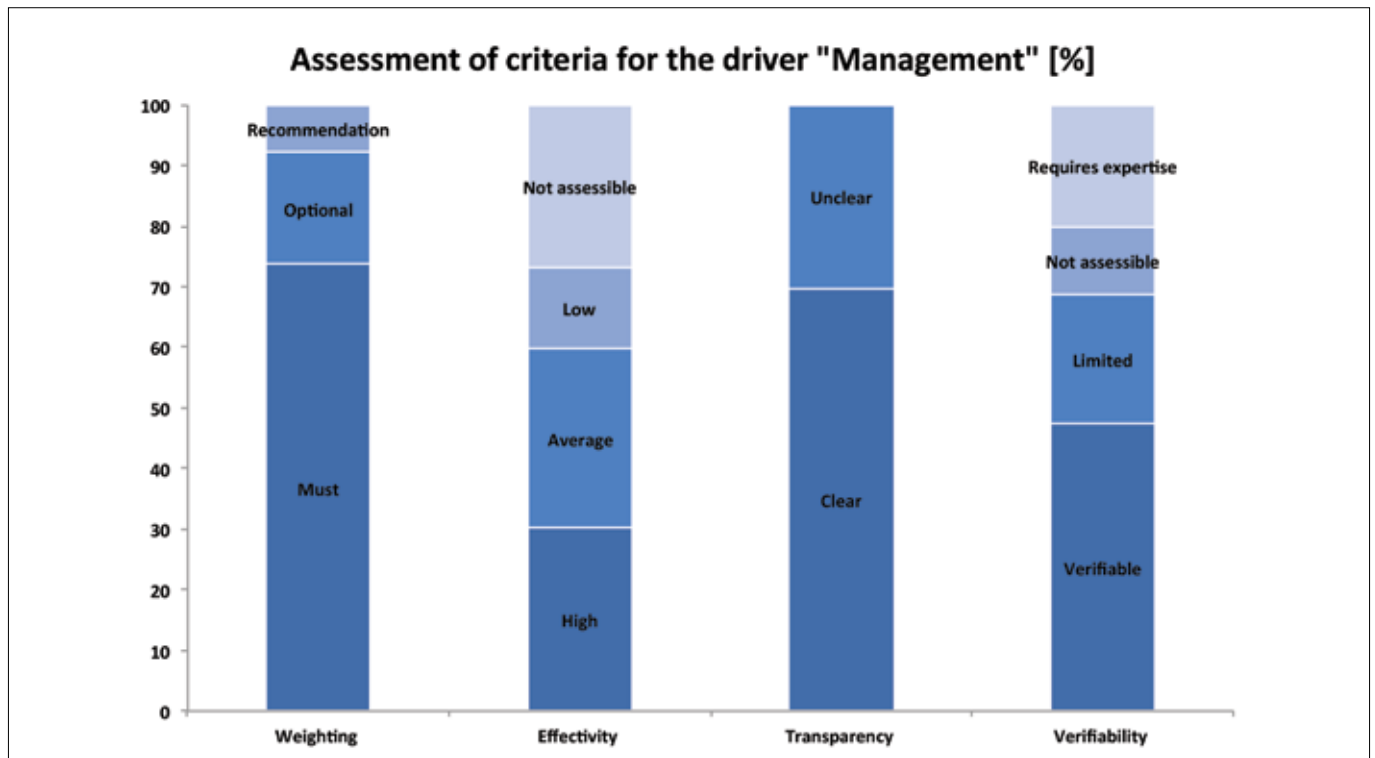


Figure 14 Assessment of criteria found in standard and company requirements on the driver „Management“

Figure 14 shows the results for the 148 assessed criteria of the driver "Management". One can see again a lower amount of criteria that have been considered as effective. A quite high amount of criteria could also not be assessed in relation to effectiveness. Nearly

half of the criteria are on the other hand verifiable with a moderate amount of criteria requiring special expertise for confirming their fulfilment.

CONCLUSIONS AND CONSIDERATIONS – BIODIVERSITY IN THE CRITERIA

6.1. Destruction and Degradation of ecosystems

6.1.1 Main results

- International standards focus on the protection of water bodies/management of riparian strips and on the protection of primary and semi-natural habitats and protected areas.
- European/national/regional standards focus on grassland preservation, protection of primary and semi-natural habitats and protected areas as well as on minimum share of ecological structures/compensation areas.
- Companies focus strongly on protection of water bodies/management of riparian strips.
- More than half of the criteria screened under this driver have been assessed as highly effective, simultaneously numerous criteria can only be verified if the auditor has special expertise.

6.1.2 Positive examples of criteria addressing this driver with high effectivity

■ INTERNATIONAL STANDARDS

Restriction of land use changes:

- RSPO - 7.3.1 (M) - There shall be evidence that no new plantings have replaced primary forest, or any area required to maintain or enhance one or more High Conservation Values (HCVs), since November 2005. New plantings shall be planned and managed to best ensure the HCVs identified are maintained and/or enhanced (see Criterion 5.2). – (please note: RSPO has elaborated guidance on how to implement this criteria).

Protection of primary and semi-natural habitats and protected areas

- UTZ G.D.111 - No production or processing occurs in or within 2 km of a protected area unless it is allowed under a management plan of the area. The management plan is implemented. Management plans must be approved by a relevant national or regional authority and include at least the following:
 - identification of the boundaries of areas accessible for production and processing and communication of such to group members, and a ban on further conversion and new land clearing outside of this area,
 - specific actions to mitigate or compensate for impacts on the environment, such as e.g.: reforestation, adoption of agroforestry practices, establishment of biological corridors, and

- clearly defined roles for supervision and implementation of the plan, and time frames. If a management plan is not yet available, the IMS engages with local authorities to develop one.

- LEAF 5.2 - Nesting birds and wildlife are protected when cutting forage.
- LEAF 5.6 - Environmentally-sensitive areas, identified in the Landscape and Nature Conservation and Enhancement Plan, are protected and managed appropriately.

Protection of water bodies; management of riparian strips

- Standard for Sustainable Cattle Production Systems (page 24) - The farm does not allow free access of cattle to natural bodies of water in order to prevent contamination of water with excrement and protect public health. Pastures have buffer areas along their borders with bodies of water or aquatic and/or terrestrial ecosystems; it uses physical means such as live fences, dead fences, electric fences, dykes, channels or other physical barriers in order to keep the animals inside the pastures and prevent their free passage to the streams, and causing erosion of the margins. The farm allows grazing in wetlands, as long as it is done in a way as to maintain or recover the mirror of water. In case grazing is allowed in wetlands, the farm implements the Ramsar philosophy that revolves around the concept of "rational use", understood as „maintaining the ecological characteristics of wetlands, through the implementation of ecosystem approaches, within the context of sustainable development“.
- UTZ G.D.106 - A buffer zone of native vegetation of at least 5m wide is kept along each border of seasonal and permanent water bodies to reduce erosion, limit contamination from pesticides and fertilizers, and protect wildlife habitats. In farms less than 2ha in area, a buffer zone of at least 2m wide is kept.
- UTZ G.D.107 - Pesticides and inorganic fertilizers are not used:
 - within 5 meters from any permanent or seasonal water body that is 3 meters wide or less (or within 2m if the farm is less than 2 ha)
 - within 10 meters from any permanent or seasonal water body that is over 3 meters wide, or -within 15 meters from any spring. Run-off from organic fertilizer is minimized.
- LEAF 5.5 - Dirty water and silage effluent are collected and safely recycled.

Minimum share of ecological structures/compensation areas

- Standard for Sustainable Cattle Production Systems (page 24) - The farm does not allow free access of cattle to natural bodies of water in order to prevent contamination of water with excrement and protect public health. Pastures have buffer areas along their borders with bodies of water or aquatic and/or terrestrial ecosystems; it uses physical means such as live fences, dead fences, electric fences, dy-

kes, channels or other physical barriers in order to keep the animals inside the pastures and prevent their free passage to the streams, and causing erosion of the margins. The farm allows grazing in wetlands, as long as it is done in a way as to maintain or recover the mirror of water. In case grazing is allowed in wetlands, the farm implements the Ramsar philosophy that revolves around the concept of “rational use”, understood as „maintaining the ecological characteristics of wetlands, through the implementation of ecosystem approaches, within the context of sustainable development“.

- GLOBAL GAP AF. 7.2.1 - Has consideration been given to the conversion of unproductive sites (e.g. low-lying wet areas, woodlands, headland strips, or areas of impoverished soil etc.) to ecological focus areas for the encouragement of natural flora and fauna? There should be a plan to convert unproductive sites and identified areas that give priority to ecology into conservation areas where viable.
- LEAF 8.15 - Habitat banks are uncultivated grass mounds (or other plant species as appropriate) about two metres wide. They help to boost numbers of beneficial predatory insects, and provide habitat for ground-nesting birds and small mammals. If fields are larger than 20 ha and have 6m margins as part of the Landscape and Nature Conservation and Enhancement Plan this may negate the need for habitat banks.
- LEAF 8.23 - There is a minimum of 5% farm area available as habitats, not used for cropping and food production.
- Rainforest Alliance 2.6 - The farm management and group administrator develop a map that includes natural ecosystems and agroforestry canopy cover or border plantings with estimated vegetation coverage and estimated percentage of native species composition. If the farm or group of member farms have less than 10% total native vegetation cover or less than 15% total native vegetation cover for farms growing shade tolerant crops, the farm management and group administrator develop and implement a plan to progressively increase or restore native vegetation, including:
 - Restoration of zones adjacent to aquatic ecosystems;
 - Restoration of farmed areas of marginal productivity to natural ecosystem; or
 - Incorporation of native trees as border plantings and barriers around housing and infrastructure, live fences, shade trees, and permanent agroforestry systems.

