

Assessing the EU BAP and its implementation –

A failure of delivery or a failure of approach?



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Executive summary

Clearly the EU Biodiversity Action Plan is up to now the most comprehensive document at EU level to deal with biodiversity and to identify actions to halt its loss by 2010. However, its mid-term review shows serious shortcomings in its implementation, while the Belgrade Assessment by the European Environment Agency shows the insufficient progress towards the 2010 target.

In our assessment we were looking for the reasons behind these shortcomings and examined how they can be overcome most effectively at EU level. We analysed the most important BAP actions supporting the ten objectives, and examined the direct reasons of the lack of delivery. However, it is not enough to identify and tackle these direct reasons, but the drivers behind these reasons need to be considered, too. The DPSIR (drivers-pressures-state-impact-response) model developed by the EEA provided the framework for our analysis.

Our findings reveal the deeply underlying cultural, institutional and structural drivers, which ultimately hinder the implementation of the more than 150 BAP actions. As our assessment shows, without tackling these drivers, the actions envisaged in the EU BAP cannot be fully realised, or even with enhanced efforts they will not deliver the desired results. On the contrary, strengthened efforts in some cases can even contribute to the drivers and thus indirectly to biodiversity loss (as for instance in the case of biofuel production). Consequently the problem of biodiversity loss cannot be tackled with biodiversity conservation measures alone, and even efforts for sectoral integration seem insufficient.

Our recommendations for the future thus on one hand identify short term priority actions at EU level, and on the other hand target the drivers through long term priority measures, which create an enabling socio-economic framework for the delivery of BAP actions both at EU and MS level. These effective tools require a holistic approach, but can respond to environmental problems like biodiversity loss or climate change at the same time.

Table of content

Executive summary	3
1. Assessment of the EU BAP and its implementation	5
1.1. General overview	5
1.2. POLICY AREA 1: Biodiversity in the EU	10
1.3. POLICY AREA 2: The EU and global biodiversity	16
1.4. POLICY AREA 3: Biodiversity and climate change	17
1.5. POLICY AREA 4: The knowledge base	19
1.6. THE FOUR KEY SUPPORTING MEASURES	19
1.7. MONITORING	20
2. Main conclusions	22
3. Recommendations	23

1. Assessment of the EU BAP and its implementation

1.1. General overview

The Biodiversity Communication (COM(2006) 216 final) is the most comprehensive EU level policy document to deal with biodiversity and to identify actions to halt its loss. The document identifies the main pressures behind biodiversity loss correctly: habitat fragmentation, degradation and destruction, over-exploitation, the spread of invasive alien species and pollution. It also identifies some of the drivers behind these pressures, namely climate change, population growth and growing per capita consumption, governance failures, the failure of conventional economics to recognise the economic values of natural capital and ecosystem services, as well as globalisation, including European trade.

However, a deeper analysis reveals many more drivers and interactions related to biodiversity loss, for which the DPSIR (drivers-pressures-state-impact-response) model adopted from the EEA model provides a useful causal framework (figure 1.). It describes the interactions between society and environment. In our analysis the *state* of environment is the biotic condition, i.e. biodiversity at genetic, species and ecosystem level. *Pressures* exerted by the society change the state of environment. They include the release of substances (emissions), physical and biological agents, the use of resources and the use of land. *Drivers* are the social, demographic and economic developments in societies, which manifest themselves in the exerted pressures. *Impacts* on human and ecosystem health, as well as resource availability result from the adverse changes of the state of environment. *Responses* are the measures taken to address drivers, pressures, state or impacts by the society.

It is important to stress that – as the Brundtland report pointed out – the issues of environment and development are inherently interlinked. It means that in a thorough analysis the pressures, drivers and impacts will be the same in the case of all environmental problems, let they be biodiversity loss, climate change, waste or air pollution. The same drivers are behind these environmental problems, and the pressures, responses and impacts interlink the various environmental issues.

Taking a closer look at the driving forces, they have different roles and characteristics in the socio-economic framework. Structural drivers (e.g. consumption and production patterns, infrastructures, urban structures) are rather static, which are hard to change in the short term and require continuous investment for maintaining their function in the society and economy. Institutional drivers (e.g. economic and legal regulations, sectoralisation in

institutions, the education system) determine the structural drivers through setting the framework for economic and social activities. Cultural drivers (the knowledge, approach, values of the people) are the most deeply underlying root causes, which determine the institutional drivers and indirectly the structures and environmental pressures in each case. However, failing to recognise these same root causes behind the environmental problems we take small pieces from the mass of problems and only manage to realise the impacts, giving end-of-pipe solutions. This leads to the further sectoralisation of the environment sector and often results in incoherent and contradictory policies.

Lacking a holistic approach, the EU Biodiversity Action Plan includes more than 150 measures, which, however, first of all target pressures, and can influence only some of the drivers to a very limited extent. Thus the BAP actions try to tackle the results of our consumption and production patterns, sectoral institutional system, economic regulatory framework and material values, among many others. The complex nexus of cause-effect relationships which connect biodiversity changes and socio-economic trends is not sufficiently revealed and the underlying problems remain untouched both by biodiversity and other EU policies. With this the BAP takes the same flawed approach as other environmental policies by applying end-of-pipe solutions without delivering substantial results for the overall environment. Unfortunately the 2008 BAP mid-term review does not point out these shortcomings or call for additional actions, discussions, etc. either.

