



# The loss of biodiversity conservation in EU research programmes: Thematic shifts in biodiversity wording in the environment themes of EU research programmes FP7 and Horizon 2020



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## ABSTRACT

Society has been seeking ways to express biodiversity's value to stimulate its protection. Economic valuation of ecosystem services has had limited success to motivate biodiversity protection and reaching the EU 2020 biodiversity strategy targets is in danger of failure. The expression of biodiversity's value in policy documents thus becomes a topic of discussion, because it greatly influences the ways policy makers think about environmental problems. We present an analysis of the word use related to biodiversity conservation versus ecosystem services in the environment themes of the FP7 and Horizon 2020 research work programs of the European Commission in the period of 2007–2014, and the projects accepted under these themes. We conclude first that biodiversity was lost as a topic in the transition from FP7 to Horizon 2020, accompanied by a three-quarters loss of biodiversity topics in the projects accepted under these research work programs. Moreover, the use of 'ecosystem services' was 1.5 times higher at the end of that period compared to the beginning in the research work programs, to the detriment of the use of 'sustainability' and 'conservation' which halved during that same period. In the light of international commitments to biodiversity conservation, the focus toward ecosystem services and away from conservation is of great concern.

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## 1. Introduction

As biodiversity in Europe is in degradation, scientists have been seeking ways to express its value to society (Wood, 1997; Pimentel et al., 1997; De Groot, Wilson, & Boumans, 2002). During the last two decades, it became popular in scientific and policy documents to express the value of biodiversity as ecosystem services and in money, in hopes of boosting our willingness to protect it (Costanza et al., 1997; Nunes & Van den Bergh, 2001; Losey & Vaughan, 2006; Perrings et al., 2010; TEEB, 2010). The economic value of ecosystem services is often calculated as being very high, but as a means to protect biodiversity its success is limited so far (Pearce, 2007). Furthermore, the current expression of biodiversity's value in ecosystem services may in itself be a troubled development that hampers successful biodiversity conservation (Mace, Norris, & Fitter, 2012). Alternative expressions and incorporating frameworks of biodiversity's value have been proposed to address some of the shortcomings of the notion of ecosystem services (Mace,

2014). The expression of biodiversity's value has thus become a topic of discussion.

The expression of biodiversity's values is of immediate concern in Europe because of uniquely European approaches to biodiversity conservation. European biodiversity conservation is frequently framed as an interactive partnership and a bottom-up approach between humans and nature, as explained by Boitani and Sutherland (2015), in which areas of conservation are human dominated agricultural landscapes and the species to be protected are dependent on human interference. This contrasts with the North American model in which a greater dualistic view is seen between nature and society. As food production and conservation overlap spatially and coexist in strong tension (Hodge, Hauck, & Bonn, 2015), biodiversity conservation in Europe is therefore expected to feel a more immediate effect if the expression of the uses and values of biodiversity changes in society. In addition, biodiversity conservation and changes in expression of biodiversity's values in Europe acquire significance worldwide, because the tension between food production and conservation that underlies the European approaches is anticipated to increase in areas around the world. Therefore, a closer look at European experiences in biodiver-

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sity conservation may be beneficial for countries who are moving along a similar development path (Boitani & Sutherland, 2015).

With the UN Convention on Biological Diversity Aichi targets in danger of being missed in the European Union (Tittensor et al., 2014; EC, 2015; EEA, 2015), a critical look is warranted at the expression of biodiversity's value in EU research frameworks that are in service of reaching these targets. Programmes of great influence in this regard are the EU Seventh Framework Research Programme (FP7) and the follow-up EU Framework Programme for Research and Innovation – Horizon 2020 –, which influence the direction of scientific research in the European Union. Horizon 2020's open calls for research projects are in service of the EU 2020 biodiversity strategy (EP resolution, 2014), which was in turn set up in response to a UN mandate to reach the UN Convention on Biological Diversity Aichi targets. In addition, Horizon 2020 complements national efforts in scientific research by co-funding other subsidy networks such as BiodivERSA and the European Cooperation in Science and Technology (COST). Finally, the Horizon 2020 subsidy mechanisms are a direct communication from the European Commission to European scientists about desired research topics and the social and politic context that such research would be in service of.