Grassland preservation

- Standard for Sustainable Cattle Production Systems (page 14) - The farm has a written native and/or improved pasture management plan that includes selection of pastures suitable for the area and the species of trees in the range, if applicable. The plan is implemented in the field. The pasture management plan includes grazing control activities, among them, pastureland segregation and rotation. The pastureland rotation plan of the farm considers: number and size of grazing sections or areas, number of animals grazing in

each section, amount of time daily grazing in each section and pasture rest period. The farm has an integrated fertilization program to improve soil fertility and achieve optimum pasture production. The program considers the following elements: establishment and maintenance of herbaceous and woody legumes; application of organic fertilizers or excrement as fertilizers (such as manure or bird droppings), as long as these materials have been previously processed; use of biomass (dry leaves, dead or live plant cover); crop and pruning residues from trees and shrubs, and/or establishment of green fertilizers in pastures. The pasture management plan of the farm includes conservation measures for natural savannas.

■ EUROPEAN/NATIONAL/REGIONAL STANDARDS

Restriction of land use changes

- PDO Saint Nectaire - Permanent pasture represents at least 90 % of grass surface.

Protected areas, primary, semi-natural ecosystems

- Donau Soja Standard S.2 - In national and international nature protection areas in which agricultural use is permitted, no Danube soja can be cultivated.

Protection of water bodies; management of riparian strips

- Biocoherence animal production - Reduce direct access to water (ponds) for animals excepted for mountain pasture
- Guaranteed Sustainability Standard for Bovine Meat (page 3) – as a rule for the whole farm, in Montado/Dehesa areas tree density must be maintained.
- Guaranteed Sustainability Standard for Bovine Meat (page 3) – when performing works in rivers and streams, perform them in Summer months; if work has to be done on the riverbed, it must be concentrated on August and September to avoid affecting fish in the breeding season.

Minimum share of ecological structures/compensation areas

- Bee friendly - Implementation of ecological areas on at least 8% of UAA
- Guaranteed Sustainability Standard for Bovine Meat (page 4) - In the area sown for forage and cereals, 20 m/ha of linear structures (riparian galleries, walls or unsown strips) must exist with a minimum width of 5 m.
- IP SUISSE: Minimum 7 % of ecological compensation surface (in real surface)

Grassland preservation

- IP SUISSE – Minimum 7 % of ecological compensation surface (in real surfaces)
- PDO Saint Nectaire - Permanent pasture represents at least 90 % of grass surface.

■ COMPANY REQUIREMENTS

Protection of primary and semi-natural habitats and protected areas

■ LU Harmony - Preserving wildlife at farm level: preserving the permanent landscape features (forest, woodlots, riparian strips)

■ Unilever SAC F55 - The conversion of High Conservation Value/ High Ecological Value/high carbon stock areas (forests, grasslands or wetlands) to farmland is prohibited.

■ Nestlé RSG - Conservation of Natural Resources and Biodiversity

Wild Fisheries

For Nestlé, suppliers will source from fisheries that are effectively managed towards sustainability, based on scientific data:

There is no sourcing from Critically Endangered or Endangered stocks per the IUCN Red List. For new product developments, avoid usage of species and source geographies that are rated as Vulnerable on the IUCN Red List to limit pressure on these stocks.

- There is no use of highly destructive fishing gear or fishing methods including dynamite, cyanide, muroami or high seas drift nets.
- There is no known sourcing from no-take zones of Marine Protected Areas.
- A list of approved certification systems for wild seafood products meeting the RSG will be created by the Nestlé team and revised annually based on scientific advice.

Aquaculture

For Aquaculture, suppliers will be required to continuously improve so that they can demonstrate compliance with one of the globally recognized Aquaculture certification standards⁵ or their equivalent within a time frame specified by each business. All farmed species will be subject to this standard over time. This list of approved certifications will be reviewed annually to ensure continued alignment with the RSG.

Protection of water bodies, management of riparian strips

■ Unilever SAC F41 - Neither you nor your workers ever dispose of inappropriate materials (such as oil, CPPs, CPP packing or containers, medicines, animal manure) in rivers, streams or other surface or ground water.

Minimum share of ecological structures/compensation areas

■ LU Harmony - Preserving the local biodiversity: 3 options are proposed either 3% of total wheat surface area implemented with floral strips or by using cover crops on the total surface area implemented with wheat before a spring crop or by planting an hedgerow.

■ Unilever SAC F60 - Areas of the farm that are unlikely to provide an economic return, must be identified and taken out of production. Areas taken out of production, buffer zones around water bodies, and areas around offices and housing must be managed

in a way that enhances biodiversity value or the provision of ecosystem services.

Grassland preservation

■ LU Harmony - Preserving wildlife at farm level: Implementation of a permanent grassland

6.1.3 Conclusions:

Protection of primary and semi-natural ecosystems and protected areas:

- ◆ Standards and companies should define primary and semi-natural ecosystems or similar terms used.
- ◆ The protection of primary and semi-natural habitats and protected areas are not only a topic for international standards but also for companies. Especially when producing in overseas countries, companies should include criteria for the protection of primary and semi-natural habitats and protected areas. In most EU countries, additional criteria for the protection of primary habitats and land use changes are not of major concern as farming land is identified and restrictions on land use changes are made. However, European/national/regional standards should include criteria focusing on the avoidance of negative impacts on semi-natural ecosystems and protected areas.

Biotope corridors:

- ◆ The creation of biotope corridors on the farm as well as in the surroundings is not sufficiently considered by the international as well as by the European/national/regional standards and companies. None of the standards and companies screened require measures that go beyond the farm and require the coordination of several stakeholders. However, the creation of „natural islands“ is only effective to a limited extent. Standards and companies should encourage farms to provide areas and landscape elements within their farms for conservation that connect ecosystems/ habitats to each other, thereby creating habitat corridors. This requires a management plan that includes a baseline assessment and determines the area's potential with the help of an expert.

Minimum share and management of ecological structures/compensation areas:

- ◆ Biodiversity is at risk on one hand by farmers giving up their land and by the intensification of agriculture on the other. Ecological structures, such as hedges, habitat corridors, ponds, small forests or solitary trees must therefore be supported and protected. Within the framework of EU agricultural policy, one speaks of ecological compensation areas. International standards and

companies should also specify criteria for ecological compensation areas and define its type, extent and minimum quality.

- ◆ For the European Union, legislation regarding agriculture and biodiversity is in place: Farmers with arable land exceeding 15 ha must ensure that at least 5% of such areas is an „ecological focus area“ dedicated to ecologically beneficial elements. Ecological focus areas cover a broad range of features, including such that affect biodiversity directly, as for example:
 - Fallow land
 - Field margins
 - Hedges & trees
 - Buffer strips
 - Legumes and covercrop
- ◆ Cross Compliance within the EU Common Agriculture Policy includes a set of standards on good agricultural and environmental condition of land. Within others, cross compliance requires “biodiversity and ensure a minimum level of maintenance: Retention of landscape features including ban on cutting hedges and trees during the bird breeding and rearing season”. Certain landscape elements are protected, that means they cannot be eliminated - but maintenance is not legally required.

Requirements of standards and of companies should go beyond legal requirements. Added value for biodiversity can be created by a higher percentage of “ecological focus areas” per farm. But not only the size, also quality needs to be considered and therefore it would be very effective to improve the quality of ecological focus areas and elements by providing advice to the farmers and promoting collaboration with NGOs and other experts (e.g. positioning of ecological landscape elements, connectivity etc.).

By defining quality aspects for ecological landscape elements, probably differences between regions/operations must be considered.

See also the conclusions of the driver “Protection of species”.

- ◆ If agricultural land will be taken out of production on a long-term basis and restored into intact biotopes, farmers should be compensated for the loss of yield. There are multiple possibilities to receive financial support and standard organisations /companies could help certified farmers regarding applications and /or involve them in joint regional projects (see agri-environmental programs).
- ◆ Verifiability is both a prerequisite and a challenge for all standards and companies. What can auditors accomplish? Can they determine if an ecosystem is intact and/or worth protecting? Auditors cannot maintain expertise in all aspects of biodiversity in all regions and animal families, but they are experts in assessing the quality of processes. Consequently, standards and companies should primarily require processes and methods for the management of biodiversity. See also results and conclusions of the category “Management”.

6.2 Overexploitation of natural resources

6.2.1 Main results

- ◆ International standards focus on restrictions regarding crop protection, other harmful substances and technologies and their handling as well as on use of nitrogen and phosphorus, soil fertility
- ◆ European/national/regional standards focus on use of nitrogen and phosphorus, soil fertility and restrictions regarding crop protection, other harmful substances and technologies
- ◆ Companies focus strongly on restrictions regarding crop protection, other harmful substances and technologies and use of nitrogen and phosphorus, soil fertility
- ◆ Around half of the criteria have been assessed as average effective and verifiable. In addition, the number of criteria requiring further expertise of the auditor is less than within the driver “Destruction and degradation”

6.2.2 Positive examples of criteria addressing this driver with high effectivity

■ INTERNATIONAL STANDARDS

Use of nitrogen and phosphorus, soil fertility

- GLOBAL GAP CB.4.2.1 to 4.2.6 - Records of all applications of soil and foliar fertilizers, both organic and inorganic
 - CB.4.2.1 Field, orchard or greenhouse reference and crop?
 - CB 4.2.2 Application dates?
 - CB 4.2.3 Applied fertilizer types?
 - CB 4.2.4 Applied quantities?
 - CB 4.2.5 Method of application?
 - CB 4.2.6 Operator details?
- Naturland B.; I. Plant production 8. Crop production - Crop rotation is the basis of agricultural plant production on which the biological cycle in organic agriculture is founded. It serves the purpose of creating long lasting soil fertility and controlling the weeds, diseases and pests at the same time. It provides the farm with good yields and economic stability, thus ensuring long-term viability. For this reason, a minimum of one fifth of the crops on the arable land have to be legumes. This proportion may be reduced with the approval of the adviser, if either the conditions are very good (to at least one sixth), or if the location is particularly susceptible to the loss of nutrients. During crop rotation, winter and summer crops should complement each other in their effects to prevent the negative developments of monoculture. Variety is an essential characteristic of organically cultivated fields. It should also be practised in the choice of seed mixtures for forage growing as well as for catch crops and undergrowth.