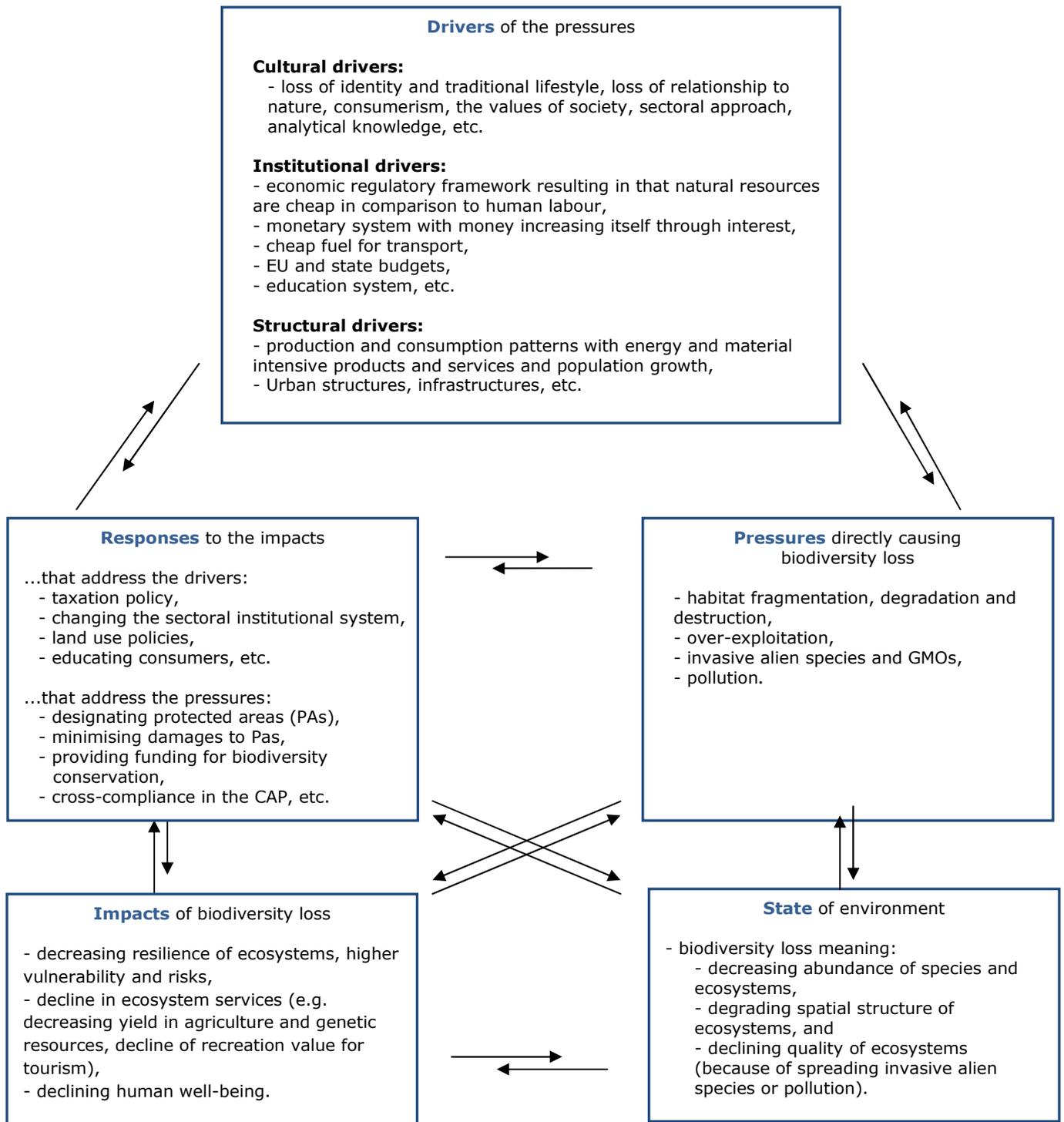


Figure 1. Biodiversity loss in the DPSIR model

Beyond exploring the relationships among the socio-economic drivers, the resulting environmental pressures and the state of environment, it is also important to closely examine how the state of environment is exactly changed by the various human impacts. Environment is a single entity and is undividable, as none of its elements like water, air, soil, living creatures and built environment, can exist without the other. The environment is the

interaction of all these. Consequently, it is a mistake to split the environment into different parts and to distinguish environmental elements that require separate policy measures. Namely these fragmented policy measures often achieve the mitigation of environmental pressures on the expense of increasing environmental pressure elsewhere – shifted in space or time. On the contrary, holistic environmental policy considers that the one and undividable environment has three attributes: the quality of environment, the amount of natural resources and the spatial structure (figure 2.).

