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AD HOC TECHNICAL EXPERT GROUP MEETING
  ON INDICATORS FOR THE STRATEGIC PLAN
  FOR BIODIVERSITY 2011-2020
Geneva, Switzerland, 14-17 September 2015

BIODIVERSITY POLICY RESPONSE INDICATORS

Note by the Executive Secretary

1.   The Executive Secretary is circulating herewith, for the information of participants in the meeting of the Ad Hoc Technical Expert Group on Indicators for the Strategic Plan for Biodiversity 2011-2020, a technical document on Biodiversity Policy Response Indicators.

2.   The working document has been published by the Organisation for Economic Co-operation and Development. It is presented in the form and language in which it was received by the Secretariat.

OECD Environment Working Papers No. 90

Biodiversity Policy Response Indicators

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BIODIVERSITY POLICY RESPONSE INDICATORS - ENVIRONMENT WORKING PAPER No. 90

by Christina Van Winkle and Katia Karousakis (OECD), Rosalind Bark (CSIRO) and Martijn van der Heide (LEI Wageningen UR)

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FOREWORD

This paper considers the types of policy response indicators that may be useful to monitor progress towards the achievement of Aichi Biodiversity Target 3 on Incentives and Target 20 on Resource Mobilisation, under the Convention on Biological Diversity, and examines the extent to which 6 datasets and monitoring systems housed at the OECD can be used for this purpose.

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[1] OECD secondee for month of September 2013 (from CSIRO).

[2] OECD secondee between November and December, 2013 (from LEI Wangeningen UR).

ABSTRACT

This paper reviews a number of OECD data sources to examine their potential for establishing indicators which can contribute to monitoring progress towards two of the 2011-2020 Aichi Biodiversity Targets under the Convention on Biological Diversity (CBD), namely Target 3 on Incentives and Target 20 on Resource Mobilisation. Aichi Target 3 refers to the need to eliminate, phase out, or reform incentives, including subsidies, harmful to biodiversity and to develop and apply positive incentives for the conservation and sustainable use of biodiversity. Aichi Target 20 refers to the need to substantially increase the mobilisation of financial resources from all sources to effectively implement the Strategic Plan for Biodiversity 2011-2020.

The objectives of this work were twofold, namely to (a) identify the indicator needs to monitor progress towards these two targets, and (b) examine to what extent existing relevant OECD datasets and monitoring systems can be used for these purposes, including the types of modifications to data collection methodology or classification that may be useful to better align the data sources with the indicator needs. Within this context, six data sources are reviewed and assessed, and gaps and data limitations as they pertain to the reporting purposes of the CBD are highlighted. Given the caveats that are raised, as well as the upcoming need to assess progress on the achievement of the Aichi Targets in 2020, the analysis here aims to provide policy-makers and negotiators with the information needed to consider whether existing OECD datasets could be used and built upon so as to further develop indicators that are useful for the CBD.

JEL codes: Q57, Q56, Q58, Q18, Q22

Keywords: Ecological Economics: Ecosystem Services; Biodiversity Conservation; Environment and Development; Sustainability; Environmental Accounts and Accounting; Government Policy; Agricultural Policy; Fishery.

RESUME

Ce document passe en revue plusieurs sources de données de l'OCDE et les possibilités de les exploiter pour établir des indicateurs utiles au suivi des progrès réalisés vers deux objectifs d'Aichi pour la biodiversité adoptés dans le cadre de la Convention sur la diversité biologique (CDB) pour la période 2011-2020, à savoir l'Objectif n° 3 sur les incitations et l'Objectif n° 20 sur la mobilisation des ressources. L'Objectif d'Aichi n° 3 vise la nécessité d'éliminer, de réduire progressivement ou de réformer les incitations, y compris les subventions néfastes pour la diversité biologique, et d'élaborer et appliquer des incitations positives en faveur de la conservation et de l'utilisation durable de la biodiversité. L'Objectif d'Aichi n° 20 concerne la nécessité d'intensifier considérablement la mobilisation des ressources financières de toutes les sources afin d'assurer la mise en œuvre effective du Plan stratégique 2011-2020 pour la diversité biologique.

Cette étude a été menée dans le double but de (a) déterminer les besoins en matière d'indicateurs pour suivre les progrès vers ces deux Objectifs et (b) d'examiner dans quelle mesure les ensembles de données et les systèmes de suivi existants de l'OCDE peuvent être utilisés à cette fin, en s'attachant notamment aux types de modifications des méthodes de collecte de données ou de classification qui pourraient être nécessaires pour recadrer les sources de données en fonction des besoins des indicateurs. Dans ce contexte, six sources de données sont examinées et évaluées en mettant en lumière les lacunes et limites dans l'optique de l'établissement des rapports à la CDB. Compte tenu des mises en garde formulées et sachant que les progrès réalisés au regard des Objectifs d'Aichi à l'horizon 2020 devront être prochainement évalués, l'analyse présentée ici vise à fournir aux décideurs et aux négociateurs les informations dont ils ont besoin pour apprécier si les ensembles de données existants de l'OCDE peuvent être utilisés et mis à profit pour poursuivre l'élaboration d'indicateurs utiles pour la CDB.

ACRONYMS

A/An/R/I	Area/Animal/Receipts/Income
AHTEG	Ad Hoc Technical Expert Group
BIP	Biodiversity Indicators Partnership
COP	Conference of Parties
CEPA	Classification of Environmental Protection Activities and Expenditures
CBD	Convention on Biological Diversity
CRS	Creditor Reporting System
CSE	Consumer Support Estimates
CQ	Community-based catch Quotas
DAC	Development Assistance Community
DCD	Development Co-operation Directorate
EEA	European Environment Agency
EFTA	European Free Trade Association
EPE	Environmental Protection Expenditure
EPER	Environmental Protection Expenditure and Revenues
EU	European Union
EXP I	Expenditure according to the abater principle
EXP II	Expenditure according to the financing principle
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GFT	Government Financial Transfers
GSSE	General Services Support Estimates
IE	Individual non-transferable Effort quotas
IEA	International Energy Agency
IFI	International Financial Institution
ITE	Individual Transferable Effort quota
ITQ	Individual Transferable Quota
IUU	Illegal, Unreported and Unregulated
IQ	Individual non-transferable Quota

JQ	Joint Eurostat/OECD Questionnaire on Environmental Protection Expenditure and Revenue
LL	Limited non-transferable permits/licences
MDB	Multilateral Development Bank
MPS	Market Price Support
MSC	Marine Stewardship Council
MRV	Measurement Reporting and Verification
NGO	Non-governmental Organization
NBSAP	National Biodiversity Strategy Action Plan
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OOF	Other Official Flows
PES	Payments for Ecosystem Services
PSE	Producer Support Estimates
RFB	Regional Fisheries Bodies
TAC	Total Allowable Catch
TEEB	The Economics of Ecosystems and Biodiversity
TDR	Transferable Development Rights
TURF	Territorial Use Rights in Fisheries
UNCCD	United Nations Convention to Combat Desertification
UN COICOP	United Nations Classification of Individual Consumption According to Purpose
UN ECLAC	United Nations Economic Commission for Latin America
UN ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNFCCC	United Nations Framework Convention on Climate Change
UN ISIC	United Nations International Standard Industrial Classification of all Economic Activities
VC	Vessel Catch limits
WTO	World Trade Organization

EXECUTIVE SUMMARY

The 10th Conference of the Parties to the Convention on Biological Diversity (CBD COP-10) reached agreement on, among other things, the 2011-2020 Aichi Biodiversity Targets. This created the need to review, refine and develop indicators to monitor progress towards the achievement of these Targets. This paper aims to contribute to the discussion on the types of policy response indicators that may be suitable for monitoring progress towards Aichi Target 3 on Incentives and Target 20 on Resource Mobilization, for which (global and national) indicators are, in general, currently lacking.

Aichi Biodiversity Target 3 states: "By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions".

Aichi Biodiversity Target 20 states: "By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties".

This paper aims to help address the following questions:

- What are the intended objectives of Aichi Biodiversity Target 3 and 20?

- What are the implications regarding indicator needs to monitor progress towards achieving the respective Targets?

- To what extent can existing relevant OECD datasets[1] and monitoring systems be used for this purpose?

- What types of modifications to the datasets may be useful (and feasible) to better meet this purpose?

To this end, the following OECD datasets are examined:

- OECD/EEA database on Instruments used for Environmental Policy and Natural Resources Management (for Target 3).

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[1] Though other datasets have been explored (and referred to in this paper), in the context of the indicators examined here, these OECD datasets have some of the most developed and comprehensive information available. Moreover, in the context of Target 3, the data and indicators examined here are not exhaustive – there are likely to be a number of other policy response indicators that would be useful to monitor progress towards this target, such as on incentives that promote or discourage land fragmentation and land sealing. International datasets on these do not, to the authors' knowledge, exist.

- OECD Agriculture Producer and Consumer Support Estimates (for Target 3).

- OECD Government Financial Transfers to Fisheries (for Target 3).

- OECD Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels (for Target 3).

- OECD DAC Creditor Reporting System and Rio markers (for Target 20).

- OECD and Eurostat Environmental Protection Expenditures and Revenue (for Target 20).

The purpose of this work is to examine the types of indicators that may be suitable for monitoring progress towards Aichi Biodiversity Target 3 and 20. For each of these datasets, the existing structure and information collected in the datasets is reviewed and assessed, and gaps and data limitations as they pertain to the reporting purposes of the CBD are highlighted. Given the caveats that are raised, as well as the upcoming need to assess progress on the achievement of the Aichi Biodiversity Targets, in 2020, this paper aims to provide policy-makers and negotiators with the information needed to consider whether the existing OECD datasets could be used and built upon so as to further develop indicators that are useful for the CBD.

Furthermore, while a key feature of indicators is to reduce the number of measurements and parameters that would normally be required to give an exact representation of a situation, the analysis here suggests that the development of robust policy response indicators for biodiversity would benefit strongly from underlying databases, consisting of more detailed information on response measures. Indicators of interest can then be extracted for the purposes of the CBD.

1.   INTRODUCTION

Indicators have been defined as a parameter, or a value derived from parameters, that points to, provides information about, and describes the state of a phenomenon/environment/area, with a significance extending beyond that directly associated with a parameter value (OECD, 2003a)[2]. Environmental indicators are used to help assess, track, and communicate environmental trends along three general categories: state (environmental conditions), pressure (drivers), and response (societal responses).

Developing environmental indicators for biodiversity is particularly complex due to the multi-dimensionality of the environmental domain, the multitude of ecosystems that need to be considered, and the multiple pressures that impact on their state. This in turn implies that developing response indicators will also not be straightforward, at least in the sense that it is difficult to constrain these to a relatively small number of indicators. While a number of organisations and institutions are collecting and reporting on biodiversity indicators that examine states (conditions) and pressures (drivers), there is a significant data gap with regard to response indicators.

Response indicators refer to actions that are being undertaken to help address the pressures on, and often deteriorating state of, the environment, and show the extent to which society responds to environmental concerns through environmental and economic policies. While response indicators can refer to measures undertaken by governments, firms, and households, examination of the latter two are beyond the scope of this analysis, and only government policy response measures are considered here. Policy response indicators for biodiversity are important because they (i) allow monitoring and evaluation of biodiversity policy development, including the extent of policy reform achieved by countries over time, and (ii) provide a common base for policy dialogue by providing a consistent and comparable method to evaluate the nature and incidence of biodiversity relevant policies.[3]

This work aims to contribute to the discussion on the types of biodiversity response indicators that may be suitable for monitoring progress towards the implementation of the 2011-2020 Aichi Biodiversity Targets, which were agreed upon at 10th Conference of the Parties to the Convention on Biological Diversity (CBD COP10) in Nagoya Japan (2010). More specifically, this paper aims to identify and analyse possible relevant policy response indicators that could be used to monitor progress towards Aichi Biodiversity Target 3 on Incentives and Target 20 on Resource Mobilisation (and by extension, those in the Strategy for Resource Mobilisation).

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[2] Similarly, the EEA (2012) defines environmental indicator as numerical values, or parameters, that help provide insight into the state of the environment and its impact on human beings, ecosystems and materials, the pressures on the environment and the responses steering the system.

[3] Further, Prip et al.'s (2010) insights into the significance of tracking policy responses are around momentum and re-orientation. They note the potential for policy response indicators to generate momentum with strategic as well as comprehensive reporting - one of their key recommendations is a re-orientation of focus from negotiation to a focus on supporting and facilitating implementation.

This paper aims to contribute in addressing the following questions:

- What are the intended objectives of Aichi Biodiversity Target 3 and 20?

- What are the data implications regarding indicator needs to monitor progress towards achieving the respective Targets?

- To what extent can existing relevant OECD[4] datasets be used for this purpose?

- What types of modifications to these datasets may be useful (and feasible) to better meet this purpose?

Although the Aichi Biodiversity Targets were agreed upon in 2010, several of the Targets, such as Target 3 and 20, still lack adequate indicators[5]. While some progress has been made towards reviewing and refining existing indicators and developing new ones for the 2011-2020 Aichi Biodiversity Targets, much work still remains. The global indicative indicators proposed for Target 3 (see Table 1), for example, are still fairly broad. Given how long it can take to identify, agree, and subsequently collect and report on data for environmental indicators, the 2020 deadline by which these biodiversity targets are agreed to be met is not far away. It has been noted, for example, that new indicator development for global monitoring, where methods and data are at an early stage of development, may require at least 3-4 years (UN, 2013). Significant work is therefore needed in this area if meaningful indicators are to be developed in time to assess progress by 2020.

This work is also relevant in the context of OECD environmental indicators work. The development of a set of Green Growth Indicators and a review of OECD's set of core environmental indicators are both currently underway, and biodiversity has been highlighted as an area where data are particularly weak and where improvements are needed (OECD, 2012a).

The paper is organised as follows: Section 2 reviews the development of policy response indicators in the context of the CBD language and highlights some of the key concepts and criteria that need to be considered in the development of environmental indicators in general. Section 3 considers the type of data that would be needed to develop indicators for Targets 3 and 20. Section 4 then analyses a selection of existing (OECD) data sets with a view to determining their suitability to measuring progress towards Target 3, and section 5 examines datasets suitable for measuring progress towards Target 20. Finally, Section 6 summarises the main findings and concludes with suggestions for further work.

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[4] Though other datasets have been explored (and referred to in this paper), in the context of the indicators examined here the OECD datasets have some of the most developed and comprehensive information available.

[5] Target 20 currently relies on the OECD DAC data on the Rio markers which tracks biodiversity–related ODA. Other indicators for the remaining elements under the Strategy for Resource Mobilisation are not available at present. Target 2 (integration of biodiversity values) and Target 15 (ecosystem resilience and carbon stocks) also currently lack indicators. This paper focuses on Target 3 and Target 20 as these are response indicators for which OECD has potentially relevant datasets.

2.   POLICY RESPONSE INDICATORS FOR BIODIVERSITY AND THE CBD CONTEXT

2.1   The need for biodiversity indicators under the CBD

The need for improved data and indicators for biodiversity is widely acknowledged and has been raised in a variety of contexts and forums. As noted, environmental indicators in general are important to assess and track changes in the state of the environment. The Pressure-State-Response model provides a commonly accepted classification of indicators into indicators of environmental pressures (both direct and indirect), indicators of environmental conditions, and indicators of societal responses. Societal responses can be further disaggregated into those undertaken by government, households, and business (OECD, 2003a)[6]. In the context of biodiversity, the timetable and targets set up in the package of measures agreed at CBD COP-10 in Nagoya, Japan, in 2010, created the need to review and refine existing, and to develop new, indicators to supplement those that had been developed to measure progress towards the 2010 Biodiversity Targets. Specifically, the Strategic Plan for Biodiversity (2011-2020), and the Aichi Biodiversity Targets, as well as the Strategy for Resource Mobilisation[7], developed a larger and more detailed set of targets than the 2010 Biodiversity Targets.[8]

Recognising this need, an Ad Hoc Technical Expert Group (AHTEG) on Indicators for the Strategic Plan for Biodiversity 2011-2020 was established and convened in June 2011 to provide advice on the further development of indicators. The AHTEG identified an indicative list of indicators – including so-called headline and operational indicators - for each of the Aichi Biodiversity Targets (see section 3 for further detail).

Following their review, Parties to CBD adopted at COP-11 in 2012 an "Indicator framework for the Strategic Plan for Biodiversity 2011–2020 and the Aichi Biodiversity Targets" with the indicative list of indicators in its annex (Decision XI/3). Specifically, Decision XI/3:

> "1.   *Takes note* of the indicative list of indicators available for assessing progress towards the goals of the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets as contained in the annex to the present decision (decision XI/3) and *recognizes* that these provide a starting point for assessing progress in the achievement of the Strategic Plan for Biodiversity 2011-2020 at various scales.
>
> 2.   *Recognize*s that the indicator framework, consisting of the five Strategic Goals and twenty Aichi Biodiversity Targets in the Strategic Plan for Biodiversity 2011-2020 and the indicators to assess progress towards their achievement, provides a flexible basis for Parties which can be adapted, taking into account different national circumstances and capabilities."

The Biodiversity Indicators Partnership (BIP), a CBD-mandated global initiative to promote and coordinate development and delivery of biodiversity indicators, already consolidates indicators for most of the twenty Aichi Biodiversity Targets. However, two targets lack adequate indicators, namely Target 3 on

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[6] As indicated above, it is the government responses (policy response indicators) that this paper focuses on.

[7] See Annex I for text on indicators for the Strategy for Resource Mobilization.

[8] In Decision X/2, para 3(b) states "Develop national and regional targets, using the Strategic Plan and its Aichi Targets, as a flexible framework, in accordance with national priorities and capacities and taking into account both the global targets and the status and trends of biological diversity in the country…". Para 3 (e) states "Monitor and review the implementation of their national biodiversity strategies and action plans in accordance with the Strategic Plan and their national targets making use of the set of indicators developed for the Strategic Plan as a flexible framework…" (emphasis added).

Incentives and Target 20 on Resource Mobilization[9] (see Box 1) and further work is needed to address this gap. OECD's Development Assistance Committee's Creditor Reporting System (DAC CRS), which collects biodiversity-related ODA using the Rio markers, is currently being used as one indicator to monitor progress toward Target 20[10].

Box 1. Aichi Biodiversity Targets 3 and 20

Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions.

Target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

Note: Parties to the CBD COP-12 adopted more specific targets for resource mobilisation (see UNEP/CBD/COP/12/L.32).

2.2 Indicator criteria and concepts to bear in mind

Against this backdrop, as the international biodiversity community considers what type of biodiversity policy response indicators may be most useful for Target 3 and 20, it is also important to recall a set of criteria that has been developed by the OECD to help guide the design of environmental indicators (Box 2). The criteria states that all indicators should be assessed/evaluated according to their (i) policy relevance, (ii) analytical soundness, and (iii) measurability (OECD, 1993).

Box 2. Criteria for selecting environmental indicators

POLICY RELEVANCE AND UTILITY FOR USERS	An environmental indicator should: ♦ Provide a representative picture of environmental conditions, pressures on the environment or society's responses; ♦ be simple, easy to interpret and able to show trends over time; ♦ be responsive to changes in the environment and related human activities; ♦ provide a basis for international comparisons; ♦ be either national in scope or applicable to regional environmental issues of national significance; ♦ have a threshold or reference value against which to compare it, so that users can assess the significance of the values associated with it.
ANALYTICAL SOUNDNESS	An environmental indicator should: ♦ be theoretically well founded in technical and scientific terms; ♦ be based on international standards and international consensus about its validity; ♦ lend itself to being linked to economic models, forecasting and information systems.
MEASURABILITY	The data required to support the indicator should be: ♦ readily available or made available at a reasonable cost/benefit ratio; ♦ adequately documented and of known quality; ♦ updated at regular intervals in accordance with reliable procedures.

Source: Extract from "Environmental indicators for environmental performance reviews", OECD, 1993.
*These criteria describe the "ideal" indicator; not all of them will be met in practice.

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[9] Two other targets for which no indicators are yet available are Target 2 (integration of biodiversity values) and Target 15 (ecosystem resilience).

[10] See operational indicator (1)(a) in Annex I.

These criteria have also been put forward in the so-called "SMART" concept of indicators, reflecting the need for indicators to be:

- Simple (easily interpreted and monitored)

- Measurable (statistically verifiable, reproducible and show trends)

- Accessible (regularly monitored, cost effective and consistent)

- Relevant (directly address issues or agreed objectives), and

- Timely (provide early warning of potential problems).

Other important characteristics of indicators are that they should be administratively practical and cost-effective to populate.

The OECD terminology also highlights two major <u>functions</u> of indicators (OECD 2003a):

i) They reduce the number of measurements and parameters that normally would be required to give an *exact* presentation of a situation.

As a consequence, the size of an indicator set and the level of detail contained in the set need to be limited. A set with a large number of indicators will tend to clutter the overview it is meant to provide.

ii) They simplify the communication process by which the results of measurement are provided to the user.

Due to this need for simplification and adaptation to user needs, indicators may not always meet strict scientific demands to demonstrate causal chains. Indicators should therefore be regarded as an expression of "the best knowledge available".

It has also been noted that attempts to develop indicator sets often fail to gain broad support because their developers invest too much effort in specifying the indicators and not enough in understanding the issues and objectives for which the indicators are intended to inform (Dept. of the Environment and Heritage, 2006). With this in mind, it is important to ensure a degree of consensus, at the outset, on what the objective of the specific Target is (see Section 3). Once a set of indicators is agreed, lessons learned from the BIP stress the need for transparency in, and documentation of, indicator development and review (UN CBD, 2010).

3. AN ASSESSMENT OF POLICY RESPONSE INDICATOR NEEDS FOR AICHI BIODIVERSITY TARGET 3 AND 20

The most detailed language currently contained within the CBD decisions to monitor progress toward the implementation of the Aichi Biodiversity Targets is that of the indicative list of indicators, as proposed by the AHTEG, as well as the Financial Reporting Framework that was adopted by Parties to the CBD at COP-12[11]. The indicative list of indicators includes headline and operational indicators as shown in Table 1.

Table 1. Headline and operational indicators for Target 3 and (selected) Target 20

Target 3	Headline	Trends in the integration of biodiversity, ecosystem services, and benefits sharing into planning, policy formulation and implementation and incentives.
	Operational	Trends in the number and value of incentives, including subsidies, harmful to biodiversity, removed, reformed or phased out
		Trends in identification, assessment and establishment and strengthening of incentives that reward positive contribution to biodiversity and ecosystem services and penalize adverse impacts
Target 20	Headline	Trends in mobilization of financial resources
	Operational	(1) Aggregated financial flows, in the amount and where relevant percentage, of biodiversity-related funding, per annum, for achieving the Convention's three objectives, in a manner that avoids double counting, both in total and in, *inter alia*, the following categories: (a) Official Development Assistance (ODA); (b) Domestic budgets at all levels; (c) Private sector; (d) Non-governmental organizations, foundations, and academia; (e) International financial institutions; (f) United Nations organizations, funds and programmes; (g) Non-ODA public funding; (h) South-South cooperation initiatives; (i) Technical cooperation. (see Annex I for the full list of 15 operational indicators)

Source: UNEP/CBD/COP/DEC/XI/3 and UNEP/CBD/COP/DEC/X/3.

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[11] The Financial Reporting Framework requests countries to provide data on annual financial flows for international and domestic expenditures. For international flows, countries are requested to provide disaggregated data on ODA, OOF and other flows, as well as methodological information. For domestic flows, countries are requested to indicate which sources (e.g. government, private/market, other) and categories (direct and indirectly related to biodiversity). See Section 5 for further detail. The Financial Reporting Framework can be found in Annex II of UNEP/CBD/COP/12/L.32.

Developing indicators for Target 3 along these lines will require identification of the types of incentives that may fall within this description, and subsequently, what specific information on the incentives will be needed to make them useful. For Target 20, the operational indicators and the accompanying Financial Reporting Framework are more specific. A key question is what data are currently available that may be able to meet these needs.

Prior to exploring what particular indicators could be appropriate to monitor progress towards the achievement of Aichi Biodiversity Targets 3 and 20 however, it is important to first consider what the intended or ultimate objective(s) of the targets might be. This will help to ensure there is a clear understanding of, and thus also a general consensus on, what the indicators are intended to inform.

3.1 Target 3 objectives

Historically, the biodiversity targets under the CBD have focused on pressure and state variables. However, as many of these targets (i.e. for 2010) were not met, the 2011-2020 Aichi Biodiversity Target 3 was introduced as a means to track response measures to help address the declining state and growing pressures on biodiversity. Ideally indicators would determine whether these response measures are increasing over space and time.[12] Questions that policy response indicators for Target 3 are intended to inform therefore include:

- Are there policy response measures in place to help address the pressures/ drivers of biodiversity loss and degradation[13]?

- If so, what are they (types)?

    − How many and how ambitious are they?

- If not, are they currently being developed (types, year of expected introduction)?

It is important to note that this target is aimed at addressing those societal measures that may have either positive or negative effects on biodiversity. Changes in these societal measures, however, may not necessarily lead to positive biodiversity outcomes. Measuring how society is responding to declining biodiversity through the implementation of incentive measures is nonetheless an important first step to ensuring positive outcomes on biodiversity. The approach taken here is to examine those *economic* measures that provide either positive or negative incentives to conserve and sustainably use biodiversity. Other influencing factors, such as regulatory and information instruments, are likely to impact on how such economic incentive measures influence the state of biodiversity. Therefore, the economic indicators examined here are necessary, but not necessarily sufficient to adequately monitor progress towards incentive reform and the real impacts these have on biodiversity. In some areas, further (e.g. more qualitative) information will be useful to evaluate and measure success.

3.1.1 Examination of terms used in Target 3

For the purposes of obtaining a better understanding of the indicator needs, each of the key terms in Target 3, as well as those in the indicative and operational indicators developed by the AHTEG, is examined below.

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[12] If policy response measures are set up appropriately, one might expect to see a correlation between the level of response variables and the pressure and state variables.

[13] The key drivers of biodiversity loss are land use change (primarily agriculture), pollution, over-exploitation of natural resources, invasive alien species, and climate change (OECD, 2012b).

On "incentives, including subsidies, harmful to biodiversity"…

Target 3 states: "incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts". The operational indicator states: "Trends in the number and value of incentives, including subsidies, harmful to biodiversity, removed, reformed or phased out".

The CBD has referred to harmful incentives in a broad way, namely economic, legal and institutional incentives that "emanate from policies or practices that induce unsustainable behaviour that destroys biodiversity, often as unanticipated side-effects of policies designed to attain other objectives" (CBD, 2011). Sainteny et al. (2012) use an extensive definition of public incentives harmful to biodiversity that includes "subsidies, tax credits, regulatory advantages and the failure to enforce or the partial enforcement of regulations as well as implicit subsidies". According to these descriptions, the scope of what constitutes incentives that are harmful to biodiversity may therefore be considerable. In addition, these often unanticipated consequences of a policy action may not be fully understood, providing significant challenges to not only the identification, but also the measurement and evaluation of such incentive measures. As noted in OECD (2003a) however, indicators are intended to reduce the number of measurements and parameters that normally would be required to give an exact presentation of a situation. Given that much of the literature on incentives harmful to biodiversity focuses on subsidies, this is the starting point taken here. While the definition of subsidies varies across organisations and institutions, the approach taken here is to identify the impacts of such support measures, and not debate the stricter definition of the term[14].

A review of the literature on types of subsidies that might be considered harmful to biodiversity refers to the following sectors (OECD, 2003b; TEEB, 2008; Sainteny *et al*., 2012): agriculture, fisheries, transport, mining, energy (fossil fuels), water, forestry, and manufacturing.

While it would be beneficial to examine all of these types of subsidies and develop indicators to assess the extent to which they are being eliminated, removed, or reformed, doing so would be significantly time-consuming and costly. For practical reasons therefore, and to help prioritise where resources should be invested first, it is important to consider which of these subsidies are likely to have large impacts on biodiversity. In this context, it is important to note that the size of the subsidy is not necessarily related to the size of the damage.[15] Reforming large volume subsidies may, however, free up resources that could, possibly, be used to finance positive incentives for biodiversity and should therefore be given equal consideration[16].

The key drivers of biodiversity loss have been identified as habitat loss and degradation, overexploitation of natural resources, climate change, invasive alien species, and pollution (particularly nutrient loading) (MEA, 2005; OECD, 2012b; Sainteny, 2009). This paper examines support provided to three sectors, agriculture, fisheries, and fossil fuels, whose activities are important drivers, both directly and indirectly, of biodiversity loss and which OECD has data readily available.[17]

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[14] See Annex II for a discussion on the definitions of subsidies.

[15] OECD countries, for instance, provide support worth over USD 250 billion to the agricultural sector, and USD 5-6 billion to the fisheries sector, every year. This does not by any means imply that impacts of agricultural subsidies on biodiversity are nearly 50-fold higher than those of fisheries subsidies.

[16] Subsidy reform may in itself incur other costs, such as to compensate the least well-off.

