# INPUT TO THE REPORT OF THE HIGH-LEVEL PANEL ON GLOBAL ASSESSMENT OF RESOURCES FOR IMPLEMENTING THE STRATEGIC PLAN FOR BIODIVERSITY 2011-2020

# (UNEP/CBD/COP/11/INF/20)

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## CLUSTER REPORT ON RESOURCE REQUIREMENTS FOR THE AICHI BIODIVERSITY TARGETS

### TARGET 2-4: MACROECONOMICS

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**2012**

# Resource requirements for Aichi Targets 2-4 – the "Macro-economics" cluster

## Final report for High Level Panel

**27 September 2012**

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Final report for High Level Panel

A report submitted by ICF GHK

Date: 27 September 2012

Job Number J30258786

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V1 9 July 2012

# Document Control

| | |
|---|---|
| **Document Title** | Resource requirements for Aichi Targets 2-4 – the “Macro-economic” cluster |
| **Job number** | J8786 |
| **Prepared by** | Matt Rayment |
| **Checked by** | Mav Conway |
| **Date** | 27 September 2012 |

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# Acknowledgements

This report has been prepared on the basis of inputs from a variety of sources. Evidence, information and advice were provided by the following:

- Victor Anderson, WWF
- Charles Arden-Clarke, UNEP
- Sandra Avérous, UNEP
- Giles Bartlett, WWF
- Nicolas Bertrand, UNEP
- Anthony Cox, OECD
- Carol Day, WWF
- Yves De Soye, UNDP
- Katia Karousakis, OECD
- Glenn-Marie Lange, The World Bank
- Markus Lehmann, CBD
- Günter Mitlacher, CBD Focal Point WWF Germany
- Caroline Petersen, UNDP
- Nik Sekhran, UNDP
- Benjamin Simmons, UNEP
- Pavan Sukhdev, Chair of High Level Panel
- Rose Timlett, WWF
- Josh Bishop

ICF-GHK would like to thank the above organisations and the relevant individuals for their time and kind assistance.

# Contents

# 1 Introduction

This report presents an assessment of the resources required to meet the “Macro-economics” cluster of Aichi Biodiversity Targets, comprising:

- **Target 2** relating to biodiversity values and their integration into plans, strategies and accounting systems;
- **Target 3** relating to negative and positive incentives;
- **Target 4** relating to sustainable production and consumption.

The report has been prepared by GHK Consulting Ltd in accordance with terms of reference set by Defra, in order to inform the work of the High Level Panel on Global Assessment of Resources for implementing the Strategic Plan for Biodiversity 2011-2020.

The report outlines the methods applied and presents an assessment of resource needs, as well as a short discussion of the benefits of meeting the Targets and the possible sources of finance.

The following three sections present assessments of the resources required to meet each of the three Targets.

# 2 Aichi Target 2

**By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.**

## 2.1 Introduction

Target 2 calls for the integration of biodiversity values into a wide range of national and local policies, strategies and processes, including planning, development and poverty reduction strategies and processes and national accounting and reporting systems.

The Target recognises that the values of biodiversity are not at present widely reflected in decision-making, and the failure to take account of them in other policies, plans and processes, including development and poverty reduction strategies, can contribute to biodiversity loss. Most national accounting and reporting systems also fail to recognise the value of biodiversity and ecosystems, so that they are paid too little attention in the formulation and monitoring of national policy. Taking account of the values of biodiversity in relevant decision-making processes and national accounting systems should contribute to better outcomes for biodiversity, and facilitate the delivery of the other Aichi Targets.

A key issue in interpreting the Target relates to the definition of "biodiversity values". While the term, and the reference to national accounting systems, may imply the use of monetary estimates of the value of biodiversity where they are available, we suggest that it should also include broader qualitative and quantitative assessments of biodiversity and its contribution to ecosystem services and to development and livelihoods. A broader interpretation of "biodiversity values", such as that adopted in TEEB, will facilitate integration into the range of different processes and strategies covered by the Target.

As biodiversity values are not fully understood and documented in many countries, we interpret the Target as requiring efforts to assess these values in order to promote their integration into policies, strategies, processes and accounting systems.

The following milestones were suggested for the Target:

- By 2012, work on biophysical inventories of biodiversity and associated ecosystem services is initiated and, by 2014, a work programme for reflecting biodiversity and ecosystem values in national accounts is developed;
- By 2014, the opportunities derived from the conservation and sustainable use of biodiversity, and the fair and equitable sharing of benefits arising from the use of genetic resources, are integrated into Poverty Reduction Strategy Papers (PRSPs) and other national development plans, and are routinely included in environmental impact assessment, strategic environmental assessment and spatial planning;
- By 2018, the most important aspects of biodiversity and ecosystem services are reflected in national statistics.

Target 2 links with most of the other Aichi Targets by helping to establish a favourable policy environment and institutional arrangements to allow change in other policy areas. It links closely with Target 1 – which seeks to raise awareness of biodiversity and its value – focusing particularly on raising awareness among policy-makers rather than other stakeholders and the wider public. Target 2 should therefore facilitate the delivery of many of the other Aichi Targets and may help to reduce the cost of their delivery over time.

Like all of the Aichi Targets, meeting Target 2 will depend on effective institutional arrangements, governance structures and capacity building measures. While this analysis takes account of specific actions that can be taken to build capacity with respect to this Target, delivering the Target involves integrating biodiversity values into the work of a range of different institutions and processes, and will depend on the effectiveness of these institutions and processes more widely. The resources required to achieve these broader changes are likely to be far greater than those needed to undertake the specific actions examined in this assessment.