Special attention has to be paid to ensuring sufficiently long periods between the cultivation of the same kind of crops. The washing out of nutrients must be prevented by suitable cultivation measures (e.g. undergrowth, ploughing rotas commensurate with local conditions). (p.18)

■ SAI FSA24 - Do you have a nutrient management plan?

The documented nutrient management plan is updated at least annually and consists of all of the following:

- Overview of nutritional requirements of all cultivated crops on your farm
- Soil type(s) of the fields
- Soil sample analysis per field
- Application rates and intervals of either mineral or organic fertilizers applied in accordance with national and local legislation and crop need.
- A simple nutrient input/output balance using best available information.
- Nutrient content of manure and/or compost

■ LEAF 2.6 - There is a long-term cropping plan: The plan identifies annual cropping cycles for the current year and the intentions for the future (over at least three years). The rotation/cycle is sustainable and appropriate to the farm business, including the soil and climate.

Grazing intensity and management

■ Standard for Sustainable Cattle Production Systems (page 14) - The farm has a written native and/or improved pasture management plan that includes selection of pastures suitable for the area and the species of trees in the range, if applicable. The plan is implemented in the field. The pasture management plan includes grazing control activities, among them, pastureland segregation and rotation. The pastureland rotation plan of the farm considers: number and size of grazing sections or areas, number of animals grazing in each section, amount of time daily grazing in each section and pasture rest period. The farm has an integrated fertilization program to improve soil fertility and achieve optimum pasture production. The program considers the following elements: establishment and maintenance of herbaceous and woody legumes; application of organic fertilizers or excrement as fertilizers (such as manure or bird droppings), as long as these materials have been previously processed; use of biomass (dry leaves, dead or live plant cover); crop and pruning residues from trees and shrubs, and/or establishment of green fertilizers in pastures. The pasture management plan of the farm includes conservation measures for natural savannas.

Prevention and control of erosion

■ Standard for Sustainable Cattle Production Systems - The farm has pastures adapted to the agro-ecological conditions of the farm and implements pasture lot rotation and fertilization programs that enable maintaining at least 95% of vegetative cover (p. 16).

■ Naturland - 1. Humus balance and fertilization (B.; IX. Permanent tropical plantations)

1.2 A fundamental means of maintaining and increasing soil fertility is to plant trees and grass. They provide diverse habitats and encourage the establishment of beneficial insects. An ideal means of breaking down the soil coverage is to sow such undergrowth as leguminous plants and herbs. No area should be entirely free of vegetation or other coverage the whole year round. (p. 36)

Restrictions regarding crop protection and restriction of use of other harmful substances or technologies

■ Fairtrade Hired Labour (page 42) - 4.2.3 Your company monitors the main pests and diseases of the Fairtrade crop, and establishes a level of damage beyond which the need to use chemical pesticides is justified. The company avoids the build-up of resistance to pesticides.

Guidance: Knowing and understanding the characteristics of the main pests of the Fairtrade crop will improve decisions on methods of control. This includes knowing how the pest affects the crop, conditions that may put the crop at risk, which parts of the plant are affected, where the pest develops and possible host plants.

By recording the presence of the pest in the fields your company is able to concentrate efforts in pesticide applications by doing spot treatments. Pesticide application decisions are based on pest monitoring.

Avoiding build-up of resistance to pesticides may include an appropriate pesticide application program where modes of action are rotated. It is a good practice to document action mechanisms of pesticides used against a specific pest or disease.

■ RSPO 4.6.3 (M) - Any use of pesticides shall be minimized as part of a plan, and in accordance with Integrated Pest Management (IPM) plans. There shall be no prophylactic use of pesticides, except in specific situations identified in national Best Practice guidelines.

Specific guidance for 4.6.3: Justification of the use of such pesticides will be included in the public summary report.

- Does the company have an IPM plan?
- Has that plan been implemented?
- Is the effectiveness of the IPM plan monitored?
- Are there records showing that the use of pesticides have been minimized in accordance with Integrated Pest Management (IPM) plan?
- Has there been prophylactic use of pesticides? If so, justification must be provided in accordance to National Best Practices.

Irrigation management

■ Rainforest Alliance 3.19 - Based on record-keeping (see 1.10), the farm demonstrates reductions in water used for irrigation, processing, or cattle production per unit of product produced or processed.

- SAI FSA55 - If you irrigate, do you have a water management plan to optimize water usage, water quality, and water availability and to reduce waste water?

This management plan is updated at least once a year. It takes into account:

1. The timing and amount of irrigation in relation to crop requirements.
2. The added value of irrigation in relation to yield and quality of crops produced.
3. Predicted rainfall and evaporation, using either daily rainfall records or weather forecasts to plan irrigation schedules.
4. An inventory of water resources.

This includes at least two of the conditions below:

- a. Avoiding depletion of water sources, beyond the recharge capacity of the watershed/catchment.
- b. Cooperate with other water users in the catchment to balance the needs.
- c. Diversify the sources of water to reduce impact and to ensure water access continuity across seasons.

This question can only be not applicable if you do not irrigate.

- This can be a separate plan or a chapter in an overall farm management plan. An alternative can be a written farmer group or community plan.

- GLOBAL GAP CB. 5.2.3 - Are record for crop irrigation/fertigation water usage and for the previous individual crop cycle's with total application volumes maintained?

The producer shall keep records of the usage of crop irrigation/fertigation water that include the date, cycle duration, actual or estimated flow rate, and the volumen (per water meter or per irrigation unit) updated on a monthly basis, based on the water management plan and an annual total. This can also be the hours of systems operating on a timed flow basis.

Requirements regarding feeding

- Naturland - 2. Feeding/2.1 General requirements - Landless livestock systems are prohibited. The basis of animal nutrition is the feed produced on the farm itself. At least 50 % of the feed must be produced on the farm itself (or come from a co- operation with another organic farm approved by Naturland). Exceptions can only be made for farms with livestock producing up to a maximum of 10 DU (dung units).

Purchased fodder must be certified by Naturland resp. meet certification standards approved as equivalent by Naturland (for which an application must be made in the latter case). Indigenous – and, wherever possible, local – sources are to be preferred to imported feed, if available in sufficient quantities and the desired quality. In the case of pigs and poultry only, the limited range of feed from conventional production in restricted quantities, as listed

in appendix 3, may be used for a transitional period ending 2017 at the latest, the figures to be understood as the annual average and referring to the dry matter given. In such cases the proportion of conventional feed may not exceed 25% of the daily ration, with the exception of itinerant flocks.

In the case of a feed crisis due to drought, fire or similar calamities only these feeds – subject to Naturland approval - may be used as well.

If feed is purchased, a maximum of 30% of the dry matter of feed given may originate from areas which have been farmed in compliance with the standards for at least 12 months prior to their harvest („conversion feed“). If this feed is produced on the farm itself, a maximum of 100% is allowed. (p. 23)

²⁶In the case of herbivores, the required ratio is 60%.

²⁷The percentage refers to the organic proportion of the dry matter in relation to the total ration.

EUROPEAN/NATIONAL/REGIONAL STANDARDS

Use of nitrogen and phosphorus, soil fertility

- IP Suisse - optimization of the use of mineral nitrogen. Five points are attributed if no mineral N is used on grass surface area. One point is lost every additional 14 kg N/ha used. No point is attributed if the nitrogen apply exceeds 56 kg/ha.
- Bioland 3.4.4 Quantity Limitation - The total volume of organic fertiliser, based on the nitrogen content, may not exceed the amount which corresponds to an animal livestock count of 1.4 manure units (= DE) per ha. A maximum of 0.5 DE of this may be organic fertiliser from external sources. (DE = maximum animal stock density according 1.4 DE, see annex 10.3). The conditions specified in Chapter 5 apply to gardening and perennial crops. In measuring the fertilising, the reserves available in the soil must be taken into consideration.

Manure management

- PDO Comté - Organic fertilizing input allowed: manure, slurry, compost. Application is allowed: only on short grass, 3 maximum spreading on each plot, total amount of nitrogen is limited to 120 kg N/ha (mineral and organic).

Average livestock density

- PDO Comté - Minimum required for grass surface: 1 dairy cow/ha; < 1,3 LU/ha of forage surface

Grazing intensity and management

- PDO Saint Nectaire - Grazing is mandatory for dairy cows during a minimum of 140 days per year. During this time, green feeding is not allowed.

Restrictions regarding crop protection and the use of other harmful substances or technologies

- Bee friendly - Exclusive use of insecticides permitted for organic agriculture during the entire crop season.
- Valeurs Parcs/Vocan d'Auvergne - Late mowing are favoured.
- Bioland 3.6 Plant Protection/3.6.1 Basic Principles - The objective of organic-biological farming is to produce plants under such conditions that their infestation with parasites and disease achieves a point where this is of no or only minor economic significance. Appropriate measures for the achievement of this are balanced crop rotation, selection of suitable varieties, soil preparation in accordance with the location and the time of year, fertilising in appropriate amounts and qualities, fertilising by growing, etc. In addition, the spread of beneficial animals should be promoted by suitable means and measures such as hedges, nesting places, wet biotopes, etc.
- GQ Hessen Crop protection (General plant part) - Chemical soil disinfection does not take place.

Irrigation management

- Bioland 2.3 Air, Soil and Water Protection - Water resources are not to be used excessively, the effects of water extraction are to be observed. Wherever possible, rainwater shall be collected and used. Any agricultural measures may not lead to salinisation of soil and water. Covering material like mulch and silo foils, forcing foils, fleeces, cultivation guard nets etc. may only be used if produced on basis of polycarbonates (e.g. polyethylene, polypropylene). Used foils shall be recycled if feasible. It is not permissible to burn used plastic in the fields

Requirements regarding feeding

- PDO Comté - Green feeding is limited to a meal per day. Grazing represents at least 50 % of intake.
- IP SUISSE - Restriction use for concentrates. The maximum number of points is obtained when farms are below 18 g of concentrates / kg milk. If above, 168 g / kg, any point is obtained.