[17] In the approach taken by Sainteny (2012), public incentives harmful to biodiversity are identified from the starting point, or lens of drivers of biodiversity loss (namely land use change, overexploitation of natural resources, pollution, climate change and invasive exotic species). The report then identifies examples of public incentives in France that impact on each of these drivers. It is a more bottom-up approach compared to the one taken in this paper here which takes a sectoral starting point given the datasets that are available at the OECD. In any case, even if the starting point is drivers of biodiversity loss, one will eventually need to consider the *causes* underlying these drivers, which can also be attributed to a sector, in one way or another.

For any type of subsidy data collected, a clear understanding of how these subsidies might have an impact on biodiversity is crucial. Demonstrating such causality is not, however, always straightforward. Depending on how the subsidies are allocated and which activities they support, these may have detrimental, neutral, undetermined, or positive impacts on biodiversity (e.g., subsidies for more environmentally-friendly agricultural practices such as the inclusion of buffer strips or fishing gear with greater species selectivity are intended to benefit biodiversity). Moreover, the actual impact of subsidies on biodiversity may also depend on other factors, such as the regulatory environment, that are in place and under which the subsidies operate (see e.g. the discussion on fisheries, section 4.2).

For those sectors where subsidies are likely to have less harmful impacts on biodiversity, interim indicators that could be developed might be simple (qualitative) yes/no indicators which refer to whether a jurisdiction has goals or target in place to either eliminate, remove or reform particular subsidies.

On "positive incentives for the conservation and sustainable use of biodiversity"

Target 3 states: "positive incentives for the conservation and sustainable use of biodiversity are developed and applied". The operational indicator states: "Trends in identification, assessment and establishment and strengthening of incentives that reward positive contribution to biodiversity and ecosystem services and penalize adverse impacts".

As in the case of harmful incentives above, a first issue to examine is what constitutes "positive incentives". Again, there is currently no commonly agreed definition on this however. A review of the literature on this topic points to many and varied instruments that are classified under this heading.

CBD COP-5, Decision V/15 on Incentive Measures, for example, refers to positive incentives as social, economic, and legal incentives designed to encourage activities that are beneficial for biodiversity. A CBD (2011) technical report on incentive measures for the conservation and sustainable use of biological diversity categorises incentive measures into direct and indirect approaches. Examples of direct approaches are subsidies, taxes, and user fees that generate positive incentives for positive activities, payments for ecosystem services (PES) schemes, markets for tradable permits (e.g. tradable development rights or individual transferable quotas for fisheries) and biodiversity offsets associated with liability and compensation schemes. Examples of indirect approaches are certification and eco-labelling schemes, and activities that support biodiversity-related markets and community-based natural resource management programmes.

The OECD has tended to categorise instruments for biodiversity conservation and sustainable use into regulatory approaches, economic instruments, and information and other instruments (e.g., OECD, 2010; OECD 2012a; 2013a). Economic instruments include[18]:

- price-based instruments (i.e. taxes, charges, fees, subsidies);

- reform or removal of perverse subsidies;

- payments for ecosystem services;

- biodiversity offsets/biobanking;

- tradable permits (e.g., individual transferable quotas (ITQ), tradable development credits);

- liability instruments (e.g., non-compliance fines or performance bonds); and

- market creation and assignment of well-defined property rights.

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[18] Note that several of these instruments are those listed as the so-called "innovative financial mechanisms" in para 14 of the Strategy for Resource Mobilisation – see discussion in section 3.4 of this paper.

Information and other instruments include eco-labelling and certification, and voluntary negotiated agreements. Indicators for information instruments (i.e. eco-labelling and certification) are already being used to measure progress towards other Aichi Biodiversity Targets (namely 6 and 7)[19]. For the purposes of this work here on Target 3, therefore, the scope of the analysis places a stronger emphasis on economic instruments.

Emerton (2000) developed a policy response matrix applying three broad categories of economic incentives for biodiversity: direct incentives, indirect incentives and disincentives and five broad categories of implementable economic instruments: property rights, markets and charge systems, fiscal instruments, bonds and deposit and livelihood support (Table 2).

Table 2. Summary table of categories of economic incentives for biodiversity conservation

	Direct incentives	Indirect incentives	Disincentives
Property rights	**Examples: O**wnership, management, access, and use rights over biodiversity. Joint, collaborative and co-management of biodiversity. Leases, concessions, licenses, permits and franchises to manage, use, harvest, and prospect biological resources.		**Examples:** Exclusion, alienation from land and biodiversity. Enforcement and penalties for unsustainable or illegal biodiversity use.
Markets and charge systems	**Examples:** Improvement of existing biodiversity markets and prices, development of new biodiversity markets and charges - tourist levies, entrance fees, user fees, prospecting fees, royalties. Tradable quotas, permits, rights and licenses.	**Examples**: Development of alternatives to biodiversity markets and products. Eco-labelling and accreditation of sustainable biodiversity products.	**Examples:** Bans on biodiversity-impacting products or markets. Biodiversity-impacting product quotas or limits.
Fiscal instruments	**Examples:** Subsidies to biodiversity conserving activities, technologies and products. Tax relief or differential taxes on land uses, technologies and products. Credits and offsets for biodiversity conserving activities.		**Examples:** Biodiversity-impacting product taxes or surcharges. Differential land use, technology and product taxes.
Bonds and deposits			**Examples:** Security deposits, restoration bonds, assurance bonds, conditional resource security
Livelihood support	**Examples:** Improving efficiency, scope and sustainability of biodiversity utilisation.	**Examples**: Rural development, livelihood diversification and improvement away from biodiversity.	

Source: Emerton (2000), pg 7.

The examples described above illustrate the multiple different instruments that could be considered under the heading of positive incentives.[20] Collecting information to develop indicators for all the possible instruments that may be classified as positive incentives for biodiversity is unlikely to be feasible in the short to medium term, however. For information that is collected across countries to be most useful, it

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[19] For example, Target 7 states: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity. Area of forest (FSC) and agriculture (FAO) under sustainable management are operational indicators for this target.

[20] Annex III summarises some other, more general, guidelines that have been proposed to help identify positive incentives.

would be helpful if some consensus and/or further guidance is provided to identify which types of incentives are considered most important and/or relevant, and should therefore be prioritised for indicator development so as to contribute most meaningfully to assessing progress towards Aichi Biodiversity Target 3.

Specific to the context of positive incentives, the AHTEG refers to four discrete attributes of an operational indicator, namely: trends in (1) *identification* and (2) *assessment* of positive incentives to encourage activities beneficial to biodiversity and ecosystem services provision, (3) *establishment* of selected positive incentives, and (4) *strengthening* of positive incentives. The implications of this language with respect to indicator development are examined in turn below. It is important to note that creating separate indicators for each element may lead to a proliferation of indicators. As these are logical steps in a sequence, indicators of early steps could be dropped as progress is made.

Identification

It is assumed here that this attribute is intended to provide information on whether a jurisdiction has considered (i.e. identified) the variety of positive incentives that could be put in place to address a particular driver of biodiversity loss or degradation. The expected response to this attribute could be a simple Yes/No indicator. This could be accompanied by a link to a website or report which describes the analysis or policy process.

Assessment

It is assumed here that this attribute is intended to provide information on whether an assessment has been undertaken with regard to the relative effectiveness of certain positive incentives vis-à-vis other potential positive incentives. The expected response to this attribute could be a Yes/No indicator. Further details on the assessment could be provided with a link to a website or report.

Establishment

It is assumed that this attribute is intended to provide information on the positive incentives that have been put in place. This could include information the type, number, and scale (e.g. geographic coverage, revenues) of incentives.

Strengthening

It is assumed that this attribute is intended to provide information on trends related to the geographic scale and/or the ambition of positive incentives in place.

3.2   Possible data requirements to monitor progress on positive incentives

In considering the types of data that may be needed to measure progress on positive incentives, the following information and databases were considered: the AHTEG indicator attributes, existing databases on policy responses (the IEA's Policy and Measures database), an existing policy response indicator (the EEA's Progress in charge structures and internalisation policies for transportation indicator), and an existing database on biodiversity markets (The Matrix 2012)[21]. The CBD also collects information from signatory countries on incentives introduced to ensure adherence with Article 11 of the Convention, which requires countries to adopt incentive measures for the conservation and sustainable use of biodiversity. The information is collected through its national reporting system, but is qualitative in nature and does not

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[21] See Annex IV.

provide the level of detail necessary to measure progress towards the Target's objectives.[22] Table 3 presents the possible data needs and attributes necessary to establish indicators for a subset of positive incentives, focussing on the most relevant economic instruments for biodiversity conservation and sustainable use.

3.3   Possible data requirements to monitor progress on harmful incentives

As discussed in Section 3.1, the scope of what may constitute harmful incentives is large, including economic, regulatory, and legal instruments that result in unanticipated adverse impacts on biodiversity. Moreover, these impacts may vary under different policy frameworks and between countries and sectors. Some potentially harmful effects of incentives may be mitigated and/or avoided by other policy measures. This needs to be considered when constructing national and global indicators for harmful incentives that may be compared over time and space.

In addition, considering the timeline of the Strategic Plan and the need to monitor progress towards the 2020 Targets, it is useful to examine readily-available data and assess whether these could be used for these purposes. As noted, above, the OECD has comprehensive databases on sector-level government financial transfers to the agriculture, fisheries, and fossil fuels sectors. These databases may be useful to produce (quantitative) indicators measuring the amount of financial support to sector-level activities identified to have potentially harmful effects on biodiversity and are therefore examined here.

To monitor progress towards the implementation of Target 3, these (quantitative) indicators can also be supplemented by more qualitative, national-level data and information on how countries are identifying, removing, reforming or phasing out incentive measures harmful to biodiversity. Complementary information could include the number of countries that have conducted thorough assessments of incentives, including subsidies, to identify their impacts on biodiversity, as well as descriptive information on how these policies have been reformed to reduce the identified negative impacts on biodiversity.

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[22] See *www.cbd.int/reports/search/default.shtml*.

Table 3. Positive incentive indicator attributes and possible data needs

Incentive	Data Fields
Taxes/charges/ Fees/subsidy	Identification: Y/N Assessment: Y/N Established: • Type (tax, fee, charge, subsidy) • Year introduced • Current status • Sectors (agriculture, fisheries, forestry, pollution, waste, etc.) • Geographic coverage • Tax rate • Revenue generated Strengthening: • E.g. Year reviewed/modified , e.g. expanded sectoral/geographic coverage, increased tax rate, etc.
Biodiversity offsets/ biobanking	Identification: Y/N Assessment: Y/N Established: • Year introduced • Government-mediated/compliance/voluntary • Programme type: biodiversity offset,bio-banking (or payment-in-lieu) • # of programmes • Hectares (and quality) • Revenue generated Strengthening: • E.g. Better design and implementation to e.g. move from no net loss to net gain and/or achieve multiple benefits, expanded sectoral coverage, other
Tradable permit schemes	Identification: Y/N Assessment: Y/N Established: • Year introduced • Programme type (ITQ, tradable development right) • # of programmes Strengthening: • E.g. Transition to auctioned permits (from grandfathering) • E.g. Level of cap reduced • E.g. Creation of TDR bank
PES	Identification: Y/N Assessment: Y/N Established: • Year introduced • Programme type/objective (e.g. biodiversity, species conservation, hydrological services/water quality, forest conservation, agri-environmental quality, etc) • # of programmes • Hectares in programmes • Payments made Strengthening: • Expansion in area, higher payments, increased number of participants

3.4   Target 20 objectives

The ultimate objective of Aichi Biodiversity Target 20 is to raise the amount of finance mobilised so as to help the achievement of the Aichi Targets as a whole. Target 20, together with the Strategy for Resource Mobilization, specifies specific financial flows for which data is requested.

3.5   Possible data requirements to monitor progress on resource mobilisation

It is beyond the scope of this paper to examine the possible data requirements of all 15 of the operational indicators specified in Decision X/3 of CBD COP-10. The analysis here is restricted to the operational indicators to which the OECD could possibly contribute, given the datasets it currently houses.

In this context, it is also important to note the areas of overlap across several of the indicators. The data needed to construct indicators for operational indicator 13 and 14 in the Strategy for Resource Mobilization for example (see Box 3), are similar to those required for Aichi Target 3.

Box 3. Operational indicator 13 and 14 of the Strategy for Resource Mobilisation

Indicator 13. Resources mobilised from the removal, reform or phase-out of incentives, including subsidies, harmful to biodiversity, which could be used for the promotion of positive incentives, including but not limited to innovative financial mechanisms, that are consistent and in harmony with the Convention and other international obligations, taking into account national, social and economic conditions.

Indicator 14. Number of initiatives, and respective amounts, supplementary to the financial mechanism established under Article 21, that engage parties and relevant organisations in new and innovative financial mechanisms, which consider intrinsic values and all other values of biodiversity, in accordance with the objectives of the Convention and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of the Benefits Arising out of their Utilization.

Thus, for operational indicator 13, indicators developed for Aichi Target 3 would be relevant for this operational indicator here as well. With respect to operational indicator 14, the innovative financial mechanisms identified by the CBD are:

1. Payments for Ecosystem Services (PES)

2. Biodiversity offsets

3. Environmental fiscal reform

4. Markets for green products

5. Biodiversity in international development finance

6. Biodiversity in climate change finance

These innovative financial mechanisms are included in other Aichi Biodiversity Targets. Indicators developed to measure progress towards Aichi Target 3 on incentives, for instance, would address PES, biodiversity offsets, and environmental fiscal reform. Aichi Targets 6 and 7 address some markets for green products through eco-labelling and certification schemes. 'Biodiversity in international development finance' is addressed through Aichi Target 20 and the indicators specified in para 7 of the Strategy for Resource Mobilisation. For biodiversity in climate change finance, the OECD CRS database is able to contribute to measuring the number of development cooperation activities and volume of official development finance that targets both biodiversity-related and climate-related objectives.

4.   ANALYSIS OF SELECTED DATASETS AND THEIR POTENTIAL TO MONITOR PROGRESS TOWARDS AICHI BIODIVERSITY TARGET 3

This section examines four datasets with the purpose of determining their suitability for developing indicators to monitor progress towards Aichi Biodiversity Target 3. These are:

- OECD/EEA database on economic instruments used for environmental policy and natural resource management.

- OECD Agriculture Producer and Consumer Support Estimates.

- OECD Government Financial Transfers to Fisheries.

- OECD Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels

For each of these, the following information is provided, as relevant:

- description of the dataset;

- impact of the incentive on biodiversity;

- assessment for use in monitoring progress towards Aichi Biodiversity Target 3;

- gaps and limitations;

- adequacy assessment and preliminary recommendations.

4.1   OECD/EEA database on instruments used for environmental policy and natural resources management

4.1.1   Description of the database

The OECD collaborates with the European Environment Agency (EEA) to collect information on the use of (i.e. implemented) environmental policy instruments. Data is collected from OECD member and accession countries, and EEA member and cooperative countries, totalling 53 countries.[23] Data collection began in 1998. Tax rate information is available from 2000 (with the exception of 2004) and tax revenue information from 1994. For all other information the data begins in 2005. The database is typically updated

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[23] OECD countries (Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Malta, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States) plus EEA countries (Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus, FYR of Macedonia, Latvia, Liechtenstein, Lithuania, Malta, Montenegro, Romania, Serbia) plus other countries (Brazil, China, Colombia, India, South Africa).

yearly, though some of the records are older.[24] There is interest from UN ECLAC and from UN ESCAP to populate the database with their relevant information (for Latin American and Caribbean countries and Asian countries, respectively).

Data is collected at the instrument level on:

- environmentally related taxes, fees and charges
- tradable permit systems
- deposit refund systems
- environmentally motivated subsidies
- voluntary approaches.

Economic instruments are further classified according to the following environmental domains in which the policy is directed:

- water pollution
- air pollution
- climate change
- land contamination
- waste management
- natural resources management
- noise
- ozone layer protection
- energy efficiency
- transport
- land management.

Within each instrument type, data can be then filtered by the type of information available (for instance, main characteristics, geographical and sectoral coverage, type of activities supported, annual cost, and revenues generated). In addition, instruments specific to an industrial sector (based on the UN ISIC Rev 3.1 classification[25]) or household expenditure category (based on the UN COICOP classification[26]) can be queried. The ISIC categories are more useful for compiling a list of all environmental instruments applied to the most biodiversity-relevant industries, such as agriculture, hunting and forestry, fishing, mining, and the manufacture of wood and wood products.

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[24] For the 34 countries listed the most recent updates provide information on existing instruments as of January 1st 2012 for 20 countries, eight countries as of January 1st 2011, five countries as of January 1st 2010 and one country as of January 1st 2009.

[25] The International Standard Industrial Classification of all Economic Activities (ISIC codes) breakdown economic activities into the following categories: agriculture, hunting and forestry; fishing; mining and quarrying; manufacturing; electricity, gas and water supply; construction; wholesale trade and retail commission, repair of motor vehicles and personal and household goods; hotels and restaurants; transport, storage and communications; financial intermediation; real estate, renting and business activities; public administration and defence, compulsory social security; education; health and social work; other community, social and personal service activities; activities of private households as employers and undifferentiated production activities of private households; and extraterritorial organisations and bodies.

[26] The Classification of Individual Consumption According to Purpose (COICOP) use the following categories: individual consumption expenditure of households on: food and non-alcoholic beverages; alcoholic beverages, tobacco and narcotics; clothing and footwear; housing, water, electricity, gas and other fuels; furnishings, household equipment and routine household maintenance; health; transport; communication; recreation and culture; education; restaurants and hotels; miscellaneous goods and services and individual consumption expenditure of non-profit institutions serving households and individual consumption expenditure of general government.

Each record has the following information:

- name of the instrument;

- type of instrument;

- jurisdiction;

- year of introduction;

- date of last revision;

- subsidy, charge/fee, tax levels + information on tradable permit schemes including geographic coverage and trading information;

- revenue raised;

- detailed information, where available on, for example: links to other policy instruments; administrative costs; type of monitoring, i.e. self-reporting, self-reporting accredited by independent verifier, agency verification, independent market monitors; and non-compliance sanctions;

- website;

- reference;

- contact details.

The database can be queried by country, instrument, and environmental domain. While there is no explicit environmental domain for biodiversity per se, several of the existing domains provide relevant information and could possibly be re-classified as such. The most biodiversity-relevant environmental domain is that labelled natural resource management. Each domain is associated with the relevant economic instrument that is in place (e.g. environmentally-motivated subsidies, charges and fees and taxes). Examples of biodiversity relevant records within the natural resource management domain are: minerals and mining taxes, sand, gravel and quarrying charges, wastewater treatment and sewage disposal, groundwater and surface abstraction charges, fisheries permits, tourism charges and national parks and reserves charges, landscape management and protection, hunting, fishing and sport fishing licences, forest management, soil pollution charges and incentives for conservation, incentives for organic farming, landscape/riparian restoration, reforestation and easements, ecological gifts tax breaks, etc. There is also some information on biodiversity offsets and bio-banking, e.g. BushTender in Victoria, Australia.

Others categories of environmental domains are also relevant to biodiversity such as water pollution and land management. Certain environmental domains are likely to exert a more direct influence on biodiversity than others. For instance, incentive measures for natural resource management, land management, and water pollution can have clear benefits for biodiversity. Instruments in other environmental domains may have less direct impacts on biodiversity, but are still relevant. Examples include instruments for climate change, air pollution, and land contamination policies. Yet other domains, such as waste management, could have direct or indirect impacts on biodiversity depending on the policy objective and instrument used.

Table 4 provides examples of the types of environmental instruments that are being implemented for each environmental domain.

Table 4. Examples of Instruments by Environmental Domain and Type

Environmental Domain	Environmentally related taxes, fees, and charges	Tradable Permit Systems	Deposit-refund schemes	Environmentally motivated subsidies	Voluntary Approaches
Water pollution	Water effluent charge; environmental protection fees; water pollution tax	Salinity trading scheme; transferable usage rights	Lead acid battery take back program	Tax deduction for mining site rehabilitation; riparian tax credit	Environmental improvement plan grants; green building certification
Air pollution	Motor vehicle registration fees; highway tolls; non-compliance fees	CO2 emissions trading scheme; compensation system for NOX and PM	--	Tax credits for investments in renewable energies; tax exemptions for biofuels	Environmental labeling of products and services; environmental performance agreements
Climate change	Carbon tax; establishment costs for carbon sink forests; motor vehicle registration fees; fuel excise tax	CO2 emissions trading scheme; tradable green electricity certificates	Deposit system on non-refillable beverage containers	Tax credits for energy efficient vehicles; agri-environmental support; subsidies for energy efficiencies in public-buildings; tax exemption for ethanol and methanol	Voluntary benchmarking agreement on energy
Land contamination	Hazardous waste tax; underground storage tank fee	--	Lead acid battery take back program	Subsidies for remediation of contaminated sites; recycling grants; pollution control tax credit	Pesticide voluntary initiative
Waste management	Plastic beverage container tax; illegal waste dumping fines; municipal waste user charge	Greenhouse Gas Emissions Trading Scheme; packaging waste recovery note and export note system	Deposit refund system for glass; cash for containers	Subsidy to local governments for waste management;	Covenant on end-of-life vehicles; green labeling
Natural resource management	Mineral exploitation charges; wastewater charges; tax on fisheries; underground water tax; hunting and fishing licenses	Individual Transferable Fishing Quotas; tradable hunting rights; tradable water abstraction rights	Deposit system on non-refillable beverage containers	Home saver rebate program; subsidy for forest management and nature conservation; conservation easement credit	Native vegetation offset scheme; environmental performance agreements; environmental labeling schemes
Noise	Aircraft noise levy; tax on air transport	--	--	Sales tax exemption for bicycles	Voluntary environmental management agreements; eco labeling scheme

Table 4. Examples of Instruments by Environmental Domain and Type (*cont.*)

Environmental Domain	Environmentally related taxes, fees, and charges	Tradable Permit Systems	Deposit-refund schemes	Environmentally motivated subsidies	Voluntary Approaches
Ozone layer protection	Charge on ozone depleting substances; product charges for packaging and waste products containing ozone depleting substances	Allowance system for HCFCs	--	Soft loans for installation of natural gas systems	Eco labeling schemes;
Energy efficiency	Fuel excise tax; import tax on used vehicles; charge on production of petrol refineries	Energy savings scheme; greenhouse gas emissions trading scheme	--	Subsidies for energy efficiency and use of renewable energies in homes;	Voluntary benchmarking agreement on energy
Transport	Road charges; motor vehicle licenses; natural gas tax	Greenhouse Gas Emissions Trading Scheme	--	Excise tax exemption for electricity used in rail transport; vehicle tax exemption for buses; traffic reduction tax credit	Green label
Land management	Charges for exploration of minerals; fee for excessive soil pollution; logging tax; duty on raw materials; reforestation charge; charge for premature harvesting of forests	Tradable development rights for land preservation	Deposit system on non-refillable beverage containers	Riparian tax credit; tax deduction for mining site rehabilitation; subsidy for land conservation; subsidies for flood protection; conservation easement credit	Permanent forest sinks initiative

Note: Other instruments, such as taxes on land sealing (e.g. through construction), would also be relevant for biodiversity.

The database has recently been developed to automate combined search queries (Braathen, 2013). There is potential to use such methods to query the existing database in a way that can be tailored for biodiversity-related positive incentives.[27]

4.1.2   *Assessment for use in monitoring progress towards Aichi Target 3*

Table 5 presents a needs assessment between the possible data required to develop an indicator (as discussed in Section 3) and the data available in the OECD/EEA database. As can be seen, the database fulfils many of the data requirements for the development of a positive incentive policy response indicator. The relative maturity of the database means it is also possible to analyse trends in the types of positive incentives implemented, and revenue raised.

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[27] The database was, for example, used in 2006 to review the use of economic instruments for biodiversity conservation and sustainable use in the EU (Bräuer et al., 2006). The paper assessed the number and composition of positive incentive instruments.

Table 5. Positive incentives, indicator attributes, and the data available in the OECD/EEA database

Incentive	DataFields	OECD/EEA
All	Global coverage Routinely collected data Established methodology Administrative feasibility	53 countries Yes Yes Yes
Taxes/charges/fees/	Identification: Y/N* Assessment: Y/N* Established: • Type • Year introduced • Current status • Sector (agriculture, fisheries, forestry, pollution,waste, etc) • Geographic coverage • Tax rate • Revenue generated Strengthening: • Year reviewed plus what reviewed, e.g. expanded sectoral/geographic coverage, increased tax rate, etc.	Yes No Yes Yes Yes Yes Yes Yes Yes Yes
Biodiversity offsets/biobanking[28]	Identification: Y/N* Assessment: Y/N* Established: • Year introduced • Government-mediated/compliance/voluntary • Biodiversity offset or banking • # of programmes • Hectares (and quality) of habitat protected/restored • Revenue generated Strengthening: • Better design and implementation to move from no net loss to net gain and/or achieve multiple benefits	Yes No Yes Yes Yes/? Yes/? Yes/? In cases In cases No
Tradable permit schemes	Identification: Y/N* Assessment: Y/N* Established: • Year introduced • Programme type (ITQ, tradable development right) • # of programmes Strengthening: • Transition to auctioned permits (from grandfathering) • Level of cap reduced • Creation of TDR bank	Yes No Yes Yes Yes No No No

Table 5 continued over page.

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[28] Note that there is currently no instrument category for biodiversity offsets but there is some information in the database on implemented programmes.

Table 5. Positive incentives, indicator attributes, and the data available in the OECD/EEA database (cont.)

Incentive	Data	OECD/EEA
PES	Identification: Y/N* Assessment: Y/N* Established: • Year introduced • Programme type (hydrological services/water quality, forest conservation, agri-environmental quality, species conservation, etc) • # of programmes • Hectares in programmes • Payments made Strengthening: • Expansion in area, higher payments increased number of participants	Yes/? No Yes Yes In cases In cases In cases No

* Ideally would need to be supplemented by qualitative information on how this was undertaken.

4.1.3   *Gaps and data limitations*

As indicated above, there is currently no explicit category for biodiversity as an environmental domain in the dataset. Moreover, while the database specifies 5 categories of instruments, there are no explicit instrument labels for PES or biodiversity offsets/banking. Data on these instruments do exist in the database however, but need to be searched for. There may also be instances where those who populate the database did not provide information e.g. on biodiversity offset programmes or PES, as this information is not specifically requested. To ensure more comprehensive reporting on economic instruments for the purposes of biodiversity conservation and sustainable use, the dataset would need to be categorised and labeled even more clearly and systematically. Adding a biodiversity environmental domain and new labels for instrument categories would improve the reporting nature of this dataset to be more useful for the CBD purposes of monitoring positive incentives for biodiversity conservation. While the dataset provides a robust framework and template for collecting data to monitor progress towards the achievement of Aichi Target 3 in the context of positive incentives, countries would need to report more systematically and comprehensively so as to ensure that the database captures a sufficiently large proportion of positive incentives so as to be used to detect trends. A good indicator requires high confidence that any trends are the result of changed policies, rather than improved data capture.

4.1.4   *Adequacy assessment and recommendations*

This database provides a good framework and template for further investigation of the development of a set of indicators for positive incentives for biodiversity. A future consideration is to re-classify the database to incorporate biodiversity as its own environmental domain, to include new labels for instrument categories for biodiversity offsets and PES, and to request more detailed information on geographic scope of the instrument. The types of indicators that could then be extracted from this database to help monitor progress towards Aichi Biodiversity Target 3 (in the context of positive incentives) include:

1.   The number of countries implementing positive incentives (by type) for biodiversity over time.

2.   The number of positive incentives for biodiversity by instrument type implemented over time.

3.   The number of positive incentives by sector (fish, forestry, agri-biodiversity, etc) over time.

4. The revenue generated (or expenditure created) by positive incentives for biodiversity (as relevant) over time.[29]

5. The number of hectares under positive incentive programmes (by country, by instrument, in total, etc).

Ideally, the incentives that would be included in the indicator set to monitor progress towards Target 3 would be those that are effective, and thus measured using some quantitative outcome. Since outcome information is unlikely to be available, economic value (4) or geographic scope (5) – which creates a measure of government effort rather than biodiversity outcome, is a step in this direction.

4.2.   OECD Agriculture Producer and Consumer Support Estimates

4.2.1   Agriculture and biodiversity

Although agriculture only accounts for less than 3% of GDP in OECD countries, the sector covers over one-third of total land area (OECD, 2013b)[30]. Agriculture plays an important role in contributing to ecosystems services, including food production, carbon sequestration, nutrient cycling, and habitat for wildlife. Some agricultural practices, however, produce harmful effects on the environment, including air and water pollution, soil degradation, and land fragmentation, all of which can result in the loss of biodiversity. Understanding the implications of agricultural practices on biodiversity requires looking both within the agro-ecosystem and other terrestrial and aquatic ecosystems affected by farming practices.