## 2.2 Actions

Meeting Target 2 is likely to involve the following actions, largely undertaken at national and sub-national level:

1. National assessments of biodiversity values. Such assessments will help to document and highlight the values associated with biodiversity in each country, and provide an evidence base for efforts to integrate these values into policies, planning processes, development and poverty alleviation strategies and plans, and national accounting systems.
2. Actions to raise awareness of the values of biodiversity among policy makers, and to integrate them into a range of relevant policies, strategies and processes. This is likely to require a programme of advocacy and series of meetings and events to raise awareness among policy makers, planners and stakeholders, and to promote the integration of biodiversity into relevant plans and processes.
3. Specific initiatives to integrate biodiversity into national accounting and reporting systems. This will require capacity building measures and the development of methodologies for data gathering and analysis.

## 2.3 Method of assessment

Based on consultations with international experts and stakeholders, and a review of relevant documentation, the following approach has been used to assess the resources required to deliver each of the three identified actions required to meet this Target.

### 1. National Assessments of Biodiversity Values

National assessments of biodiversity and ecosystem services and their value could be addressed through a national TEEB study in each country, which would collate and document evidence of the value of biodiversity and ecosystems nationally, as well as the importance of integrating these values into policies, plans and strategies.

Efforts are underway to establish national TEEB studies in a number of countries. Information provided by the TEEB Secretariat identifies approximately 30 current TEEB inspired initiatives at the national and regional level at various levels of conception or implementation. These vary in their scale and state of development – they include a range of local, national and regional studies, some focusing on particular ecosystems, and a mixture of scoping studies and full assessments.

The scope of national TEEB studies varies widely, which results in wide variations in the resources required. National studies range from reviews of existing literature on the value of biodiversity and ecosystem services to more detailed assessments involving consultations with multiple stakeholders and compiling and combining biophysical and economic data and models. Some studies have attempted comprehensive assessments at the national level, while others have focused on particular ecosystems, areas or conservation issues.

For the purpose of meeting Target 2, there is a requirement for overall studies at the national level that examine the values and benefits of biodiversity and ecosystems in each country and identify the key priorities for integrating these values into national policies, plans and strategies. This will not necessarily require comprehensive or fully monetised value assessments, but requires structured assessments that address the range of benefits that biodiversity provides to different groups and sectors across the country as a whole, and its linkages with a range of different policies.

The resources required to deliver national TEEB-like studies have been reviewed through consultations with the TEEB Secretariat and with reference to relevant literature and other assessments, including the GEF-6 needs assessment.

## 2. Integration of Biodiversity Values into Policies, Strategies and Plans

Once evidence has been compiled on biodiversity values in each country, efforts will then be needed to integrate these values into relevant policies, plans and strategies. The priorities for this will vary by country – for example in some countries integrating biodiversity values into development and poverty reduction strategies will be a priority, while in others there will be a greater focus on spatial planning or sectoral development strategies. These priorities will determine the target audiences, which might include development agencies, local or regional planning authorities, economic development interests, business groups, the farming and forestry sectors and others.

The work is likely to involve communications, meetings and workshops designed to raise awareness of biodiversity values among target audiences and to identify and take forward priorities for integration.

It is anticipated that the main resources required to achieve this will be:

- Staff time – employing one or more advocates to raise awareness of biodiversity among policy makers and to advocate integration of biodiversity values into relevant plans and strategies;
- Expenses – to cover costs of publications and organisation of workshops;
- Consultancy – specific studies on options for integration into particular policy areas.

An average resource requirement per country has been estimated based on a review of international staff costs for policy advisers, and appropriate budgets for other expenses, and this has been scaled up to assess likely resource needs at the global level.

## 3. Developing National Accounting and Reporting Systems

The target calls for action to integrate the value of biodiversity into national accounting and reporting systems. This requires working with central banks and ministries of finance in different countries to include measures of natural capital and ecosystem services in national accounts, and building the institutional structures and methods of data collection and analysis to achieve this.

Accounting methodologies are being developed internationally. The System for Environmental-Economic Accounts (SEEA) is an internationally agreed method for accounting for material natural resources such as minerals, timber and fisheries, and was recently adopted by the UN Statistical Commission.

Wealth Accounting and the Valuation of Ecosystem Services (WAVES) is a global partnership that aims to promote sustainable development by ensuring that the national accounts used to measure and plan for economic growth include the value of natural resources. The objectives of WAVES are to establish environmental accounts in six to ten countries and incorporate these into national policy analysis and development planning, to develop internationally-agreed guidelines for ecosystem accounting, and to spread environmental accounting through a global partnership.

WAVES was launched in 2010 and is developing methodologies for ecosystem accounting, as well as working with five developing countries (Botswana, Colombia, Costa Rica, Madagascar and Philippines) to develop and implement national accounting systems. The first priority of WAVES is to implement the SEEA and use the methods that are internationally recognised. The second is to help develop an agreed methodology for measuring ecosystem services[1]. A Multi-Donor Trust Fund has been established and fundraising for implementation phase (2012 through 2015) is ongoing with a proposed budget of $15 million.

WAVES employs a flexible and modular approach in different partner countries, allowing countries to adopt different approaches according to national priorities, resources and data. The five countries WAVES is working with at present are focusing on various accounting

[1] WAVES Partnership (2012) Moving beyond GDP - How to factor natural capital into economic decision making. http://www.wavespartnership.org/waves/sites/waves/files/images/Moving_Beyond_GDP.pdf

issues relating to water, land and ecosystem accounts; particular issues such as watershed management and protected areas; and management of natural resource based sectors such as mining, forestry, agriculture and tourism.