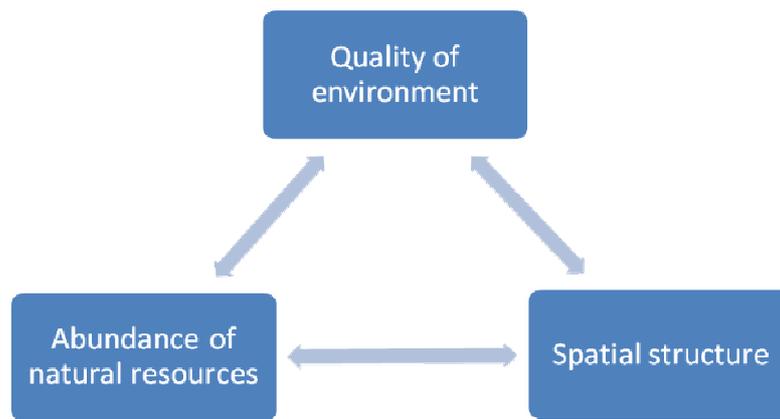


Figure 2. The three attributes of environment

The problem of fragmented environmental policies can be illustrated with the example of climate change. It has become already widely recognised that inappropriate climate change mitigation measures can contribute to shifting environmental pressure, resulting in biodiversity loss. Climate change mitigation measures first of all focus on the emission reduction of greenhouse gases, i.e. try to improve the quality of environment through reducing pollution. One way of doing this is the production of energy from biomass for heating, transport or other purposes. However, this often means bringing new, often marginalised areas into intensive land use, which leads to the loss of (semi-)natural ecosystems, increased water extraction needed for irrigation, or pollution through the use of pesticides and fertilisers. Depending on the location of the area concerned, this change can also further destroy the connectivity among natural ecosystems and thus make species even more vulnerable to climate change. In this case the improvement of the air quality (through the reduction of greenhouse gas emissions) is in trade-off with the abundance of natural resources (through the disappearance of (semi-)natural ecosystems and increased water extraction), the quality of water and soil (through increased fertiliser and pesticide use) and with the spatial structure (if the land use change further destroys ecological connectivity).

This shifting of environmental pressure can happen even if intensively used areas are switched to biomass production, for instance because of the related higher agricultural subsidies. This often induces indirect land use changes with similar consequences, which are particularly difficult to regulate within the conventional policy framework. An additional, and not insignificant problem is that this newly generated renewable energy from biomass does not replace, but usually add up to the existing energy production capacities.

But trade-offs can happen not only between different environmental fields, like climate change and biodiversity, but also within the same field of the fragmented environmental policy. Even climate change mitigation and adaptation measures are ultimately contradictory without an appropriate regulatory framework. While mitigation measures include the reduction of greenhouse gas emissions, adaptation measures aimed at the treatment of the impacts (weather extremes like heat waves, floods, storms, etc.) in most cases imply the use of natural resources and energy (needed for dams, cooling systems, irrigation systems, etc.), which directly and indirectly leads to greenhouse gas emission increase and thus causes a positive feedback in climate change.

We can see that without a holistic regulatory framework in place that ensures the respect of the global carrying capacity, the total environmental pressure will not decrease, but on the contrary generate additional environmental problems elsewhere. It is also shown by the DPSIR model that this holistic regulatory framework requires economic, legal and other policy tools that can give response to all of the socio-economic drivers at the same time, and thus reduce the whole set of environmental pressures.

1.2. POLICY AREA 1: Biodiversity in the EU

HEADLINE TARGET: Biodiversity loss of most important habitats and species halted by 2010, these habitats and species showing substantial recovery by 2013

The conservation of habitats and species of Community importance is a cornerstone of EU biodiversity policy. The Habitats and Bird Directives are the main tools for implementation, which provide for the establishment and management of Natura 2000, complemented by additional protection requirements.

With species and habitat level conservation in the focus, EU biodiversity policy has introduced some new and even innovative aspects: it provides for the designation of Natura 2000 on purely scientific ground, and requires MSs themselves to find the most appropriate management tools for achieving favourable conservation status of species and habitats of Community importance, let they be on or outside the designated Natura 2000 sites. It also aims to maintain a balance between socio-economic and conservation interests so that they both can exist parallel. Altogether the EU nature directives have put about 20% of the European surface under effective conservation management, which is a unique achievement in biodiversity conservation on a global scale. For the protection of species and habitats within the Natura 2000 sites, the nature directives provide for some important measures: the external pressures on the Natura 2000 sites are to be controlled among other measures through the requirements of article 6., but prevention of potential conflicts originating from investment projects could be achieved through Strategic Environmental Assessments of plans and programmes as well. In addition, appropriate financing is to be secured for the Natura 2000 implementation.