Agro-ecosystems support a wide variety of agricultural biodiversity, defined by the Convention on Biological Diversity as the variety and variability of animals, plants and micro-organisms, at the genetic, species and ecosystem level, which are necessary to sustain key functions of the agro-ecosystem, its structure and process.[31] For instance, nearly two-thirds of agricultural land is comprised of semi-natural habitats, primarily permanent pasture, which supports a variety of biodiversity through low-intensity farming. The amount of land dedicated to permanent pasture, however, is declining in many OECD countries, as land is being converted to either forestry or cultivation. It is difficult to assess how the reduction in permanent pasture is affecting biodiversity as more information would need to be known about the quality of the habitat prior to and after the conversion. Given the magnitude of decline in permanent pasture areas across most OECD countries over the past decade, however, it is likely to be one of the contributing factors to the overall decline in farmland bird populations, and perhaps other flora and fauna dependent on permanent pasture land (OECD, 2013b). In addition, the intensification of agricultural activities, in an effort to produce higher yields, could include the use of chemical fertilisers and pesticides, mechanisation, and irrigation, which may harm both agricultural and "wild" biodiversity in surrounding ecosystems. Some of the environmental effects of intensification are spatially specific. Agricultural intensification can have i) local environmental consequences, such as lower soil fertility, increased erosion, and reduced biodiversity, ii) regional consequences such as the pollution of ground water and eutrophication of rivers and lakes, and iii) global consequences such as air pollution and climate change (Matson et al., 1997). In addition, and arguably more harmful to biodiversity, is the expansion of agricultural lands through natural forest, wetland, and other natural habitat conversions.

Examining the impacts of support to the agricultural sector on biodiversity must therefore specially consider those policy measures that encourage intensification or expansion of agricultural activities,

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[29] This information is relevant for the Strategy for Resource Mobilisation. See indicator (14) in Annex 1 on new and innovative financial mechanisms.

[30] 2008-2010 average.

[31] COP-5 Decision V/5 Annex.

particularly without environmental safeguards. The activities supported by these policy measures may increase food production, but at the trade-off of losing other valuable ecosystem services, many of which have the potential to negatively impact biodiversity (e.g. soil degradation and the loss of wildlife habitat). It is difficult to assess, however, the trade-offs that must be made, in an effort to increase food production, between bringing more land into cultivation versus intensifying current agricultural lands to gain higher yields. For instance, if a farmer has a choice, in an effort to increase yield, to either intensify a plot of land already under cultivation, or bring new land under cultivation, it is difficult to determine which of those alternatives would result in more harm to biodiversity, without further information on the status of the land being considered for cultivation.

4.2.2   *Measuring support to the agricultural sector*

The OECD uses a comprehensive system for measuring and classifying support to agriculture – the Producer and Consumer Support Estimates (PSE and CSE) and related indicators. The indicators have been developed to:

1.   monitor and evaluate developments in agricultural policy;

2.   establish a common base for policy dialogue among countries; and

3.   provide economic data to assess the effectiveness and efficiency of policies.

Agricultural support includes:

1.   Budgetary transfers (e.g., payments based on area farmed or number of animals kept) and revenue foregone (e.g., investment credit, energy or water).

2.   Market price transfers arising from policy measures that create a gap between domestic market price and the border price of a commodity, where this gap equals the market price differential. Examples of policies include import measures (e.g., tariffs, tariff quotas and licensing requirements); export measures (e.g., export subsidies, export credits, and quantitative restrictions); and domestic price support measures (e.g., production quotas, administered prices and intervention purchases).

The indicators were mandated by OECD Ministers in 1987, and have since been calculated for OECD and an increasing number of non-OECD countries, and are widely referred to in the public domain. The dataset currently includes 47 countries (27 EU members treated as a single entity)[32], with annual estimates covering the period from 1986 to the present.[33]

The indicators classify agricultural support first by the policy transfer recipient. Producer Support Estimates (PSE), which can have both positive and negative impacts on biodiversity, are defined as *the annual monetary value of gross transfers from consumers and taxpayers to individual agricultural producers, measured at the farm-gate level, arising from policy measures that support agriculture, regardless of their nature, objective or impacts on farm production or income*. The dataset also includes transfers to producers collectively (e.g., research, development, training, inspection, irrigation infrastructure provision) through the General Services Support Estimates (GSSE) as well as transfers to

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[32] EU-27, Australia, Canada, Chile, Iceland, Israel, Japan, Korea, Mexico, New Zealand, Norway, Switzerland, Turkey and the United States as well as the emerging economies of Brazil, China, Russia, Ukraine, South Africa, Indonesia, and Kazakhstan.

[33] Data on emerging economies have been collected since 1995 with the exception of Indonesia and Kazakhstan, which were added in 2013.

consumers of agricultural commodities (e.g., flour mills, meat-processing plants, fruit packing houses) through the Consumer Support Estimate (CSE). For the purposes of this analysis, only PSE estimates are considered here as they have the most influence on farming behaviour, which can impact biodiversity. These indicators measure the *provision* of support to agricultural producers and not the *impacts* of support and therefore result in some limitations to interpretation of the datasets in terms of the impact on the environment and biodiversity.

The support provided by the policy measure to individual producers through PSE may be delivered in several different ways: an increased output price (Market Price Support); a reduced input price (e.g. a fertiliser subsidy) or cost share for fixed capital; a direct payment (e.g. a cheque from the government); a revenue foregone by government (e.g. a tax concession); a reimbursement of a tax or charge (e.g. as for fuel taxes in some countries); or a gratuitous service in kind to individual farmers (*e.g.* delivery of extension services[34]).

4.2.3 Description of the dataset

Policy measures supporting individual producers are classified according to the implementation criteria. For a given policy measure, the implementation criteria are defined as the conditions under which the associated transfers are provided to farmers, or the conditions of eligibility for the payment. Policy measures are thus classified by (i) the basis upon which support is provided (a unit of output, an animal head, a land unit, etc.); (ii) whether support is based on current or non-current production parameters; (iii) whether production is required to receive support or not; (iv) whether the payment rate is fixed or variable; and (v) whether the policy transfer is specific or variable, among other measures. These policy characteristics affect producer behaviour, and distinguishing policies according to implementation criteria enables further analysis of policy impacts on production, trade, income, the environment, etc. The current PSE classifications are as follows:

A. Support based on commodity output (Market Price Support and payments based on output)

B. Payments based on input use

C. Payments based on current A/An/R/I[35], production required

D. Payments based on non-current A/AN/R/I, production required

E. Payments based on non-current A/AN/R/I, production not required

F. Payments based on non-commodity criteria

G. Miscellaneous

Names and definitions of PSE categories are described in Box 4.

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[34] Extension services, if provided collectively to the agricultural community, can also be captured through the GSSE.

[35] The letters stand for Area (A), Animal Numbers (AN), Receipts (R) or Income (I).

Box 4. Definitions of categories in the PSE classification

Definition of categories

Category A1, Market price support (MPS): transfers from consumers and taxpayers to agricultural producers from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity, measured at the farm gate level.

Category A2, Payments based on output: transfers from taxpayers to agricultural producers from policy measures based on current output of a specific agricultural commodity.

Category B, Payments based on input use: transfers from taxpayers to agricultural producers arising from policy measures based on on-farm use of inputs:

- ***Variable input use*** that reduces the on-farm cost of a specific variable input or a mix of variable inputs.
- ***Fixed capital formation*** that reduce the on-farm investment cost of farm buildings, equipment, plantations, irrigation, drainage, and soil improvements.
- ***On-farm services*** that reduce the cost of technical, accounting, commercial, sanitary and phyto-sanitary assistance and training provided to individual farmers.

Category C, Payments based on current A/An/R/I, production required: transfers from taxpayers to agricultural producers arising from policy measures based on current area, animal numbers, revenue, or income, and requiring production.

Category D, Payments based on non-current A/An/R/I, production required: transfers from taxpayers to agricultural producers arising from policy measures based on non-current (i.e. historical or fixed) area, animal numbers, revenue, or income, with current production of any commodity required.

Category E, Payments based on non-current A/An/R/I, production not required: transfers from taxpayers to agricultural producers arising from policy measures based on non-current (i.e. historical or fixed) area, animal numbers, revenue, or income, with current production of any commodity not required but optional.

Category F, Payments based on non-commodity criteria: transfers from taxpayers to agricultural producers arising from policy measures based on:

- ***Long-term resource retirement***: transfers for the long-term retirement of factors of production from commodity production. The payments in this subcategory are distinguished from those requiring short-term resource retirement, which are based on commodity production criteria.
- ***A specific non-commodity output***: transfers for the use of farm resources to produce specific non-commodity outputs of goods and services, which are not required by regulations.
- ***Other non-commodity criteria***, transfers provided equally to all farmers, such as a flat rate or lump sum payment.

Category G, Miscellaneous payments: transfers from taxpayers to farmers for which there is a lack of information to allocate them among the appropriate categories.

In addition to the above PSE classification scheme[36], a set of labels may also be applied to certain policy characteristics relating to the provision of support (Box 5):

- with or without current commodity production limits and/or limits to payments;
- with variable or fixed payment rates;
- with (mandatory or voluntary) or without input constraints;
- with or without commodity exceptions;
- based on area, animal numbers, receipts or income;
- based on a single commodity, group of commodities or all commodities.

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[36] The PSE classification scheme was revised in 2006 to better reflect the evolution of policy measures in the agriculture sector. The methodology remains the same and therefore all indicators proposed can be constructed on the current dataset.

Box 5. Definitions of labels in the PSE classification

With or without current commodity production limits and/or limit to payments: defines whether or not there is a specific limitation on current commodity production (output) associated with a policy providing transfers to agriculture and whether or not there are limits to payments in the form of limits to area or animal numbers eligible for those payments. Applied in categories A – F.

With variable or fixed payment rates: Any payments is defined as subject to a variable rate where the formula determining the level of payment is triggered by a change in price, yield, net revenue or income or a change in production cost. Applied in categories A – E.

With or without input constraints: defines whether or not there are specific requirements concerning farming practices related to the programme in terms of the reduction, replacement, or withdrawal in the use of inputs or a restriction of farming practices allowed. Applied in categories A – F. The payments with input constrains are further broken down to:

- Payments conditional on compliance with basic requirements that are mandatory (*with mandatory*).
- Payments requiring specific practices going beyond basic requirements and voluntary (*with voluntary*).
    - specific practices related to environmental issues;
    - specific practices related to animal welfare;
    - other specific practices.

With or without commodity exceptions: defines whether or not there are prohibitions upon the production of certain commodities as a condition of eligibility for payments based on non-current A/An/R/I of commodity(ies). Applied in Category E.

Based on area, animal numbers, receipts or income: defines the specific attribute (i.e. area, animal numbers, receipts or income) on which the payment is based. Applied in categories C – E.

Based on a single commodity, a group of commodities or all commodities: defines whether the payment is granted for production of a single commodity, a group of commodities or all commodities. Applied in categories A – D.

Source: OECD, 2013c.

One label of note identifies payments that are conditional on *voluntary input constraints*. These constraints may be for environmental, animal welfare, or other specific purposes, and require farmers (through voluntary compliance measures) to adhere to set production practices in order to obtain the subsidy. Payments that require specific practices related to environment issues may support activities such as[37]:

- The maintenance of protected/environmentally sensitive areas.

- Nitrate reduction.

- Organic crop farming.

- Crop rotation.

- The extensive management of grasslands.

- The conversion of agricultural land to wetlands and ponds.

- Amenities such as terraces, stone walls, hedges, shelter belts and buffer strips.

- Wildlife habitats.

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[37] This is not an exhaustive list of activities supported through environmental input constraints. Further, in many cases one programme affects several of these activities.

Given that these support measures are directly linked to promoting agricultural practices that are likely to benefit the environment and biodiversity, this label would be of value in establishing near-term indicators for agricultural subsidy reform.

4.2.4   *Agricultural support and impact on biodiversity*

The impacts of agricultural support measures on biodiversity largely depend on their effects on farm-level behavioral changes; namely the intensive (input use) or extensive (land use) degree of agricultural production. Some forms of support to the agriculture sector distort prices and resource allocation decisions, which may lead to either the intensification of agricultural practices (through increased labour and capital inputs) or the expansion of agricultural land. Some support measures could also incentivise the overuse of inputs, such as pesticides and fertilisers, which could lead to the loss of biodiversity through the depletion of soil resources and air and water pollution. As discussed in the previous section, it is difficult to determine which changes in agricultural activities will result in the greater impacts on biodiversity without additional information on the alternative allocation decisions (i.e. to bring new land into cultivation or intensify currently cultivated land). Some forms of support may, however, more strongly incentivise allocation decisions that may harm biodiversity, such as support measures without environmental safeguards or directly subsidising inputs such as environmentally-harmful pesticides (which could, as discussed, lead to their overuse). Other forms of support are designed to correct market failures and support environmentally-friendly practices, such as support to landowners who plant trees to reduce agricultural runoff, and for removing marginal land from production in order to provide habitat for wildlife.

As a result, it is not appropriate to categorise all agricultural support as harmful to biodiversity. Rather, the subsidies must be disaggregated to determine what support potentially leads to environmentally-harmful practices, and what support potentially leads to more environmentally-friendly practices. It can be generally assumed, however, that subsidies that encourage intensification of agricultural practices and expansion of commodity production, through price distortions, have the potential to most negatively impact biodiversity (OECD, 2003b). Some subsidies, however, may have a stronger effect on the incentive to intensify and expand output than others. Therefore, in order to measure both the removal, reform, and phase out of subsidies harmful to biodiversity, PSE classifications would need to be considered based on their magnitude of impact on biodiversity. The PSE classification scheme can roughly indicate the degree to which producers are incentivised to increase agricultural output, either through greater inputs or land expansion. In general, the more support is 'coupled' to the production of a commodity-output, the greater the incentive to increase output.

OECD members transfer, on average, USD 250 billion annually in support to the agriculture sector. Considering the direct link between agriculture and biodiversity and the scale of financial support, this is a key sector which should be monitored for subsidy reform, including both the removal or phasing out of harmful subsidies and the promotion of positive incentives. Positive trends have already been seen in OECD member countries, with the composition of PSE trending to include a higher proportion of support decoupled from production requirements. Support based on commodity output, for instance, dropped from over USD 200 billion in 1990 (30% of gross farm receipts) to USD 110 billion (8% of gross farm receipts) in 2011. Payments based on non-commodity criteria, including the retirement of land and other practices that support biodiversity, increased from USD 3 billion in 2000 to over USD 5 billion in 2010 (Figure 1.)

Figure 1. OECD Composition of Producer Support Estimate, 1986-2012

% of gross farm receipts

Legend:
- Miscellaneous payments
- Payments based on non-commodity criteria
- Payments based on non-current A/An/R/I, production not required
- Payments based on non-current A/An/R/I, production required
- Payments based on current A/An/R/I, production required
- Payments based on input use
- Support based on commodity output
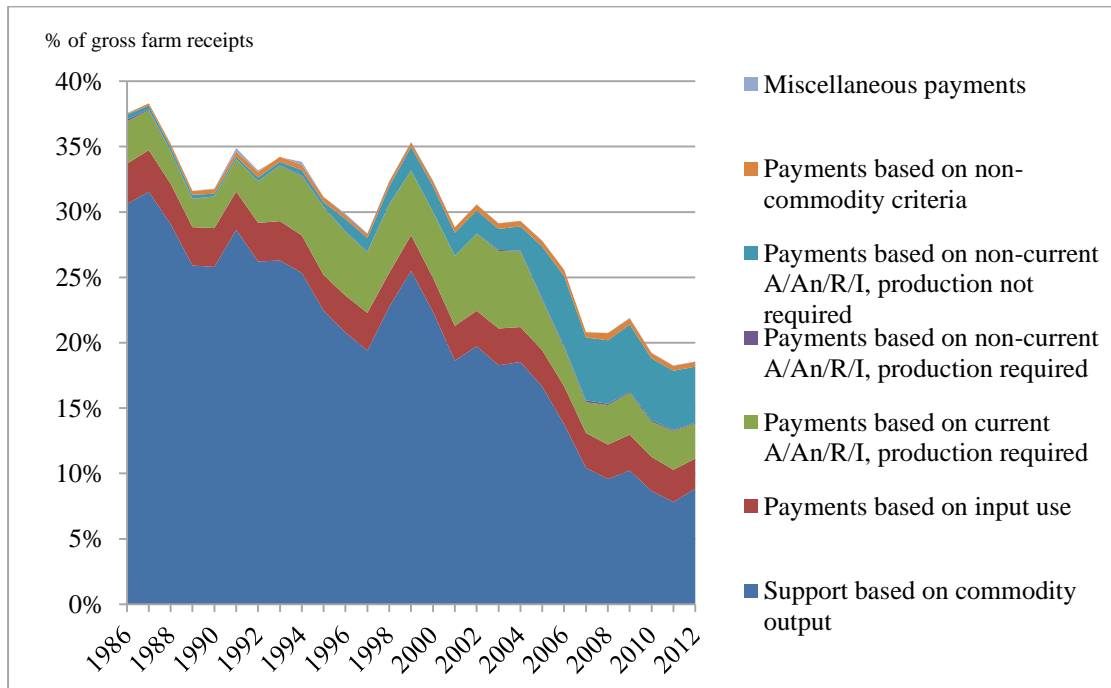
Source: OECD, PSE/CSE Database, 2013, www.oecd.org/agriculture/pse.

OECD has conducted analytical work on assessing and identifying environmentally harmful subsidies (OECD, 2005, 2013b), which has allowed support measures, including PSE, to be ranked according to their relative impacts on the environment. These impacts are directly related to the incentive of farmers to increase output. On this basis, market price support, output payments and variable input subsidies (e.g., fertilizer, pesticide and energy subsidies), particularly with no input constraints, are potentially most production and trade distorting, and thus implicitly also potentially most damaging to the environment and biodiversity than other types of support measures. This is primarily due to the strong incentive these payments can create to increase output, through both intensification and expansion of agricultural production, including in environmentally sensitive areas. These types of subsidies accounted for 73% of OECD producer support in 2000-2001, which amounted on average to approximately USD 180 billion per year. Since then, these more environmentally and biodiversity harmful subsidies have accounted for less of the combined total PSE, dropping to 49% in 2011. However, these subsidies still accounted for over USD 120 billion per year. Monitoring the transition from these forms of subsidies to less environmentally harmful forms can contribute to tracking progress towards Aichi Biodiversity Target 3. It is important to note that while these incentive measures have the *potential* to be the most harmful to the environment, their actual effects depend on a host of other factors, such as whether there are production quotas attached to them and whether they incorporate strong cross-compliance requirements, or are constrained by agri-environment regulations independent of the support programmes (OECD, 2013h). The assessment here provides a non-empirical categorisation of policy measures based on their potential impacts on biodiversity. The true impacts on biodiversity of any subsidy measure, however, are site-specific. This assessment nonetheless provides a foundation to build upon and allows for a proxy indicator/set of proxy indicators to be established to monitor agricultural policy measures and their potential effects on biodiversity.

4.2.5   *Assessment for use in monitoring progress towards Aichi Biodiversity Target 3*

By classifying the potential impacts of agricultural support on biodiversity, the PSE database can be used to monitor both the amount and type of subsidy reform within the agricultural sector over time. Then, on a country level basis[38], a comparison can be drawn to determine trends in agricultural support to determine whether subsidies with potential negative impacts on biodiversity are being phased out, reformed, or eliminated, and subsidies with positive impacts are increasing. An effort has therefore been made here to classify the potential impact on biodiversity, and the magnitude of that impact, for each PSE category and subcategory. It is important to note that any categorisation of this kind is a simplification and that the actual impact of a specific support measure on biodiversity will depend on local environmental characteristics and other factors. In the absence of better data however, such an approach could provide a starting point, or proxy indicator, for monitoring progress towards Aichi Target 3 in the context of agriculture. Table 6 identifies each PSE category and the anticipated potential impact and magnitude on biodiversity.

Table 6. Agricultural support and potential impact on biodiversity

PSE Category	PSE Sub-Category	Example	Potential Impact on Biodiversity (Negative/Positive/ Undetermined)	Expected Magnitude (High/ Moderate/ Low)	Comments
A. Support based on commodity output	A1. Market Price Support	Policy measures that create a market price differential between domestic market price and border price. Includes price support for 15 standard commodities, plus country-specific additional commodities in order to ensure MPS represents >70% of agricultural production.	Negative	High	Market Price Support increases the price of commodities, creating the greatest incentive for monoculture, increasing inputs, and farming on potentially environmentally-sensitive land. These sector wide support measures have the lowest effectiveness of achieving environmental goals.
	A2. Payments based on output	Direct payments to farmers, e.g. milk price supplements for cheese production; loan deficiency payments	Negative	High	Single commodity output payments increase the revenue of farmers, incentivising intensification of farming practices.
B. Payments based on input use	B1. Based on variable input use	Fertilisers; pesticides; animal feed; seeds; water; energy; hired labour; maintenance and operational costs of capital (plant, machinery, buildings, etc.); interest concessions on loans for the purchase of variable inputs; insurance premiums; fuel tax rebates	Negative*	High	Payments based on inputs reduce the costs of farming, thus incentivising intensification of farming practices.

Table 6 continued over page.

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[38] The European Union is treated as a single entity.

Table 6. Agricultural support and potential impact on biodiversity (*cont.*)

PSE Category	PSE Sub-Category	Example	Potential Impact on Biodiversity	Expected Magnitude of Impact	Comments
B. Payments based on input use (cont.)	B2. Based on fixed capital formation	On-farm infrastructure (e.g. construction of irrigation and drainage facilities); interest concessions on investment loans; property tax exemptions	Negative*	Moderate to High	Payments reduce the costs of farming, thus incentivising increased output.
	B3. Based on on-farm services	Extension and advisory services; pest and disease control; management training	Negative*	Moderate	Services may improve farming efficiency and reduce costs.
C. Payments based on current A/An/R/I, production required		Payment per area of specific crops; payment per animal; Income tax concessions, crop insurance payments; organic crop farming; environmental grass premiums	Negative*	Moderate	Payments increase revenue and encourage continued farming on potentially environmentally-sensitive lands. However, since farmers are not incentivised to intensify farming to the extent as support based on outputs or input use, the effects are more moderate.
D. Payments based on non-current A/An/R/I, production required		Structural payment to all milk producers with five or more cows	Negative*	Low	Payments do not change based on current production levels. Although the transfer reduces costs of production, does not incentivise intensification or expansion and should not have a strong impact on biodiversity.
E. Payments based on non-current A/An/R/I, production not required		Counter cyclical payments (based on historic base area and yields); single payment schemes (based on historic reference amounts)	Negative*	Low	Although these payments may increase the revenue of farmers, it does not incentivise intensification or expansion, and therefore has a low impact on biodiversity.
Payments based on non-commodity criteria	F1. Based on long-term resource retirement	Retirement of land from production, permanent reduction in milk production, afforestation or destroying trees in orchards or vineyards	Positive	Moderate to High	Payments are automatically labelled as being 'with' input constraints.
	F2. Based on a specific non-commodity output	Plant hedges, build stone walls to protect biodiversity or improve the countryside	Positive	Moderate to High	Payments are automatically labelled as being 'with' input constraints.
	F3. Based on other non-commodity criteria		Undetermined	Additional Information Required	
G. Miscellaneous payments			Undetermined	Additional Information Required	

* Some payments support environmentally-friendly technologies or farming practices, such as reduced-tillage or organic farming, which may either reduce the negative impacts on the environment and biodiversity, or even act as a positive incentive for biodiversity. These payments are classified with a voluntary environmental input constraint label and will therefore be included in the indicator to monitor subsidies in support of more environmentally-friendly practices.

Source: Based on analysis from PSE Manual; OECD, 2005; OECD, 2013b.

4.2.6   Gaps and data limitations

The PSE dataset provides a comprehensive system of measuring and classifying government support to the agricultural sector that could, as a starting point, be used to establish a set of proxy indicators to monitor subsidy reform in the context of biodiversity. It is worthwhile noting that this analysis considers the impacts of support measures only within the country providing them, and does not consider the spill-over effects of agricultural policies in other countries. For example, if support for intensification efforts (e.g. fertilisation) decreases in one country, this could lead to the intensification/conversion in another country, which may in turn lead to different, perhaps, more detrimental, outcomes on biodiversity. The ultimate goal, of course, is that all countries would aim to reduce or reform any subsidies that are harmful to biodiversity. A further issue that would also need to be considered is that, for example, efforts to intensify crop production through fertiliser may have different outcomes on biodiversity depending on the current state of the land. For instance, additional fertiliser in one area/country may lead to eutrophication if the carrying capacity of the environment is exceeded, but in another area/country may be taken up by the crops, implying less, or even neutral impacts to biodiversity.   It is outside of the scope of this analysis to consider such spill over effects but should be taken into consideration when interpreting the status of achieving Aichi Biodiversity Target 3.

The current voluntary environmental input constraint label identifies support provided under the condition that farmers adhere to certain production practices considered environmentally-friendly. This label has the potential to provide some insight as to how much support is 'tied' to environmentally-friendly behaviour. However, the labels provide only qualitative information, with no indication of the restrictiveness of the constraint, which may vary from one policy measure to another. In addition, much of the environmental concerns in the agricultural sector have focused on air and water quality for human health near population centres (OECD, 2003c) and are not necessarily biodiversity related.   The indirect effects of air and water quality on habitat quality however do not limit this label from providing a valuable indicator, at least in the near term in which to monitor subsidy reform.

4.2.7   Adequacy assessment and recommendations

Many countries have reformed current agricultural policies by 'greening' policy support measures to promote more environmentally friendly farming practices, including crop diversification, low-intensity farming, and maintaining ecological areas for wildlife. The current PSE classification and labelling scheme allows for an indicator or set of indicators to monitor and evaluate agricultural subsidy reform away from perverse incentives and towards incentives to conserve and sustainably utilise biodiversity in agricultural lands. .The PSE database, however, was not established and cannot be used to monitor the 'greening' of agricultural policies that may include environmentally-motivated cross-compliance measures. Although these policy reforms may provide positive incentives for and benefits to biodiversity, monitoring and tracking policy reform requires a more nuanced approach than the current classification scheme allows. Therefore, countries may wish to conduct a more qualitative assessment of their agricultural policies to supplement the quantitative indicators available from the PSE database. Interpretation of these indicators must account for the fact that these subsidy measures can only be estimated by their *potential* impacts on biodiversity, which may be mitigated and/or avoided through other policy measures. Therefore, ideally these indicators should be supplemented with information on how countries are conducting their own analysis to identify and understand the effects of subsidies and, in those cases where their own qualification differs, provide an explanation.

Decoupling support from production. The notion of decoupling agricultural support from production has been at the forefront of agricultural policy for over two decades now, beginning with the Uruguay Round of trade negotiations, spanning from 1986-1994 and conducted within the framework of the General Agreement on Tariffs and Trade. Although attention to decoupling originated from the trade and

production distorting effects resulting from these subsidies, they also have direct impacts on the environment. Payments that do not require production are rather provided on historic land area or number of animals, or other non-commodity criteria such as long term resource retirement and land improvement. These forms of support do not as strongly incentivise the intensification or expansion of agricultural inputs, and therefore are less harmful, and in some cases beneficial to biodiversity. Through agricultural policy reform, support linked to commodity production has already decreased in proportion to support not requiring production. In 1990, support tied to production accounted for 98% of total PSE in OECD countries, whereas in 2011, support was down to 73%.

Possible Indicator (1): Proportion and amount of PSE support tied to production

Figure 2. Trends in Agricultural Support Requiring Production for OECD Countries (1990-2011)

Figure in USD millions
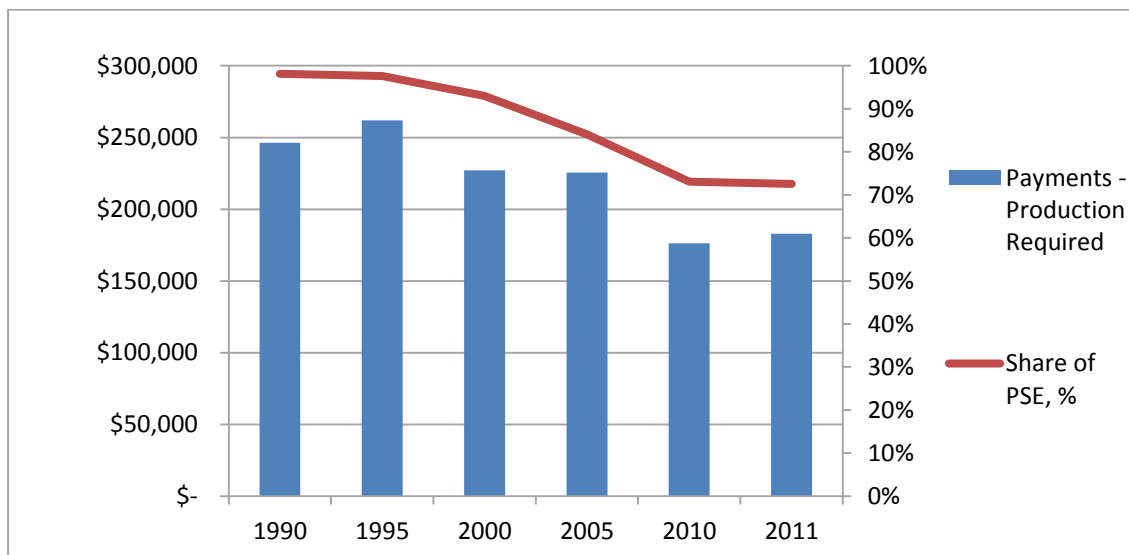
Source: OECD, PSE/CSE Database, 2012, www.oecd.org/agriculture/pse.