At the Rio+20 summit in June 2012, fifty-seven countries, the European Commission and a number of businesses[2] supported a communiqué that calls on governments, the UN system, international financial institutions and other international organisations to strengthen the implementation of natural capital accounting around the world, building on the work of the WAVES programme[3].

The WAVES programme therefore represents the agreed model for developing national accounting systems across the world. Details of the resources used by national WAVES partners have therefore been used as the basis for a global assessment.

## 2.4 Assessment of resource needs

### 1. National Assessments of Biodiversity Values

Discussions with the TEEB Secretariat indicate that the costs of national TEEB studies range from approximately $50,000 for a scoping study to up to $1.25 million for the most detailed assessments. The combined cost of 5 in-depth developing country studies currently being supported through the TEEB process and funded by the EU is $5 million, an average of $1 million per study (including central communications, staff time and other shared costs). These costs also vary according to the size of the country and the scale and range of different services and values being assessed.

The GEF 6 needs assessment recognises the range of resource requirements for different studies and suggests an average requirement of $500,000 per study as a one-off investment. It proposed that studies should be prioritised in regions with high biodiversity and ecosystem service values; the investments required to support studies in 10-50 countries were estimated at between $5.0 and $25.0 million.

The average investment estimated by the GEF 6 needs assessment seems reasonable given that the resources required for individual country studies are likely to range from less than $100,000 for very small countries to more than $1 million for larger countries with more complex and valuable ecosystems. Scenario 1 therefore uses an average investment of $500,000 per country.

A more detailed analysis, including collation and analysis of more detailed biophysical as well as economic and social data might involve a higher level of investment averaging $1 million per study[4] (Scenario 2).

To undertake these assessments in all countries of the world would require 195 studies (including those countries in which studies are already underway). The cost of achieving this would therefore be $97.5 million (Scenario 1) or $195 million (Scenario 2). These investments would be largely made over the years 2013 to 2015 inclusive. These are estimates of total resource needs and include current expenditures.

As our knowledge of the value of biodiversity and ecosystems improves over time, and since the process of integrating these values into decision making will be an on-going process, there is a strong case to undertake further update studies in the future. Annual expenditures averaging $100,000 per country (Scenario 1) - or $150,000 per country (Scenario 2) - would fund follow up studies over time. Total global resource needs for these ongoing expenditures would therefore be $19.5 million per annum (Scenario 1) or $29.3 million per annum (Scenario 2) from 2016 onwards.

[2] http://www.wavespartnership.org/waves/sites/waves/files/images/NCA_List_of_Supporters.pdf

[3] http://www.worldbank.org/en/news/2012/06/20/massive-show-support-action-natural-capital-accounting-rio-summit

[4] Some detailed national studies have involved higher levels of investment – especially those involving more detailed analyses of biophysical as well as economic data (e.g. the UK National Ecosystems Assessment). However, it is considered that this range of investment should be sufficient to support policy and advocacy work.

## 2. Integration of Biodiversity Values into Policies, Strategies and Plans

The resources required to deliver this action have been estimated as follows:

- **Employment of policy advisors** – 1-2 policy officers could be employed in each country to raise awareness of the value of biodiversity among policy-makers and to further the integration of these values into key plans and strategies. Priorities would be determined on a national basis and according to the findings of the national TEEB studies. International data on wage rates for central government policy advisors suggests an average cost of $45,000 per employee per annum, including overheads and support costs[5]. The resources required are therefore estimated to average $45,000 to $90,000 per country per annum, which would amount to an investment of $26 to $51 million for 195 countries over a 3 year period;
- **Events, publications and consultancy** – additional resources will be required to cover the costs of workshops and events, publications, and further research and consultancy on specific policy issues, as required. Adding an additional budget for these items of $50,000 per policy officer per year would require an additional budget of $29 to $59 million over three years.

These figures give an overall estimate of investment needs of $56 million (Scenario 1) or $110 million (Scenario 2) over a three year period 2013-2015.[6]

As raising awareness of biodiversity values and integration into plans and processes is a long term process, there would be a requirement for ongoing expenditures, which might involve an annual budget averaging $60,000 per country (Scenario 1) or $120,000 per country (Scenario 2) to cover the costs of employing one policy advisor with additional expenses for workshops and publications.

It should be noted that effectively integrating biodiversity values into wider policy and planning processes would then require additional action by a large number of different actors across a range of different government departments, agencies and authorities. The resources required to achieve this are difficult to estimate but are likely to greatly exceed those needed to undertake the specific, catalytic actions identified above.

## 3. Developing National Accounting and Reporting Systems

Information has been provided by the WAVES programme about the resources allocated to the development of national accounting systems in different countries. The WAVES programme has an overall proposed budget of $15 million over the four year period 2012 to 2015 and is working to develop methodologies to account for natural capital and ecosystem services, as well as to develop national accounting systems in five countries. An average sum of $1.5 million per country has been allocated to each country, to develop the required capacity and data collection and processing systems to develop national accounts in each country. The flexibility of the WAVES approach could be extended to other countries, recognising that there will be variations in resource needs and rates of progress depending on available capacity, data and priorities[7].

[5] Data on wage rates for central government policy advisors are available on the website www.wageindicator.org. These indicate that monthly wage rates vary widely between countries from less than $100 to more than $4,000. Grouping countries in quartiles according to GDP per capita suggests a mean average salary of $22,500 per annum for policy advisors. Doubling this figure to take account of additional employment costs and overheads gives an average cost of $45,000 per employee per annum.