Previous analyses of EU research programmes illuminate shared topics of accepted projects, but investigations of trends through time have been rare. Both the BiodivERSA database (BiodivERSA, 2013) and the Biodiversity Information System for Europe (BISE, 2011) aim to create clarity in the distribution of topics among accepted research projects of EU research programmes via a searchable database, but do not expand upon trends through the years. Trends through time that have been recognized in literature, however, give cause for concern. A trend has been identified by Matei, Henckel, Gauthier and Le Roux (2011) concluding that budget allocated to biodiversity-related projects in the Environment theme in FP7 has significantly decreased between 2007 and 2010. Similarly, an analysis of themes was presented on the abstracts of projects accepted under the European BiodivERSA research infrastructure from 2004 to 2011, concluding that research funded in Europe shifted focus from organismal and population levels to a focus on larger organizational levels such as ecosystems, with a changed emphasis on monetary costs and benefits of biodiversity protection (Gambette, Eggermont, & Le Roux, 2014).

Our study builds on this by analyzing the visibility and recognition of biodiversity and its conservation in the wording of open call research subsidy documents of the EU. More precisely, trends in word use are traced for the open call descriptions on the topic of biodiversity conservation in the documents of the environment theme in the EU Seventh Framework Research Programme (FP7) from 2007 to 2013 and the EU Framework Programme for Research and Innovation—Horizon 2020 of 2014–2015. Our focus is on the prevalence of 'conservation' of biodiversity, and how this differs in prevalence from to other mentioned keywords related to biodiversity, such as 'ecosystem services'. This content analysis allows us to make inferences on thematic shifts underlying biodiversity conservation in the EU research programmes. Clarity on the trends of wording of biodiversity's value in EU research programmes is a necessary investigation to ensure a tight focus on efforts to halt biodiversity degradation in the EU.

## 2. Methods

We performed an analysis on the open call research descriptions of FP7 and Horizon 2020 research work programs, focusing on the documents published as the thematic work program 'Environment (including climate change)' from FP7 2007–2013 and its follow-up theme 'Climate action. environment. resource efficiency

**Table 1**

Location of biodiversity related activities within the themes of the FP7 work program ([http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference\\_docs.html#fp7](http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html#fp7)).

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<i>Ideas</i>	• European Research Council (ERC)
<i>People</i>	• Marie Curie Action
<i>Capacities</i>	• Research infrastructures (7 subchapters)
<i>Euratom</i>	• Euratom
<i>Cooperation</i>	• Health
	• Food, agriculture and fisheries, and biotechnology
	• Information and Communication Technologies
	• Nanosciences, Nanotechnologies, Materials and new Production
	• Technologies
	• Energy
	• Environment (including Climate Change)
	◦ Activity 6.2 Sustainable management of resources
	▪ Sub-Activity 6.2.1 Conservation and sustainable management of natural and man-made resources and biodiversity
	• <b>Area 6.2.1.4 Biodiversity</b>
	• Transport (including Aeronautics)
	• Socioeconomic Sciences and the Humanities
	• Space
	• Security

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and raw materials' from Horizon 2020, because these are most directly concerned with biodiversity conservation. Furthermore, the project objectives have been analyzed of projects that were accepted under these specific open calls. This would illuminate whether any trends we find in the open call descriptions of the work programmes are mirrored in the stated objectives of projects that are submitted to these open calls. For a complete explanation of the methods used, we refer to the supplementary materials. All FP7 and Horizon 2020 documents were retrieved from <http://ec.europa.eu/research/index.cfm> and [http://cordis.europa.eu/projects/home\\_en.html](http://cordis.europa.eu/projects/home_en.html)

First, the location of biodiversity as a topic in chapters and subchapters was traced in the structure of the work programs through the years as a reflection of its priority as a research subject. Secondly, we traced word use in the documents through the years. In this analysis we aimed to trace why biodiversity is considered important in the work programs and to what end. For the coding of words, first all places in the work programs where biodiversity or a related term is mentioned were identified, and then it was noted manually which values were attached to it in the same paragraph. This procedure generated a list of values that was summarized in nine groups (Table S3). Then the visibility of the groups in the text was traced through the years by counting in the documents the words for the values. In addition to these nine groups, we traced referrals to 'costs and benefits' and 'stakeholder participation'. These referrals too can be seen as indicators of either a focus on economic valuation or a widening view on biodiversity values.

## 3. Results

### 3.1. Structure of the FP7 and Horizon 2020 work programs

The foremost observation regarding the structure of the FP7 documents is that biodiversity loss in itself is not a recognized topic at a high organizational level in the text, but that it is embedded five levels down within the structure (Table 1). FP7 has five different sections: *Cooperation*, *Ideas*, *People*, *Capacities* and *Euratom*; only in the *Cooperation* section are distinct research fields delineated. It has ten themes, and two themes in particular concern values of biodiversity: theme two, 'Food, agriculture and fisheries, and biotechnology' and theme six, 'Environment (including climate change)'. Each theme has subsections named *Activities* and these are further broken down into *Sub-Activities* and then into *Areas*, and on this level

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