Change in composition of support. OECD has determined through its work on agri-environmental indicators and subsidy reform that (1) market price support, (2) payments based on commodity output and (3) payments based on variable inputs without constraints pose the greatest threats to the environment (OECD, 2013b). These three forms of support have the greatest influence on production and trade in terms of distorting farmer decisions to intensify and expand agricultural output. Such decisions, are therefore likely to pose a greater risk to biodiversity than other forms of agricultural support. Therefore, it is possible to produce an indicator from the current dataset that represents the proportion of government support to agricultural producers that aligns with these three categories of support. Reform is already underway throughout many OECD member countries to phase out and eliminate these forms of subsidies, currently representing 49% of total PSE in 2011, down from 86% in 1990 and 73% in 2000 (Figure 3). Monitoring this continued trend could be one indicator to measure progress towards achieving Target 3.

Possible Indicator (2): Proportion and amount of PSE support to the potentially most harmful subsidies (MPS + Commodity Output +Non-constrained variable input use)

Figure 3. Trends of PSE based on MPS, Commodity Output, and Non-Constrained Variable Input Use in OECD countries (1990-2011)

Figure in USD millions
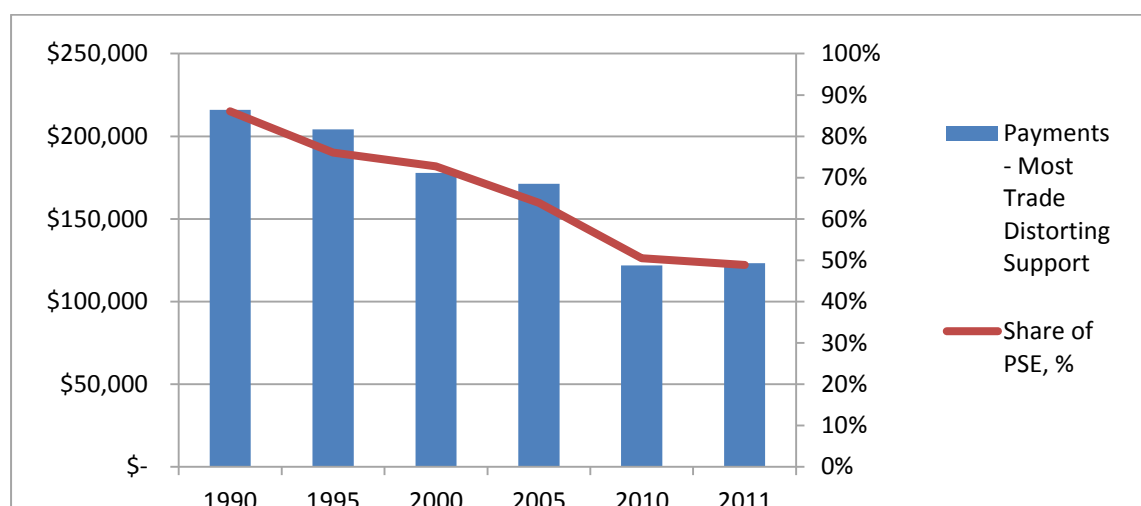
Source: OECD, PSE/CSE Database, 2012, www.oecd.org/agriculture/pse.

Environmental input constraints. The current labelling system includes an input constraint to identify support that is conditional to farmers adhering to certain voluntary production practices considered as environmentally-friendly. This label could be used as a proxy for policy support with environmental objectives. Monitoring the trend of the composition of PSE support with voluntary environmental constraints could provide a good indication of policy measures supporting farming practices that may benefit the environment and biodiversity. As mentioned previously, not all environmental efforts are directed towards biodiversity, such as air and water pollution control near high urban populations, but the indirect link on environmental health and biodiversity could allow this indicator to serve as an adequate proxy for subsidy reform. In the long-term, this labelling scheme may be further refined to identify agricultural subsidies with biodiversity conservation restrictions.

Possible Indicator (3): Proportion and amount of PSE with voluntary
environmental input constraints

Figure 4. Share of PSE with voluntary input constraints in OECD countries (1990-2011)

Figure in USD millions
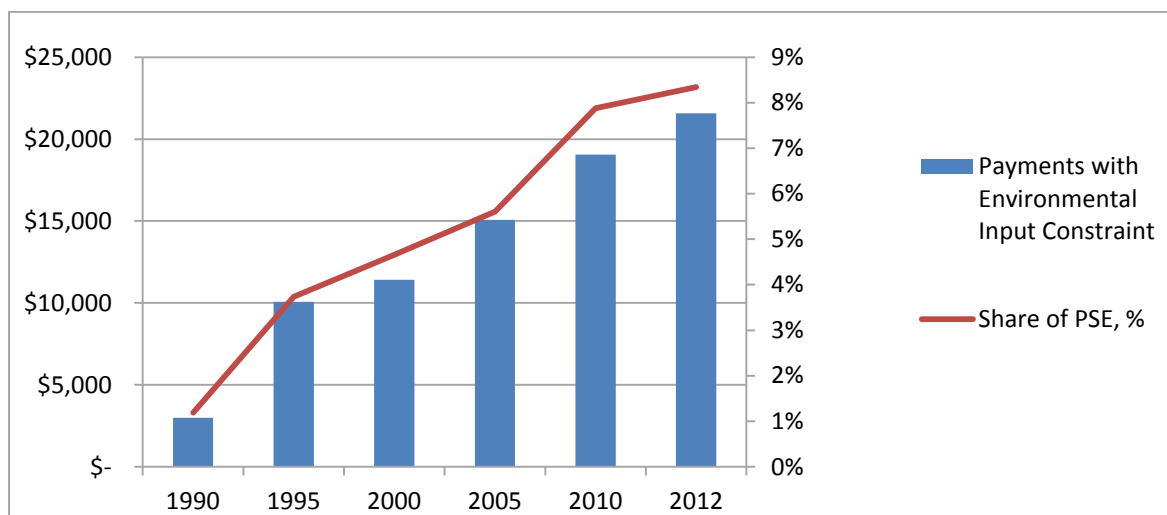
Source: OECD, PSE/CSE Database, 2012, www.oecd.org/agriculture/pse.

Non-commodity payments. One final indicator that could be extracted from this dataset is the amount of support provided based on non-commodity criteria, such as long-term resource retirement, afforestation, or the use of farm resources to provide services that improve the countryside or protect biodiversity. Although these forms of payments account for less than 3% of total PSE, the monetary amount of support provided for these goods and services have clear environmental and biodiversity objectives. In 1990, non-commodity payments in OECD countries accounted for USD 2.76 billion, just over 1% of total PSE. In 2011, these payments amounted to just under USD 5 billion accounting for 2% of total PSE. While still low in terms of total support to the agricultural sector, these payments represent a positive incentive to decrease production, retire resources, and improve land for the benefit of biodiversity. As these payments are intended to protect a public good that would otherwise likely not be invested in by the landowner, this indicator provides an unambiguous measure of a positive incentive with beneficial outcomes to biodiversity in the agricultural sector.

Possible Indicator (4): Payments based on non-commodity criteria

Figure 5. Payments based on non-commodity criteria in OECD countries (1990-2011)

Figure in USD millions
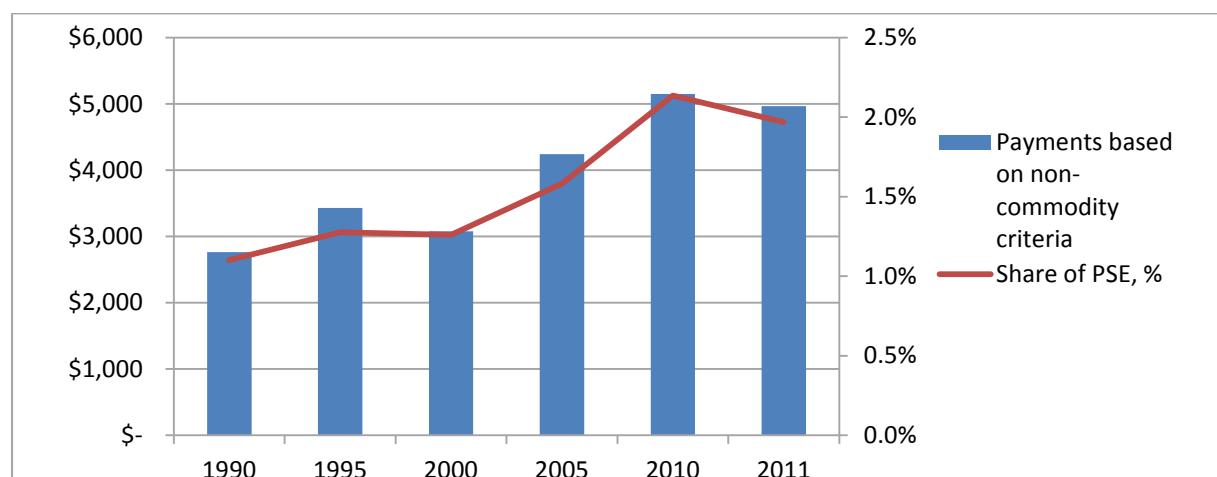
Source: OECD, PSE/CSE Database, 2012, www.oecd.org/agriculture/pse.

Support to the agricultural industry can be utilised as a measure to correct for a number of negative externalities generated from farming practices and to ensure that land is maintained to benefit both people and the environment. Recent work by OECD on agri-environmental indicators reveals that agriculture in OECD countries today reflects enhanced environmental performance, through the use of fewer environmentally harmful inputs and the widespread adoption of environmentally beneficial practices.[39] Measuring how subsidies support these trends through the above recommended indicators will enable countries to monitor progress towards Target 3.

4.3   OECD Government Financial Transfers to fisheries

4.3.1   *Incentive structures in the fisheries industry*

Marine fisheries are common pool resources, considered to be part of the public assets, but often over-exploited when fishers are granted unlimited access to them. Therefore, regulatory measures are a necessary tool to effectively manage fisheries resources for the public good. Early fisheries policies promoted expansion of fishing capacity to harvest a resource that was considered in good biological condition. However, combined with modern fishing technologies, the resulting overcapacity has led to crisis and collapse of many once-abundant fish stocks. Modern fisheries polices have shifted from promoting capacity expansion to managing the fish stock and limiting access, although many policies from the earlier expansionary phase in fisheries remain. Effective regulatory instruments, such as management systems, ensure the health of marine fisheries and ecosystems while simultaneously aiming to achieve maximum sustainable yields. These regulatory instruments and their effective enforcement influence the behaviour of fishers to comply with rules and regulations. Economic instruments, such as financial support,

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[39] Such as conservation tillage, improved manure storage, soil nutrient testing, and drip irrigation. See OECD Compendium of Agri-environmental indicators (2013).

can also influence fisher's behaviour, but only inasmuch as the regulatory system in place is able to effectively manage fishing effort. As a result, monitoring progress on economic incentive reform would need to be supplemented by information on management regimes.

The FAO estimates that, today, over one-half of all fish stocks are fully-exploited, and nearly one-third are over-exploited[40]. In many cases, poorly designed fisheries management policies provide incentives that lead to overharvesting, higher levels of by-catch (non-target fish species) and the depletion of marine ecosystems. In accordance with the Johannesburg Plan of Implementation, resulting from the World Summit on Sustainable Development, countries have agreed to implement strict management plans to maintain or restore stocks to levels that can produce the maximum sustainable yield[41] (United Nations, 2002, paragraph 30(a)). In addition, countries were called upon to "eliminate subsidies that contribute to illegal, unreported and unregulated fishing and to over-capacity, while completing the efforts undertaken at the WTO to clarify and improve its disciplines on fisheries subsidies." (United Nations, 2002, paragraph 30(f))[42].

Fisheries managers deploy a number of different tools to control fishing activity and achieve a targeted level of harvest and stock size. Some regimes rely on limiting the amount of fishing effort exerted on a fish stock through setting regulations on mesh size, amount of fishing gear, or area/time closures, also known as input controls. Other regimes rely on regulating the catch through Total Allowable Catch (TAC) limits or other output controls. In addition to technical measures, management regimes often rely on other instruments to regulate access to fisheries resources, such as by issuing licences, catch quotas, effort quotas, and other incentive-based access controls. Sound management regimes combined with effective enforcement are essential to sustainably managing fisheries resources for the benefit of society.

OECD classifies management regime instruments based on the extent of effort controls (e.g. restrictions on fishing gear such as mesh size) and output controls for catch, such as TAC and ITQs (Table 7).

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[40] FAO definitions: 1. Fully-exploited: The fishery is operating at or close to an optimal yield level, with no expected room for further expansion. 2. Over-exploited: The fishery is being exploited at above a level which is believed to be sustainable in the long term, with no potential room for further expansion and a higher risk of stock depletion/collapse. FAO. 2012. The State of World Fisheries and Aquaculture 2012. Rome. 209 pp.

[41] Maximum Sustainable Yield is equivalent to the largest yield that can be taken from a fish stock while maintaining the current population size, which occurs at the point of maximum growth rate of the fish stock.

[42] United Nations (2002). Johannesburg Plan of Implementation. IV. Protecting and managing the natural resource base of economic and social development. In: UN Department of Economic and Social Affairs, Division for Sustainable Development [online]. [Cited 16 September 2013].

Table 7. Typology of Management Instruments

Control Method	Control variable	
	Fishing effort (input control)	Catch (output control)
Regulatory (administrative technical measures)	• Mesh size • Size/amount of gear • Area/time closures	• Size and sex selectivity • TAC
Regulatory (administrative access control)	• Limited[a] non-transferable[c] permits/licenses (LL) • Individual non-transferable effort quotas (IE) • Territorial Use Rights in Fisheries (TURF) • Other types of effort limits	• Individual[b] non- transferable[c] quotas (IQ) • Community-based catch quotas (CQ) • Other types of catch limits (maximum landings or vessel catch limits - VC)
Economic market-based (economic access control or "rights-based method"	• Transferable[c] licenses[a] (LTL) • Individual transferable effort quotas (ITE)	• Individual[b] transferable[c] quotas (ITQ)
Economic non-market based (monetary transfers)	• Input[d] tax • Subsidy • Charges	• Landing tax • Subsidy • Charges

Source: OECD (2006b).

Notes:

[a] System restricting the number of vessels authorised to fish, their individual fishing capacity and fishing time.

[b] Individual quota = fraction of a TAC (Total Allowable Catch) allocated to a vessel or fishing firm.

[c] Transferable = tradable on a market.

[d] Components of fishing effort (intermediate consumption, fixed capital, labour).

Financial support measures may encourage capacity and effort-enhancing behaviours by subsidising investment, reducing risk, or increasing revenue. The magnitude of impact from these economic incentives, however, must be considered in the context of the regulatory system, which can set strict limits on fishers' behaviour. In particular, market-based management approaches have proven effective in many cases in aligning the private industry incentives with public objectives for conservation. Therefore, the incentives generated by financial support measures should be considered within the context of the management and enforcement regime in place in order to identify a robust policy response indicator adequate of monitoring incentive reform in the fisheries sector.

4.3.2   *Measuring support to the fisheries sector*

The fisheries sector in OECD countries receives approximately USD 6.4 billion a year in transfers from the government. Collecting information on how support is channelled into the fishing industry is essential in facilitating a discussion of policy performance and improvements. The characteristics of the fishing industry require a different approach to measuring government support. First, fisheries policies tend to focus on fleet composition and the nature of the recipient rather than specific species or products. In addition, the highly heterogeneous nature of fish products makes calculating market price support

difficult[43]. Finally, exoneration from social charges, tax concessions (e.g. fuel) and other benefits that derive from tax and social policies are often poorly understood and difficult to measure.

The OECD collects and disseminates data concerning Government Financial Transfers (GFT)[44]. These transfers are defined as "the monetary value of government interventions associated with fisheries policies" and cover transfers from central, regional and local governments (OECD, 2012c). GFTs are indicators of financial support paid to the fisheries sector by government and are classified under one of three broad headings:

1. Direct payments by government to fishers, which are primarily directed at increasing their income.

2. Cost reducing transfers, which are aimed at reducing the costs of fixed capital and variable inputs.

3. General services, including management, surveillance and enforcement which are transfers paid by government not necessarily received directly by fishers, but which nevertheless reduce the costs they face[45].

OECD collects GFT to marine capture fisheries, aquaculture, and the marketing and processing sector, although reporting on aquaculture and marketing and processing has been sparse. The FAO estimates that nearly one-half of the world's food fish is sourced from aquaculture and may represent the fastest growing food production sector. Aquaculture requires a large amount of inputs, often sourced from marine resources, and can therefore have potentially large effects on marine ecosystems and biodiversity. While there is a need to improve reporting in this sector, the evidence is that direct support to aquaculture is small. Therefore, only support to marine capture fisheries will be considered here as a possible indicator to monitor incentive reform in the fisheries sector[46].

4.3.3 Description of dataset

OECD has been collecting data on financial support to the marine capture fisheries sector since 1965. The current GFT classification of support has been collected on an annual basis since 1996 for all 34 OECD member countries[47]. Since then, a growing number of non-OECD countries have been added, including Argentina, Chinese Taipei, the Russian Federation, and Thailand. Results are published in the series of statistical publications, *Review of Fisheries: Country Statistics*.

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[43] Market Price Support can be approximated through tariffs, but is not reported in OECD's Review of Fisheries.

[44] APEC and WTO also collect information on fisheries subsidies.

[45] Some countries do impost cost recovery charges to fisheries to recoup general services expenses.

[46] Moreover, marine capture fisheries are publicly held resources, while aquaculture is "privatised". Hence, the model for understanding GFTs is different.

[47] There are inconsistencies with how countries report financial transfers that make drawing comparisons across countries and over time challenging. One area that is consistently underreported is subsidies in the form of foregone revenue, such as fuel tax exemptions and unpaid social contributions.

GFTs are indicators of financial support paid to the fisheries sector by government. Transfers to the marine capture fisheries are classified under 4 categories and 17 sub-categories:

A. Direct Payments
    1. Decommissioning of vessels and licenses
    2. Disaster relief payments
    3. Grants for vessel construction, modernization and equipment
    4. Income support and unemployment insurance
    5. Other direct payments

B. Cost Reducing Transfers
    1. Subsidized loans for vessel construction, modernization and equipment
    2. Interest subsidies
    3. Fuel tax exemptions
    4. Insurance rebates and subsidies
    5. Income tax rebates for fishers and unpaid social contributions
    6. Other cost reducing transfers

C. General Services
    1. Management Services
    2. Research Services
    3. Enforcement Services
    4. Provision of infrastructure
    5. Other general Services

D. Cost Recovery Charges

Source: OECD, 2012c.

Of the total government transfers to fisheries reported by countries, approximately one-third supports management, research and enforcement services (C1, C2, and C3), collectively referred to as fisheries services. These transfers include the costs associated with the establishment and administration of management regimes, monitoring and surveillance of compliance with fisheries laws and regulations, and the data collection and analysis associated with stock and risk assessments, necessary to establish catch limits for fish stocks. An additional one-third is directed to the provision of fisheries infrastructure (C4). Because of difficulties in identifying and defining the full range of transfers, these figures are likely an underestimate of the total support provided to the sector. Approximately three-quarters of total support, however, has been directed towards general services (C1-5) since 2001 (Figure 6). On average, support to the fishing industry in OECD countries represents nearly 20% of the total landed value of fish stocks.[48]

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[48] Average value from 2007-2009. This figure varies considerably among OECD countries, representing 1% in the United Kingdom and 57% in the Sweden.

Figure 6. Composition of GFT to Marine Capture Fisheries, OECD Total
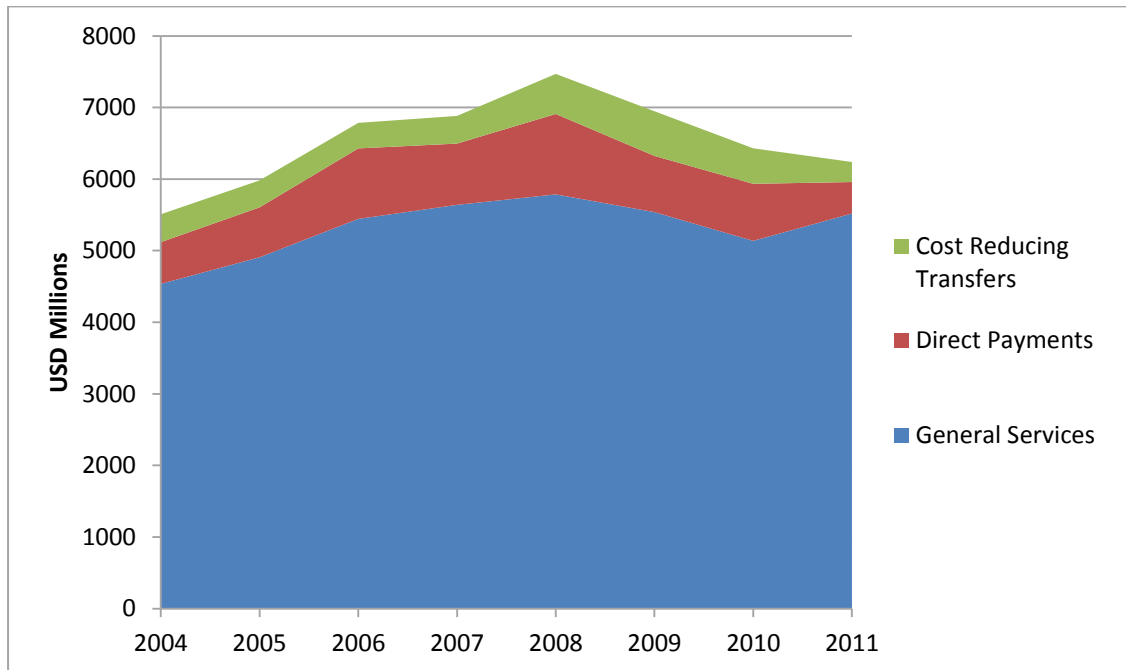
Source: OECD GFT database (Note: Includes Chinese Taipei and Thailand)

4.3.4   *Fisheries support and impact on biodiversity*

Subsidies to the fisheries sector in the form of direct payments, such as income support, and cost reducing transfers, such as subsidized loans for vessels and equipment, can alter the incentive structure to increase capacity[49]. Increasing capacity can result in larger and more powerful vessels, more sophisticated fishing gear (e.g. electronic equipment such as fish finders), and other effort inputs such as time spent at sea and human labour.

The effect of a subsidy, however, depends on the status of the fishery and how effectively management and enforcement efforts can constrain the incentive to expand fishing capacity and effort (see Figure 7). If, for example, subsidies to fisheries are removed while the fish catch is limited by other measures, the effects of the subsidy on the resource may not be as significant as if there were no constraints on catch, such as in an open access fishery[50] (OECD, 2006c). Even with effective management regimes however, incentives to expand output may inhibit optimally performing policies through; income redistribution; political pressure on governments to relax control measures; enhanced illegal, unreported, and unregulated (IUU) fishing activities; and increasing the incentive to purchase more inputs, thereby reducing the transfer efficiency of payments (Tangermann, 2013).

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[49] The technical use of the terms "capacity" and "effort" is a subject of much debate. Capacity is often referred to as the extractive capital available to catch fish (measured in tonnage, engine size, fishing gear, and human capital), whereas fishing "effort" is the degree to which fishing capacity is employed (often times days at sea). For a more detailed explanation, see WWF (2004) For the purposes of identifying subsidies that are harmful to biodiversity, any support that enhances either capacity or effort can be seen as harmful to biodiversity, and are thus used interchangeably here.

[50] Open access fisheries do not exist within OECD countries, as all fisheries are subject to some form of catch or effort control.

Figure 7. Mediators of Impacts of GFT Policies
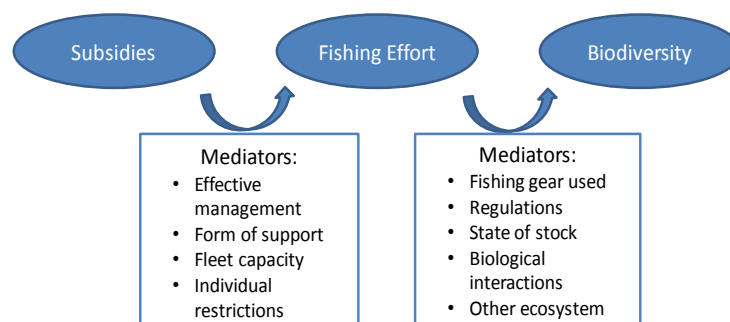
In many countries, policy makers have responded to overcapacity by introducing policies designed to remove capacity from the fishing industry, such as through vessel and license decommissioning schemes. Although these efforts are primarily targeted at reducing fishing effort and providing fishers with an exit strategy from the sector, there are potential positive impacts on marine ecosystems and biodiversity. The evidence on the effectiveness of buyback programmes, however, is mixed. When the management system allows it, capacity can seep back into the fishery, especially when there is substantial idle and/or latent capacity. In some cases capacity is already declining, and so it is difficult to determine whether buyback programs accelerate or slow that decline. Also, when anticipated by fishers, buyback programs can incentivise an increased capacity prior to the buyout, thereby neutralizing the expected benefits (OECD, 2006c). Capacity-reducing support is a relatively inefficient and uncertain way to reduce fishing effort as the "natural background capacity" increases by around 2 percent per year, inter alia, through innovation (Banks et al., 2002). Hence, a better approach is to reform fisheries management regimes to ensure that incentive structures are in place for fishers to not increase capacity or effort beyond the carrying capacity of the fish stocks.

Capacity-enhancing support in the absence of effective management can be generally regarded as harmful to biodiversity, as any transfers that increase the incentive for larger catches will have negative effects on the target fish stock, bycatch, and marine biodiversity. Capacity-reducing support, however, may or may not bring biodiversity benefits, depending on the situation. Ideally, they can incentivise actors to exit the industry, and accelerate adjustment, thus reducing pressures on both fish stocks and marine resources. At their worst, they simply provide more transfers to fishers.

Measuring and classifying government support is a useful aid to understanding the degree of policy intensity in the sector, even when effort or harvest is effectively controlled. All support tends ultimately to increase desired effort, and so can increase pressure on the system and promote illegal activity. Some government transfers are provided to ensure resource conservation, such as enhancing fish stocks and conducting research and development in clean harvesting gear. Many OECD countries, for example, have initiated bycatch reduction plans by financing the purchase, installation and operation of more "environmentally-friendly" fishing techniques and gear (e.g. bycatch reduction devices).

Although the total amount of government support has not declined over time, recently, an increasing emphasis has been placed on "environmentally-friendly" support, with some of the support linked to more environmentally acceptable fishing gear and technologies, the reduction of fishing capacity and effort, closure of fishing grounds, retraining of fishers, etc. The data collection, however does not distinguish environmentally friendly support at present. Although the effectiveness of this shift in focus in terms of improving the sustainability of fisheries and the economic health of the fishing sector remains to be tested, monitoring the trends in government support towards more sustainable and environmentally-friendly fishing practices could be one way to identify policy reform in the fisheries sector. Identifying the positive

and negative impacts of transfers on biodiversity is a complex, yet necessary step in supporting policy reform and monitoring progress. The database as it is currently structured does not allow for an indicator to be constructed that measures policy reform towards more environmentally-friendly and sustainable fishing practices, but this could be explored in the future.

4.3.5   *Assessment for use in monitoring progress towards Aichi Target 3*

The role of the management regime notwithstanding, an assessment of each GFT category according to their potential impact on biodiversity is provided in Table 8. These potential impacts assume that the management regime in place is not 100% effective at enforcing catch limits and effort, and therefore any change in incentive structure will influence fisher behaviour. Given the lack of available data on management regimes, enforcement efforts, fishing methods, and state of the fish stock, however, it is not possible to identify the magnitude of the potential impact on biodiversity from policy measures.

Table 8. GFT category and expected impact on biodiversity

Classification of Policy Measure	Potential Impact on Biodiversity (Negative/Positive /Undetermined)	Comments
Direct Payments		
Decommissioning of vessels and licenses	Undetermined	Transfers to decommission vessels and licenses are intended to reduce capacity in fisheries (positive). However, the injection of new capital into the sector may in fact increase capacity without effective controls (negative). Without changes in management, effort may leak back into the sector (neutral). In addition, some countries allow the decommissioned vessel to be shifted to another fishery, negating the overall capacity-reducing efforts (neutral to negative depending on the status of fishery where vessel shifted). (OECD, 2006c; Sumalia, 2010; UNEP, 2004)
Disaster relief payments	Undetermined	May be used to reduce capacity in the fishing sector (positive). More often, such payments are intended to cover losses and therefore maintain capacity (neutral).
Grants for vessel construction, modernization and equipment	Negative*	Payments effectively increase fishing capacity by reducing costs. (Sumaila, 2010, UNEP, 2004)
Income support and unemployment insurance	Undetermined	Income support to employees reduces the costs to firms for remaining in the industry and can often prevent adjustment away from unsustainable levels of fishing. Income support to fishers also leads to dependence and inhibits ability of fishermen to respond to market conditions and transition to other industries. Support could be provided, however as a flanking measure for fishers exiting the industry, thereby reducing overall capacity. Similar to supporting the decommissioning of vessels, however, this capacity could leak back into the sector without proper management efforts in place. (Sumaila, 2010, UNEP, 2004)
Other direct payments	Undetermined	More information needed.
Cost Reducing Transfers		
Subsidized loans for vessel construction, modernization and equipment	Negative*	Payments effectively increase fishing capacity by reducing costs. (Sumaila, 2010, UNEP 2004)
Interest subsidies	Negative*	Payments effectively increase fishing capacity by reducing costs.