■ COMPANY REQUIREMENTS

Use of nitrogen and phosphorus, soil fertility

- FANTA 1 - Fertilize under the following recommended thresholds: 240 kg N/ha, 30 kg P/ha y 116 kg K/ha.
- FANTA 2 - Increase the percentage of organic matter above 2%. Triturate the pruning residues to increase the content of organic matter (if there are not diseases).
- Unilever SAC F6 - The Nutrient Management Plan must include a calculation of the amount of Nitrogen and Phosphorus to be applied in each year, taking into account all sources of nutrients applied and those available from the soil. The calculation must

also include an assessment of the amount of nutrients removed from the crop or pasture by harvesting and/or grazing.

Prevention and control of erosion

- LU Harmony - Promoting direct sowing under cover to avoid erosion and preserve soil biodiversity

Restrictions regarding crop protection and the use of other harmful substances or technologies

- LU Harmony - Selection of wheat field according to previous crop, wheat variety and soil management to secure quality of wheat Lu'Harmony and reduce the pesticide use in particular against Fusarium wilt.
- FANTA 3 - Pesticides will be only applied if necessary and never in non-productive areas as edges, borders, path and other singular natural elements of the farm.

Handling of crop protection products and other harmful substances or technologies

- Unilever SAC F67 - There must be improvements in waste management over time. The plan shall include a timeline and monitoring system showing how waste management has been improved.

6.2.3 Conclusions:

Use of nitrogen and phosphorus, soil fertility:

- ◆ European/national/regional standards focus more on the aspects use of nitrogen and phosphorus, soil fertility than international standards. International standards often implemented "only" one criterion asking for a nutrient management plan whereas European/national/regional standards implemented several concrete criteria to regulate the use of nitrogen and phosphorus. For international standards it might be complicated to regulate every single regional aspect but if no clear figures, specific measures, methods and specifications are required and given, it will be a general recommendation that can be easily misinterpreted.
- ◆ Standards and companies should demand results based indicators such as nutrient balances and provide an accepted method for its calculation and also ask for soil and tissue analysis. These are concrete and efficient measures with positive impacts for protecting biodiversity and the climate.
- ◆ Standards and companies should define plant-specific nutrient limits, optionally combined with tolerance thresholds and a time reference (e.g. in a three year average). This method allows for efficient nutrient management.
- ◆ The timing for organic fertiliser application and other farm characteristics (e.g. cleared fields) are just as important parameters for determining environmental impacts as is the amount of fer-

tiliser itself. Standards and companies should therefore include crop specific requirements.

- ◆ Varied crop rotations support biodiversity and soil fertility. Moreover, they reduce the intensity of pest infestations and suppress undesired weeds. As a result, they reduce the need for pesticides and herbicides. Most standards do not have clear guidelines concerning crop rotations and cycles. The use of another crop is often recommended without providing further details or on the implementation side. Standards and companies should go beyond EU cross compliance, which requires farms to grow at least three crops per year in which no single crop covers more than 70% and no single crop covers less than 5%.

Restrictions regarding crop protection, other harmful substances or technologies:

- ◆ Negative impacts on biodiversity often only become apparent in middle to long-term time frames. Standard organisations should assert their influence so that governments regularly and rigorously review the biodiversity impacts of authorized pesticides.
- ◆ Changing and/or reducing the application of pesticides requires a change of the agricultural system. There is a lot of information on alternative products and procedures available but conventional farmers do not use them because of routine, diffuse fears or the need to constantly increase efficiency. Standard organisations and companies should support system changes towards the protection of biodiversity through research, pilot projects and the roll out of results via training of farmers.
- ◆ There is little economic interest for systematic research on threats to biodiversity by the application of pesticides and metabolites. There is a conflict between the standard, its requirements, and the marketing of pesticide manufacturers. Standards should be stronger in proactively excluding the use of critical substances before they are prohibited by law. Standards should define a list of allowed substances and a strategy with a clear timeframe to continuously shorten the list so as to progressively limit pesticide use to substances that are less dangerous to humans and the environment.
- ◆ In addition to providing a list of banned and allowed pesticides, standards should also oblige farmers to seek advice on this topic. In some instances, those responsible for the standards provide advice. Important information includes: know-how with regard to efficacy and side effects on biodiversity, correct application, storage and disposal of pesticides, risk management in case of accidents, preventive and alternative crop protection methods.
- ◆ EU Sustainable Use of Pesticides Directive, IPM and banning agrochemical molecules: The Directive 2009/120/CE sets the rules for reducing the environmental impact of agrochemicals in Europe. Compared to other areas in the world, this directive is very ambitious, as it is mandatory for all EU farmers and addresses very important issues such as: training, mandatory permits for crop

protection product (CPP) users, calibration of machinery, regulations for handling and storage of products, and the promotion of Integrated Pest Management (IPM). There is still room for improvement but the directive could be considered as a solid baseline to build on, and of course, the minimum criteria to comply with for standards and companies operating in the EU. Another added value of the directive is that it opens a pathway for realising the implementation of IPM. Although the IPM approach is mentioned in most standards, a specific set of actions is not always included. Actions such as pest and diseases census, establishment of thresholds for treatments, priority of biological control over CPPs use, etc. are encouraged. The directive shall be a red line (legal compliance) and its recommendations (not mandatory aspects) shall be considered in standard criteria and companies requirements in order to go clearly beyond legal compliance.

- ◆ Standards should prohibit the preventive use of herbicides and only allow them if there is no other alternative.
- ◆ Diversity of species, varieties and ecological structures lead to more stable ecosystems and reduce pressures from pests. Standards should therefore define criteria for the promotion of diversity.
- ◆ Certified operations should demonstrate a continuous improvement in the use of fertilisers, pesticides and herbicides (management system approach).
- ◆ Species diversity reduces the populations of pest organisms. See criteria for protection of species.

Average livestock density and grazing intensity/management:

- ◆ The low number of references regarding criteria such as the 'average livestock density' and the 'grazing intensity and management' is misleading. Expectations regarding these criteria are only reasonable when considering the sub-sample of standards and labels that focus on farms where animal production takes place. If we consider that sample, then these criteria become more representative. In fact, limits to the livestock density in the farm are among the most common requirements in the context of animal production in extensive regimes, both when it comes to standards or labels and to agri-environmental support schemes. Furthermore, excessive livestock densities – particularly regarding bovine populations – are among the main causes identified for the decline of agro-silvopastoral systems such as the Montado/Dehesa; on the other hand, the adequate presence of some animal species contributes positively to the balance and long-term management of these systems. However, a high grazing intensity on a very short period (1 to 2 days) cannot be directly linked to negative conservation practice. Rotational grazing, if well managed, is compatible with biodiversity pasture conservation.
- ◆ The Common Agricultural Policy (CAP) established a premium for the maintenance of livestock systems if the stocking rate is below 1.4 Livestock Units (LU)/ha, but an increasing number of

experts and studies are showing that this number must be lower to be compatible with Montado/Dehesa conservation. Several National Rural Development Programmes currently require very low livestock densities for a variety of goals related to biodiversity. In the Portuguese Rural Development Program the attribution of subsidies aiming at the conservation and regeneration of Montado areas in Natura 2000 sites requires livestock densities between 0.15 and 0.5 LU/ha. Similar specifications regarding the maintenance of relevant vegetation in grazing areas and areas of Iberian Lynx (*Lynx pardinus*) habitat require livestock densities of 0.5 LU/ha or less. Finally, specifications concerning the management of extensive permanent grasslands and the rotation of cereal crops and fallow in Natura 2000 sites require livestock densities of 0.7 LU/ha or less.

- ◆ Nevertheless, one has to bear in mind that any limit to the livestock density is a simplification of the complexity of a grazing system. As examples, the need to take into account the grazing intensity (in terms of climate condition for a given geographical area and season) can be as relevant in terms of impact as the livestock density itself, and the same number of animals may have different impacts depending on the species (e.g. cattle or sheep).

Irrigation management:

- ◆ In spite of the impact of climate change and increasing pressure on water resources, standards, especially European/National/regional standards, and companies have defined only a few criteria for irrigation. Many standards request just legal compliance, which means to respect the legal permits for water withdrawals.
- ◆ Water shall be a mandatory driver for all standards and company requirements due to its close relation to biodiversity and for being a scarce resource for almost all EU countries in the future, according to climate change scenarios. Most critical aspects are covered by EU and National regulations i.e. cross compliance Statutory Management Requirements (SMRs) and Good Agricultural and Environmental Conditions (GAECs) do address topics such as legal access to water, good practices for avoiding nitrate pollution of water bodies, etc. Standards and companies should go beyond basic compliance and ensure a more advanced commitment. The first step should be towards water use control/knowledge, which can be improved by making the use of irrigation sheets mandatory (noting irrigation times and volumes) and encouraging the use of water meters whenever possible.
- ◆ A further step beyond „awareness of water use“ could be the actual reduction of water used. This can be done by promoting the use of technologies (tensiometric probes, pictures and aerial sensors), limiting the irrigation system (allowing only localized irrigation, buried irrigation systems that avoid evapotranspiration, etc.) or promoting specific agronomic techniques (mulching, etc.).
- ◆ Standards and companies should link and describe the excess of water use as bad agronomic performance with increasing economic costs (water price and/or energy for pumping) and an increased

probability of encountering additional problems (fungal diseases, higher nutrient requirements, higher sensitivity to pests, etc.).

- ◆ The link between water source and water use (ecosystem and ecosystem service) is critical. However, farm operators are often overwhelmed when they are required to assess whether a water source is overused or is not being used sustainably. Besides, regulatory compliance is not a guarantee for the sustainable use of water resources in many countries. Standard organisations should provide assistance for certified operations e.g. by providing information (maps and studies) on water-scarce regions, establishing contact to (environmental) organisations that are committed to the protection of lakes/rivers and establishing contacts to government agencies that are responsible for the implementation of management plans under the EU Water Framework Directive.
- ◆ Many standard organisations review the water consumption of certified farm operations and should have enough information to calculate farm averages as well as averages for certain types of operation in specific regions. An analysis of consumption data of certified farms should be used to establish concentration limits for certain crops taking into account climatic conditions. These limits should be met within the certified farm operations and continuously improved within a defined timeframe. Altogether, standard organisations should be able to demonstrate that their certified farm operations have a lower water footprint than comparable operations that are not certified.
- ◆ Standard organisations and companies should contribute to climate adaptation measures on their certified farms and within their supply chains. This includes also research regarding crop varieties with higher resilience against climate change impacts to substitute certain crop varieties not adapted to the region or climate. For such an assessment, standard organisations should involve independent nature conservation experts.
- ◆ The driver “Overexploitation of natural resources” is the driver with the highest number of criteria addressed. However, around half of the criteria have been assessed as averagely effective. On the one hand, this might depend on the number of criteria being important but having in general an average influence on biodiversity. On the other hand, this reflects that criteria within this driver still have potential for improvement.