The intention of the directives and the supporting BAP actions are clear, but the measures identified cannot altogether stabilise or decrease the pressures originating from over-exploitation, land use changes, pollution and spread of biological agents on Natura 2000. BAP actions A.1.1.1.-A.1.1.5 mainly target the state of environment (e.g. through compensatory measures) and the significant pressures on the sites (e.g. through the application of SEA, EIA and other assessments under article 6.), but only to a very limited extent the socio-economic drivers behind. While conservation and assessment tools and their enforcement are improving also due to BAP implementation, and the available financing also seems to increase to some extent (though much more improvement would be necessary in all these fields), the external pressures are growing even more. The growing pressures are enhanced by the Lisbon process on growth and competitiveness and the recent stimulus package responding to the economic crisis. Boosting the economy is regarded as a

high priority enjoying strong political support, but within the current economic and monetary framework it inevitably leads to environmental destruction. And the given responses of nature conservation targeting the state of environment and the environmental pressures cannot offset these trends.

The high number of legal cases at national and EU courts in which infrastructural plans conflict with Natura 2000 also indicates the strong economic pressure on the network. In some cases, e.g. in the Rospuda valley, the conservation interests is defended but in other many cases the “overriding public interest” that gives the way to projects damaging Natura 2000 sites is defined in support of boosting the (energy and material intensive) economy. It is obvious, that as long as it is not defined what “overriding interest” of the wider public really is, the decision will tend to favour the economy reflecting the general structural drivers of today’s society. As a recent study¹ on the Trans-European Transport Networks (TEN-T) and Natura 2000 shows the aim to build a coherent European transport network is in deep conflict with maintaining the coherent European biodiversity network with nature on the loser’s side. Unfortunately there is strong indication, that the compensatory measures that are to offset the damage done by infrastructure projects often have poor result. They cannot fulfil their original goal as reconstructed nature is rarely comparable to the original state.

Thus we can say that both the conservation status of species and habitats and the coherence and connectivity of the network are under an increasing pressure, and the conservation tools try to keep up offsetting these trends in a response, without a real chance of achieving an altogether positive end result for biodiversity. In the end profit interests often prevail over biodiversity interests because the intrinsic value of biodiversity is not acknowledged, nor is the role of biodiversity in providing ecosystem services and contributing to human well being understood.

It is important to realise that the conservation of the species and habitats of Community importance can be only achieved if there is a total limit of environmental pressures in the Community. Without this the growing pressures affecting Natura 2000 sites will prevent the network to achieve its original goal. Limiting the total environmental pressure shall include the absolute limiting of the use of natural resources and the use of land. Without new and appropriate policy tools that can make it happen, the current measures cannot offset the increasing pressures from the other sectors, because their full implementation is prevented by the underlying socio-economic drivers.

¹ TEN-T and Natura 2000: the way forward, 2008

HEADLINE TARGET: In wider countryside (terrestrial, freshwater, brackish water outside Natura 2000 network), biodiversity loss halted by 2010 and showing substantial recovery by 2013.

The BAP identifies sectoral integration measures which shall ensure that agriculture, forestry and other sectors contribute to biodiversity conservation in the wider countryside. On one hand specially designed regimes shall give a major contribution. For example actions A 2.1.3 on high-nature value farmland and forest areas and A 2.1.7 on less favoured areas shall – similarly to protected areas and the Natura 2000 approach – improve the management of selected sites. On the other hand the whole of the sectors shall improve their contribution to biodiversity conservation through generally applicable measures (A 2.1.4 and A 2.1.9 actions on cross-compliance and A 2.1.13-15 actions on forestry).

The BAP mid-term review shows the efforts made for maximising the benefits from CAP payments to biodiversity (e.g. guidance for MSs, safeguard clauses in Rural Development Plans attached to measures with potential adverse impacts on biodiversity). However, the Commission also proposed to abolish set-aside under the “CAP Health Check” exercise, and the system of cross-compliance might also become under pressure.

These controversial results in sectoral integration are not surprising. The sectoral conflicts between agriculture, forestry, water management and biodiversity are deeply rooted in the socio-economic framework, and cannot be easily resolved through targeted and separate actions as it is envisaged in the BAP.

Without giving a full analysis of the sectoral conflicts between biodiversity and agriculture, it is interesting to examine some of the most important underlying drivers. The nature directives and the BAP require adequate financing to Natura 2000, as well as for other measures beneficial for biodiversity (action A2.1.1). However, more environmentally friendly products are not competitive on the national and global market, because cheap and apparently unlimited natural resources make it more profitable to invest into energy and material intensive activities even on the expense of natural capital loss (here the economic regulations are the institutional drivers of biodiversity loss). Additional EU and national funding might compensate for this income loss, but its total amount is limited by the available budget and the economic priorities. Besides, several factors hinder the effectiveness of this funding, such as the delays in introduction of support for Natura 2000 sites in many MSs, low awareness among farmers, low allocation of this type of funding on national level or extra administration. Because of these conflicting interests and the limiting factors environmentally friendly agriculture remains limited in extent and cannot achieve a major

positive land use change on the fields.

Consumption patterns (which are structural drivers) also favour cheaper products (e.g. food) with larger external costs to quality products from environmentally friendly production. Awareness raising activities can positively influence these consumption decisions, but their impact is limited, if the economic incentives are just the opposite. An example for this is the market share of organic food even in the most conscious regions and MSs, the highest being in Austria with 5.4% of the domestic market (data from 2006²).