[6] These estimates exceed those used in the GEF-6 needs assessment which put the estimated the cost of activity to "facilitate strategic programming to value biodiversity" at $200,000 US per country, as a one-off contribution to cover the costs of analysis, development of a work programme and capacity building measures. However, the GEF-6 needs assessment was based on a contribution rather than an overall cost assessment, and focused on developing countries only, where unit costs are lower.

[7] There will be wide variations in the resources required by different countries, according to data needs and availability. Some countries are likely to be able to draw on existing datasets while others will need to develop new systems of data collection. Therefore resource requirements can be expected to vary widely around the estimated national average, as will the rate of progress that can be made from a given level of investment.

If similar levels of investment were required in all countries of the world, this would suggest an overall budget of $300 million would be required to develop national accounting systems globally (based on work in a further 190 countries in addition to the current WAVES budget). While at least 24 countries already have some form of natural capital accounts[8], some further development work would be required in most countries in accordance with developing international standards and methodologies.

There would also be a requirement for ongoing expenditures to collate and publish natural capital and ecosystem accounts annually. The required costs are difficult to estimate at this stage but can be expected to be less than the initial development costs, and could perhaps amount to between $200,000 (Scenario 1) and $400,000 (Scenario 2) per country per year. This level of expenditure would enable some development and refinement of methodologies for natural capital and ecosystem accounting over time, to broaden the scope and coverage of accounting systems.

## 2.5 Results

### 2.5.1 Estimate of Investment Needs and Ongoing Expenditures

Delivery of Aichi Target 2 is estimated to require a total investment of $453 million and on-going annual expenditures of $70 million, under Scenario 1, the lower investment scenario (Table 2.1). Total resource needs for this scenario over the 2013-2020 period are estimated at $804 million, requiring an average of $100 million per year to be allocated to relevant actions over this period. Under the higher investment scenario, Scenario 2, overall investment requirements are estimated at $605 million with annual recurrent expenditures of $130 million, giving a total resource requirement over the period of $1258 million at an annual average of $157 million (Table 2.2).

The largest expenditures are required for action 3 – development of national accounting systems – which accounts for approximately 60% of the estimated overall resource requirements.

[8] WAVES Programme (2012) *op. cit.*

**Table 2.1 Estimated resource needs for Target 2- breakdown**

| Activity | Investment needs (total period, 2013 – 2015) | | Recurrent annual expenditure (2016 onwards) | | Recurrent total (total period, to 2020) | |
|---|---|---|---|---|---|---|
| | Scenario 1 | Scenario 2 | Scenario 1 | Scenario 2 | Scenario 1 | Scenario 2 |
| 1. National TEEB Studies | 97.5 | 195.0 | 19.5 | 29.3 | 97.5 | 146.3 |
| 2. Policy integration work | 55.6 | 109.8 | 11.7 | 23.4 | 58.5 | 117.0 |
| 3. National accounting initiatives | 300.0 | 300.0 | 39.0 | 78.0 | 195.0 | 390.0 |
| **Total** | **453.1** | **604.8** | **70.2** | **130.7** | **351.0** | **653.3** |

**Table 2.2 Total resource needs for Target 2**

| Activity | Total for the whole period (2013 – 2020) | | Average annual (for period 2013 – 2020) | |
|---|---|---|---|---|
| | Scenario 1 | Scenario 2 | Scenario 1 | Scenario 2 |
| 1. National TEEB Studies | 195.0 | 341.3 | 24.4 | 42.7 |
| 2. Policy integration work | 114.1 | 226.8 | 14.3 | 28.4 |
| 3. National accounting initiatives | 495.0 | 690.0 | 61.9 | 86.3 |
| **Total** | **804.1** | **1258.1** | **100.5** | **157.3** |

### 2.5.2 Additional Resource Needs

#### 1. National Assessments of Biodiversity Values

The figures above present an overall estimate of the resources required to undertake national TEEB studies across the world. The budgets currently being allocated to national TEEB studies are not precisely known but can be expected to amount to approximately $15-$20 million over the next three years, suggesting an additional investment requirement of between $80 million (Scenario 1) and $180 million (Scenario 2), or between $155 million and $290 million in the 2013 to 2020 period as a whole.

#### 2. Integration of Biodiversity Values into Policies, Strategies and Plans

The resources required for this action are largely additional to current allocations.

#### 3. Developing National Accounting and Reporting Systems

The current WAVES budget is $15 million over 4 years, while 24 countries currently have some form of natural capital accounts. Overall it is likely that current levels of investment in national accounting systems are likely to be around $10 million annually, suggesting additional investment requirements of $270 million over the 2013 to 2015 period.

As one eighth (24/195) of countries currently have some form of natural capital based accounts, current annual expenditures are likely to be around one eighth of their required levels, suggesting additional ongoing annual expenditures of $34 to $68 million will be needed.

## 2.6 Discussion

### 2.6.1 Discussion of estimates of resource needs

The above figures are somewhat speculative and should not be regarded as precise estimates of the resources required to deliver Target 2. There is some degree of flexibility in the scale of effort that could be devoted to the different activities identified, which could result in different cost estimates. That said, the actions identified are based on current programmes of action being undertaken internationally, for which the ranges of costs are known, and the likely magnitude of investments and on-going expenditures required for these particular actions is therefore unlikely to diverge substantially from that estimated.

However, the estimates above are for specific and targeted actions only and should be regarded as highly conservative given the scale of the challenge in assessing biodiversity values and particularly in integrating them into the different plans and processes. This process of integration will require the efforts of a large number of actors across different government departments, agencies and authorities, with much larger resource implications.