6.3 Protection of species and invasive alien species

6.3.1 Main results

- ◆ All standards and companies focus on management of ecological infrastructure and on special measures for the protection of species.
- ◆ Management of invasive alien species and of wild animals and plants are not considered by companies.
- ◆ Three-quarters of the criteria have been assessed as highly effective, whereas half of them require special expertise from the auditor for verification, because special botanical and animal skills are needed.

6.3.2 Positive examples of criteria addressing this driver with high effectivity

INTERNATIONAL STANDARDS

Special measures for the protection of species

- Standard for Sustainable Cattle Production Systems (page 23) - The farm recognizes that the tree component or the recovery of natural ecosystems contributes to capturing carbon dioxide and therefore to mitigating emissions produced in the farm. The farm plants or protects native trees in the pastures to decrease heat stress in animals, which is reflected in higher production of beef and milk in tropical areas, and at the same time generates other products such as timber, posts, firewood, forage and fruit for the animals. The farm has a canopy cover of at least 20% or more distributed proportionally among the areas destined for the cattle; it includes native trees in all pastures, live fences and areas destined for conservation or recovery of natural ecosystems. In systems such as savannas, where natural climax ecosystems with a canopy cover of less than 20%, the farm has areas destined to conservation or regeneration of these natural ecosystems equivalent to a minimum of 20% of the area destined to cattle production. In case the tree cover is scarce, the farm has a plan to establish and expand tree cover, which indicates the current areas of existing cover and the areas where cover with native species will be established in the future. The plan to establish tree cover includes some of the following elements: planting or natural regeneration methods, measures for maintaining species less than two meters tall and grazing protection, implementation schedule and person responsible, actions to favor connectivity and creation of living fences to divide pastures and different types of grasses.
- UTZ G.D. 112 - Threatened and endangered species in the production area are identified, communicated to group members, and protected. Hunting, trafficking, or commercial collection of such species does not occur.

Management of ecological infrastructure (hedgerows, ponds, other habitats)

- Fairtrade Small Producer Organizations 3.2.34 - You must report on activities that you or your members carry out to protect and enhance biodiversity.
- Guidance:** Members are free to choose how they report their activities to you. Activities can include:
- identification of key biodiversity issues in the region and actions that your members have implemented in order to improve the situation
 - activities you have provided to your members such as raising awareness about biodiversity or training in techniques to protect it
 - agro-forestry systems
 - maintaining and restoring natural ecosystems in areas that are not suitable for cultivation, and in buffer zones around bodies of

water and watershed recharge areas and between production and areas of high conservation value, either protected or not

- activities to increase ecosystem connectivity by identifying unproductive sites and buffer zones.

You may find valuable knowledge within your local community regarding further activities. With time you may benefit from advice by local experts such as authorities, universities, NGOs or online data bases.

Restoration of ecosystems can take place by actively replanting native vegetation or by actively protecting it to allow regeneration of native vegetation.

- UTZ G.D. 113 - The group promotes ecological diversity by protecting and enhancing habitats and ecosystems.

Examples include:

- Planting trees and/or flowers
 - Safeguarding biological corridors
 - Preservation of semi-natural areas (e.g. hedges, meadows. etc.)
- Shaded cropping/agroforestry systems fulfill this requirement.

Management of invasive alien species

- FSC (page 109) - The Organisation shall only use alien species when knowledge and/or experience have shown that any invasive impacts can be controlled and effective mitigation measures are in place.
 - Fairtrade Small Producer Organizations 3.2.38 - You must raise awareness among your members so that alien invasive species are not introduced.
- Guidance:** Initial classification of alien species may be made by your members based on their own knowledge. You may want to contact a local expert who could provide support in identifying alien species and ways in which their introduction and propagation may be avoided. For further information see the Convention of Biological Diversity at <http://www.cbd.int/invasive/>

EUROPEAN/NATIONAL/REGIONAL STANDARDS

Special measures for the protection of species

- Bee friendly, a European label to promote products that respect bees, is requiring at the higher level, a qualitative criterion that hedges or any biodiversity areas must be constituted by more than 5 species of indigenous and spontaneous flora.
- Standard for Sustainable Cattle Production Systems (page 24) - The farm is committed to the responsible co-existence of cattle and wildlife. Therefore it seeks to be informed with local authorities and specialists in order to manage a predator attack and knows whom to contact in case of repeat occurrence. Cattle farms with natural areas or near natural areas or inside biological corridors, take measures to prevent attacks to cattle by wild predators, even if there is no previous history of attacks. A susceptible farm or one that has reported attacks from wild predators' implements measures to minimize the risk of attacks to cattle, including: locating cows

with their calves in interior pastures or pens, locating large animals -including animals with horns- in outlying pastures adjacent to or near forests, and installing electric fences in outlying pastures adjacent to or near forests. In case the cattle is attacked, the farm reports these incidents to the competent local authorities, or seeks organisations specializing in wildlife management

- Guaranteed Sustainability Standard for Bovine Meat (page 4) – nesting sites in areas of harvesting must be identified by the farmer with the support of the advisory system, which must have technical competences in the area of biodiversity. In a width of 5-10 m (variable according to species and location), the harvest will not be made to ensure a protection area around the nest.
- Guaranteed Sustainability Standard for Bovine Meat (page 3) – when performing works in rivers and streams, perform them in Summer months; if work has to be done on the riverbed, it must be concentrated on August and September to avoid affecting fish in the breeding season.
- QZ – Baden Württemberg 9. Measures to promote biodiversity (ZA I – Getreide, Ölsaaten, Hülsenfrüchte) – Lark window (no requirement for lentils): Two lark nesting sites per hectare should be created as uniformly as possible. These areas should be at least 3m wide and at most 12m long. The ideal size is 16 – 24m².

Management of ecological infrastructure (hedgerows, ponds, other habitats)

- IP Suisse: Surface area to promote biodiversity #5.4 (flowered fallow) et #5.8 (flowered grass strip for pollinators and useful organisms)
- QZ Baden – Württemberg 7. Planting, preservation and maintenance of natural structural elements(ZA II – Hopfen) – Natural structural elements such as hedges, field plants, field rains, etc., must be preserved or re-established in the field area with the aim of improving the living conditions for beneficial organisms. For hedging hop fields near roads, residential buildings etc. hedges from privet, field horn and other robust shrubs, which are not hosts for diseases and pests of the hops, are suited.

■ COMPANY REQUIREMENTS

Special measures for the protection of species

- NESTLÉ RSG 1. Use of fire for harvest preparation is subject to plans for gradual elimination. Where burning is used as part of sugarcane harvesting, a long-term plan is in place to reduce and eliminate the practice (taking into account any community impacts).
- Unilever SAC F57 - The hunting, fishing or gathering of rare, threatened or endangered species on the farm is prohibited. All farmers and workers shall be informed that destroying important habitats on-farm (or off-farm because of farming activities) is not allowed.

Management of ecological infrastructure (hedgerows, ponds, other habitats)

- FANTA 1. Facilitate the ecological permeability of the farm in base of internal elements that act as nodes: specks between parcels, corridors, edges of plots, borders of farms and singular elements such as wells, electric towers or booths. Do not disturb the vegetable margins of the plots: do not tread, do not deposit residues and minimize works with machinery. To allow the establishment of vegetation cover in the slopes of irrigation ponds and canals as well as elements of not-used irrigation systems. To allow the natural variability of species in the covering of slopes and not to plant ornamental species, since the autochthonous species have better ecosystemic benefits.
- FANTA 2. Introduction of permanent crops.

Management of invasive alien species

- FANTA 3. To allow the natural variability of species in the covering of slopes and not to plant ornamental species, since the autochthonous species have better ecosystemic performances. Avoid the presence of exotic and invasive species.

6.3.3 Conclusions:

Use of wild animal and plants:

- ◆ The aspect “Use of wild animals and plants” is poorly addressed because few standards and production systems rely on this aspect. Also, this issue is not relevant for most agricultural production systems in Europe, but of course it would deserve a specific development of criteria for production systems where wild animals and plants are used due to its huge complexity.
- ◆ If criteria for wild collecting/harvesting use the phrase „sustainable collection”, standards should define what is meant by this.
- ◆ It is recommended, which standards that include criteria on wild collecting/harvesting refer to the Fair Wild Standards. This standard covers all aspects of the sustainable collection of wild plants.

Invasive alien species:

- ◆ The view of alien invasive species (AIS) must be differentiated because less than 90% of the invasive species are not problematic. The focus must be on the AIS that are proven to or can potentially be problematic for the regional ecosystem or native species.
- ◆ Some countries (e.g. USA, South Africa, and Switzerland) have developed so called “black lists” with AIS that should not be imported or released into the wild. The concept has now been transferred to Germany and Austria (see <http://www.neobiota.de/massnahmen.html>). Standard organisations should provide

lists of problematic AIS for their certified companies and enforce that the farmer seeks advice in order to curb the further spread of AIS. For example, consulting farm operators can be appointed in cooperation with the regional nature conservation agencies, NGOs or experts on AIS.

- ◆ Standard organisations should respond quickly when AIS are identified in the regions they are working in. Eliminating invasive species becomes more difficult and more expensive with time and the more assimilated the species becomes.
- ◆ Standard organisations should request that farm operators only use native species whenever possible to prevent the unintended spread of AIS through their activities (e.g. spread of seeds or plant parts).