Another structural driver is that local markets for local products have diminished, and the supplies of cities highly depend on agribusiness. This is a result of the urban sprawl originating from the restructuring of economy in the last decades and even centuries. More and more people find employment in the industry and nowadays increasingly in the service sector, while less people stay in agriculture and produce the same or increasing amount of food and other agricultural products for the whole society. This inevitably requires increased productivity in agriculture, realised with a decreasing number of farmers. This structural change is made possible of course with the support of the economic regulation: the prices of natural resources (needed in higher amounts for intensive agriculture and industry) are cheaper than human labour (needed in higher share in extensive land use systems).

Thus considering all the influencing factors, within the current economic framework it is not an economic interest of the state to substantially increase the share of environmentally friendly production in the agricultural fields through substantial funding, as it would threaten the international competitiveness of its agricultural sector. In order to resolve this conflict of interest on national and EU level and thus achieve the headline target, a substantial economic reform is needed, which prefers extensive land use with less material and energy input but higher human labour in the production systems. Such changes, however, go beyond any CAP reform, which is confined to the agricultural subsidy system alone, and also go beyond the incorporation of economic values of biodiversity into the current economic regulatory framework, which alone cannot tackle the current systemic failures either.

Nevertheless, limiting natural resource and land use would correctly balance the costs of natural resources and human labour. Thus limiting the use of natural resources and land is an important precondition to stop biodiversity loss not only on Natura 2000 sites, but also in the wider countryside.

² Source: Survey by Aberystwyth University/Institute of Rural Sciences, Agromilagro Research, FiBL and ZMP

HEADLINE TARGET: Regional and territorial development benefiting biodiversity, and negative impacts on biodiversity prevented and minimised or, where unavoidable, adequately compensated for, from 2006 onwards.

The BAP has correctly identified that halting biodiversity loss is not possible without tackling the pressures from regional and territorial development. The most important tools identified for this are Strategic Environmental Assessments for plans and programmes, and in particular for Operational Programmes (OPs), as well as Environmental Impact Assessments for projects. The mid-term assessment shows that the biodiversity dimension in SEAs has been assessed in general terms in most cases of the OPs, and the SEA of the regional programmes did not contain specific recommendations concerning biodiversity, except for most OPs on transport or large infrastructures when projects were likely to cross Natura 2000 areas. This shows the lack of good common practice on how to apply SEAs for the benefit of biodiversity.

Besides, a major shortcoming of the current regulation is that not all normative and development decisions are subject to SEAs. A most important field missing from the regulation is budgetary decisions both at national and EU levels. Clearly the available resources greatly determine the efficiency and the scale of impacts of the different measures, let they support biodiversity conservation or just the opposite, environmental destruction. Without assessing this, it is not possible to minimize the negative impacts on environment and biodiversity, and it is also difficult to realise a substantial CAP reform.

Another shortcoming lies in the methodological limitations of SEAs. Different plans and programmes (e.g. related to climate change mitigation and adaptation, ecological networks, infrastructural plans) are assessed independently from each other, which does not allow for the assessment of synergistic effects. Thus the total environmental pressure on biodiversity cannot be taken into account and the true costs of the plans and programmes cannot be assessed. A similar problem is that only significant and local/national environmental impacts are considered in both SEAs and EIAs, but global and insignificant ones are out of the scope. For instance if each landowner inside a Natura 2000 site cuts a single tree, it is technically and socially virtually impossible to apply article 6. against each landowner, yet the total effect of all those trees can be devastating (the problem of “death by a thousand cuts”). EIA and SEA do not allow for the assessment of cumulative effects of different sectors on regional, national or community levels – e.g. growth in resources use or in land use. When assessing the expected impacts separately they might all seem insignificant, but altogether they can lead to substantial changes in the environment. Again, there needs to be an absolute limit on the input side of environmental pressures (use of resources and land), as

the current policy tools are not sufficient to tackle the various pressures separately.

HEADLINE TARGET: Negative impacts on EU biodiversity of IAS and alien genotypes prevented or minimised from 2010 onwards.

At this point it still cannot be known what measures the future EU regulatory framework on IAS (action A5.1.1) will contain. However, it can be only effective, if appropriate responses are given not only on the pressures that IAS directly exert on biodiversity, but also to the underlying socio-economic drivers as well. These drivers are closely linked to the increasing international transport of goods and persons, which is made possible by the relatively low transport costs. These low costs make it economically viable to transport even basic goods thousands of kilometres away, with high external costs for the environment while also opening the pathway to IAS. Consequently while developing measures to prevent, control and eradicate IAS and mitigate their impacts on biodiversity, it is similarly important to focus on prevention on global level, so that the introduced measures are not offset with an ever increasing pressure resulting from the growing global transport. Limiting the use of natural resources (which is also linked to limiting energy use) would have a beneficial effect on these drivers behind the spread of IAS as well.