Table 8 continued over page.

Table 8. GFT category and expected impact on biodiversity (cont.)

Classification of Policy Measure	Expected Impact on Biodiversity (Negative/Positive/ Undetermined)	Comments
Fuel Tax exemptions	Negative	Payments effectively increase effort by lowering marginal costs, especially for the most damaging, fuel-intensive gears. (Sumaila, 2010)
Insurance rebates and subsidies	Negative	Payments effectively increase fishing capacity by reducing fixed costs.
Income tax rebates for fishers and unpaid social contributions	Negative	Payments effectively increase fishing capacity by increasing net revenue.
Other cost reducing transfers	Undetermined	More information needed.
General Services		
Management services	Undetermined**	Costs associated with administering, adjusting, and proposing amendments or additions to the existing management system. Includes stock and fishery habitat enhancement programs. If fishers paid the full costs of management services, effort would likely be lower, but good management is essential to conservation.
Research services	Undetermined**	Research is necessary to assess stock levels and ensure adequate management regime. However, some research is used to improve fishing technologies and gear, which can increase capacity (negative). Some research is used to produce more environmentally-friendly fishing technologies, such as reduced bycatch gear (positive), although this may lead to increased effort to account for the potential reduction in targeted species (undetermined)
Enforcement services	Undetermined**	Necessary to ensure an effective management regime is in place, in addition to preventing IUU fishing. However, similar to other general services support, if fishers paid the full costs of enforcement services, effort would likely be lower.
Provision of infrastructure	Undetermined**	In the absence of user charges, the costs of fishing would decrease, thus increasing pressure on fish stocks. However, some infrastructure is essential for the proper function of management.
Other general services	Undetermined**	More information needed.
Cost Recovery Charges		Cost recovery charges are applied to general services, but full costs are not recovered. Not used by all countries.

* Grants and loans for vessel construction, modernization and equipment that are used to support biodiversity-friendly fishing gear, such as reduced bycatch gear, may reduce the negative impact these types of support measures have on biodiversity. However, the effects of reduced bycatch gear on biodiversity is controversial, as it may lead to not only reduced bycatch, but a reduction in the target species catch, leading to increased effort.

** Whether publicly-funded general services, such as management, research and enforcement services, are considered subsidies to the industry is a subject of significant debate. The debate centres around the appropriate role of the public sector to manage fisheries resources; if the resource is considered a public good then taxpayer funds should cover the management and conservation of fisheries, but if the private sector is the primary beneficiary, then these costs should be recouped through "full cost recovery" charges. Some OECD countries use cost recovery charges, but not all.

Source: Based on analysis from OECD, 2006c; UNEP, 2004; and Sumaila et al., 2010.

4.3.6   *Gaps and data limitations*

GFT data is collected and reported on an annual basis and is the only source of comparable data on GFTs. The data, however, is not always reported in a timely manner (most recent-year data is often preliminary with many missing data points) and there is currently no formal review process to ensure that all policies are captured in the survey instrument. In addition, data is based on self-reporting by members and often lacks source information that would allow independent verifications[51].

The current OECD classification system provides a detailed perspective of how financial transfers are provided to the fisheries sector. Without complementary information on the fisheries management setting however, the economic, environmental and social effects of various types of transfers are difficult to assess. In addition, several direct and cost reducing transfers to the fisheries sector have ambiguous effects on capacity and effort. Transfers to decommission vessels and licenses, for example, are intended to reduce capacity, thereby reducing the pressure and having a positive impact on biodiversity. Without effective management controls, however, effort may leak back into the sector, neutralizing the expected positive impact. Furthermore, these decommissioned vessels may simply shift to another fishery which, depending on the status of the fishery, may result in causing more harm to biodiversity.

As discussed in Section 4.3.4, the current dataset does not capture information on a number of factors that influence the effects of subsidies, such as the biological status of fish stocks, the state of existing management systems, the type of fishery, and how effective enforcement measures are at regulating fish catch and effort. In fisheries that are operating below full capacity, for instance, subsidies will likely be less harmful to fish stocks than those operating at full or above capacity (UNEP, 2004). In addition, subsidies tend to be more harmful in open access fisheries, or management regimes that rely solely on catch controls, than regimes that have implemented rights-based management controls such as individual transferable quotas.

Data are also lacking on the fishing methods and gear employed in fisheries that are provided with GFTs. There is evidence that high seas bottom trawling, a fishing method that involves dragging fishing nets along the sea floor, is particularly harmful to marine biodiversity as it damages environmentally-sensitive habitats and harms fish species with low growth rates (e.g., Sumaila et al., 2010). Although subsidies that support fishing fleets that employ this method are estimated to be fairly low[52], the environmental impacts are disproportionately high. In addition, estimates reveal that the current profitability of trawling fleets is largely dependent on fuel subsidies given their huge fuel consumption (Sumaila et al., 2010). Fuel tax concessions were the subject of a recent study that estimated that total support provided by these instruments was USD 2 billion in 2008 [TAD/FI(2010)8].

Lastly, much of the research on the environmental effects of fisheries subsides to date has focused on the target stock species and a limited number of bycatch (e.g. OECD, 2005; UNEP, 2004). Little research has been done to determine how fisheries subsidies affect marine biodiversity within the broader ecosystem context. This will hinder the ability to assess how subsidy reform impacts on marine biodiversity more generally, rather than on target fish stocks.

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[51] An experts meeting was held in 2013 to discuss improvements to the GFT, and new resources have been allocated in 2014 to implement the recommendations of the experts meeting. (Agenda can be found here: TAD/FI(2012)13/REV1).

[52] Estimated at USD 152 million per year according to Sumaila et al. (2010).

4.3.7   Adequacy assessment and recommendations

As demonstrated, the incentive structure in the fisheries sector is complex: constructing indicators from financial support measures alone will not be sufficient, but is an essential step to monitoring reform. The current structure of the GFT dataset does not allow for an *exact* assessment of changes in the composition of support away from biodiversity harmful measures and towards biodiversity-friendly measures. It does, however, allow for a measurement of the *intensity* of financial support to the fisheries sector that may negatively influence fisher behaviour, affecting marine biodiversity.

Support with negative impacts. Although in theory capacity-reducing measures should benefit biodiversity by relieving the pressure on fish stocks, the effects of these measures are uncertain. Ideally, an analytically sound indicator would not include transfers with ambiguous effects. Based on the assessment in Table 6, it is possible to construct an indicator from the current GFT database that monitors the *intensity* of government support measures to the fisheries sector that are anticipated to have a *negative* impact on biodiversity, caveating that without information on a) the state of the fish stock, b) fishing methods employed, c) management regimes and d) effective enforcement of management regimes, the magnitude of the impact is less certain. Support measures with possible negative impacts would include: grants and subsidized loans for vessel construction, modernization, and equipment; interest subsidies; fuel tax exemptions; insurance rebates and subsidies; and income rebates for fishers and unpaid social contributions.

Possible Indicator (1): Proportion and amount of GFTs with potentially negative impacts on biodiversity

This indicator could easily be constructed in the short term from the current GFT classification with no modifications based on the assessment in Table 6. The interpretation of this indicator would require strong caveats indicating that, without the additional information listed above (such as the state of the fish stocks and the management regimes in place), the effects on biodiversity are uncertain. Monitoring the intensity of support to these potentially biodiversity-harmful policy measures could nonetheless serve as an adequate proxy indicator to monitor government efforts to eliminate, phase-out, ore reform incentives measures with potentially harmful effects on biodiversity in the fisheries sector.

Inclusion of labels.   Another possible indicator that could be developed would be to introduce a labelling scheme to identify which forms of support are provided with a behavioural constraint, such as support measures intended to encourage more sustainable and environmentally-friendly fishing practices[53]. For instance, support for the purchase or upgrade of bycatch-reducing fishing gear and technology may benefit marine biodiversity. Research on more environmentally-friendly fishing practices, such as gear and technology, will also benefit marine biodiversity. Labels could be applied to each classification to determine if government support is correcting for a market failure that otherwise would not be addressed by private industry. The indicator in this case would be the proportion and amount of subsidies that are provided with a behavioural constraint. It should be noted that although reduced bycatch technologies are intended to benefit biodiversity in one respect, they may be harmful in other respects. For instance, gear that reduces bycatch may also reduce targeted catch, thereby reducing efficiency and requiring more fishing effort to catch a given amount of fish. However, this measure could serve as an adequate proxy

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[53] The new GFT classification will include a label for "Fishing behaviour constraints required" that may be able to be utilised for these purposes. This would include payments that require specific fishing practices or actions to be taken or avoided by the recipient. These specific requirements concern all constraints on production practices from the harvest to the first sale (such as requirements on specific use of gear and other input, selectivity, fish practices, engine power, landing conditions) but do not include pure administrative or enforcement constraints (such as completing logbooks, presence of observes on board).

indicator to monitor incentive reform away from capacity-enhancing support and towards support that encourages and incentivises sustainable and biodiversity-friendly fishing behaviours.

Possible Indicator (2): Proportion and amount of GFTs with behavioural constraints

This indicator could not be constructed from the current database and would therefore require modifications. The GFT database is currently under review with the aim of improving the ability of the GFT database to inform on the nature and scale of financial transfers to fisheries and enhance its ability to support research into the impacts of that support[54]. .

Capturing management regimes. The impact of GFTs on biodiversity will depend in large part on the management regimes that are in place. Most countries employ a variety of different management instruments and regulations. In the past, OECD has collected information to inventory country's administrative, legal, and other aspects of fisheries management systems[55]. Although up-to-date information is not available, including information on fisheries management systems in country reporting may be a possibility for the future and is currently being considered as part of the GFT reclassification exercise.

4.3.8   *Current efforts to identify and measure management regimes*

A key step in supporting management reform for improved sustainability is the development of more detailed, systematic and comparable information on fisheries and management trends. FAO developed The State of World Marine Capture Fisheries Management Questionnaire in 2004 to assist country review authors to organise and assess national fisheries management (FAO, 2007). The questionnaire has since been implemented in a number of regional reviews, including the Pacific, Indian, and Western Central Atlantic Ocean regions. The questionnaire is collected on the country level for three major sub-sectors: (1) commercial/industrial (large-scale); (2) small-scale, artisanal, lifestyle, subsistence, indigenous, customary fisheries; (3) recreational, including non-consumptive use such as catch and release fishing, ecotourism and diving, and includes information on the:

1. Legal framework

2. Policy framework

3. Description and status of fisheries in the country

4. Management activity, including instruments (spatial, temporal, catch and size, rights/incentive-adjusting, and gear restrictions)

5. Costs and funding of fisheries management

6. Implementation of global fisheries mandates and initiatives

7. Participation in regional fisheries bodies (RFBs)

These studies are conducted on an ad-hoc basis, however, and do not provide a comprehensive review of fisheries management across countries. Therefore, incorporating this information on management regimes into an indicator to measure policy responses in the fisheries sector at this time may not be possible. However, this questionnaire may be useful for future work to systematise collection of country level management systems for the purposes of establishing robust indicators to monitor fisheries reform.

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[54] TAD/FI(2013)12.

[55] *www.oecd.org/tad/fisheries/publicationsdocuments/reports/7/*

Relevant Aichi Targets: Sustainable Fisheries

It is worthwhile to note that another 2011-2020 Aichi Biodiversity Target, Target 6, states:

By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Several indicators have already been identified by BIP to monitor progress towards this target, including two that either incorporate or reflect effective management regimes:

1. Proportion of fish stocks within safe biological limits (FAO).
2. Number of Marine Stewardship Council certified fisheries (MSC).

The Marine Stewardship Council principles to certify fisheries are a) health of the target fish stock, b) impact of the fishery on the environment, and c) effective management of the fishery. Although this target is not intended to monitor subsidy reform, these indicators are a reflection of management regimes that directly influence fishing behaviour and the impact on marine biodiversity and ecosystems.[56]

4.4. OECD Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels[57]

4.4.1 *Fossil fuels and biodiversity*

The production (e.g. extraction) and consumption (e.g. burning) of fossil fuels contribute to land degradation, pollution and climate change, all identified as some of the main pressures driving biodiversity loss (OECD, 2012b). The extraction of fossil fuels creates local disturbances that have not only immediate effects on biodiversity through habitat loss and degradation, but may also result in long term effects on ecosystem function and productivity (Butt et al., 2013). Table 9 summarises the impacts of production on biodiversity by type of fossil fuel. Air pollution, for example, leads to acid rain which damages crops, forests, soils and acidifies lakes and streams. The burning of fossil fuels also contributes to biodiversity loss through GHG emissions and the resulting changes in climate patterns. The Millennium Ecosystem Assessment predicts climate change to become one of the most dominant direct drivers of biodiversity loss and changes in ecosystem services globally by the end of the century (MEA, 2005).

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[56] It is worthwhile noting that there is limited evidence demonstrating that certification schemes, including the MSC certification for fisheries, leads to improved environmental and socioeconomic outcomes. See, for instance, *www.stapgef.org/stap/wp-content/uploads/2013/05/Environmental-Certification-and-the-GEF.pdf*. In addition, fisheries that have been certified thus far most likely are the "low hanging fruit" that had already met most of the standards. The fisheries that would require greater reform have yet to fulfil the requirements for certification. Therefore, the biodiversity outcomes of the MSC program are uncertain.

[57] This section draws heavily from the OECD Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels 2013 (OECD, 2013g) and the OECD Policy Brief *An OECD-Wide Inventory of Support to Fossil Fuel Production or Use. OECD* © 2012.

Table 9. Impacts of Fossil Fuel Production on Biodiversity

		Oil (land and offshore drilling, seam gas extraction)*	**Gas** (natural and coal seam gas extraction)	**Coal** (strip and underground mining)
Direct impacts (local and catchment wide)	Seismic noise disorientates fauna	X		
	Water by-products can contain oils, environmental toxins and heavy metals	X	X	
	Increases noise pollution		X	X
	Increases air pollution		X	X
	Destroys habitats			X
	Changes topography of the area			X
	Produces toxic waste			X
	Alterations to water table and surface flow			X
	Reduces aesthetic value of landscape	X	X	X
Indirect impacts	Roads facilitate growth of many other threat factors	X	X	X
	Habitat destruction and fragmentation as a result of supporting infrastructure	X	X	
	Facilitation of invasive species and pathogen movement (e.g., from ballast water)	X	X	X
Consequences of disaster**	Widespread damage and pollution of habitats, kills and contaminates flora and fauna	X	X	
	Contamination of groundwater	X	X	X
	Land subsidence	X	X	X

Source: Butt and Beyer, 2013 (http://descrier.co.uk/science/fossil-fuel-extraction-affects-biodiversity/). Based on: a) The Energy and Biodiversity Initiative. *Integrating Biodiversity into Environmental and Social Impact Assessment Processes*, b) E&P Forum/UNEP (1997). *Environmental management in oil and gas exploration and production*. Technical Report 37, and c) The Energy and Biodiversity Initiative. *Good Practice in the Prevention and Mitigation of Primary and Secondary Biodiversity Impacts*. Notes:
*These studies did not specify oil sands extraction, which can have additional impacts similar to coal extraction. Other unconventional production methods, including hydraulic fracturing, were also not assessed in these studies.
**Disasters considered here include accidents such as fires and oil spills as well as natural disasters and their implications on operations, such as floods, earthquakes, and lightening.

Governments support the production and consumption of fossil fuels through a variety of measures, such as through the direct transfer of funds or through tax concessions. A number of these support mechanisms may be inefficient or wasteful, and may result in greater environmental damages by distorting the cost of producing and consuming fossil fuels. Reforming or eliminating inefficient support for the consumption or production of fossil fuels can contribute towards achieving economic and fiscal objectives, while also helping to tackle environmental problems such as climate change (Burniaux and Chateau, 2011; OECD, 2012b) and biodiversity loss. Therefore, measuring support to fossil- fuel production and use may be helpful in monitoring progress towards Aichi Biodiversity Target 3, with the aim of reducing incentives harmful to biodiversity, as well as Aichi Biodiversity Target 20, with the aim to mobilise resources from all sources, including the removal, reform or phasing out of subsidies, as specified under para 20 of the Indicators for the Strategy for Resource Mobilisation (see Annex 1).

In the OECD's June 2009 Declaration on Green Growth, members agreed to "encourage domestic policy reform, with the aim of avoiding or removing environmentally harmful policies that might thwart green growth, such as subsidies to fossil fuel consumption or production that increase greenhouse gas emissions…" (OECD, 2009). Subsequently, G20 Leaders committed to "rationalize and phase out over the medium term inefficient fossil fuel subsides that encourage wasteful consumption"[58].

Recent OECD work has compiled an inventory of over 550 measures that support fossil-fuel production or use in its 34 member countries. Data is available annually since 2005. The aggregate amount of these support measures, both direct budgetary transfers and tax expenditures, amounted to USD 55-90 billion per year over the 2005-2011 period. The OECD is currently undertaking work to expand country coverage to the BRIICS countries.[59]

4.4.2   *Measuring support to fossil fuel production or use*

Governments support energy production in a number of ways, including by: intervening in markets in a way that affects costs or prices; transferring funds to recipients directly; assuming part of their risk; selectively reducing, rebating or removing the taxes they would otherwise have to pay; and undercharging for the use of government-supplied goods or assets. Support to energy consumption is also provided through several common channels: price controls intended to regulate the cost of energy to consumers; direct financial transfers; schemes designed to provide consumers with rebates on purchases of energy products; and tax relief. Figure 8 provides an organising framework for examining the different types of support to fossil fuels, reflecting their formal incidence (to whom and what a transfer is first given) and the transfer mechanisms used[60]

Consumption of fossil fuels is here understood in a broader sense than just final consumption since it refers to the stage at which fuels are burnt, whether this occurs in the motor vehicles, stationary engines, heating equipment or power plants. Production, in turn, encompasses the following stages: extraction; transportation (e.g. through pipelines); and processing and refining. Measures encouraging the use of fossil fuels in power generation are, however, included under consumption since it is the combustion of fuels that is directly supported here (OECD, 2013g).

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[58] *www.g20.utoronto.ca/2009/2009communique0925.html.*

[59] Note: the International Energy Agency (IEA) has been producing data on fossil-fuel consumer subsidies in emerging and developing countries for several years using an estimation approach known as the "price-gap" method, which measures the extent to which a policy keeps domestic fuel prices below an international reference price. However, the price-gap approach does not capture support to producers and tax concessions to producers and consumers, which account for much of the support provided by developed countries, since such measures do not push final prices below the level of international reference prices. Such support and tax concessions nonetheless reflect policies that may induce greater production or use of fossil fuels than would otherwise be the case (OECD 2012 Policy Brief on "An OECD-Wide Inventory of Support to Fossil-Fuel Production or Use").

[60] OECD 2012 Policy Brief on "An OECD-Wide Inventory of Support to Fossil-Fuel Production or Use".

Figure 8. Matrix of fossil fuel support measures, with examples

		Statutory or Formal Incidence (to whom and what a transfer is first given)							Direct consumption	
		Production			Costs of Production Factors					
		Output returns	Enterprise income	Cost of intermediate inputs	Labour	Land and natural resources	Capital	Knowledge	Unit cost of consumption	Household or enterprise income
Transfer Mechanism (how a transfer is created)	**Direct transfer of funds**	Output bounty or defficiency payment	Operating grant	Input-price subsidy	Wage subsidy	Capital grant linked to acquisition of land	Capital grant linked to capital	Government R&D	Unit subsidy	Government-subsidized life-line electricity rate
	Tax revenue foregone	Production tax credit	Reduced rate of income tax	Reduction in excise tax on input	Reduction in social charges (payroll taxes)	Property-tax reduction or exemption	Investment tax credit	Tax credit for private R&D	VAT or excise-tax concession on fuel	Tax deduction related to energy purchases that exceed given share of income
	Other government revenue foregone			Under-pricing of a government good or service		Under-pricing of access to government land or natural resources; Reduction in resource royalty or extraction tax		Government transfer of intellectual property right	Under-pricing of access to a natural resource harvested by final consumer	
	Transfer of risk to government	Government buffer stock	Third-party liability limit for producers	Provision of security (e.g., military protection of supply lines)	Assumption of occupational health and accident liabilities	Credit guarantee linked to acquisition of land	Credit guarantee linked to capital		Price-triggered subsidy	Means-tested cold-weather grant
	Induced transfers	Import tariff or export subsidy	Monopoly concession	Monopsony concession; export restriction	Wage control	Land-use control	Credit control (sector-specific)	Deviations from standard IPR rules	Regulated price; cross subsidy	Mandated life-line electricity rate

Notes: Definitions of these terms are available in Chapter 1 of the Inventory.

Source: OECD, 2013g.

4.4.3 Description of the database[61]

The *OECD Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels* takes stock of the broad set of measures identified by governments that effectively "support" fossil-fuel use or production, as defined by the PSE-CSE framework, which has already been used extensively to measure support, most notably in agriculture.[62] The scope of "support" is deliberately broad, and is broader than some conceptions of "subsidy". It covers a wide range of measures that provide a benefit or preference for a particular activity or a particular product, either in absolute terms or relative to other activities or products. The data in the inventory were sourced from official government documents and web sites, and complemented by information provided directly by government agencies. The valuations are generally those estimated by the respective governments, although the OECD has allocated support to the different fuels based on production and consumption volumes or values where such information is not available from government sources.

Policy features that support fossil fuels have been put in place for various reasons. While a number of the measures may be inefficient or wasteful, others may not be. The inventory does not analyse the impact of specific measures or pass judgement on which ones might be usefully kept in place, and which ones a country might wish to consider for possible reform or removal. Its purpose is to provide information about policies that provide some level of support as a starting point for further analysis about the objectives of particular measures, their impacts (economic, environmental and social), and possible reforms and alternatives.

The *Inventory* provides information about the incentives created within each national economy. Caution is required, however, in interpreting the support amounts and in aggregating them, as the majority of support mechanisms identified in the inventory are tax expenditures. Tax expenditures are *relative* preferences within a country's tax system that are measured with reference to a benchmark tax treatment set by that country. Since the benchmark or "normal" tax treatment varies considerably from country to country, the value of this type of support is not comparable across countries.[63] Further, with respect to aggregation, tax-expenditure estimates generally do not take into account interactions that may be involved where multiple measures are removed at the same time (see section 4.4.5 on data gaps and limitations for further discussion).

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[61] This section is drawn directly from the OECD 2012 Policy Brief on "An OECD-Wide Inventory of Support to Fossil-Fuel Production or Use*"*.

[62]The PSE-CSE framework distinguishes among those measures that benefit producers (PSE: Producer Support Estimate), consumers (CSE: Consumer Support Estimate), and those that benefit producers collectively, or that do not support current production, such as industry-specific R&D (GSSE: General Services Support Estimate). For more information, see the OECD's PSE Manual, available at: *www.oecd.org/agriculture/PSE*

[63]The OECD publication *Taxing Energy Use* shows consumption tax expenditures together with energy taxation and consumption in each OECD country (see OECD, 2013b). This publication establishes an analytic foundation for discussions about appropriate tax settings on energy use and for the assessment of the tax treatment of different types, uses and users of energy.

As indicated in Figure 9, in absolute terms, petroleum products (i.e. crude oil and its derivative products) have generally been the prime beneficiaries of the fossil-fuel support measures listed in the inventory (70% in 2011). This reflects to some extent the large share of oil in countries' total primary energy supply, along with the fact that petroleum products are now consumed in OECD countries mainly in transport, a usage which is more heavily taxed on average. The peak observed for 2008 was driven partly by transfers via Mexico's excise tax on transport fuels — the IEPS — the rate of which becomes negative in times of high international oil prices, thereby providing a subsidy to final users of fuel.[64]

In terms of recipients, Figure 10 shows that, in absolute terms, measures relating to the consumption of fossil fuels have accounted for more than two-thirds of total support in recent years; producer measures accounted for slightly more than a fifth. This difference in part reflects the fact that several major OECD countries included in the inventory do not produce fossil fuels on a significant scale, but are important consumers (e.g. France, Italy, and Sweden).

Figure 9. Support to fossil fuels in OECD countries by year and type of fuel

(Millions of current USD)

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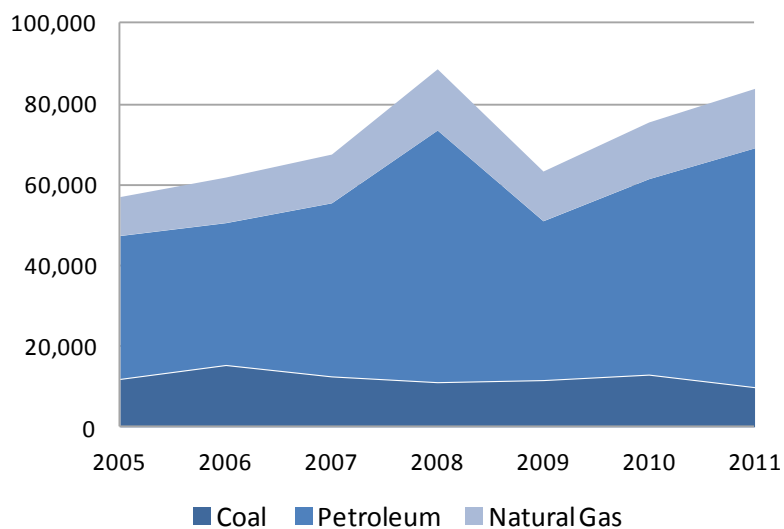
[64]The spot price of West Texas Intermediate (WTI) light sweet crude oil averaged about USD 100 per barrel in 2008.

Figure 10. Support to fossil fuels in OECD countries by type of indicator

(Millions of current USD)
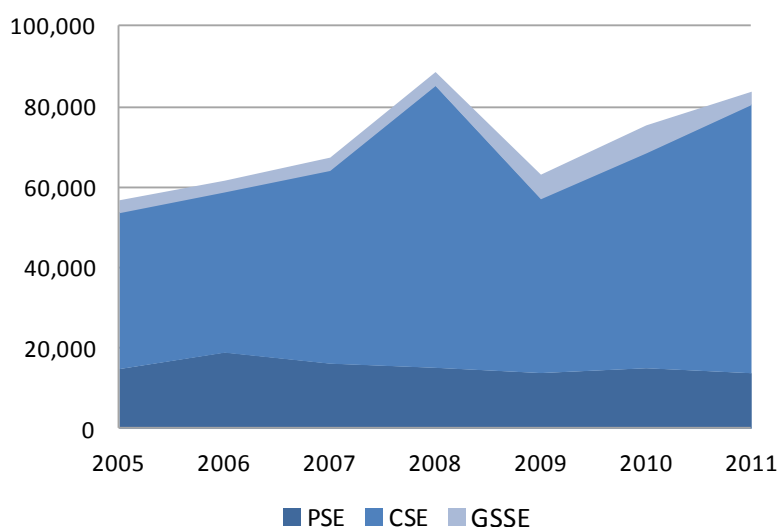
Note: The above charts are based on an arithmetic sum of the individual support measures identified for all 34 OECD member countries. It includes the value of tax relief measured under each jurisdiction's benchmark tax treatment. The estimates do not take into account interactions that may occur if multiple measures were to be removed at the same time.

Source: OECD (2013e).

Some countries are more transparent than others when it comes to budgetary support and tax expenditures, which has implications in terms of the coverage of support mechanisms in the inventory, with the largest number of support mechanisms listed for those countries that are most transparent. Part of the value of this inventory is that it provides a standardised template for reporting measures. This common platform should encourage countries to become more open in quantifying and reporting on policy measures that affect fossil-fuel production or use.

More generally, the OECD inventory marks the beginning of an ongoing process that will be broadened and deepened over time. The inventory will gradually be expanded to cover countries acceding to the OECD and Key Partners of the OECD (e.g. China, India). Numerous other forms of support — notably those provided through risk transfers, concessional loans, injections of funds (as equity) into state-owned enterprises, and market price support — were not quantified in this inventory. The data requirements for estimating the transfers associated with such measures are greater than for budgetary transfers and tax expenditures, and the calculations to estimate the support elements more complex.

4.4.4   *Assessment for use in monitoring progress towards Aichi Target 3*

The data available through the inventory could be used as a proxy for a global indicator to monitor progress towards achieving Target 3 in the context of incentives to fossil fuel production and consumption that are harmful to biodiversity. As in the case of support to other sectors, one might find that certain individual support measures may be more harmful to biodiversity than others, some might be neutral, and others may possibly even be beneficial for biodiversity in some respects (e.g. support environmental safeguards during the production and consumption process or if a subsidy serves to substitute natural gas for coal). This would need to be done on an individual country by country basis however. Given this caveat, and the data available in the OECD fossil fuel inventory, the following proxy indicators might be considered.