Special measures for the protection of species:

- ◆ There are measures that always have fundamental positive impacts for protecting biodiversity (e.g. limitations on fertilizer/pesticide use and water management). The identification of general measures to create or maintain landscape elements is more difficult. Ideally, a standard defines measures for the creation and maintenance of typical regional features in combination with measures to promote indicator species.
- ◆ Some standards such as the German regional quality standard QZ Baden Württemberg have good experience by providing a catalogue of measures, out of which the farmer can select a minimum number of measures. This procedure supports biodiversity because operational and regional conditions can be better adapted to.
- ◆ A baseline assessment is not required in most standards. However, conducting a baseline assessment is a prerequisite for the implementation of criteria (e.g. when action plans are developed). Moreover, the positive impacts of criteria can only be determined if a baseline assessment has been completed and monitoring is in place.
- ◆ It is important to consider how detailed the baseline assessment should be so that it provides meaningful data while not overwhelming the farm operator. Standards should as a minimum require habitat mapping on the farm and adjacent areas. Operations in or adjacent to protected areas or „High Conservation Value Areas“ should also monitor animal and plant species that have been classified by regulating authorities as protected species or have been listed on the IUCN Red List.
- ◆ A statement on habitat quality is often only possible by identifying the presence of indicator species e.g. sandy areas that contain sand beetles, wild bees, wasps, etc. Standards should therefore require a baseline assessment as well as the appropriate assessment methodology to determine which species can be identified and how they can be protected. This assessment must ideally be very simple and not need require expertise. FIBL

Switzerland and the Ornithological Station Sempach in Switzerland have developed a simple but meaningful indicator species system.

- ◆ Standards should provide assistance to certified farm operations for monitoring the presence of protected plant/animal species, conducting a baseline assessment, identifying indicator species and monitoring biodiversity development (e.g. by means of the selected target or indicator species). This assistance may include: training measures (e.g. in cooperation with environmental organisations), regional check lists, establishment of contacts with regional/local nature conservation authorities and environmental organisations, regional checklists, etc.
- ◆ Most of the European member states identified species for which this member state bears a regional responsibility. A selected number of these species can be used as indicators of the development and preservation of ecological structures. Regular monitoring of these species is therefore required.

The conclusions for 5.1 Destruction and Degradation of ecosystems are also of high importance for the protection of species and should be considered. Intact habitats are essential for the survival of species.

- ◆ Monitoring the impact on biodiversity is a challenge for all standard organisations and therefore a task that organisations should implement together. A regional monitoring system backed by different standards would be more meaningful and cost-efficient.
 - ◆ Standards can specify criteria for processes (e.g. requirements for the elaboration of a conservation plan) and can give guidance for a certain measure (e.g. species diversity of sown meadow). Based on this, certifiers can assess the quality of processes and conduct a basic evaluation of the action's quality. The success of the measure depends on external factors that the certifier cannot directly observe, but which rather have to be detected through monitoring.
- For other conclusions see „Monitoring“.

6.4 Loss of genetic diversity:

6.4.1 Main results

- ◆ All standards addressing this driver focus on the aspect GMO-free and on the promotion of crop plant varieties
- ◆ Companies addressing this driver focus on crop plant varieties but not addressing the promotion of livestock breed varieties at all.

6.4.2 Positive examples of criteria addressing this driver with high effectivity

INTERNATIONAL STANDARDS

GMO-free

■ Standard for Sustainable Cattle Production Systems (page 9)
- Although currently transgenic bovines or buffaloes are not commercially available, the SAN clarifies it does not allow genetic alteration of animals in certified farms or the presence of clones. The farm has a reproduction program (natural breeding, insemination and/or embryo transfer) to produce its own animals, it buys them from certified farms or from farms that keep the animals' history and guarantee that the animals are not transgenic nor originated from clones. The farm has breeding, artificial insemination and/or embryo transfer records, as well as calving records in the individual file of the mother of the calf born in the farm that ensures the animals are not cloned. The farm has documentation showing that the animals purchased from third parties did not originate from clones (individual record from the farm of origin indicating bull, cow, and date of birth and weaning of the animal purchased).

■ NATURLAND (Aquaculture) A.; II. General (management) regulations resp. other predominant provisions 3. Non-employment of GMO and GMO derivatives - Genetically modified organisms (GMOs) and their derivatives are incompatible with organic production. Products produced according to the Naturland standards must therefore be manufactured throughout the whole of their production and value chain without the use of genetically modified organisms (GMOs) and GMO derivatives. The definitions given under sec. 2 of Directive 2001/18/EC of the European Parliament and of the Council, and the exclusion criteria for genetic engineering of the eco-regulations Council Regulation (EC) No. 834/2007 and Commission Regulation (EC) No. 889/2008 apply.

Even the unintentional contamination of products certified by Naturland with genetically modified organisms may also lead to certification being denied. (p.10)

2 A „GMO derivative“ is any substance produced from or by means of GMOs but not containing any GMOs itself. „The use of GMOs and GMO derivatives“ means their use as a foodstuff, an ingredient of foodstuffs (including additives and flavouring), processing additives (including extraction solvents), animal feed, compound feed, the raw materials of animal feed, fodder additives, processing additives for animal feed, certain products for animal feed, pesticides, fertilisers, soil ameliorators, seed, vegetative propagation material and animals.

For the purposes of these standards, the following definitions apply: 1. organism: any biological unit capable of reproduction or passing on genetic material. 2. genetically modified organism (GMO): an organism, the genetic material of which has been modified in such a way as is not possible in a natural manner by cross-breeding and/or natural recombination.

EUROPEAN/NATIONAL/REGIONAL STANDARDS

Promotion of livestock breed varieties

- The French high environmental value standard, managed by the Ministry of Agriculture, has included a criterion based on the number of bred species.
- DO „Dehesa de Extremadura“ - The product to be protected by the PGI is produced exclusively from carcasses of extensively raised animals of the indigenous breeds Retinta, Avileña-Negra Ibérica, Morucha, Blanca Cacerena and Berrendas.

Promotion of crop plant varieties

- High environmental value standard - Indicator: specific and variety diversity.
Number of clone for vineyard. Number of varieties for orchard and vegetable.
- Bioland 3.5 Seeds, Seedlings and Plant Materials/3.5.1 Basic Principles - For growing, those species and varieties of plants should be used which are best suited for the conditions prevailing at the location, they should not easily be subject to disease and be of a high physiological nutritional quality. In farming, varieties typical for the area should be used in preference to hybrid varieties. The use of CMS hybrids originating from cytoplasmic fusion is forbidden in vegetable growing.

Support of endangered livestock breeds and crops

- High environmental value standard - Indicator: number of species, varieties and breeds endangered.

GMO-free

- With the Bee friendly label, GMO is banned and external inputs are required to be authorized with the “organic farming” label.
- GQ Hessen 3.5.3 Seed and planting material (General plant part)
- The use of genetically modified seed and plant material is prohibited.

6.4.3 Conclusions

GMO-free

- ◆ GMO-free raw materials are a key factor for the preservation of biodiversity in the food industry. Conventional crops are better adapted to natural conditions, making them less susceptible to pests and diseases and often need fewer pesticides. An increased use of pesticides has a negative impact on the diversity of non-crop plants that grow in the fields and adjacent areas also affecting insects that depend on these non-crop plants. Another essential problem of genetically modified plants is outcrossing and their uncontrolled spread. Consequently, the standard organisations and companies with criteria in this driver completely exclude genetically modified raw materials.

- ◆ Standards in countries with genetically modified plants should support certified farm operations by providing them an overview (sold plant types, brands, etc.). This overview helps the farm operator avoid unknowingly purchasing genetically modified plant material.
- ◆ The conservation of genetic diversity shall be promoted by using more genetically diverse crops, as well as taking special actions on endangered material (landraces or breeds). In some specific cases, the chances for introducing genetic variability is very much reduced. i.e. processing tomatoes (GMO free, but highly selected) do not have traditional relatives. They were created for food industry purposes and the varieties used respond to very specific needs (degree of sugar, colour, viscosity, etc.). Another example: for hard wheat, the industry demands very high levels of proteins that can mainly be achieved by using only selected varieties. The traditional varieties are most times far from the specifications required and farmers will not produce goods that do not meet the specifications required. Therefore it is necessary that the food industry supports the development towards genetic diversification by changing/adapting specification needs to the characteristics of traditional varieties.
- ◆ The support of endangered livestock breeds and crops is not well addressed. One main problem is that lists for those species do not always exist at national level. Standards and companies could collect this information and where possible encourage farmers to use old or endangered livestock breeds and crops.

Crop plant varieties and livestock breed varieties

- ◆ Certified farmers are not motivated and/or incentivized (e.g. plus points) to contribute to diversity of crops and livestock species.
- ◆ Especially the standardization of production systems and the concentration in few high performance varieties was leading to loss of agro-biodiversity. Old /traditional varieties are often not protected and therefore not marketable. This limits the exchange of seeds as well as their further development. Also standards play an important role in the standardization and reduction of cultivated varieties. Therefore they have a responsibility to increase support for and protection of agro-biodiversity.
- ◆ To make better use of traditional varieties, higher efforts in research and readiness by farmers are required to spur the support of these varieties and breeds. Since a decision in this regard often results in lower yields compared to conventional farming, this is rarely observed in practice. Here political decision makers, standards and companies are likewise responsible to counteract.

6.5 Management:

6.5.1 Main results

- ◆ Standards and companies with criteria in this driver focus on the request of an environmental management system and on training for workers and farmers.
- ◆ All other aspects have been less addressed.

- ◆ Only a low amount of criteria have been considered as effective; whereas the effectivity of a high amount could not be assessed. However, nearly half of the criteria are verifiable.

6.5.2 Positive examples of criteria addressing this driver with high effectivity

INTERNATIONAL STANDARDS

Monitoring

- RSPO 5.2.4 - Where a management plan has been created there shall be ongoing monitoring:
 - The status of HCV and RTE species that are affected by plantation or mill
 - operations shall be documented and reported;
 - Outcomes of monitoring shall be fed back into the management plan.
 - a. Does the management plan contain ongoing monitoring of status of HCV and RTE species that are affected by plantation or mill operations?
 - b. Is the status documented and reported?
 - c. Are the outcomes of monitoring fed back into the management plan?