Ensuring the protection of biodiversity in the case of releasing GMOs into the environment (action A5.2.2) requires sound scientific basis in the authorisation procedure. However, the positions of MSs on the use of GMOs and also some scientific results seem controversial. These debates are limited though to the direct effect of GMOs on the human health and environment, while economic interests might be in the background in favour or against them. At the same time it is not investigated and discussed appropriately, how GMOs can live up to the social and environmental challenges that they are said to respond to. While famine and undernutrition are linked in many ways *inter alia* to the problems of distribution of food and trade, the collapse of agricultural production systems in many places due to wars, changes in the tribal system and urban sprawl, the solution seems to be not a merely technological one. With this GMOs might be an expensive and inappropriate answer to the wrong question, with at least some (lower (?) or higher (??)) environmental and human health risks involved. Unfortunately though, the BAP and its review do not see the need of looking at the global socio-economic context of the use of GMOs in a holistic manner. Again the drivers behind the problems are ignored in the discussions and the problems and socio-economic challenges are targeted in a less effective way.

1.3 POLICY AREA 2: The EU and global biodiversity

TARGET: International governance for biodiversity substantially more effective in delivering positive biodiversity outcomes by 2010.

The Convention on Biological Diversity is clearly the most coherent multilateral environmental agreement to conserve biodiversity. It also covers a wide range of issues, going beyond in situ and ex situ conservation to sectoral integration, incentives, sharing of benefits or indigenous knowledge. However, the implementation of the CBD sees a lot of shortcomings at both national and Community levels, similarly to the BAP actions, which are discussed above. Only a more holistic approach to biodiversity conservation, which explores the cultural, institutional and structural drivers and identifies the necessary systemic responses to them can improve the effectiveness of international governance for biodiversity. The common driving forces behind the various environmental problems substantiate the development of a common framework for international environmental governance, and the negotiations on the Post 2010 Strategic Plan provide a valuable opportunity for opening up such discussions. Limiting the total environmental pressure through limiting natural resource and land use as well as controlling emissions and biological agents is the only possible way to achieve the target. Of course such global policy framework would also touch upon international trade, the economic regulations leading to over-exploitation. In a globalised world, where environmental problems have become a common challenge of mankind and the possibilities of introducing systemic changes are limited on national level, such international discussions and agreements are essential.

TARGET: Financial resources flowing annually to projects directly benefiting biodiversity has substantially increased in real terms (for period 2006-2010 compared with period 2000-2005; and again for period 2011-2013).

TARGET: EU 'mainstream' external development assistance delivering enhanced biodiversity and related livelihoods benefits, and negative impacts on biodiversity prevented or minimised, from 2006 onwards.

The global aspect of financing projects and development schemes experiences similar problems as at EU level. Ensuring financing for biodiversity projects cannot alone ensure that environmental pressure on biodiversity is decreasing. Besides, external development

assistance exports the same development patterns to the developing countries, which entail the same cultural, institutional and structural problems leading to biodiversity loss as in the EU. Due to the lack of comparable environmental standards, this often leads to even greater environmental problems than in Europe.

TARGET 8.1: Impact on biodiversity of EU trade significantly reduced by 2010 and again by 2013.

As correctly identified by the Biodiversity Communication, globalisation and trade are among the drivers behind the environmental pressures leading to biodiversity loss. With globalised trade environmental problems are further expanded in scope, in a global environment where uniform environmental standards are not in place. However, the identified tools, like trade-related Sustainability Impact Assessments (actions A8.1.1 and A8.1.5) and negotiations in the context of WTO and the Doha Development Agenda (actions A8.1.1, A8.1.2 and A8.1.5) do not aim to change the economic framework through limiting the input (natural resources and land) into the economy, although this would also substantially reform trade relations. Within such a changed framework the developed world takes a smaller share than what it does today, and the global ecological footprint is reduced.

1.4 POLICY AREA 3: Biodiversity and climate change

HEADLINE TARGET: Potential for damaging impacts, related to climate change, on EU biodiversity substantially reduced by 2013.

The BAP recognizes the strong interdependencies between biodiversity and climate change, and the critical role of healthy ecosystems in strengthening resilience to climate change and other environmental stresses. However, this principle is considered mostly when it comes to adaptation to climate change. It is important to note that natural surface cover is very important both for adaptation and for mitigation, through its direct role in regulating climate. As scientific assessments show, the role of ecosystems is comparable in global CO₂ budgeting to fossil fuel emissions (5 Pg/year Co₂ absorption capacity of land and ocean ecosystems and 1.5 Pg/year Co₂ emission through deforestation compared with 7.6 Pg/year

CO₂ emission from fossil fuels³). It is vital for every country to ensure the best possible operation of ecosystem services by saving their natural interactions and structures. By protecting the natural functions of ecosystems we protect ourselves against climate change even if the limitation of greenhouse gas level exerts its impact in the longer term. Therefore it is absolute necessary to limit further degradation of green areas, as well as to stand for the largest possible reconstruction of natural vegetation cover. Nevertheless, the role of biodiversity in mitigation is not considered sufficiently in current climate change policies, although it should be in its focus with the same priority as greenhouse gas emissions.