### 2.6.2 Benefits of delivering the Target

Integration of biodiversity values into plans, strategies and accounting systems should help to ensure that the true value of biodiversity is reflected in decision making, which in turn should help to reduce the rate of loss of biodiversity and ecosystem services. This will deliver a wide range of benefits for people and the economy. By helping to maintain natural capital, it should contribute to sustainable livelihoods and promote the long term sustainability of economic development.

### Benefits of Natural Capital Accounting

Natural capital accounting can contribute to better decision making, providing countries with information to help them improve the management of ecosystems for the benefit of people and the economy as well as biodiversity. For example, it is helping to inform

decision making about:

- Management of scarce water resources in Mexico and Australia;
- How to maximise the benefits of tourism to local economies in Zanzibar;
- The health and fisheries benefits of cleaning up Manila Bay in the Philippines;
- The management of natural resources in Andalucia, Spain; and
- Decoupling economic growth and energy consumption in Norway and the Netherlands.

It is hoped that the development of ecosystem accounting through the WAVES programme will help Botswana to diversify its economy through management of its ecosystems; Madagascar to finance more than 60,000 square kilometers of protected areas; and the Philippines to manage its marine fisheries.

*Source: WAVES Partnership (2012) – Moving Beyond GDP*

### 2.6.3 Funding opportunities

This Target aims to further the conservation of biodiversity by integrating biodiversity values into wider plans and processes – therefore much of the impetus is likely to come from the biodiversity conservation community and there will be a need for funding from core biodiversity budgets. However, since delivering the Target plays an essential role in achieving sustainable development globally, there will be a wide range of beneficiaries and there is scope to secure funding from a range of sources such as governments, businesses and international development agencies, building on the international partnerships that have already been established to finance both the TEEB and WAVES initiatives.

# 3 Aichi 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.**

## 3.1 Introduction

Target 3 calls for elimination or reform of incentives and subsidies harmful to biodiversity, and the development of positive incentives for the conservation and sustainable use of biodiversity.

Incentives harmful to biodiversity include government subsidies that encourage activities damaging to biodiversity, as well as other policies and practices that fail to take into account the value of natural resources or the existence of environmental externalities. It is therefore important to identify policies and practices that generate such perverse incentives and formulate plans to remove or reform them.

TEEB estimated that global subsidies total between $1 and $2 trillion annually, with many of them harmful to the environment and biodiversity. These figures include estimated global subsidies for agriculture of $261 billion annually (2006-2008); energy $556bn (2008); fisheries $15-35 billion (2008); transport at $238 -306 billion (of which environmentally harmful subsidies are estimated at $173-233 billion) and water $67 billion (environmentally harmful subsidies - $50 billion)[9].

The extent of other perverse incentives relating to a failure to price externalities or to properly value natural resources is more difficult to quantify. TEEB notes that subsidies (and other perverse incentives) come in many forms, and can include direct transfers of funds, potential direct transfers (to cover possible liabilities), income and price supports, tax credits/exemptions/rebates, low-interest loans and guarantees, preferential treatment and use of regulatory support mechanisms (e.g. demand quotas), as well as implicit income transfers when natural resources or services are not priced at full provisioning cost. Some subsidies are clearly visible in government budgets while others are not accounted for in national budgets.

Eliminating or reforming biodiversity harmful subsidies will have benefits in reducing pressures on biodiversity from economic activities, in freeing up budgetary resources that can potentially be used for beneficial activities, and in enhancing economic efficiency by correctly pricing goods and services.

Reform of incentives and subsidies harmful to biodiversity should therefore yield economic benefits over time and – where it involves on-budget subsidies – deliver savings in resource requirements. However, achieving this will require resources to be invested in activities to identify harmful incentives and to develop and implement strategies for reform.

It is important to note that the need for reform of harmful incentives extends beyond biodiversity objectives and will help to meet a range of environmental, economic and social goals. Incentives often harm biodiversity indirectly through their wider effects on the environment and by distorting economic decisions. Therefore the need to address biodiversity harmful incentives should be seen as part of a broader policy agenda, and may draw on wider budgetary resources.

Positive incentive measures encourage the achievement of biodiversity-friendly outcomes or support activities that promote the conservation and sustainable use of biodiversity. They

[9] TEEB – The Economics of Ecosystems and Biodiversity for National and International Policy Makers (2009). Chapter 6 – Reforming subsidies

can be further differentiated into direct and indirect approaches. Direct approaches typically provide monetary incentives which seek to emulate market prices — they generally involve paying relevant actors to achieve biodiversity-friendly outcomes. Examples include long-term retirement (or set aside) schemes; conservation leases, covenants or easements; tax incentives; and schemes providing payments for ecosystem services. Indirect approaches seek to support activities or projects that are not designed exclusively to conserve or promote the sustainable use of biodiversity, but have the effect of contributing to these objectives. Many of these incentives are non-monetary (or 'non-market') in nature (although they may have financial implications for the provider); for instance, the official recognition of the role of local communities in the context of community-based natural resource management programmes.

The development of positive incentives may be funded to some extent through resources currently spent on harmful subsidies (e.g. through reform and redirection of agricultural subsidies in OECD countries), but will also require investments to identify priorities, design incentive schemes, develop capacity and implement pilot projects.