Request of a Biodiversity Action Plan

- LEAF 8.1. - Landscape and Nature Conservation Audit includes map(s) with reference to the following key environmental features: areas and sites on farm with any statutory landscape designation; lakes, ponds and watercourses or semi-natural habitats; land on which other important species are found; lists of any important species recorded in the area or traditional buildings.
- SAI FSA63 - Have you assessed biodiversity and identified priority actions to preserve biodiversity on your farm?

An assessment includes:

 1. Identification of on farm rare and endangered species (plant and animal)
 2. Identification of priority actions that promote biodiversity on farm
 3. Take part in a biodiversity plan at landscape level if available and practical.

Small-scale farmers in lower income countries are able to explain the potential impacts of their operations on biodiversity and how they avoid potential negative impacts and create potential benefits of their operations on biodiversity.

The assessment should include plants, animals and soil. This assessment can be managed at landscape or group level and the assessment can be made by public or private bodies.

- SAI FSA64 - Do you have a biodiversity plan for your farm to maintain or improve biodiversity? The biodiversity plan is

reviewed annually and, if available and practical, is part of a biodiversity plan at landscape level.

Guidance: This plan can be a separate plan or a chapter in an overall farm management plan. Farmers are encouraged to have a biodiversity action plan for their farm which includes:

- A map of the location of areas or features important to biodiversity on and around the farm.
- Details of how provision is made for wildlife habitats and food sources through hedges, field margins, extensive pasture, etc.
- Measures to avoid degradation and deforestation of High Conservation Value Areas (HCV) areas or other ecologically sensitive areas.
- Assessment of possible disruption of biological corridors because of farm activities and if required, based on the assessment mitigation measures.
- This plan can be managed at landscape or group level and the review can be made by public or private bodies.

Qualification of workers and farmers

■ Fairtrade Small Producer Organizations 3.2.2 - You must provide training to your members on the subject of integrated pest management. Training must include:

- the monitoring of pests and diseases
- alternative ways to control pests and diseases
- preventive measures against pests and diseases
- measures to avoid that pests and diseases build up resistance to pesticides

Guidance: Alternative controls refer to methods other than the use of chemical pesticides. These can include biological controls such as the introduction of natural enemies or physical controls such as sticky traps to capture pests, as well as other means that serve to reduce and/or control the population of the pest. Preventive measures refer to cultivation techniques that may reduce the presence or the effects of pests. Your members are free to choose suitable measures. These can include crop rotation, ground covers, mixing compost with the soil, removing pest infested plants and plant parts and intercropping.

Cooperation with collective local/regional approach

■ FSC (page 43) - The Organization, through engagement with local communities, shall take action to identify, avoid and mitigate significant negative social, environmental and economic impacts of its management activities on affected communities. The action taken shall be proportionate to the scale, intensity and risk of those activities and negative impacts.

■ EUROPEAN/NATIONAL/REGIONAL STANDARDS

Request of an environmental management system

■ The specifications of the French Biocohérence label included a farmer self-diagnosis on agro-environmental, social and economic

practices. Bio Cohérence supports farmers based on the results of the self-diagnosis. The document has been built in order to increase the awareness of farms on environmental issues.

Qualification of workers and farmers

- The Bee friendly label requires that people working on a Bee friendly farm is trained to the identification and awareness about pollinators and their roles. Bee Friendly training sessions are organized in regions by the initiative of Bee Friendly with local partners
- Bee friendly - qualification of farmers Knowledge transfer on pesticide regulation and black list

Cooperation with collective local/regional approach

■ The French environmental certification (level 2) from the Ministry of Agriculture requires the involvement of farmers in collective action programs, if available in the respective geographical area of a farmer, that deal with the reduction of pesticide use.

■ COMPANY REQUIREMENTS

Request of a Biodiversity Action Plan

- Unilever SAC S3 - Suppliers have a responsibility to ensure that there is documented evidence that every farm either has an individual Biodiversity Action Plan (BAP) - OR shall themselves co-ordinate farmers' activities within a BAP that encompasses a range of activities across the farmed landscape from where raw materials are purchased.
- Unilever SAC - S4 The BAP shall include a map or other assessment of the farmed landscape including assessing the presence or absence of (i) rare, threatened or endangered species and habitats, (ii) parts of the landscape of High Conservation, (iii) parts of the landscape with value for biodiversity and (iv) parts of the landscape providing valued ecosystem services. The presence of any known wildlife corridors within the landscape shall be included in the documentation/map.
- Unilever SAC S5 - The BAP must include a list of actions that farmers can take to support biodiversity. These must be related to the local biodiversity priorities, and issues on which farming has direct or indirect influence. These can include discussions with NGOs and governments or priorities, and awareness-raising and training in the first year, but must thereafter move to pilot scale and actions on every farm. Progress over time must be shown, preferably by setting measurable goals on monitoring programme towards them.
- Unilever SAC F58 - The BAP should focus upon at least one of the following themes (A-G). Tick all those that apply for each farm separately.

A - If rare, threatened or endangered species or habitats exist locally, then the BAP must include an evaluation of the risks posed to the species or habitat, and commitment to maintaining/enhancing the farmed landscape for their benefit. The BAP in-

cludes a monitoring programme to determine if the plan is being successful.

B - If there are High Conservation Value forests, wetlands or other areas within or adjacent to the farmed landscape, on-farm BAP activities can be focused on enhancing these values.

C - Creating, maintaining and enhancing a network of natural vegetation ("wildlife corridors") along live fences, hedges, ditches, riparian strips, roadside and field margins across the landscape.

D - This may include actions such as: part of the farm being made available for river overflow (to prevent floods downstream), planting vegetation that encourages predators to help reduce pest-pressure, planting wild flowers to maintain pollinator populations, developing woodlots to reduce the pressure on local forests for firewood, maintaining sacred or archaeological sites etc.

E - If there are no specific biodiversity or ecosystem service priorities, the BAP, or options within the BAP, may concentrate on making general improvements to the landscape that are considered to have a positive value for biodiversity.

F - If alien or invasive species are a problem, then the BAP must include an evaluation of the size of the problem and commitment and action to practical improvement and a monitoring programme to determine if the plan is being successful.

G - If the Unilever crop or animal breed requires on-farm conservation of landraces, wild or rare varieties or rare animal breeds, the conservation programme may become the major component of any BAP. If this is the case, the BAP must include a description of the conservation goals and the programme in place to achieve these goals and monitoring data to show that progress is being made.

- Unilever SAC F59 - There must be improvements in biodiversity and ecosystem services management over time. The BAP shall include a timeline and monitoring system showing how the biodiversity/ecosystem service value of the farmed landscape has been maintained and improved over time.

Qualification of workers and farmers

- FANTA 1. Give the necessary training to the workers according to their functions, such as the phytosanitary manipulation card, where appropriate. Operators applying phytosanitary products must wear appropriate protective clothing and equipment according to the instructions given in the technical data sheets. Personal protective equipment (PPE) should be stored separately from plant protection products.
- NESTLÉ RSG 1. 5. Food waste and Post-Harvest Losses
Food waste and post-harvest losses are minimized.
 - Growers and processors adopt appropriate technology and systems to reduce postharvest losses and food waste.
 - Suppliers and farmers should gather evidence to inform future

interventions with the intention to focus attention in reducing post-harvest losses and other food waste along the value chain.

- Where post-harvest losses do occur, efforts are made to reduce losses to an acceptable minimum.

Cooperation with collective local/regional approach

- NESTLÉ RSG 2. Creation of shared value for society and local communities and Rural Development

Small scale producer access to Nestlé's supply chains is not disadvantaged through application of responsible sourcing guideline.

Small scale producers do not face undue or disproportionate obstacles to becoming a Nestlé supplier as a result of the implementation of these requirements.

6.5.3 Conclusions

Management

- ◆ Standards and companies should make clear improvements on the aspects Monitoring, Cooperation with Collective Local/Regional Approach, Cooperation with External Experts and Request of a Biodiversity Action Plan.
- ◆ Verifiability is both a prerequisite and a challenge for all standards. What can auditors accomplish? Can they determine if an ecosystem is intact and/or worth protecting? Auditors cannot maintain expertise in all aspects of biodiversity in all regions and animal families, but they are experts in assessing the quality of processes. Consequently, standards should—in particular international ones—primarily require processes and methods for the management of biodiversity.
- ◆ Efficient management, e.g. in a biodiversity action plan, includes:
 - Conducting a baseline assessment
 - Identifying direct and indirect impacts
 - Setting priorities (e.g. protection of water or particular species)
 - Setting measurable goals and designing possible actions (action plan)
 - Setting indicators and procedures for monitoring (e.g. dimension of ecological structures plus a few key indicator species, continuous monitoring, input from experts)
 - Collaboration with stakeholders (e.g. conservation authorities, nature conservation organisations, local communities, scientific institutions)
- ◆ A baseline assessment is not required in most standards. However, conducting a baseline assessment is a requirement for the implementation of criteria (e.g. when action plans are developed). Moreover, the positive impacts of criteria can only be determined if a baseline assessment has been completed and monitoring is conducted.

It is important to consider how detailed the baseline assessment should be so that it provides meaningful data while not overwhelming the farm operator. Standards should as a minimum require habitat mapping on the farm and adjacent areas. Operations in or adjacent to protected areas or „High Conservation Value Areas“ should also monitor animal and plant species that have been classified by regulating authorities as protected species and/or have been listed on the IUCN Red List.

- ◆ Standards can specify criteria for processes (e.g. requirements for the elaboration of a conservation plan) and can give guidance for a certain measure (e.g. species diversity of sown meadow). Based on this, certifiers can assess the quality of processes and conduct a basic evaluation of the action's quality. The success of the measure depends partly on external factors that the certifier cannot directly observe, but which rather have to be detected through monitoring.