There is already a Commission Communication on deforestation, saying that within the framework of the UNFCCC negotiations, the EU calls for halting global forest cover loss by 2030. However, further fundamental changes in land use and spatial planning within the EU are necessary. The BAP promotes spatial planning which spotlights sustainable land use and takes account of ecological requirements and specific local factors, to avoid further losses of biodiversity. But at the same time, as a result of the socio-economic drivers economic interests are still given priority in spatial planning, playing down traditional land use techniques adapted to the local characteristics, and (especially in the new MSs) urging for more and more infrastructure development and greenfield investments, which makes natural habitats even more isolated and fragmented. This is exactly the opposite than what is needed: the man made infrastructures form a coherent network, while natural ecosystems are disconnected. It would be necessary to change this trend for maintaining ecosystem functions and ecosystem services in any way. But under a changing climate this is much more pressing than before: in order to enable ecosystems to counteract climate change, a mosaic-like, diverse landscape should be preferred providing diverse connections between natural habitats, so that migration and on a longer time scale, evolution can operate.

Both biodiversity policy and climate change policy must be integrated in a holistic environment policy, in order to preclude making separate sectors competing with each other. An effective climate change policy targets three kinds of pressure with the same priority: (1) greenhouse gas emissions, (2) qualitative and quantitative degradation of (semi)natural habitats and (3) excessive use of natural resources. Eventually both adaptation and mitigation need the same measurements, a new economic macro-structure with lower demand for natural resources and land. The economic regulatory framework should be fundamentally changed, to make extensive agriculture competitive and viable in the market, to limit further building-in of green areas, and to rationalize the already available infrastructure, instead of enlarging it. Parallel to our lower demand of land, more and more space should be rewilded and given back to natural processes. However, these

³ Le Quéré, unpublished; Canadell et al. 2007, PNAS

interconnections are not discussed in the BAP and its review either. Even if such measures would be necessary for limiting temperature increase and thus the damaging impacts on biodiversity in order to realise the headline target.

1.5 POLICY AREA 4: The knowledge base

TARGET: Research findings on biodiversity and ecosystem services has substantially advanced our ability to ensure conservation and sustainable use by 2010 and again by 2013.

The identified BAP actions in order to improve the knowledge base are all useful for biodiversity conservation. However, the target will not be achieved, if we do not have understanding how the socio-economic driving forces generate environmental pressures and what policy responses can change their course. Thus research shall be enhanced on the drivers for environmental pressures, which is totally missing from among the identified measures. This action would complement the similar actions calling for enhanced research on the state of biodiversity (A 10.1.3) and on the most significant pressures (A 10.1.4).

1.6 THE FOUR KEY SUPPORTING MEASURES

The identified key supporting measures related to financing, decision-making, partnerships and public education are necessary for the implementation of any effective EU policy. However, in the light of the above discussed problems it is a serious shortcoming that the socio-economic policy context of the identified BAP targets is not considered when the concrete actions were identified. The only attempt for this is related to the understanding of the values of ecosystem services and expansion of incentives for safeguarding biodiversity (action B2.1.2). Nevertheless, if the values of ecosystem services are incorporated into the current economic framework instead of changing the economic framework itself so that it values ecosystem services, then this might not change the fundamental drivers and reduce the pressures on biodiversity eventually.

It would be necessary that the envisaged debate on the vision and future biodiversity policy goes deeper into complex relationships between biodiversity loss, environmental pressures and the socio-economic drivers. Otherwise biodiversity policy continues to produce end-of-pipe solutions and the target of halting biodiversity loss will never be achieved.

1.7 MONITORING

The mid-term review noted the progress with the SEBI 2010 initiative, the first set of 26 biodiversity indicators will be published by the EEA in the first half of 2009. However, these 26 indicators do not address the driving forces behind the changes, but only reflect on the pressures, state, impacts and responses. Thus policy makers and the whole society do not receive a feedback on the underlying socio-economic trends, which generate the various environmental pressures, and it is not possible to measure the effectiveness of sectoral integration. Without this, we do not have a clear picture on the progress towards the 2010 target. Unfortunately though the mid-term review does not highlight this shortcoming and does not call for further work on monitoring the drivers either.

Indicator	Indicator type
1 Abundance and distribution of selected species	State
2 Red List Index for European species	State
3 Species of European interest	State
4 Ecosystem coverage	State
5 Habitats of European interest	State
6 Livestock genetic diversity	State
7 Nationally designated protected areas	Response
8 Sites designated under the EU Habitats and Birds Directives	Response
9 Critical load exceedance for nitrogen	Pressure
10 Invasive alien species in Europe	Pressure
11 Occurrence of temperature-sensitive species	State
12 Marine Trophic Index of European seas	State
13 Fragmentation of natural and semi-natural areas	Pressure
14 Fragmentation of river systems	Pressure
15 Nutrients in transitional, coastal and marine waters	Pressure
16 Freshwater quality	Pressure
17 Forest: growing stock, increment and fellings	Pressure
18 Forest: deadwood	State
19 Agriculture: nitrogen balance	Pressure

20 Agriculture: area under management practices potentially supporting biodiversity	State/Response
21 Fisheries: European commercial fish stocks	Pressure
22 Aquaculture: effluent water quality from finfish farms	Pressure
23 Ecological Footprint of European countries	Pressure
24 Patent applications based on genetic resources	Response
25 Financing biodiversity management	Response
26 Public awareness	Response