Possible milestones for this Target were specified as follows:

- By 2012, transparent and comprehensive subsidy inventories and inventories of possible positive incentive measures are established by all OECD countries, and an assessment of their effectiveness against stated objectives, of their cost-efficiency, and of their impacts on biodiversity, is being initiated;
- By 2014, prioritized plans of action for the removal or reform of subsidies that are harmful to biodiversity and for the development and application of positive incentives, are prepared and adopted;
- By 2020, subsidy programmes identified in the plans of action are being effectively reformed or phased out, and positive incentive measures identified in the plans of action are being effectively phased in.

Target 3 links with most of the other Aichi Targets, especially those which deal with sectors or ecosystems affected by harmful incentives (e.g. agriculture and fisheries subsidies) or involve actions that would benefit from the introduction of positive incentives for biodiversity. Incentive reform can be considered an essential enabling activity that should contribute to meeting these other Targets.

A key question relating to the scope of actions costed under this Target is the extent to which the assessment considers the costs of scaling up positive incentives for biodiversity at global level. Positive incentives will play an important role in the delivery of many of the Aichi Targets. For example:

- Incentive measures will play an important role in the delivery of sustainable agriculture (Target 7) – for example through the role of agri-environmental payments in market creation and through premiums for organic food;
- Payments for Ecosystem Services (PES) have an important potential role to play in the protection, maintenance and enhancement of a variety of ecosystems such as wetlands and forests (Targets 5, 7, 14, 15);
- Global incentive mechanisms such as REDD+ and carbon markets will be important in protecting forests and other habitats (Targets 5, 7, 14, 15);
- Incentive measures will also help to deliver required management actions in protected areas (Target 11).

The resources required for these types of incentive measures are being examined in relation to the assessments being undertaken for each of these other Targets, and are therefore not addressed here, in order to avoid double counting.

The assessment of resources required for Target 3 therefore focuses on the evidence and enabling activities required to provide the appropriate framework and incentive structures required to deliver the Aichi Targets as a whole. This will include studies, policy development, capacity building measures and the development of pilot programmes, while the costs of global up-scaling of positive incentives are addressed separately in relation to the other Targets.

By reforming subsidies and developing positive incentive measures, Target 3 should facilitate the delivery of many of the other Aichi Targets and should help to reduce the costs of delivering other Targets over time, though the extent of any potential cost savings cannot be estimated at this stage.

Like all of the Aichi Targets, meeting Target 3 will depend on effective institutional arrangements, governance structures and capacity building measures. While this analysis takes account of specific actions that can be taken to build capacity with respect to specific biodiversity related actions contributing to this Target, delivering the Target involves the actions of a wide range of institutions (including ministries and departments dealing with finance, agriculture, energy, transport, water and other issues), and will depend on the effectiveness of these institutions and processes more widely. As for Targets 2 and 4, implementation will depend on the ability to engage a large number of actors across government, suggesting that the resources required to achieve these broader changes will be greater than those needed to undertake the specific actions examined in this assessment.

## 3.2 Actions

Meeting Target 3 is likely to involve the following types of action, largely undertaken at national and sub-national level:

1. National studies to develop inventories of biodiversity harmful incentives, set out the case for reform, identify and appraise reform options, and establish action plans for the removal or reform of these incentives.
2. Policy actions to advocate reform proposals within governments, undertake legal analyses and impact assessments, develop and implement reform packages, and engage with affected stakeholders.
3. Studies to identify and appraise options for positive incentives for biodiversity, and to develop action plans for their introduction.
4. Capacity building measures and pilot projects to develop and test positive incentive measures.

## 3.3 Method of assessment

Based on consultations with international experts and stakeholders, and a review of relevant documentation, we propose the following approach to assessing the resources required to meet this Target.

### 1. National Studies of Biodiversity Harmful Incentives

National studies will provide a foundation for incentive reform by identifying harmful incentives, gathering evidence of their environmental, social and economic impacts, identifying barriers to reform and enabling actions that will facilitate reform, specifying and approving reform options, and setting out action plans for the elimination and reform of these incentives.

These studies can apply checklists and toolkits that have been developed internationally. For example, the OECD has developed and applied a checklist approach to identify and analyse environmentally harmful subsidies, the EU has developed a guidance tool for reform of environmentally harmful subsidies and the UK has adapted this to the reform of biodiversity harmful incentives. These tools define "subsidies" broadly to include the under-pricing of natural resources. Applying these toolkits in a structured way across all economic sectors and ecosystems should provide a firm evidence base with which to tackle biodiversity harmful incentives.

Studies will be required in all countries with potentially biodiversity harmful incentives. The cost of these studies will vary according to the scale and variety of subsidy and incentive schemes. An assessment of the resources required can be made by estimating the ranges of costs for studies of different sizes and multiplying these by the numbers of countries in which studies are needed. Evidence of the costs of work undertaken in different countries

will be supplemented by estimates made by assessing time requirements and costing these at appropriate daily rates.

### 2. Policy Actions to Implement Reform Proposals

Once action plans for elimination and reform of biodiversity harmful incentives have been developed, there will be a need for further policy development work. This will require advocacy of reform within governments, development of detailed reform proposals, undertaking legal analyses and impact assessments, developing and implementing reform packages, and engaging with affected stakeholders.

The resources required for these activities will include:

- Staff time – including in engagement with government colleagues, policy development, impact assessment and engagement with affected stakeholders;
- Legal and consultancy studies regarding specific aspects of reform;
- Publications, communications and events.

The resources required have been estimated using appropriate estimates of unit costs, in order to assess the costs of these actions on a national basis.

### 3. Studies on Positive Incentives

In countries where positive incentives are lacking or undeveloped, studies will help to inform priorities and options for the development of such incentives, identify barriers and enabling factors, assess key design issues, and develop recommendations for the development of new incentive measures. As well as identifying opportunities for new incentives at the national level, studies will also help to examine the potential of international schemes (such as REDD+ and carbon markets) in providing positive incentives for biodiversity.