- ◆ Biodiversity Action Plans should include specific measures with agronomic-related benefits, well explained, in order to avoid that these plans are an objective by themselves with no real implementation or no interest for farmers.
- ◆ We asked the screened standards and companies, if they provide training on biodiversity aspects for their assessors and certified farms or suppliers. The general feedback confirms that biodiversity is not an issue in capacity building activities. Biodiversity is a complex issue and the success of criteria and requirements depends strongly on the quality of the measures implemented. Therefore it is of great importance that standard organisations and companies include biodiversity aspects into their training activities. See also the point “Need of investment”.

Annexes

Annex 1 – List of standard organization and companies screened

STANDARD ORGANISATION / COMPANY	PRODUCTS
INTERNATIONAL STANDARDS	
Global G.A.P.	Aquaculture Dairy products Meat productions Fruits Vegetables Cereals and Legumes
LEAF	All products
EU Organic Farming	All products
FSC	Forestry products
PEFC	Forestry products
Standard for sustainable cattle production systems	Meat production
Certified Bee Friendly	Dairy production
Fairtrade	All products
UTZ Certified	All products
Rainforest Alliance	All products
SAI Platform	All products
Naturland	All products (including aquaculture)
RSPO	Palm Oil
EUROPEAN/NATIONAL/REGIONAL STANDARDS	
DO Ternera Extremadadura	Meat production
DOP Mertolenga	Meat production
DOP Charneca	Meat production
DOP Bravo Ribatejo	Meat production
DOP Carne Porco Alentejano	Meat production
DOP Carne Alentejana	Meat production
DOP Dehesa de Extremadura	Meat production

Sustentabilidade Garantida	Meat production
RSPCA	Meat production
Designation of origin	Vegetables
Bioland	Animal products/Crops and Legumes
Agri confiance	Dairy production
IP-Suisse	All products
High environmental value standard level 3 – option A	All products
Bio Cohérence	Vegetal productions/Animal productions
AOP Saint Nectaire	Dairy production
AOP Comté	Dairy production
Donau Soja	Cereals and Legumes
QS Standard	Fruits/Vegetables/Potatoes
Marque „Produits du Parc naturel regional des Volcans d’ Auvergne” pour les fromages et produits laitiers	Dairy production
Geprüfte Qualität Hessen	Cereals and Legumes
Qualitätszeichen Baden-Württemberg	Cereals and Legumes
Qualitätszeichen Rheinland-Pfalz	Cereals and Legumes
COMPANIES REQUIREMENTS	
Nestlé	Vegetables
CONESA	Vegetables
PASCUAL	Dairy products
FANTA	Fruits
Bel	Dairy products
Elipec	Meat production
Continente	Meat production
Programma Origens - Intermarché	Meat production
LU’Harmony – Mondeléz International	Cereals and Legumes
Unilever	All products
Kaufland	All products

Annex 2 – Glossary

Glossary of terms

■ **Alien species** A species, subspecies or lower taxon, introduced outside its natural past or present distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce. (Convention of Biological Diversity)

■ **Biodiversity** The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. (Convention on Biological Diversity)

■ **Convention on biological diversity (CBD)** The Convention on Biological Diversity (CBD) is an international legally-binding treaty with three main goals: conservation of biodiversity; sustainable use of biodiversity; fair and equitable sharing of the benefits arising from the use of genetic resources. Its overall objective is to encourage actions which will lead to a sustainable future.

The conservation of biodiversity is a common concern of humankind. The Convention on Biological Diversity covers biodiversity at all levels: ecosystems, species and genetic resources. It also covers biotechnology including through the Cartagena Protocol on Biosafety. In fact, it covers all possible domains that are directly or indirectly related to biodiversity and its role in development, ranging from science, politics and education to agriculture, business, culture and much more.

The CBD's governing body is the Conference of the Parties (COP). This ultimate authority of all governments (or Parties) that have ratified the treaty meets every two years to review progress, set priorities and commit to work plans. The Convention was opened for signature at the Earth Summit in Rio de Janeiro on 5 June 1992 and entered into force on 29 December 1993. At the 2010 10th Conference of Parties (COP) to the Convention on Biological Diversity in October in Nagoya, Japan, the Nagoya Protocol was adopted.

<http://www.un.org/en/events/biodiversityday/convention.shtml>

■ **Ecological infrastructures or farmland features** Farmland features are a critical environmental resource, forming the skeleton of the agricultural landscape or agriculture's 'green infrastructure'. They can be defined as spatially identifiable natural, semi-natural or man-made landscape elements. Some are integral to current farming systems, whereas others are relics of traditional systems long abandoned. They are classified in a number of ways, depending on the level of detail at which they are identified. A common classification of features is that developed by Bunce et al. (2005) which has been field tested in all of the major Environmental Zones in Europe (it is known as the BioHab classification system). It covers all habitats in Europe in a consistent manner and was developed to monitor changes in habitats and biodiversity.

Following the classical description of a landscape, the BioHab classification system clusters features in a farmed landscape into three categories:

- 1 **Point Features:** individual landscape components which cover a small part of the overall landscape, for example, single trees, small clusters of trees, ponds, monuments, windmills, buildings, cairns, tumuli and other archaeological remains.
- 2 **Linear Features:** landscape components that are linear in nature, for example, hedges, lines of trees, stone walls, terrace walls, banks, streams, ditches, margins and buffer strips, riparian strips, tracks, irrigation networks, drovers' roads and transhumance routes, fences and paths.
- 3 **Patch Features:** landscape components covering larger areas, for example, semi natural grassland, orchards, woodlands, waterbodies, dehesas, montados and large areas of rocky ground.

Farmland features provide a range of environmental benefits and ecosystem services. These include the maintenance of biodiversity through the provision of habitats and food sources and natural resource protection. In some cases they contribute to the mitigation of climate change through carbon sequestration and facilitate adaptation to climate change by enhancing the resilience of species, whilst also enabling them to disperse in response to changing conditions.

http://ec.europa.eu/environment/agriculture/pdf/IEEP%20_2008_%20Final%20Report.pdf

■ **Genetically Modified Organism (GMO)** An organism, the genetic material of which has been modified in such a way as is not possible in a natural manner by cross-breeding and/or natural recombination. (Naturland Standards on Production)

■ **High Conservation Value Areas (HCVs)** Habitats, which are of outstanding significance or critical importance due to their high environmental, socioeconomic, biodiversity or landscape values. The HCV concept was originally developed by the Forest Stewardship Council. It is now a keystone principle of sustainability standards as well as being widely used for landscape mapping, and in conservation in natural resource planning and advocacy. HCVAs may be part of larger habitats or may be an entire habitat. (HCV Network)

■ **Indicator species** A species whose status provides information on the overall condition of the ecosystem and of other species in that ecosystem. They reflect the quality and changes in environmental conditions as well as aspects of community composition. (Biodiversity A-Z)

■ **Invasive alien species** An alien species whose introduction and/or spread threaten biological diversity. (Convention of Biological Diversity)

■ **IUCN Red List** The IUCN Red List of Threatened Species™ provides taxonomic, conservation status and distribution information on plants, fungi and animals that have been globally evaluated using the IUCN Red List Categories and Criteria. This system is designed to determine the relative risk of extinction, and the main purpose of the IUCN Red List is to catalogue and highlight those plants and animals that are facing a higher risk of global extinction (i.e. those listed as Critically Endangered, Endangered and Vulnerable). The IUCN Red List also includes information on plants, fungi and animals that are categorized as Extinct or Extinct in the Wild; on taxa that cannot be evaluated because of insufficient information (i.e., are Data Deficient); and on plants, fungi and animals that are either close to meeting the threatened thresholds or that would be threatened were it not for an ongoing taxon-specific conservation programme (i.e., are Near Threatened). (www.iucnredlist.org)

■ **Mitigation hierarchy** The mitigation hierarchy is defined as:

- » **Avoidance:** measures taken to avoid creating impacts from the outset, such as careful spatial or temporal placement of elements of infrastructure, in order to completely avoid impacts on certain components of biodiversity.
- » **Minimisation:** measures taken to reduce the duration, intensity and/or extent of impacts (including direct, indirect and cumulative impacts, as appropriate) that cannot be completely avoided, as far as is practically feasible.
- » **Rehabilitation/restoration:** measures taken to rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/or minimised.
- » **Offset:** measures taken to compensate for any residual significant, adverse impacts that cannot be avoided, minimised and or rehabilitated or restored, in order to achieve no net loss or a net gain of biodiversity. Offsets can take the form of positive management interventions such as restoration of degraded habitat,

arrested degradation or averted risk, protecting areas where there is imminent or projected loss of biodiversity.

A key principle is that offsets cannot provide a justification for proceeding with projects for which the residual impacts on biodiversity are unacceptable. This means that the avoidance options have to be considered seriously in harmful cases.

(Glossary European Commission and Business and Biodiversity Offsets Programme (BBOP))

■ **No net loss; Net positive impact (gain) of biodiversity**

See definition for Mitigation hierarchy.

■ **Organism** Any biological unit capable of reproduction or passing on genetic material.

(Natuurland Standards on Production)

■ **Semi-natural areas** Areas modified by human influence but retaining most natural features such as species diversity and species interrelation complexity. (INBio Costa Rica)

■ **Soil biodiversity** Millions of microbial and animal species live in and make up soils, from bacteria and fungi to mites, beetles and earthworms. Soil biodiversity is the total community from genes to species, and varies depending on the environment. The immense diversity in soil allows for a great variety of ecosystem services that benefit the species that inhabit it, the species (including humans) that use it, and its surrounding environment.

<http://www.globalsoilbiodiversity.org/?q=BackgroundSoilBiodiversity>

The Convention on Biological Diversity (CBD) defines soil biodiversity as „the variation in soil life, from genes to communities, and the ecological complexes of which they are part, that is from soil micro-habitats to landscapes“.

<http://eusoils.jrc.ec.europa.eu/library/themes/Biodiversity/>



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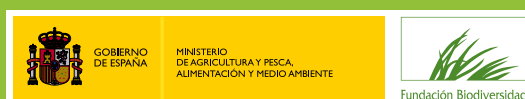


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