Support to all production and consumption. One possible indicator could measure the total amount of support, for both production and consumption, for all fossil fuels and how these support measures are changing over time. Rather than measuring the absolute value of these support measures, which as highlighted above would not be comparable across countries, a proxy indicator could monitor the change in support measures over time.

Possible indicator (1): Change in total amount of production and consumption support over time (e.g. in %, from a predetermined base year)

Fossil fuels emit different amounts of carbon dioxide when burned. Table 10 below shows the pounds of CO_2 emitted per million BTUs of energy. Coal emits the greatest amount of CO_2 per million BTUs of energy, followed by oil, with the lowest emissions from natural gas.[65]

Table 10. CO$_2$ emissions by fuel type

Fuel Type	Pounds of CO$_2$ emitted per million BTUs of energy
Coal (anthracite)	228.6
Coal (bituminous)	205.7
Coal (lignite)	215.4
Coal (subbituminous)	214.3
Diesel fuel & heating oil	161.3
Gasoline	157.2
Propane	139.0
Natural gas	117.0

Source: U.S. Energy Information Administration, 2014.

As can be seen from the Table 10, coal emits approximately 50% more CO_2 when burned compared to other fossil fuels. One study (Anderson and McKibben, 1997) found that removing coal subsidies in Western Europe and Japan would reduce global CO_2 emissions by 5% (1990 reference year) by 2005. Therefore, another possible indicator could monitor support to coal. Climate change is just one driver of biodiversity loss, whereas the production of fossil fuels, including the method of extraction and transportation, also act as direct drivers of biodiversity loss. Measuring support only to coal would not account for the other drivers of biodiversity loss from other fuel types (such as the hydraulic fracturing extraction methods or risks of oil spills), but does address its contribution to climate change and harmful extraction methods (such as strip mining).

Possible indicator (2): Change in total amount of production and consumption support to coal products over time (e.g. in %, from a predetermined base year)

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[65] And in fact, a further distinction could also be made between conventional hydrocarbons and the unconventional ones (e.g., shale gas and shale oil).

4.4.5   *Gaps and data limitations*

Interpretation of fossil fuel support indicators would need to be made with caution. A majority of support measures in OECD countries are in the form of tax concessions, which are measured with reference to a benchmark tax treatment set by that country. Therefore, a change in fossil fuel support could indicate that either additional tax exemptions were made, or that the benchmark tax treatment changed. For instance, if a farmer receives a tax exemption for fossil fuels, the value of that exemption is based on the amount the farmer would have to pay if they were not exempt. If a government increases the overall fossil fuel tax, and farmers still enjoy their tax exemption privilege, the indicator will reflect that the value of support to farmers increased, although in fact this increase will likely not impact the incentive structure of the farmer, and thus will likely not result in an increase in fossil fuel consumption.

In theory, the removal of a subsidy should result in higher prices, leading to reduced demand and decreased GHG emissions. However, fuel substitution must be considered as different fossil fuels are more or less polluting. For instance, if subsidy removal results in natural gas being substituted with coal, overall GHG emissions may not be reduced. Therefore, it cannot be assumed that a reduction in fossil fuel subsidies will result in a reduction of GHG emissions and hence the potential for these to harm biodiversity.

As indicated above, measuring the absolute value of fossil fuel support would not be appropriate for developing national level indicators to monitor incentive reform for fossil fuels, as comparison across countries is not possible, and would rather serve as a global indicator measuring support to OECD (and other) countries as a whole. Indicators that measure the *change* in support measures over time could, however, be used as a national indicator, noting the number of caveats raised above.

In addition, adding together tax expenditure estimates may be problematic for a number of reasons, as Finance Ministries estimate tax expenditures through the 'revenue foregone' method. First, this particular method for estimating the revenue lost due to a given tax concession assumes that the taxpayers do not respond to changes in the tax rules. This assumption that the removal of a tax concession would not lead to changes in behaviour is made necessary by the complexity involved in estimating behavioural responses. This problem is compounded when aggregating tax expenditures estimates together, and any total will therefore likely overestimate the amount of tax revenue that would be raised through reform. Second, tax expenditures are estimated in isolation of one another, which does not allow for interactions between tax measures. In practice, taxpayers would most likely make more intensive use of tax breaks to compensate for the removal of another tax measure. These limitations must be caveated when interpreting both national and global estimates.

5. ANALYSIS OF SELECTED DATASETS AND THEIR POTENTIAL TO MONITOR PROGRESS TOWARDS AICHI TARGET 20

This section examines two datasets with the purpose of determining their suitability for meeting the indicator and reporting needs to measure progress towards Aichi Target 20 and the Strategy for Resource Mobilization. These are:

- OECD DAC Creditor Reporting System (CRS).

- OECD/Eurostat Environmental Protection Expenditures and Revenue.

For each of these, the following information is provided, as relevant:

- Description of the dataset.

- Assessment and recommendations for use in monitoring progress towards Aichi Biodiversity Target 20 and the Strategy for Resource Mobilization.

5.1 OECD DAC Creditor Reporting System[66]

5.1.1 *Measuring international flows of financial resources to biodiversity*

International flows of financial resources originate from several sources, including public, private, and not-for-profit organisations. These financial resources can be distributed through grants, loans, or securities which can be either concessional or non-concessional in character. Official Development Assistance (ODA) refers to public concessional financing administered with the purpose of promoting economic development and welfare of developing countries, and can be either bilateral or multilateral[67]. A graphical depiction of these international financial flows can be seen in Figure 11 below.

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[66] All information provided in this section, including definitions and detailed reporting instructions, can be found in the converged statistical reporting directives DCD/DAC(2013)15/FINAL, or on-line at *www.oecd.org/dac/stats/methodology* (OECDd (2013), OECDe (2013), OECDf (2013)).

[67] Definitions of the types of financial resources can be found in Annex V.

Figure 11. Types of international financial flows related to development
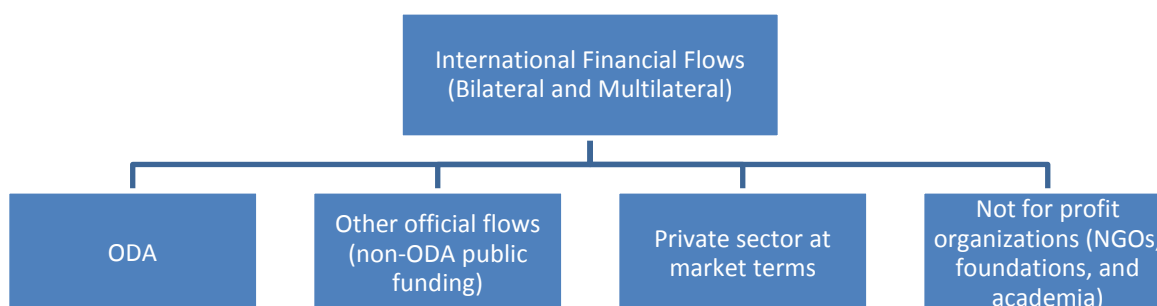
The OECD's Development Assistance Committee (DAC) was established in 1960 to promote development cooperation and other policies to contribute to sustainable development and collects development finance statistics from its members and other donors (non-DAC countries and multilateral agencies such as the World Bank, regional development banks, and UN agencies) every year. In 1967, the Creditor Reporting System (CRS) was established jointly by the OECD and the World Bank with the aim of supplying participants with a regular flow of data on indebtedness and capital flows. The development finance statistics collected through the CRS are able to contribute to measuring resource flows to biodiversity from official sources, including bilateral and multilateral ODA as well as other official flows.

Biodiversity-related official development finance is captured in the DAC statistics through the use of the Rio-markers, which identify activities across multiple sectors that target the objectives of the Convention on Biological Diversity.

5.1.2   *Description of the database*

The CRS monitors resource flows covering both bilateral and multilateral ODA, other official flows (OOF), as well as private flows. For bilateral ODA, data is available at the activity level[68]. Official aid can be distributed in one of three ways; either i) directly to recipient countries through bilateral aid projects, ii) channeled through multilateral institutions through earmarked projects (multi-bi projects), or iii) to multilateral institutions through core contributions. Figure 12 below provides a schematic view of the resource flows covered in the DAC statistics.

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[68] An aid activity can take many forms. It could be a project or a programme, a cash transfer or delivery of goods, a training course or a research project, a debt relief operation or a contribution to a non-governmental organisation.

Figure 12. Schematic view of the resource flows covered in the DAC statistics
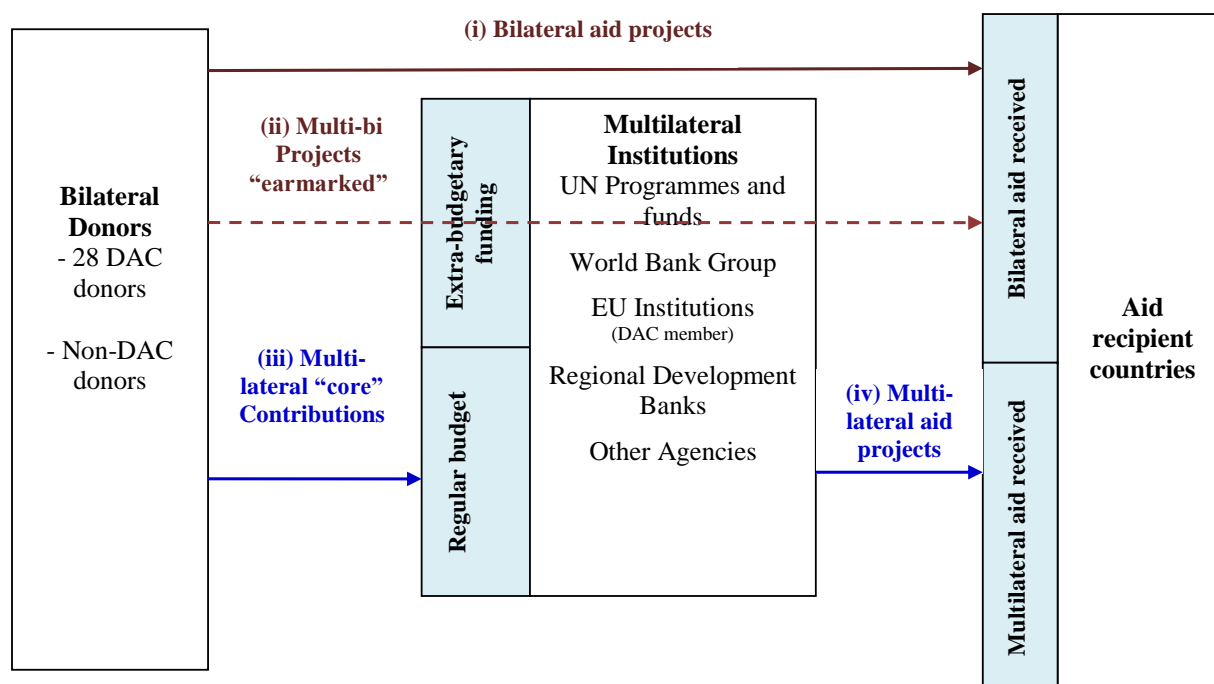
Source: OECD DAC Statistics.

Note: (i) and (ii) are Rio marked; (iii) is not Rio marked; (iv) could be Rio marked in principle.

The CRS activity-level reporting system collects resource flows to developing countries[69] which includes, inter alia, the following information in Table 11:

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[69] Only resource flows to developing countries on the DAC List of ODA Recipients are included.

Table 11. Classification of the Creditor Reporting System

Classification	Description
Donor	DAC country; non-DAC country, Multilateral institutions; Private donors
Recipient	Data can be broken down by country, region, and income group.
Channel of delivery	The first implementing agency.
Type of flow	ODA; OOF; Private grants: Private market; Non-flow; Other flow.
Type of aid	Budget support; core contributions and pooled programmes and funds; project type interventions; experts and other technical assistance; scholarships and student costs in donor countries; debt relief; administrative costs; other in-donor expenditures (Note: Rio markers are applied to all bilateral ODA excluding general budget support, imputed student costs, debt relief except debt swaps, administrative costs, development awareness and refuges in donor countries. They should also be applied to non-export credit OOF though this is not mandatory. Multilateral contributions should not be marked.)
Sector	Main purpose category – the main economic or social infrastructure categories which an individual activity is intended to foster (e.g. education, health, water supply and sanitation). Within each sector is a series of sub-sectors. (Note: Biodiversity is a sub-sector under the General Environmental Protection Sector)
Amount type	Current prices (USD million) and constant prices (2012 USD million)
Flow type	Commitments and gross disbursements
Year	DAC statistics are compiled on a calendar year basis

Note: See Annex V for detailed descriptions of types of flows, channels of delivery, and sectors.

Source: OECD DAC CRS (2013d).

The Rio markers: tracking the policy objectives of development finance

In addition to the descriptive activity-level information on finance flows, the CRS also contains information on the policy objectives of the activity through the use of markers. In 1992, developed countries that signed the three Rio Conventions (UNFCCC, CBD, and UNCCD[70]) committed themselves to provide assistance to developing countries in their implementation of the Conventions. Since 1998[71], the DAC has monitored aid targeting the objectives of these three Rio conventions through the CRS using the "Rio markers". The Rio markers identify finance targeting (i) biodiversity, (ii) desertification (iii) climate change mitigation, and (iv) climate change adaptation[72]. Each activity that is reported to the CRS is screened and marked with three values measuring the extent to which the environmental objectives are targeting:

0: not targeted to the policy objective

1: significant objective

2: principal objective

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[70] UN Framework Convention on Climate Change, Convention on Biological Diversity, and the UN Convention to Combat Desertification.

[71] Reporting began in 1998 and became compulsory in 2007.

[72] The climate change adaptation marker was created in 2009 and implemented in reporting on 2010 flows.

Principal policy objectives are those which can be identified as being fundamental in the design and impact of the activity and which are an explicit objective of the activity. They may be selected by answering the question "would the activity have been undertaken without this objective?" *Significant* policy objectives are those which, although important, are not one of the principal reasons for undertaking the activity. The score not targeted means that the activity has been screened against, but was found not to be targeted to, the policy objective.

DAC members apply the Rio markers to all bilateral ODA excluding general budget support[73]. There was a formal decision in 2011 to mark non-export credit OOF[74] although this is on a voluntary basis and to date only a few DAC members are implementing this. Bilateral ODA earmarked and channelled through multilateral institutions ("bi-multi") is Rio marked, but core multilateral contributions are not marked as the donor relinquishes the exclusive control of the funds and thus is not able to specify how the funds are spent. A number of multilateral institutions[75] report their outflows from core contributions, but do not currently apply the Rio markers.

Biodiversity-related official development assistance is defined as activities that promote at least one of the three objectives of the CBD: (i) the conservation of biodiversity, (ii) sustainable use of its components (ecosystems, species or genetic resources), or (iii) fair and equitable sharing of the benefits of the utilisation of genetic resources. The criteria for eligibility applied to the biodiversity Rio marker considers whether activities contribute to:

1. protecting or enhancing ecosystems, species or genetic resources through in-situ or ex-situ conservation, or remedying existing environmental damage; or

2. integration of biodiversity and ecosystem services concerns within recipient countries' development objectives and economic decision making, through institution building, capacity development, strengthening the regulatory and policy framework, or research; or

3. developing countries' efforts to meet their obligations under the Convention[76]

A key feature of the Rio markers is that an activity can be marked and tracked against multiple policy objectives (e.g. activities that target both biodiversity and climate change objectives). To qualify for a score principal or significant, the objective has to be explicitly promoted in project documentation. Rio-marked biodiversity-related finance can span across many different sectors. Although activities that fall under the biodiversity subsector (purpose code 41030) are restricted to activities directly targeting the conservation or protection of species and their habitats[77], any activity conducted in another sector (e.g. agriculture, forestry), but still addresses biodiversity concerns, should be coded under the relevant CRS purpose code and marked for biodiversity.

Total bilateral biodiversity-related aid commitments by members of the OECD DAC reached USD 6.1 billion, on average, per year in 2010-2012, representing 5% of total ODA commitments (Figure 13). A

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[73] Imputed student costs, debt relief (except debt swaps), administrative costs, development awareness, and refugees in donor countries are also not Rio marked.

[74] Summary Record of the 62nd Meeting of the DAC Working Party on Statistics: DCD/DAC/STAT/M(2011)2/FINAL para 18.

[75] See Annex V for list of reporting entities.

[76] See Annex V for further description of the activities that should be classified as biodiversity-related under the Rio marker system.

[77] These activities that fall under the biodiversity subsector are all coded with the "principal" Rio marker.

majority of these funds (59%) targeted biodiversity as a significant objective, while 41% targeted biodiversity as the principal objective. The growth in biodiversity-related funding is coming from aid activities that incorporate biodiversity as a significant rather than primary objective.

Figure 13. Trends in biodiversity-related aid, two-year averages. 2006-2012, bilateral commitments, USD billion, constant 2011 prices
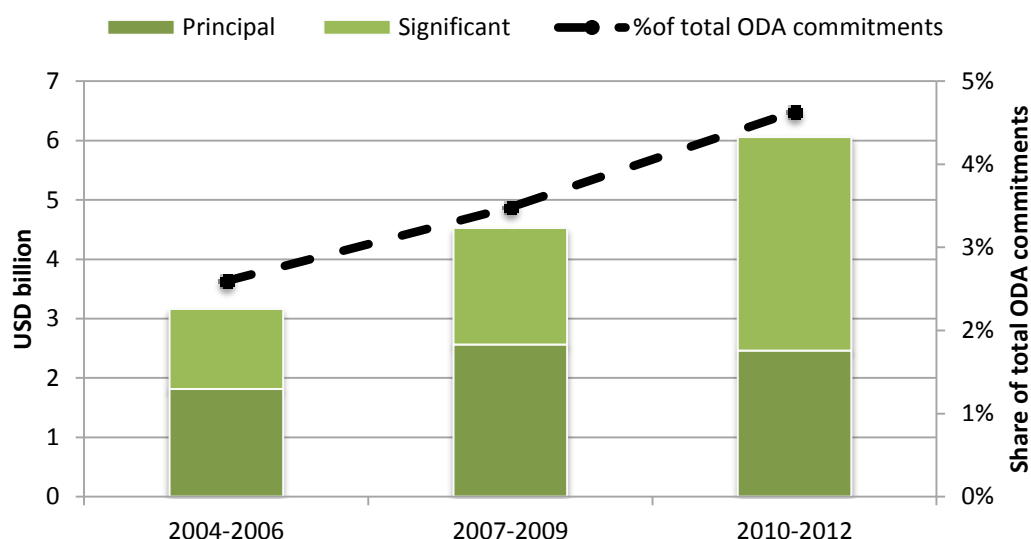
Source: OECD DAC Statistics (March 2014).

The Rio markers were designed to help members in measuring official development finance targeting the objectives of the Rio Conventions, and to support members in their reporting to the Conventions (e.g. as an input to their National Communications or National Reports). However, it is important to note that policy marker data are descriptive rather than quantitative. The system allows for the identification and approximate quantification of activities targeted to policy objectives and provides information on the degree to which members implement these policies in their aid programs. There may be limitations in drawing on "qualitative" Rio marker data for reporting against quantified international finance goals. In presenting marker data, the figures for principal and significant objectives can be shown separately and the sum referred to as the "estimate" or "upper bound" of biodiversity-related aid.

5.1.3   *Assessment for use in monitoring international financial flows to biodiversity*

The revised Financial Reporting Framework, agreed upon at CBD COP-12, in Decision XII/3 is intended for use by Parties to provide baseline information (from 2006 through 2010) and report on their contribution to reaching the global financial targets. Countries are requested to report annual international financial flows for ODA, OOF, other flows[78], and total. In addition, countries are asked to provide methodological information to support their calculations, including (i) whether ODA includes bilateral and/or multilateral flows, (ii) if ODA/OOF reflect commitments or disbursements, (iii) if ODA/OOF/Other flows include financial resources directly related and/or indirectly related to biodiversity, (iv) if the OECD DAC 'Rio marker' data was used for official resources, (v) the coefficient used, as applicable, for resource flows indirectly related to biodiversity, and (vi) average confidence levels (i.e. high, medium, low). This

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[78] Other flows include, where available, resources mobilised by the private sector as well as non-governmental organisations, foundations, and academia. (If this information is not available, countries are requested to leave the row empty).

analysis will therefore identify both the possible indicators and the suitability of using the Rio marker data for the purpose of reporting international financial flows to the Convention under this framework.

Indicator 1 measures: Aggregated financial flows, in the amount and where relevant percentage, of biodiversity-related funding, per annum, for achieving the Convention's three objectives, in a manner that avoids double counting, both in total and in, inter alia, the following categories:

    (a)   Official Development Assistance (ODA)

    (b)   Domestic budgets at all levels

    (c)   Private sector

    (d)   Non-governmental organizations, foundations, and academia

    (e)   International financial institutions

    (f)   United Nations organizations, funds and programmes

    (g)   Non-ODA public funding

    (f)   South-south cooperation initiatives

    (g)   Technical cooperation

This indicator is intended to track biodiversity-related funding from a range of sources which, when combined, provides an aggregate picture of financial flows to biodiversity. The data collected in the DAC statistics may be able to serve as a source and basis of indicators for a number of these categories.

Each sub-indicator where the DAC statistics may be able to contribute is assessed below. The assessment includes how the data can be useful in its current format, as well as possible recommendations to improve the data collection methodology to better suit reporting needs.

Indicator 1(a) Official Development Assistance. Currently, the best estimate of total biodiversity-related ODA that can be obtained from the CRS is through the Rio markers applied to *bilateral* ODA. Bilateral ODA has accounted for approximately 65%, on average, of total ODA between 2010 and 2012. The remaining 35% of ODA, in the form of multilateral ODA, is not Rio marked and thus biodiversity-related multilateral ODA cannot be tracked through the current CRS. The biodiversity Rio marker has been applied to bilateral ODA since 1998[79], including ODA channelled through non-governmental organisations, international financial institutions, and United Nations organisations, funds and programmes. Bilateral ODA, in total, provides an "estimation" or "upper bound" of biodiversity-related aid and is already being used by the Biodiversity Indicators Partnership (BIP)[80] to monitor global aid flows to biodiversity.

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[79] Some DAC members began reporting on the Rio marker after 1998. Reporting became compulsory in 2007.

[80] The Biodiversity Indicators Partnership is a CBD-mandates global initiative to promote and coordinate development and delivery of biodiversity indicators in support of the CBD, Multilateral Environmental Agreements (MEA), IPBES, national and regional governments and a range of other sectors. The Partnership brings together over forty organizations working internationally on indicator development to provide the most comprehensive information on biodiversity trends. For more information visit www.bipindicators.net.

The current Financial Reporting Framework requests countries to provide annual ODA to biodiversity-related activities. In addition, countries are requested to indicate whether they are reporting financial flows to activities that are directly and/or indirectly related to biodiversity. The framework identifies indirect activities as those with other primary purposes (e.g. ecosystem-based approaches to climate-change mitigation or adaptation) in other sectors (e.g. agriculture, forestry, tourism) but that promote biodiversity-friendly initiatives. Based on this language, financial flows directly related to biodiversity could be reported as the amount of bilateral ODA with the "principal" biodiversity marker, whereas activities marked as "significant" could reflect indirect financial flows which promote biodiversity-friendly activities. In addition, countries are to indicate whether a coefficient was applied to indirectly-related financial flows, to account for only a proportion of financial flows to activities with other primary objectives.

Owing to concerns regarding the limitations in drawing on "qualitative" Rio marker data for reporting against quantified finance goals, it is known that a large number of members draw on Rio markers to provide the basis for their reporting but also apply coefficients (as mentioned above with reference to the reporting framework) to adjust and reduce the share of finance reported to the CBD. A joint OECD DAC ENVIRONET and WP-STAT Task Team was recently established to improve the Rio markers, environment and development finance statistics[81]. As part of this work, a survey was recently distributed to all DAC members to, *inter alia*, gain a better understanding of how members are drawing on the Rio marker data for international reporting obligations. A number of members provided information on how they are applying coefficients to adjust biodiversity-related ODA reported to the CBD and the survey revealed a range of coefficients being used. This is particularly the case with respect to *significant* marker data, where parties apply coefficients to the markers that vary completely from 0% to 100% (OECD DCD, 2014 forthcoming).

Figure 14. Share of Rio marker data reported to CBD (coefficient)
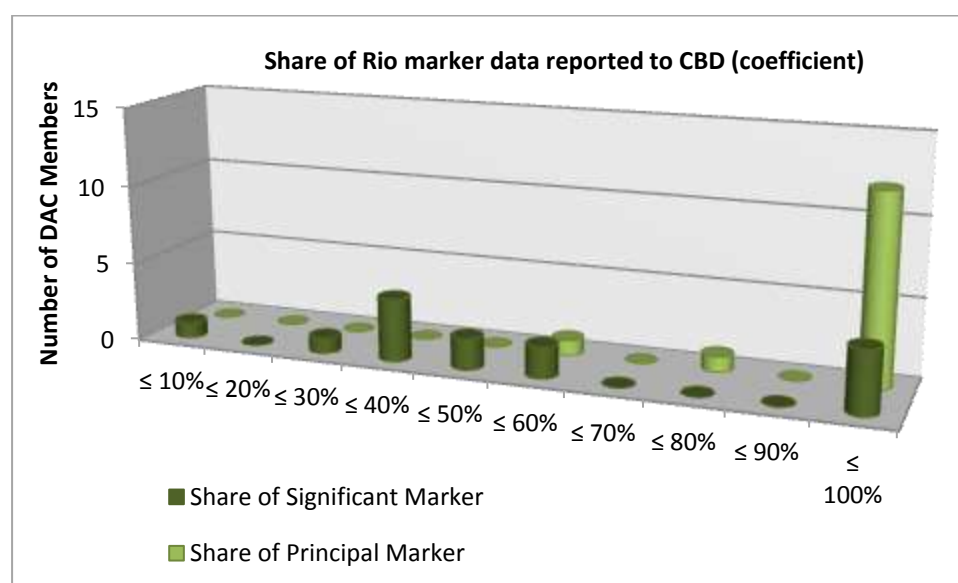
Source: OECD DAC, Summary of DAC members' survey responses, March 2014.

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[81] Terms of Reference and Scope of Work for a Joint ENVIRONET and WP-STAT Task Team to Improve Rio Markers, Environment, and Development Finance Statistics, DCD(2013)8/REV2.

While there is no agreed or common approach to the use of coefficients, and in general there is limited evidence to inform the scale of these adjustments, some DAC members have developed advanced approaches and methodologies to support their reporting to the Rio conventions. France, for example, adopted the following rules for weighting projects considered to have a significant contribution to biodiversity (Rio marker 1):

- 80% of funding included: sustainable management of forests and fisheries, REDD

- 30% of funding included: agro-ecology, pastoralism-transhumance, beekeeping, sustainable management of fisheries, local management of biological resources, organic fair trade sectors, wastewater treatment, IWRM

- 5% of funding included: urban development with an urban biodiversity element, sustainable waste treatment – reducing waste impact, lines of credit for the environment (non-climate), saving water

- 100%: staff time allocated to biodiversity, knowledge production studies focusing on biodiversity

- 50%: communications activities with a biodiversity aspect[82]

It is unclear from the language of the text whether multilateral ODA should be accounted for in Indicator 1(a) or Indicators 1(e) and (f). A discussion of how to estimate multilateral ODA, from both international financial institutions and UN bodies follows below.

Indicator for 1(b) Domestic budgets. The Creditor Reporting System is a database on international flows and does not collect information on domestic budgets. See section 5.2 below on how the Eurostat and OECD Environmental Protection Expenditures questionnaire may be able to contribute to this indicator.

Indicator for 1(c) Private sector. The Creditor Reporting System covers private financial flows but data are less granular than for bilateral activities, due to confidentiality constraints (for example on foreign direct investments). There is no methodology at present for identifying private flows targeting biodiversity concerns and the CRS data therefore cannot contribute to this indicator. See section 5.2 below on how the Eurostat and OECD Environmental Protection Expenditures questionnaire may be able to contribute to this indicator.

Indicator for 1(d) NGOs, foundations and organisations. Core and non-core contributions to NGOs, foundations, and organizations by DAC member are separately identifiable in the CRS through delivery channels (when a bilateral donor funds NGOs whose work is dedicated to biodiversity, or funds the implementation of a biodiversity-related activity through these organisations). These figures, however, do not reflect total biodiversity-related *outflows* from these organizations as financial resources are received from private contributors as well, which are not reported by the DAC. The Bill and Melinda Gates Foundation does currently report outflows to the CRS, and more are expected to report in the coming year. However, at this time, only inflows from official sources are captured within the CRS and are included in bilateral ODA figures.

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[82] Agence Française de Développement (2013), Cross-cutting Intervention Framework, Biodiversity 2013-2016.

Indicators 1(e) international financial institutions and (f) UN organisations, funds and programmes. As noted above, finance for biodiversity also flows through multilateral organisations[83], including international financial institutions and UN bodies. While earmarked contributions channelled through these multilateral organisations ("multi-bi" contributions) are included in Rio marked bilateral figures, core contributions are not. Multilateral agencies do not screen their activities against the objectives of the CBD and do not report yet against the Rio markers. While it would be possible to identify funding that is directed towards the biodiversity subsector within the CRS database (100% of which targets the objectives of the Convention), this would substantially underestimate the total amount of funding for biodiversity-related activities from these multilateral sources (the biodiversity subsector only accounts for approximately 15% of total bilateral biodiversity-related ODA).