The cost of these studies will vary according to the scale and complexity of the needs to be addressed and the potential incentive schemes to address them. An assessment of the resources required can be made by estimating the ranges of costs for studies of different sizes and multiplying these by the numbers of countries in which studies are needed. Evidence of the costs of work undertaken in different countries will be supplemented by estimates made by assessing time requirements and costing these at appropriate daily rates.

### 4. Capacity Building Measures and Pilot Projects for Positive Incentives

In countries which currently lack positive incentive schemes for biodiversity, implementation of such schemes will depend on development of appropriate institutional structures, delivery capacity and administrative arrangements, and on tackling challenges related to land tenure and other potential barriers. Pilot projects will help to develop and test the required structures and delivery arrangements.

These needs can be addressed through projects to develop and trial incentive schemes in different countries. The costs can be assessed with reference to similar schemes which have been introduced in different countries. For example, by 2010 the GEF had funded 42 projects involving Payments for Ecosystem Services schemes, including 14 in which PES was the central element. These 14 schemes involved GEF funding of $70 million and co-financing of $395 million, and included high profile national PES schemes in Costa Rica, Mexico and other countries. These have included projects to build the human and institutional capacity required by stakeholders to develop and implement PES schemes (at global, national and local scales), to value ecosystem services, and/or to develop and implement pilot PES schemes financed either by governments or by arrangements between buyers and sellers.[10] The figures indicate an annual expenditure per project of $33 million up to 2010.

The GEF 6 needs assessment recognises that the GEF has supported similar projects in recent years to develop economic incentive measures for the conservation and sustainable

[10] Global Environment Facility (2010) Payment for Ecosystem Services. www.theGEF.org

use of biological diversity. Projects have piloted approaches through ecotourism, revenues for protected area management, and payment for ecosystem services schemes. Projects funded so far by the GEF range from $6.5 million US up to $24 million US and the GEF co-funding ratio ranges between 10 – 30%. The GEF 6 needs assessment suggests an allocation of $10m per project, for a total of 10, 20 or 30 projects in the 2014 to 2018 period. This investment includes support for capacity building measures.

## 3.4 Assessment of resource needs

### 1. National Studies of Biodiversity Harmful Incentives

The costs of national studies to identify biodiversity harmful incentives, identify and prioritise options for reform and develop action plans to implement these priorities will vary between countries according to the size of their economies, the complexity of their policy frameworks, and the salaries and fees of researchers.

The overall average cost of a national study might be in the region of $100,000.[11]

Studies should be prioritised in those countries with larger and more complex economies where biodiversity harmful incentives are likely to be of significant concern. Undertaking work in 75 countries (Scenario 1) or 150 countries (Scenario 2) would require a one off investment of $7.5 million or $15 million respectively.

### 2. Policy Actions to Implement Reform Proposals

The resources required to deliver this action have been estimated as follows:

- **Employment of policy advisors** – 1-2 policy advisors could be employed in each country charged with taking forward specific proposals for incentives reform, engaging with relevant government departments and stakeholder groups. This activity would tend to focus on high and middle income economies, as well as some of the larger developing economies. The average cost is estimated at $60,000 per employee per annum, including overheads and support costs[12]. The resources required are therefore estimated to average $60,000 to $120,000 per country per annum, which would amount to an investment of $13.5 million to $54 million for 75 or 150 countries over a 3 year period;
- **Events, publications and consultancy** – additional resources will be required to cover the costs of workshops and events, publications, and consultancy and legal studies on specific policy issues, as required. Adding an additional budget for these items of $100,000 per year would require an additional budget of $22.5 to $45 million over three years.

These figures give an overall estimate of investment needs of $36 million (Scenario 1) or $99 million (Scenario 2) over a three year period 2013-2015.

As reform of incentives is a long term process, there would be a requirement for on-going expenditures, which might involve an annual budget averaging $100,000 per country (to cover the costs of employing one policy advisor with additional expenses for workshops, publications and fees).

The above assessment focuses on the specific actions that would be required to catalyse change. The implementation of reforms would depend on influencing the work of a larger number of government officials. The resources required are difficult to estimate but are potentially much greater than the estimates set out here.

[11] Based on between 100 and 200 days' work at an average global rate of $500-1000 per day, which will vary between countries.

[12] Based on an average wage rate for policy advisors of $30,000 per annum, derived from www.wageindicator.org doubled to take account of additional employment costs and overheads. This is higher than the figure used for Target 2 because there would be a greater focus on middle and high income economies.

### 3. Studies on Positive Incentives

The costs of national studies to identify priorities for positive incentives, develop and appraise options for the development of these incentives, examine design issues and formulate proposals for incentive schemes are expected to be similar to those for harmful incentives above – averaging $100,000 per country.

Studies should be prioritised in those countries where positive incentives are least developed. Undertaking work in 75 countries (Scenario 1) or 150 countries (Scenario 2) would require a one off investment of $7.5 million or $15 million respectively.

### 4. Capacity Building Measures and Pilot Projects for Positive Incentives

Data on support for the development of PES and related positive incentive schemes funded by the GEF suggest an average cost of approximately $40 million per project, at current prices, including co-funding.

The GEF 6 scenarios assume that 10, 20 or 30 projects could be funded over the five years between 2014 to 2018. As an ongoing need for such investments can be expected, we could assume a requirement of 16, 32 or 48 projects over the 8 year period from 2013 to 2020.