Table 1. Types of the first set of biodiversity indicators⁴

⁴ Halting the loss of biodiversity by 2010: proposal for a first set of indicators to monitor progress in Europe, EEA Technical report No 11/2007, Copenhagen

2. Main conclusions

- Biodiversity loss cannot be halted, if the total environmental pressure in terms of natural resource use, land use, pollution and the spread of alien biological agents is not limited
- Environmental pressures are continuously maintained by the cultural, structural and institutional driving forces, which form the socio-economic framework
- The BAP does not respond to the various socio-economic drivers behind environmental pressures and thus the environmental pressures cannot be tackled even with improved conservation tools
- If not all the drivers are tackled, then pressures will be regenerated and biodiversity will continue to decline
- If the cultural, structural and institutional drivers behind the environmental pressures leading to biodiversity loss are tackled, that would tackle all other environmental problems as well
- Environmental policy needs to take a holistic approach to environment, equally considering its three attributes: the amount of natural resources, the spatial structure and the quality of ecosystems, in order to avoid trade-offs among them, i.e. the shifting of environmental pressures in space or time

3. Recommendations

Halting the loss of biodiversity is possible in the long term within a properly functioning market economy, which is able, by taking a holistic approach, to ensure the sustainable use of natural resources, the good quality of the environment, the coherence of ecosystems, as well as social justice. Whilst immediate implementation of already identified conservation measures, and some additional ones, is essential in the short term, it is indispensable to complement these efforts with the design and implementation of long term measures which can lead to fundamental changes in the socio-economic drivers underlying biodiversity loss. These measures should bring about the lowering of total environmental pressure to a level that stays within the global ecological carrying capacity.

RECOMMENDATION 1. Put an absolute limit on total natural resource and energy use and ensure the sustainable use of biodiversity. Applying input side regulation to the economy is the only effective way to decrease total environmental pressure. This would create the right balance between the use of natural resources and human labour in the production process, and thus contribute to achieving full employment. This would shift the production and consumption patterns towards less energy- and material-intensive products and services, and positively change the values of society by making people appreciate natural resources more, including healthy ecosystems. As production and consumption patterns fundamentally change, the sustainable use of biodiversity, including the management of Natura 2000 sites, becomes more profitable for the land owners. Similarly, this would make a substantial contribution both to improving the coherence of ecosystems and to limiting pollution and the spread of invasive alien species and use of GMOs, by creating an enabling socio-economic environment for effective policies and legal regulation in those fields.

Long term priority measures

Immediate priority actions

Develop and introduce **economic measures to limit total energy use** in the economy

Finalise **Natura 2000** in terrestrial and marine areas and realise its proper management through effective conservation measures and by providing sufficient funding. Launch initiatives, with funding, to take concrete action for biodiversity in the wider European context.

Include the conservation of all natural ecosystems amongst **climate change** mitigation and adaptation measures under any future international agreement (push for “biodiversity credits” to be issued for the preservation of forests, peat bogs and other natural ecosystems, as a system parallel to carbon credits)

Adopt the **Soil Directive** for the sustainable use of soil

RECOMMENDATION 2. Improve the coherence and connectivity of natural ecosystems. As the status of biodiversity is largely determined by the spatial structure of ecosystems, effective land use policy that can ensure the coherence and connectivity is indispensable for biodiversity conservation. Currently there is no coherent ecological network in Europe, on the contrary, man made infrastructures form a coherent network of roads, rails, pipelines, etc. This needs to be changed.

Long term priority measures

Develop and adopt **land use policy**, including at EU level, in order to:

- limit green field investments,
- rehabilitate degraded areas and give natural processes free rein in them,
- rationalise the current man-made infrastructures which prevent ecosystem coherence.

Immediate priority actions

Launch the **EU Wilderness Initiative** and design tools to effectively conserve and possibly extend the wilderness areas as appropriate for the conservation of European biodiversity

Minimise the negative impacts of programmes, plans and projects on ecosystem **coherence** through SEA, EIA and other tools

RECOMMENDATION 3. Effectively control the total environmental pressure originating from pollution and biological agents. The quality of the state of the environment and thus ecosystems needs to be ensured through strict legal regulations, which first of all aim for prevention (through controlling the intentional and unintentional spread of invasive alien species, maintaining the integrity of ecosystems, giving up the use of GMOs and controlling the production of chemicals and other pollutants) and which apply control and eradication as complementary measures.

Long term priority measures

Expand the EU **chemicals policy** in order to address the total pressure from pollution

Give up the idea of **GMOs**, as a false solution to social and ecological challenges

Immediate priority actions

Develop and adopt a new EU legal regulatory framework for the prevention, control and eradication of **invasive alien species**

In order to achieve the above, an open debate with no sacred cows, which examines fundamental socio-economic links and relationships in a holistic approach, needs to start within the framework of the EU discussion on future biodiversity policy. This debate should also be extended to the global level within the framework of the CBD, WTO and other fora, as global solutions are needed for global biodiversity.