It may be possible to calculate "imputed multilateral contributions", as is currently estimated for climate-related finance. This would involve identifying the share of outflows (core resources only) from multilateral organisations targeting biodiversity, and then multiplying that percentage by members' core contributions. This figure could provide approximations of multilateral ODA (international financial institutions and UN organisations, funds and programmes). It is important to note that if multilateral ODA is included with 1(a), these resource flows should then not be included for indicators 1(e) and (f) to avoid double counting. This methodology could only provide an approximation of multilateral flows and perhaps realistically only be calculated for a few of the largest multilateral organisations funding biodiversity-related activities. Therefore, this approximation would not include 100% of donor's contributions to multilateral organisations.

Multilateral institutions have adopted their own methodology for tracking climate finance using a joint approach that was agreed upon by representatives from a number of the largest multilateral development banks. However, no methodology to date has been adopted for tracking biodiversity finance. A description of this joint approach and comparison to the OECD DAC system is described in Annex V.

Indicator 1(g) Non-ODA public finding. As described, there was a formal decision in 2011 to mark non-export credit OOF although this is on a voluntary basis and to date only a few countries are implementing this. Although DAC members have only begun to apply the Rio markers to non-ODA funding, data on these financial flows, once marked, could be applied to this indicator.

Indicator 1(h) South-South cooperation initiatives. Although the CRS provides a framework to report on South-South cooperation initiatives, very few countries are currently reporting at this time. The CRS framework however, does provide an appropriate basis to collect data for this indicator.

Indicator 1(i) Technical cooperation. The DAC statistical system does not explicitly track capacity building/technology transfers within the ODA portfolio, but financial resources can be monitored to a given sector and to capacity building-type activities based on categories (CRS purpose codes) outlined in the DAC Statistical Directives. One example is the environmental protection sector, which is a significant sector that includes capacity building activities, particularly financial support to environmental research, education, policy and administration management. In addition, further sector-specific capacity building-type activities (e.g. policy, management, research and education in key economic infrastructure sectors) are

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[83] Although multilateral agencies receive contributions from both official and private sources, their outflows are recorded as official receipts of developing countries regardless of the origin of the funds. A distinction is made between concessional outflows (assimilated to ODA) and non-concessional outflows (assimilated to OOF). Reporting is limited to expenditures from the agencies' regular (core) budgets and should not include earmarked funding as these flows are classified in DAC statistics as bilateral aid, given that the bilateral donor effectively controls or directs the use of the funds. In these situations, the bilateral donors report the multilateral agency as the channel of delivery of the funds. DCD/DAC/STAT(2008)21/REV3.

also being monitored and can be identified through the DAC CRS. These figures would be a subset of total bilateral ODA and thus double-counting should be avoided in reporting on Indicator 1(i). Indicator 9, however, is intended to also measure the amount and number of South-South and North-South technical cooperation and capacity-building initiatives that support biodiversity. Therefore, this subset of bilateral ODA could be used to monitor progress towards Indicator 9.

5.2 OECD and Eurostat data on environmental protection expenditure and revenues

5.2.1 Measuring domestic flows of financial resources to biodiversity

Indicator 1(b) and Indicator 3[84] are intended to measure and monitor domestic budgets at all levels directed toward biodiversity-related funding of domestic activities. In addition, the Financial Reporting Framework, agreed at CBD COP-12, specifies that for domestic flows, countries are requested to indicate which sources and categories are covered in their domestic expenditure. Sources include government budgets (central, state/provincial, local/municipal), extra-budgetary, private/market, other (i.e. NGO, foundations, academia) and collective action of indigenous and local communities. Categories include expenditures directly and indirectly related to biodiversity. Since the early 1990s, both Eurostat[85] and the OECD have been collecting data on environmental protection expenditures, with the purpose of tracking the level of spending on activities that are directly aimed at the prevention, reduction and elimination of pollution or any other degradation of the environment (including biodiversity). Beginning in 1996, Eurostat and the OECD began a collaborative data collection effort through a Joint Questionnaire (JQ) for all OECD EU members, in order to increase harmonization and minimize reporting efforts.

5.2.2 Description of dataset

The OECD and Eurostat collect environmental protection expenditure and revenue data from all OECD countries and European Union member states, as well as candidate countries and EFTA countries. Data are available annually from 1990. The database is updated biennially for all OECD countries, and as of 2013, annually for EU countries[86]. Expenditures are classified into four main sectors: public, business (mining and quarrying; manufacturing; and electric, gas and water supply), households, and specialised producers (both public and private enterprises) of environmental protection services (such as waste collection). The public sector and specialised producers are actors who produce environmental protection services for use by other sectors; the public sector producing non-market services and specialised producers market services.

Only activities and actions where environmental protection is the primary objective are included. Activities with primary objective outside of the environmental domain (for instance, health or safety at the workplace) are excluded, even if there are direct benefits to the environment. The environmental protection expenditure data collection methodology distinguishes between two expenditure principles. Expenditure according to the *abater* principle (EXP I), includes all expenditure that a sector makes for measures it executes. Any economic benefits directly linked with these environmental protection activities (receipts from by-products) are deducted in order to calculate the net amount of money spent by the sector for its own activities. The *financing* principle (EXP II) measures how much money a particular sector (directly) contributes to environmental protection activities, wherever they are executed. This means that the part of EXP I that was directly financed by others (through subsidies or fees) should be deducted, while the part of EXP I in other sectors that this sector finances directly (through subsidies or fees paid) should be added.

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[84] Indicator 3: Amount of domestic financial support, per annum, in respect of those domestic activities which are intended to achieve the objectives of this Convention.

[85] The statistical office of the European Union.

[86] In the EU, the establishment of environmental protection expenditure accounts will become mandatory under the EU regulation on environmental accounting.

The framework is based on double entry bookkeeping, where each activity and expenditure item has an abater (producer) and a financing side. All financing flows are recorded twice, both at the paying and the receiving sector (as subsidies given and received, as purchases made and revenues received, etc.). Table 12 below reflects the questionnaire framework according to these two principles.

Table 12. Environmental protection expenditure framework (EPE)

	PUBLIC SECTOR (Table 1)	BUSINESS SECTOR (Table 2)	HOUSEHOLDS (Table 3)	SPECIALISED PRODUCERS (Table 4)	TOTAL ECONOMY
	A Investment expenditure – **B** Internal current expenditure **C** Receipts from by-products	**A** Investment expenditure *Of which: end-of-pipe* **B** Internal current expenditure **C** Receipts from by-products	– **B** (connected and adapted products) –	**A** Investment expenditure – **B** Internal current expenditure **C** Receipts from by-products	Sum of tables 1, 2 and 4 – Sum of tables 1-4 Sum of tables 1, 2 and 4
Abater principle	Expenditure I (A+B-C)	Expenditure I (A+B-C)	Expenditure I (B)	Expenditure I (A+B-C)	Sum of tables 1-4
	D Subsidies / transfers (paid) **E** Fees / purchases (paid for EP services) **F** Revenues (from EP services)	**D** Subsidies / transfers (received) **E** Fees / purchases (paid for EP services) *Of which: paid to public sector* –	**D** Subsidies / transfers (received) **E** Fees / purchases (paid for EP services) *Of which: paid to public sector* –	**D** Subsidies / transfers (received) **E** Fees / purchases (paid for EP services) *Of which: paid to public sector* **F** Revenues (from EP services)	zero* Sum of tables 1-4 *(Note: total fees / purchases should equal total revenues)** Sum of tables 1 and 4
Financing principle	Expenditure II (EXP I+D+E-F)	Expenditure II (EXP I-D+E)	Expenditure II (EXP I-D+E)	Expenditure II (EXP I-D+E-F)	Sum of tables 1-4 (equal to EXP I)

Environmental protection expenditures are classified by environmental domains according to the Classification of Environmental Protection Activities (CEPA), including:

1. Protection of ambient air and climate
2. Wastewater management
3. Waste management
4. Protection and remediation of soil, groundwater and surface water
5. Noise and vibration abatement
6. Protection of biodiversity and landscape
7. Other (includes protection against radiation, and environmental research and development)

According to the CEPA and Expenditures:

Protection of biodiversity and landscape refers to measures and activities aimed at the protection and rehabilitation of fauna and flora species, ecosystems and habitats as well as the protection and rehabilitation of natural and semi-natural landscapes. The separation between 'biodiversity' and 'landscape' protection may not always be practical. For example, maintaining or establishing certain landscape types, biotopes, eco-zones and

related issues (hedgerows, lines of trees to re-establish 'natural corridors') have a clear link to biodiversity preservation. Excluded is the protection and rehabilitation of historic monuments or predominantly built-up landscapes, the control of weed for agricultural purposes as well as the protection of forests against forest fires when this predominantly responds to economic reasons. The establishment and maintenance of green spaces along roads and recreational structures (e.g. golf courses, other sports facilities) are also excluded. Actions and expenditure related to urban parks and gardens would not normally be included but may be related in some cases to biodiversity – in such cases the activities and expenditures should be included.[87]

The protection of biodiversity and landscapes includes activities in the following three categories:

> A. Protection and rehabilitation of species and habitats
>
> B. Protection of natural and semi-natural landscapes
>
> C. Measurement, control, laboratories, and the like

This classification captures expenditures directly related to the protection of biodiversity and landscapes, but may not include other biodiversity conservation and sustainable use activities that fall outside the scope of 'protection'. As a result, the expenditures reported through the EPER may only account for a portion of biodiversity-related domestic expenditures. In addition, activities that fall under this CEPA identify only those activities with the primary objective of biodiversity and landscape protection, and may not identify those activities with other environmental objectives but still contribute to biodiversity and landscape protection. Therefore, the EPER data on this category may underestimate the total flows to biodiversity conservation and sustainable use that align with the objectives under the Convention.

The EPE provides expenditures at the country level classified according to the sector. Expenditures are further classified by environmental domain, when possible. For specialised producers, biodiversity is clustered and reported as "other" domain due to limited data availability. Specialised producers are mainly active in providing waste and wastewater management services, however, and may only marginally contribute to biodiversity-related activities. Table 13 below reflects the data availability for environmental expenditures on biodiversity and landscape protection.

Table 13. Data availability on biodiversity and landscape protection expenditures

	Biodiversity and landscape protection domain available	Country-level data available
Public Sector	Yes	Yes
Industry	Yes	Yes
Specialised producers	No. Clustered into "other" domain.	Yes

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[87]See:
http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=DSP_NOM_DTL_VIEW&StrNom=CEPA_2000&StrLanguageCode=EN&IntPcKey=&IntKey=2999730&StrLayoutCode=HIERARCHIC&IntCurrentPage=1 .

Figure 15. Public Sector environmental protection expenditure by environmental domain in European countries, 2011 (% of total)

Other
Biodiversity and landscape
Noise and vibration
Soil and surface and groundwater
Waste
Wastewater
Air

(1) 2010
(2) 2008
(3) 2009
(4) 1998
(5) 1999
(6) 2004
(7) 2002
(8) 2008
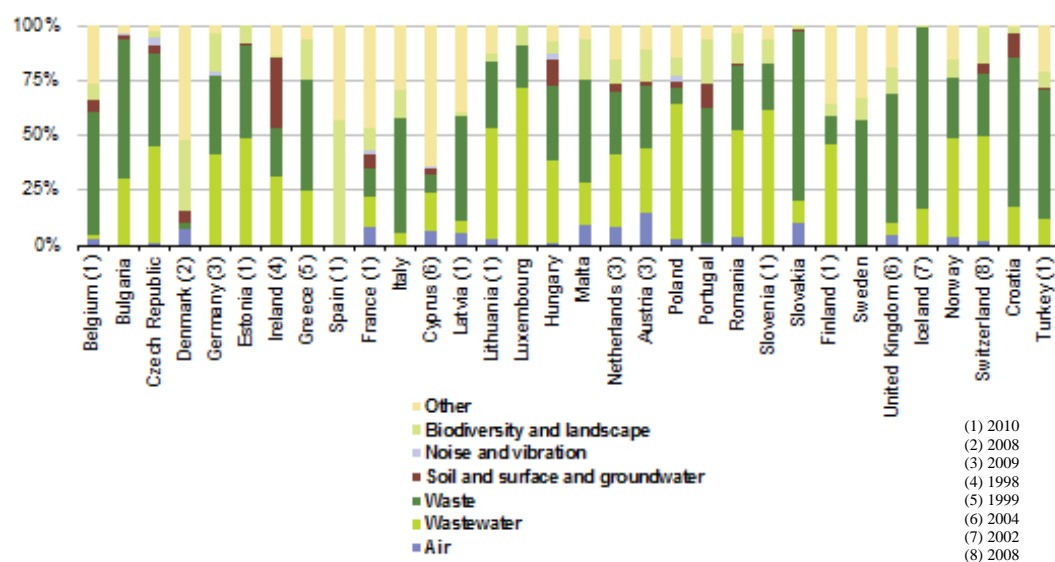
Source: Eurostat (online data code: env_ac_exp1r2).

Figure 16. Business sector environmental protection expenditure by environmental domain in European countries, 2011 (% of total)

Other
Biodiversity and landscape
Noise and vibration
Soil and surface and groundwater
Waste
Wastewater
Air

(1) Denmark, Estonia, Ireland, Greece, Italy, Luxembourg
(2) 2002
(3) 2009
(4) 2010
(5) 2003
(6) 2007
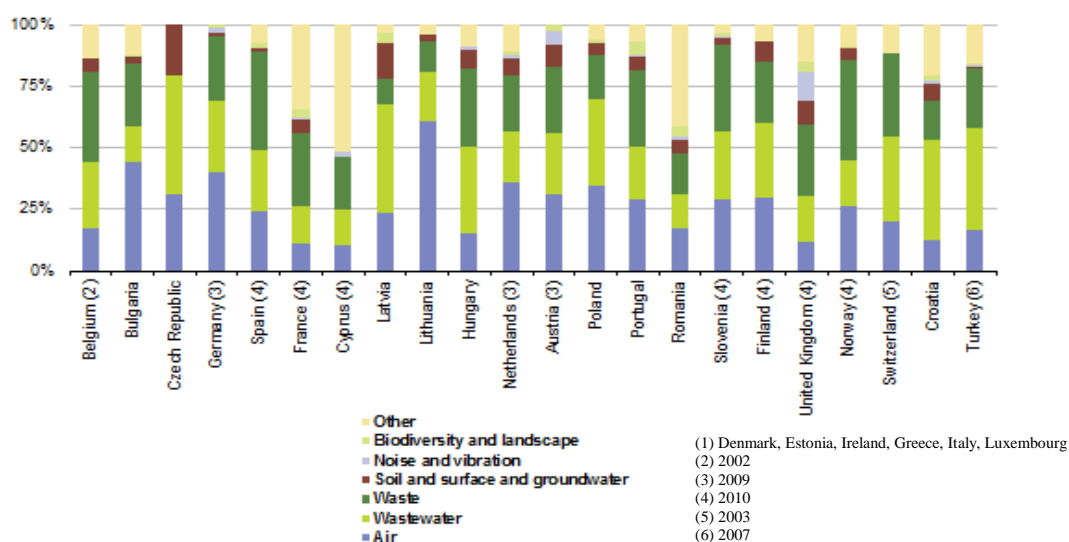
Source: Eurostat (online data code: env_ac_exp1r2).

5.2.3   *Assessment for use in monitoring domestic financial flows to biodiversity*

The environmental protection expenditure data may be used for indicators 1(b) and 3 to monitor domestic resources from both the public sector and from business to biodiversity and landscape protection. For indicator 1(c) on Private sector financial flows, the subset on business sector expenditure could be used for this purpose, but would only capture domestic financial flows. Due to data limitations, it is not possible to identify resources from specialised producers, although resources from this sector are likely marginal. Annual data for public sector funding is fairly comprehensive with gaps in reporting from a few countries and no reporting for others. Data from business however is much sparser with very little data prior to 2006, and many countries not reporting at all. As discussed in section 5.2.1, the financial reporting framework under the CBD requests countries to identify whether the expenditures they are reporting include those directly and/or indirectly related to biodiversity. The CEPA category in the EPER database would only capture expenditures directly related to biodiversity and landscape protection, and would need to be reported as such. There may be expenditures in other CEPA classes (e.g. protection of ambient air and climate) that may be indirectly related to biodiversity but are not identified as such in the database. In order to capture domestic expenditures indirectly related to biodiversity, the current EPER database and the underlying data collection framework would require further modification[88].

An aggregate indicator for both the public and business sectors could monitor financial resources from domestic budgets at all levels towards biodiversity-related activities. Isolating business expenditures could monitor financial resources from the private sector, but would only capture domestic spending. It is important to clearly identify which figures are being reported so as to eliminate the risk of double counting (e.g. including private sector spending with domestic budgets). In addition, as expenditures can vary significantly from year to year, it is recommended to use a 3-year average to reflect trends over longer time periods.

Possible Indicator (1): Total investment expenditures + internal current expenditures (Public + business sectors) – for Indicators 1(b) and 3

Possible Indicator (2): Total investment expenditures + internal current expenditures (business sector only) – for Indicator 1(c)

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[88] The planned review of the underlying questionnaire to ensure coherence with the SEEA and the EU's Environmental Protection Expenditure Accounts, will provide an opportunity to further explore these aspects.

6.   SUMMARY FINDINGS

This paper has examined the types of policy response indicators that may be useful to monitor progress towards the implementation of Aichi Biodiversity Target 3 on Incentives, and several of the indicators proposed for Aichi Target 20 on Resource Mobilisation (in particular under the Strategy for Resource Mobilisation). For Target 3, and predominantly the positive incentives, this paper examined the OECD/EEA database on Instruments Used for Environmental Policy and Natural Resources Management. For Target 3, and predominantly the incentives harmful to biodiversity, this paper examined the OECD databases on Agriculture Producer and Consumer Support Estimates, the OECD Government Financial Transfers to Fisheries, as well as the OECD Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels. For Target 20, data from the OECD DAC Creditor Reporting System, and the OECD/Eurostat Environmental Protection Expenditures and Revenue were examined. For each of these, the existing structure and information collected in the datasets was reviewed and assessed, and gaps and data limitations as they pertain to the reporting purposes of the CBD were highlighted. Given the caveats that have been raised, as well as the upcoming need to assess progress on the achievement of the Aichi Biodiversity Targets, including Target 3 and 20, in 2020, the analysis here aims to provide policy-makers and negotiators with the information needed to consider whether the existing OECD datasets could be used and built upon so as to further develop indicators that are useful for the CBD.

More specifically, this analysis reviewed several of the important sectors with incentive measures that could result in positive or negative outcomes for biodiversity. To comprehensively monitor progress towards Aichi Biodiversity Target 3, ideally all sectors and policies with possible impacts on biodiversity would be monitored, including economic, regulatory, and other incentive measures. The analysis here of economic incentives, however, provides a starting point by considering available, international data that may contribute to the development of indicators for the purposes of the CBD. While this is a necessary step in monitoring progress towards the implementation of Target 3, in some areas further (e.g. more qualitative) information will be useful to evaluate and measure success. For example, it is important to note that reforming subsidies according to their potential impact on biodiversity may not necessarily result in positive outcomes. The real effects can also be influenced by the regulatory and enforcement framework, the local environmental conditions of where impacts occur, and other factors.

While an objective of this work is to examine the types of *indicators* that may be suitable for monitoring progress towards Aichi Biodiversity Target 3 and 20 (whereby a key function of an indicator is to reduce the number of measurements and parameters that normally would be required to give an exact representation of a situation), the analysis here suggests that the development of indicators would require the development of underlying *databases* consisting of much further information and from which indicators of interest could then be extracted.

Summary of findings for Aichi Target 3 on Incentives

- **The OECD/EEA database on instruments used for Environmental Policy and Natural Resources Management**

This database measures, *inter alia*, the number, type, and where relevant the value, of economic instruments used for environmental policy, and provides a good framework for the development of an indicator(s) for positive incentives for biodiversity. Minor adjustments in the existing classification of the database, including incorporating biodiversity as its own environmental domain and including additional labels for instrument categories for biodiversity offsets and PES, would further facilitate its use for CBD reporting purposes. The types of indicators that could then be extracted from this database to help monitor progress towards Aichi Biodiversity Target 3 (in the context of positive incentives) include:

1. The number of countries implementing positive incentives (by type) for biodiversity over time.

2. The number of positive incentives for biodiversity by instrument type implemented over time.

3. The number of positive incentives by sector (fish, forestry, agri-biodiversity, etc.) over time.

4. The revenue generated (or expenditure created) by positive incentives for biodiversity (as relevant) over time.[89]

5. The number of hectares under positive incentive programmes (by country, by instrument, in total, etc.).

Ideally, the incentives that would be included in the indicator set to monitor progress towards Target 3 would be those that are effective, and thus measured using some quantitative outcome. Since outcome information is unlikely to be available, economic value (4) or geographic scope (5) – which creates a measure of government effort rather than biodiversity outcome, is a step in this direction.

- **OECD Agriculture Producer and Consumer Support Estimates (PSE/CSE)**

The OECD Agriculture PSE/CSE database is a comprehensive system for measuring and classifying support to agriculture. This database could be used to develop proxy indicators that monitor progress towards i) the elimination, phasing out and reform of support measures to agricultural producers that are potentially harmful to biodiversity, and ii) the use of support measures that provide potentially positive incentives for the conservation and sustainable use of biodiversity in agricultural ecosystems. The possible indicators that could be extracted from this database are:

1. Proportion and amount of PSE support not tied to production.

2. Proportion and amount of PSE support to potentially most harmful subsidies (MPS + Commodity Output +Non-constrained variable input use).

3. Proportion and amount of PSE with voluntary environmental input constraints.

4. Payments based on non-commodity criteria.

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[89] This information is relevant for the Strategy for Resource Mobilisation. See indicator (14) in Annex 1 on new and innovative financial mechanisms.

- **OECD Government Financial Transfers to Fisheries (GFT)**

Containing government support data to fisheries for OECD and a growing number of non-OECD countries, this database could be used to construct an indicator to measure the reduction or phasing out of harmful incentives generated from financial transfers to marine capture fisheries. Although not sufficient to comprehensively monitor incentive reform in the fisheries sector, reforming financial transfers is an important step to correcting harmful incentives which may lead to biodiversity loss. This data would however also need to be complemented with information on the management regimes in place across different fisheries, as these can help to ensure the health of marine fisheries. A possible indicator that could be extracted from the GFT database is:

1) Proportion and amount of financial transfers with potential negative effects on biodiversity (grants and subsidized loans for vessel construction, modernisation and equipment + interest subsidies + fuel tax exemptions + insurance rebates and subsidies + income tax rebates for fishers and unpaid social contributions).

In the future, it may also be possible to include the use of labels to identify support measures with behavioural constraints[90]. This label would identify support measures provided under the condition that fishers respect certain fishing practices considered environmentally friendly, such as through the use of reduced bycatch fishing gear, or adopting more environmentally friendly fishing methods. An indicator could then be constructed to monitor the proportion and amount of financial transfers with behavioural constraints:

2) Proportion and amount of GFTs with behavioural constraint

- **OECD Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels**

This database measures government support measures to the production (i.e. extraction) and consumption (i.e. burning/use) of fossil fuels (coal, oil, and natural gas). This database could be used to monitor how economic instruments that support the production and use of fossil fuels are being reduced, reformed, or phased out. As much support to fossil fuels is provided in the form of tax expenditures, which are relative preferences within a country's tax system that are measured with reference to a benchmark tax treatment set by that country, the absolute value of fossil fuel support should only be considered at the global level. National-level indicators could measure the change in fossil fuel support over time.

Possible indicator (1): Change in total amount of production and consumption support over time (e.g. in % from a predetermined base year)

In addition, because of GHG effects of coal consumption are substantially higher than oil or natural gas, and considering that climate change is anticipated to be one of the main drivers of biodiversity loss in the coming decades (MEA, 2005), another indicator to monitor incentive reform to fossil fuels could include only support to coal production and consumption:

Possible indicator (2): Change in total amount of production and consumption support to coal products over time (e.g. in % from a predetermined base year)

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[90] The current classification system of the database is presently under review by the OECD Committee for Fisheries.

Summary of findings for Target 20

- **OECD DAC Creditor Reporting System**

Biodiversity-related official development finance is measured and monitored within the OECD DAC CRS through the "Rio markers", applied to bilateral ODA from members of the OECD DAC and to bilateral OOF going forward.

The DAC statistical framework is based on standardised definitions, rules, classifications and bases of measurement. These methodologies for financial data collection and reporting could serve as a point of reference towards more consistent measurement methodologies, and could be built on for monitoring biodiversity finance.

Originally Rio markers were designed to help members in their preparation of National Reports to the CBD, though measuring official development finance targeting the objectives of the Rio Conventions. In recent years however, new financial commitments on behalf of developed country Parties have emerged together with concerns regarding the limitations in drawing on "qualitative" Rio marker data for reporting against quantified finance goals. Whilst a large number of members draw on Rio markers to provide the *basis* for their reporting to the CBD in doing so a recent OECD DAC survey revealed that many members are applying coefficients to adjust the share of finance reported internationally to the Rio conventions. There is however no agreed approach to this and little evidence to inform the scale of these adjustments, which leads to a range of coefficients being used. This is particularly the case with respect to *significant* marker data where parties apply coefficients to the markers that vary completely from 0% to 100% (OECD DCD, 2014 *forthcoming*).

Multilateral ODA is not Rio marked within the CRS system but work is underway under the OECD DAC Joint ENVIRONET-WP-STAT Task Team to reconcile "green" finance flows and going forward, through increased collaboration with MDB's, it may be possible to calculate *imputed multilateral contributions* targeting biodiversity.

Non-ODA public funding is not yet Rio marked by all members, but a formal decision in 2011 was adopted to mark non-export credit OOF on a voluntary basis. Once members begin to apply the Rio markers, these figures can be used to report on non-ODA public funding. Although the CRS provides a framework to report on South-South cooperation initiatives, very few countries are currently reporting at this time. In addition, the DAC statistical system does not explicitly track capacity building/technology transfers within the ODA portfolio, but aid can be monitored to a given sector and to capacity building-type activities based on categories (CRS purpose codes). These figures, however, would be a subset of total bilateral ODA[91].

OECD and Eurostat data on Environmental Protection Expenditures and Revenue

The environmental protection expenditure data collected by OECD and Eurostat, which currently covers OECD, EU Member States, EU candidate and EFTA countries may be used for several of the indicators for Target 20 (and the Strategy for Resource Mobilization) to monitor *domestic* resources from both the public and private sector as reported in the environmental domain classified "protection of biodiversity and landscape". While the framework exists, reporting in this particular domain has been poor and would need to be improved. Moreover, given the measures and activities that "protection of

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[91] This subset of bilateral ODA could be used to monitor progress towards Indicator 9, which intends to monitor the amount and number of South-South and North-South technical cooperation and capacity-building initiatives that support biodiversity.

biodiversity and landscape" refer to, it is likely that expenditures reported in this dataset are limited to *conservation* measures and activities, rather than those that more broadly also encompass sustainable use. For indicator 1(c) on private sector financial flows, the subset on business sector expenditure could be used for this purpose, but would only capture domestic financial flows. It would also be important to clearly identify which figures are being reported so as to eliminate the risk of double counting (e.g. including private sector spending with domestic budgets for Indicator 1). The possible indicators that could be extracted from this database are:

1) Total investment expenditures + internal current expenditures (public + business sector) *i.e.,* for indicator 1(b) on domestic budgets at all levels and 3 on amount of domestic financial support.

2) Total investment expenditures + internal current expenditures (business sector only) *i.e.,* for indicator 1(c) on private sector.

Table 14. Summary of OECD datasets examined for Target 3 and 20 and issues for consideration

Database	Data collection and current country coverage	Issues/ Considerations
EPNRM	• 1998-present • 53 countries	• Introduce biodiversity as its own environmental domain • Introduce new categories of instruments for PES and biodiversity offsets • Collect more detailed information on the geographic scope of the instrument
PSE	• 1987-present • 47 countries	• Bearing caveats raised above, a set of proxy indicators can be developed from the PSE database to monitor both potentially harmful and positive incentives for biodiversity in the agricultural sector
GFT	• 1965-present • OECD countries, Argentina, Chinese Taipei, Russian Federation, Thailand	• Use subset of data to develop an indicator on proportion and amount of GFT with potentially negative impacts on biodiversity • Consider establishing labels to develop an indicator on proportion and amount of GFT with behavioral constraints
Fossil Fuels	• 2005-present • OECD countries, Brazil, India, Russia	• Absolute figures not comparable across countries as benchmark tax treatments vary by country. Changes in this indicator may not be representative of changes in the incentive structure, since reduced tax expenditures could reflect a reduction on the benchmark tax treatment.
CRS	• Rio marker data available from 1998-present[92] • 29 DAC members • 8 non-DAC countries • 30 multilateral organisations • 1 Private donor	• To date only DAC members are applying the Rio markers to bilateral ODA • DAC members agreed in 2011 to apply Rio markers to non-export credit OOF • Multilateral organisations do not currently apply Rio markers
EPER	• 1990 - present • OECD members, European Union members as well as candidate and EFTA countries	• Environmental protection expenditure can be used to monitor both public and business sector domestic financial flows to biodiversity • Would capture expenditures *directly* related to biodiversity but not expenditure indirectly related to biodiversity. Furthermore, in the context of direct expenditure, this is likely to capture only expenditures related to biodiversity conservation, rather than those more broadly related to sustainable use. • While the template exists, data is sparse and countries would need to report more systematically

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[92] Note: Rio marker reporting began in 1998 for DAC members and became compulsory in 2007. Non-DAC countries and other organisations do not apply the Rio markers.

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ANNEX I.   TEXT ON INDICATORS FOR THE STRATEGY FOR RESOURCE MOBILIZATION

The headline indicator for Target 20 was identified as "**Trends in mobilization of financial resources**". The operational indicators for this target were agreed on and adopted in Decision X/3 of COP-10 to monitor the implementation of the strategy for resource mobilization, based on its mission and eight goals[93]:

(1) Aggregated financial flows, in the amount and where relevant percentage, of biodiversity-related funding, per annum, for achieving the Convention's three objectives, in a manner that avoids double counting, both in total and in, *inter alia*, the following categories:

   (a) *Official Development Assistance (ODA).*

   (b) *Domestic budgets at all levels.*

   (c) Private sector.

   (d) Non-governmental organizations, foundations, and academia.

   (e) *International financial institutions.*

   (f) *United Nations organizations, funds and programmes.*

   (g) *Non-ODA public funding.*

   (h) South-South cooperation initiatives.

   (i) Technical cooperation.

(2) Number of countries that have:

   (a) Assessed values of biodiversity, in accordance with the Convention.

   (b) Identified and reported funding needs, gaps and priorities.

   (c) Developed national financial plans for biodiversity.

   (d) Been provided with the necessary funding and capacity building to undertake the above activities.

(3) *Amount of domestic financial support, per annum, in respect of those domestic activities which are intended to achieve the objectives of this Convention.*

(4) Amount of funding provided through the Global Environment Facility and allocated to biodiversity focal area.

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[93] Operational indicators in *italics* may possibly be developed using current OECD datasets or via modifications thereof.

(5) Level of CBD and Parties' support to other financial institutions that promote replication and scaling-up of relevant successful financial mechanisms and instruments.

(6) *Number of international financing institutions, United Nations organizations, funds and programmes, and the development agencies that report to the Development Assistance Committee of Organisation for Economic Co-operation and Development (OECD/DAC), with biodiversity and associated ecosystem services as a cross-cutting policy.*

(7) Number of Parties that integrate considerations on biological diversity and its associated ecosystem services in development plans, strategies and budgets.

(8) Number of South-South cooperation initiatives conducted by developing country Parties and those that may be supported by other Parties and relevant partners, as a complement to necessary North-South cooperation.

(9) Amount and number of South-South and North-South technical cooperation and capacity-building initiatives that support biodiversity.

(10) Number of global initiatives that heighten awareness on the need for resource mobilization for biodiversity.

(11) Amount of financial resources from all sources from developed countries to developing countries to contribute to achieving the Convention's objectives.

(12) Amount of financial resources from all sources from developed countries to developing countries towards the implementation of the Strategic Plan for Biodiversity 2011-2020.

(13) *Resources mobilized from the removal, reform or phase-out of incentives, including subsidies, harmful to biodiversity, which could be used for the promotion of positive incentives, including but not limited to innovative financial mechanisms, that are consistent and in harmony with the Convention and other international obligations, taking into account national social and economic conditions.*

(14) *Number of initiatives, and respective amounts, supplementary to the financial mechanism established under Article 21, that engage Parties and relevant organizations in new and innovative financial mechanisms, which consider intrinsic values and all other values of biodiversity, in accordance with the objectives of the Convention and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of the Benefits Arising out of Their Utilization.*

(15) Number of access and benefit-sharing initiatives and mechanisms, consistent with the Convention and, when in effect, with the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of the Benefits Arising out of Their Utilization, including awareness-raising, that enhance resource mobilization.

ANNEX II. DEFINITION OF SUBSIDIES

There is, to date, no universally accepted definition of subsidies. The OECD applies a broad definition of subsidies as a result of a government action that confers an advantage on consumers or producers, in order to supplement their income or lower their costs.

The definition of a subsidy in the WTO Agreement on Subsidies and Countervailing Measures: For the purpose of this Agreement, a subsidy shall be deemed to exist if:

(a)(1)   there is a financial contribution by a government or any public body within the territory of a Member (referred to in this Agreement as "government"), *e.g.* where:

(i)   a government practice involves a direct transfer of funds (*e.g.* grants, loans, and equity infusion), potential direct transfers of funds or liabilities (*e.g.* loan guarantees);

(ii)   government revenue that is otherwise due is foregone or not collected (*e.g.* fiscal incentives such as tax credits)[94]

(iii)   a government provides goods or services other than general infrastructure, or purchases goods;

(iv)   a government makes payments to a funding mechanism, or entrusts or directs a private body to carry out one or more of the type of functions illustrated in (i) to (iii) above which would normally be vested in the government and the practice, in no real sense, differs from practices normally followed by governments;

or

(a)(2) there is any form of income or price support in the sense of Article XVI of GATT 1994;

and

(b) a benefit is thereby conferred.

According to the UN System of National Accounts, subsidies are current unrequited payments that government units, including non-resident government units, make to enterprises on the basis of the levels of their production activities or the quantities or values of the goods or services which they produce, sell or import (WTO, 2006).

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[94] In accordance with the provisions of Article XVI of GATT 1994 (Note to Article XVI) and the provisions of Annexes I through III of this Agreement, the exemption of an exported product from duties or taxes borne by the like product when destined for domestic consumption, or the remission of such duties or taxes in amounts not in excess of those which have accrued, shall not be deemed to be a subsidy.
Source: World Trade Organization (1999).

Table 15. Mapping types of subsidy to definitions

Type of Subsidy	Definitions of a subsidy			
	ESA	**WTO**	**OECD**	**Pieters**
On-budget subsidies				
Direct transfer of funds, e.g. grants	X	X	X	X
Potential direct transfers of funds, e.g. covering liabilities		X	X	X
Government provides goods or services other than general infrastructure		X	X	X
Government directs other bodies to do any of the above		X	X	X
Off-budget subsidies				
Income or price support		X	X	X
Government revenues due are foregone or not collected, e.g. tax credits		X	X	X
Tax exemptions and rebates		X	X	X
Preferential market access		X	X	X
Accelerated depreciation allowances			X	X
Regulatory support mechanisms, e.g. feed-in tariffs, demand quotas			X	X
Selective exemptions from government standards			X	X
Resource rent for foregone natural resources			X	X
Implicit subsidies, e.g. resulting from the provision of infrastructure				X
Implicit income transfers resulting from a lack of full cost pricing				X
Implicit income transfers resulting from non-internalisation of externalities				X

Source: IEEP et al. 2009.

ANNEX III. IDENTIFYING POSITIVE INCENTIVES

To motivate the identification of positive incentives, the TEEB Implementation Guide for Aichi Target 3 (Rode *et al*., 2012) asks the following questions:

- What biodiversity related problems could be addressed with the help of biodiversity friendly incentives?

- How could incentives be used to address the main threats to biodiversity?

- How could incentives encourage actions in support of biodiversity?

A complementary approach outlined in CBD COP-10, Decision X/2 on The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets is to consider the multiple entry points for positive incentives, to:

- address underlying causes of biodiversity loss

- reduce direct pressures on biodiversity;

- direct action to conserve/restore biodiversity;

- direct efforts to ensure continued ecosystem services provision;

- support capacity building, knowledge, and access.

These types of broad questions or entry points, although not necessarily useful for the purposes of indicator development, may be useful for developing databases similar, for example, to that of the International Energy Agency (IEA) on policies and measures relevant to the energy domain (see Annex IV for description).

ANNEX IV. EXAMPLES OF OTHER DATABASES ON POLICIES AND MEASURES

IEA Policies and Measures Databases

The International Energy Agency (IEA) has developed a suite of databases designed to track national policy responses (comprising market-based instruments and general support mechanisms) in the energy domain. The Policies and Measures Databases provide policy response information on energy-related policy and measures in IEA, and some non-IEA, countries.

Each database record comprises information on the:

- policy or measure's title;

- country;

- jurisdiction (local, state/regional, national, supranational);

- year it was implemented;

- current policy status (in force, ended, superseded – planned policies are not included in the database);

- policy type (economic instrument, fiscal incentives, tax relief / grants / subsidies / loans, policy support, etc.);

- policy target (overarching framework or strategic plan, theme, e.g. energy efficiency, sector, multi-sectoral); and

- a detailed summary description.

Delegates from IEA member countries are given opportunity to review the information in the databases twice a year. These database records provide sufficient information to address two of the four indicator attributes specified in AHTEG for Target 3, namely identification and establishment, and perhaps partial information to consider the strengthening attribute.

EEA's Progress in charge structures and internalisation policies indicator

The European Environment Agency's (EEA) has 242 indicators covering 23 topics.[95] Of this total, 35 are biodiversity indicators. In the entire indicator set just two are designated as policy instruments indicators. The EEA has developed a Progress in charge structures and internalisation policies for transportation indicator. The indicator is a score sheet of measures implemented.[96] It has, like other policy

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[95] Agriculture, air pollution, biodiversity, chemicals, climate change, coasts and seas, energy, environment and health, environmental scenarios, fisheries, green economy, household consumption, industry, land use, natural resources, noise, policy instruments, soil, tourism, transport, urban environment, waste and material resources and water.

[96] Note that implemented does not mean that the externalities are fully internalised. The "ticks do not provide information on the absolute charge level or its revenues and on its appropriateness.

response indicators, no units of measure only a count (Hagan and Whitman, 2006). However, colour coding is used to provide a quick summary of implementation and strengthening status. Where, "a green "plus" (new measure) and green total number of measures means an advancement in internalisation, a red "minus" (removed measure) and red total number of measures means a decay in internalisation. Green and red ticks hold their colour for one year. A black colour of the total numbers means no change."[97] A similar overview indicator could be developed for biodiversity-related positive incentive policy responses.

The Matrix 2012: Ecosystem Marketplace with the Gordon and Betty Moore Foundation initiative

"The Matrix 2012"[98] is an Ecosystem Marketplace with the Gordon and Betty Moore Foundation initiative. The Matrix 2012 collates information on global ecosystem markets. It summarises a database of information on carbon, watershed and water quality, biodiversity, and certified product markets. For each ecosystem market, information is provided on the:

- market type (government-mediated, voluntary, etc.);

- market size (current, projected for 2014 and 2020)[99];

- market participants;

- market shapers;

- market service providers, as well as an assessment of;

- the developing world impact;

- the environmental impact; and

- future directions.

The Matrix 2012 provides the type of information that enables the analyst to track the four AHTEG indicator attributes, e.g. to *identify* potential instruments for biodiversity protection, follow market *establishment* in terms of geographic scope and size, and *assess* the environmental and conservation outcomes of current markets, and to consider market trends, challenges and opportunities and emerging drivers that have opportunity to *strengthen* and scale-up current markets using the analysis provided by Ecosystem Marketplace with the Gordon and Betty Moore Foundation.

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[97] See *www.eea.europa.eu/data-and-maps/figures/progress-in-charge-structures-and-2*.

[98] See *www.ecosystemmarketplace.com/documents/acrobat/the_matrix.pdf*. A detailed report on ecosystem markets is also available (Madsen et al., 2010).

[99] There are six Biodiversity Markets sub-markets listed below with information in square brackets on the 2012 market size in US dollars and forecast market size in US dollars in 2020. Compliance Biodiversity Offsets [$3 billion, $5-8 billion], Voluntary Biodiversity Offsets [$25 million, $70 million], Government-mediated Biodiversity PES [$2 billion, $2.9 billion], Recreation (ecotourism, park fees, hunting licences) [$115-230 billion, $200 billion], and Genetic Resources (Access & Benefit Sharing) [$35 million, $100 million], Individual Fisheries Quotas (ITQs and IFQs) [$5 billion, $9 billion]. This same information for the two certified product markets is Certified Agricultural Products [$64 billion, $190 billion] and Certified Forest Products [$54 billion of which FSC $20 billion, $228 billion – FSC only].

ANNEX V.   FURTHER DESCRIPTION OF THE CRS DATABASE

Box 6. Definitions of types of international flows

Bilateral and multilateral

Bilateral transactions are those undertaken by a donor country directly with a developing country. They also encompass transactions with non-governmental organisations active in development and other, internal development-related transactions such as interest subsidies, spending on promotion of development awareness, debt reorganisation and administrative costs.

The definition of a *multilateral* contribution is based on two criteria: the multilateral character of the recipient institution and the multilateral character of the contribution. Donors' contributions that satisfy both criteria by meeting the following tests should be recorded under the heading "multilateral":

   a) the recipient institution conducts all or part of its activities in favour of development and developing countries; and

   b) the recipient institution i) is an international agency, institution or organisation whose members are governments, who are represented at the highest decision-taking level by persons acting in an official capacity and not as individuals; or ii) is a fund managed autonomously by a multilateral agency as defined in i); and

   c) funds are pooled so that they lose their identity and become an integral part of the recipient institution's financial assets.

Concessional and non-concessional

Grants are wholly concessional by definition. Non-concessional loans are those provided at, or near to, market terms. Concessional loans are those provided at softer terms. To help distinguish ODA from OOF, a minimum *grant element* has also been specified. The grant element is defined as the difference between the face value of the loan and the discounted future debt service payments to be made by the borrower. The discount rate used in the ODA calculation is constant over time and across currencies, and fixed at 10 per cent.

Official and private

Official transactions are those undertaken by central, state or local government agencies at their own risk and responsibility, regardless of whether these agencies have raised the funds through taxation or through borrowing from the private sector. This includes transactions by public corporations e.g. corporations over which the government secures control by owning more than half of the voting equity securities or otherwise controlling more than half of the equity holders' voting power; or through special legislation empowering the government to determine corporate policy or to appoint directors. Multilateral development agencies are considered official bodies. *Private* transactions are those undertaken by firms and individual residents in the reporting country from their own private funds.

Official Development Assistance (ODA)

Official development assistance is defined as those flows to countries and territories on the DAC List of ODA Recipients and to multilateral development institutions which are:

   i) provided by official agencies, including state and local governments, or by their executive agencies; and

   ii) each transaction of which:

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a) is administered with the promotion of the economic development and welfare of developing countries as its main objective; and

b) is concessional in character and conveys a grant element of at least 25 per cent (calculated at a rate of discount of 10 per cent).

Other Official Flows (OOF)

Other official flows are defined as transactions by the official sector which do not meet the conditions for eligibility as ODA, either because they are not primarily aimed at development, or because they are not sufficiently concessional, e.g.:

1. Grants to developing countries for representational or essentially commercial purposes.

2. Official bilateral transactions intended to promote development which are not concessional in character or have a grant element of less than 25 per cent.

3. Official bilateral transactions, whatever their grant element, that are primarily export facilitating in purpose. This category includes by definition export credits extended directly to developing countries by an official agency or institution ("official direct export credits" financing).

4. The net acquisition by governments and central monetary institutions of securities issued by multilateral development banks at market terms.

5. Subsidies (grants) to the private sector to soften its credits to developing countries

6. Funds in support of private investment (loans and grants by the official sector to a private company in the donor country to help finance a specified investment in a developing country).

7. Official sector direct or portfolio investment (equities and shares) which do not qualify as ODA.

8. Reorganisation of non-ODA debt undertaken by the official sector at non-concessional terms, and forgiveness of military debt.

Source: OECD DAC Statistical Directives (DCD/DAC(2013)15/FINAL).

Channel of Delivery. Aid can be delivered through a variety of channels. The channel of delivery is the first implementing partner, which has implementing responsibility over the funds and is normally linked to the extending agency by contract or other binding agreement, and is directly accountable to it. Where several levels of implementation are involved, donors are instructed to report the first level of implementation as the channel of deliver.

The channel of delivery concept serves two purposes: (i) it permits the identification of core funding to specific multilateral organisations; and (ii) it enables the calculation of aggregates on bilateral aid channelled through multilateral organisations and non-government organisations (NGOs). Five categories of channels are distinguished:

1. *Public sector institutions*, including central, state or local government department in donor or recipients countries.

2. *NGOs and civil society*, with NGOs defined as any non-profit entity in which people organise themselves on a local, national or international level to pursue shared objectives and ideals, without significant government-controlled participation or representation. NGOs include foundations, co-operative societies, trade unions, and ad hoc entities set up to collect funds for a specific purpose. NGO umbrella organisations and NGO networks are also included.

3. *Public private partnerships (PPP) and networks*, which are collaborative arrangements between private actors and bilateral/multilateral agencies or governments to address specified developmental issues. A PPP is an operational partnership whose board or other governance structure includes both public officials and private individuals. A network is a global or regional organisation that supports and brings together public sector, private sector and civil society organisations with similar goals to facilitate knowledge sharing.

4. *Multilateral organisations or international institutions with governmental membership*. They include organisations to which donors' contributions may be reported either in whole or in part as multilateral ODA as well as organisations that serve only as channels for bilateral ODA. Examples are WTO, European Union Institutions, Regional Development Banks, IMF, World Bank Group, and UN agencies.

5. *Other*, which includes 'for-profit' institutions, consultants and consultancy firms, universities, colleges and other teaching institutions, research institutes, think-tanks, and any other implementers that cannot be placed in another channel category.

Sector. Aid activities are also classified according to sector using a series of purpose codes. The sector is assigned based on the destination of a contribution by asking "which specific area of the recipient's economic or social structure is the transfer intended to foster" (DCD/DAC(2013)15/FINAL). Only one purpose code can be assigned per aid activity. When the contribution benefits multiple sectors, the sector that receives the largest proportion of the contribution should be reported. The DAC sector classification contains the following broad categories:

- *social infrastructure and services* (covering the sectors of education, health, population, water, government and civil society);

- *economic infrastructure and services* (covering transport, communications, energy, banking and finance, business services);

- *production* (covering agriculture, forestry, fishing, industry, mining, construction, trade, tourism);

- *multisector/cross-cutting* (covering general environmental protection, other multisector including urban and rural development); and

- *non-sector allocable* (for contributions not susceptible to allocation by sector such as general budget support, actions relating to debt, humanitarian aid and internal transactions in the donor country).

Table 16. Description of General Environmental Protection sector and subsectors

| Sector	Description
General environmental protection	Covers activities concerned with conservation, protection or amelioration of the physical environment without sector allocation.
Sub-sector	**Description**
Environmental policy and administrative management	Environmental policy, laws, regulations and economic instruments; administrational institutions and practices; environmental and land use planning and decision-making procedures; seminars, meetings; miscellaneous conservation and protection measures not specified below.
Biosphere protection	Air pollution control, ozone layer preservation; marine pollution control.
Biodiversity*	Including natural reserves and actions in the surrounding areas; other measures to protect endangered or vulnerable species and their habitats (e.g. wetlands preservation).
Site preservation	Applies to unique cultural landscape; including sites/objects of historical, archeological, aesthetic, scientific or educational value.
Flood prevention/control	Floods from rivers or the sea; including sea water intrusion control and sea level rise related activities.
Environmental education/ training	
Environmental research	Including establishment of databases, inventories/accounts of physical and natural resources; environmental profiles and impact studies if not sector specific.

* All aid activities classified under the biodiversity sub-sector are classified, by definition, with the principal objective (2) Rio-marker (discussion on Rio markers below).

Note: Sector specific environmental protection activities should be included in the respective sectors, and the environment marker checked. Multi-sector/cross-cutting includes only environment activities not allocable by sector.

Source: OECD (2013e, p. 90).

The below figure reflects biodiversity-related spending according to sub sectors. As can be seen, the biodiversity subsector only accounted for 17% of total Rio-marked biodiversity-related aid in 2012. Rather, a majority of biodiversity-related aid is distributed through other subsectors, including forestry (15%), agriculture (7%), and water resources (6%), among others.

Figure 17. Top 10 sub-sectors receiving biodiversity-related aid in 2012
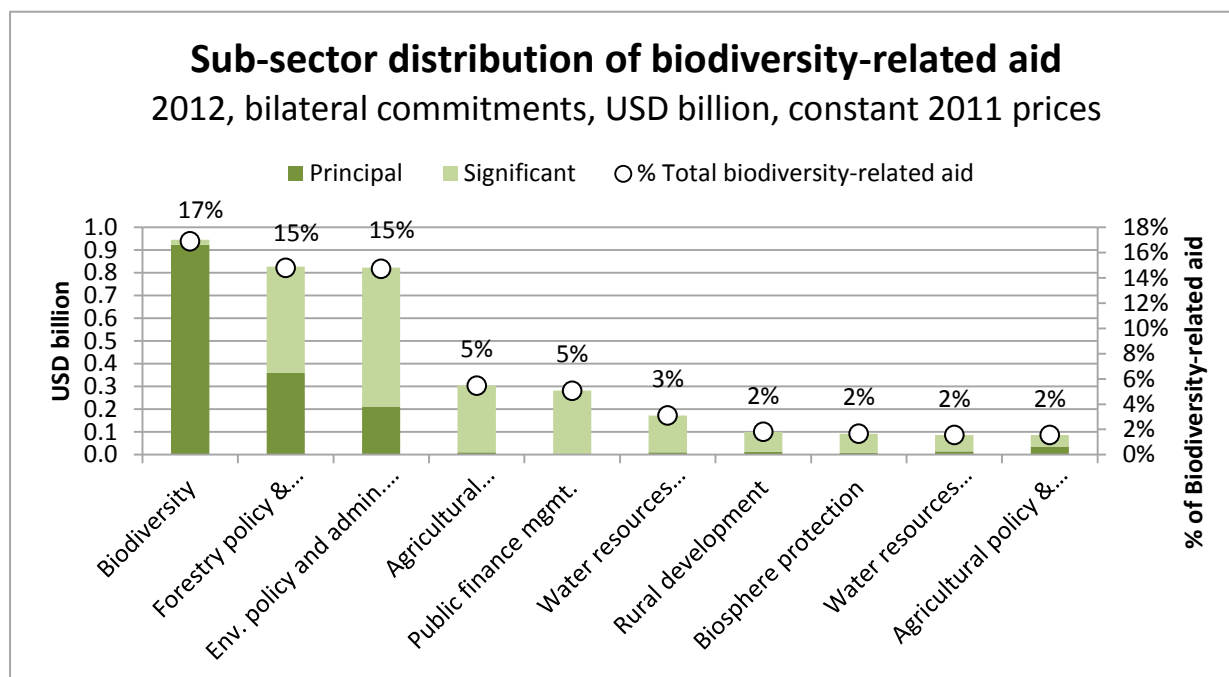
Source: OECD, DAC CRS (March 2014).

Table 17. List of OECD DAC data submitters

DAC Members				
Australia	EU Institutions	Ireland	New Zealand	Spain
Austria	Finland	Italy	Norway	Sweden
Belgium	France	Japan	Poland	Switzerland
Canada	Germany	Korea	Portugal	United Kingdom
Czech Republic	Greece	Luxembourg	Slovak Republic	United States
Denmark	Iceland	Netherlands	Slovenia	
Non-DAC countries				
Bulgaria	Hungary	Liechtenstein	Russia	United Arab Emirates
Chinese Taipei	Israel[2]	Lithuania	Saudi Arabia	
Cyprus[1]	Kuwait (KFAED)	Malta	Thailand	
Estonia	Latvia	Romania	Turkey	
Multilateral Organisation				
AfDB	GAVI	IFAD	OSCE	UNPBF
AfDF	GEF	IFC	UNAIDS	UNRWA
Arab Fund (AFESD)	Global Fund	IMF	UNDP	UNTA
AsDB	IAEA	IMF (Concessional Trust Funds)	UNESE	WFP
AsDB Special Funds	IBRD	Islamic Dev Bank	UNEP	WHO
BADEA	IDA	Montreal Protocol	UNFPA	
CarDB	IDB	Nordic Dev Fund	UNHCR	
EBRD	IDB Special Fund	OFID	UNICEF	
Private donors				
Bill & Melinda Gates Foundation				

[1]Note by Turkey:

The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

Note by all the European Union Member States of the OECD and the European Commission:

The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

[2] The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Table 18. Biodiversity Rio marker

AID TARGETING THE OBJECTIVES OF THE CONVENTION ON BIOLOGICAL DIVERSITY	
DEFINITION An activity should be classified as biodiversity-related (score Principle or Significant) if: **CRITERIA FOR ELIGIBILITY**	It promotes at least one of the three objectives of the Convention: the conservation of bio-diversity, sustainable use of its components (ecosystems, species or genetic resources), or fair and equitable sharing of the benefits of the utilisation of genetic resources. The activity contributes to: a) protection or enhancing ecosystems, species or genetic resources through in-situ or ex-situ conservation, or remedying existing environmental damage; or b) integration of bio-diversity and ecosystem services concerns within recipient countries' development objectives and economic decision making, through institution building, capacity development, strengthening the regulatory and policy framework, or research; or c) developing countries' efforts to meet their obligations under the Convention. The activity will score "principal objective" if it directly and explicitly aims to achieve one or more of the above three criteria.
EXAMPLES OF TYPICAL ACTIVITIES **1. Typical activities take place in the sectors of:** *Water and sanitation* *Agriculture* *Forestry* *Fishing* *Tourism*	• Integration of biological diversity concerns into sectoral policy, planning and programmes; e.g. – Water resources protection and rehabilitation; integrated watershed, catchment and river basin protection and management; – Sustainable agricultural and farming practices including substitution of damaging uses and extractions by out-of-area plantations, alternative cultivation or equivalent substances; integrated pest management strategies; soil conservation; in-situ conservation of genetic resources; alternative livelihoods; – Combating deforestation and land degradation while maintaining or enhancing biodiversity in the affected areas; – Promotion of sustainable marine, coastal and inland fishing; – Sustainable use of sensitive environmental areas for tourism.
2. Typical non-sector specific activities are: *Environmental policy and administrative management* *Biosphere and biodiversity protection* *Environmental education/training* *Environmental research*	• Preparation of national bio-diversity plans, strategies and programmes; biodiversity inventories and assessments; development of legislation and regulations to protect threatened species; development of incentives, impact assessments, and policy and legislation on equitable access to the benefits of genetic resources. • Establishment of protected areas, environmentally oriented zoning, land use and regional development planning. • Protecting endangered or vulnerable species and their habitats, e.g. by promoting traditional animal husbandry or formerly cultivated/collected plants or ex-situ conservation (e.g. seed banks, zoological gardens). • Capacity building in taxonomy, bio-diversity assessment and information management of biodiversity data; education, training and awareness-raising on bio-diversity. • Research on ecological, socio-economic and policy issues related to biodiversity, including research on and application of knowledge of indigenous people. • Supporting development and use of approaches, methods and tools for assessment, valuation and sustaining of ecosystem services.

Source: OECD (2013f, p. 43).

Measuring financial flows from international financial institutions to climate change mitigation and adaptation activities

Recent work has been underway to improve the tracking and reporting of international financial flows to climate change mitigation and adaptation activities that may provide a precedent for tracking resource flows to biodiversity in the future. In 2012, the African Development Bank led a team of Multilateral Development Banks to develop a new approach to track climate financing, including both adaptation and mitigation financing (AfDB, 2013). This joint approach was agreed upon by representatives from the following MDBs:

- African Development Bank

- Asian Development Bank

- European Bank for Reconstruction and Development

- European Investment Bank

- Inter-American Development Bank

- International Finance Corporation

- World Bank.

Although each MDB has a different methodology for tracking climate finance, the joint approach aims to find commonalities and is an attempt to jointly report on resources mobilised for a set of commonly-agreed climate-related activities. There are a more similarities than differences between the OECD DAC Rio markers and the MDB Joint approach[100].

The OECD DAC Joint Task Team on the Rio Marker, Environment and Development Finance Statistics

The OECD DAC Joint Task Team[101] of the Network on Environment and Development Co-operation (ENVIRONET) and Working Party on Development Finance Statistics (WP-STAT) on improvement of Rio markers, environment and development finance statistics was revived in November 2013. The overarching goal IS to ensure that DAC methodologies and data remain the reference for the international community in measuring Official Development Assistance (ODA) and non-export credit Other Official Flows (OOF) related to climate change, biodiversity, desertification and other environmental concerns. This will be achieved initially through a one year programme of work over 2014 to improve the quality, coverage, use and communication of the Rio marker data. Further information of the Task Team's activities and recent meetings can be found online (http://www.oecd.org/dac/environment-development/statistics.htm#taskteam).

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[100] Additional information can be found at:
www.oecd.org/dac/environment-development/workshop-riomarkers-february2013.htm.

[101] See "Terms of reference and scope of work for a Joint ENVIRONET and WP-STAT Task Team on Improvement of Rio markers, environment and development finance statistics", OLIS Ref: DCD(2013)/8/REV2. For further information please contact Valerie.Gaveau@OECD.org and Stephanie.Ockenden@OECD.org.