Support for 32 such projects (Scenario 1) would require an investment of $1280 million while 48 projects (Scenario 2) would require an investment of $1920 million in the period 2013 to 2020.

## 3.5 Results

### 3.5.1 Estimate of Investment Needs and Ongoing Expenditures

Delivery of Aichi Target 3 is estimated to require a total investment of $1331 million and on-going annual expenditures of $7.5 million, under Scenario 1, the lower investment scenario (Table 3.1). Total resource needs for this scenario over the 2013-2020 period are estimated at $1369 million, requiring an average of $171 million per year to be allocated to relevant actions over this period. Under the higher investment scenario, Scenario 2, overall investment requirements are estimated at $2049 million with annual recurrent expenditures of $15 million, giving a total resource requirement over the period of $2124 million at an annual average of $265 million (Table 3.2).

The largest expenditures are required for action 4 – support for positive incentive schemes – which accounts for more than 90% of the estimated overall resource requirements.

**Table 3.1 Estimated resource needs for Target 3 - breakdown**

| Activity | Investment needs (total period) | | Recurrent annual expenditure (2016 onwards) | | Recurrent total (total period, to 2020) | |
|---|---|---|---|---|---|---|
| | Scenario 1 | Scenario 2 | Scenario 1 | Scenario 2 | Scenario 1 | Scenario 2 |
| 1. Studies – negative incentives | 7.5 | 15.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2. Policy work to reform negative incentives | 36.0 | 99.0 | 7.5 | 15.0 | 37.5 | 75.0 |
| 3. Studies – positive incentives | 7.5 | 15.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4. Positive incentive schemes | 1280.0 | 1920.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Total** | **1331.0** | **2049.0** | **7.5** | **15.0** | **37.5** | **75.0** |

**Table 3.2 Total resource needs for Target 3**

| Activity | Total for the whole period (2013 – 2020) | | Average annual (for period 2013 – 2020) | |
|---|---|---|---|---|
| | Scenario 1 | Scenario 2 | Scenario 1 | Scenario 2 |
| 1. Studies – negative incentives | 7.5 | 15.0 | 0.9 | 1.9 |
| 2. Policy work to reform negative incentives | 73.5 | 174.0 | 9.2 | 21.8 |
| 3. Studies – positive incentives | 7.5 | 15.0 | 0.9 | 1.9 |

| Activity | Total for the whole period (2013 – 2020) | | Average annual (for period 2013 – 2020) | |
|---|---|---|---|---|
| 4. Positive incentive schemes | 1280.0 | 1920.0 | 160.0 | 240.0 |
| **Total** | **1368.5** | **2124.0** | **171.1** | **265.5** |

### 3.5.2 Additional Resource Needs

Some countries are currently taking action to identify negative incentives and assess options for reform, as well as to examine options for the development of positive incentives. Current levels of investment are not known but are likely to be a small fraction of those required.

For action 4, the GEF 6 needs assessment provides some data on recent resource allocations which can be compared with identified needs. Up until now the GEF has funded up to 10 projects in each period; this suggests that Scenario 1 (20 projects over 5 years, equivalent to 32 projects over 8 years) would require a doubling of expenditure, while Scenario 2 (30 projects over 5 years, equivalent to 48 over 8 years) would require a tripling of expenditure. This suggests a $640 million increase in investment (including co-funding) under Scenario 1 over the 8 years between 2013 and 2020, and a $1280 million increase under Scenario 2 over the same period.

## 3.6 Discussion

### 3.6.1 Discussion of estimates of resource needs

The costs of actions 1-3 are somewhat speculative and should not be regarded as precise estimates of the resources required. There is some flexibility in the scale of effort that could be devoted to these different activities, which could result in different cost estimates. However, the costs of these actions are relatively small.

Action 4 is based on proposals in the GEF 6 needs assessment, as well as recent rates of co-funding, so unit costs can be assessed with a greater degree of uncertainty. However, the resources required are sensitive to the scale of activity that is deemed to be required, with the GEF 6 needs assessment assuming that anything between 10 and 30 projects could be funded over the next five year period. As the levels of investment required for this activity are much greater than for the others, the overall cost estimates vary widely according to the number of projects assumed to be funded.

As for Target 2, the estimates can be regarded as conservative given the scale of the challenge in reforming negative incentives and in developing positive incentives. The estimates are for specific and targeted actions only, and would need to be followed by implementation efforts involving a larger number of policy officials across different government departments, with potentially much larger resource implications.

### 3.6.2 Benefits of delivering the Target

Removal or reform of negative incentives will have a range of benefits, including:

- Protection of biodiversity;
- Maintenance of ecosystem services;
- Improvements in economic efficiency, through better pricing of natural resources and externalities, helping to ensure better allocations of resources;
- Budgetary savings, especially through reductions in subsidies.

#### Reforming negative incentives – the EU Common Agricultural Policy

The CAP has contributed to a massive reduction in Europe's biodiversity, particularly through the role of price supports in encouraging the expansion and intensification of agricultural production, with the loss of habitats and unfarmed features, increased use of pesticides and fertilisers, and growth in stocking rates and grazing pressure. The CAP has also been expensive for EU taxpayers and impacted negatively on producers in developing countries, through the subsidised export of surplus production on world markets.

Successive reforms of the CAP since 1992 have decoupled support from production, helping to reduce the incentives for intensive production and the adverse impacts of the CAP on trade and producers in other countries. Although the overall cost of the CAP to

taxpayers has yet to be significantly reduced, a proportion of the budget has been shifted to agri-environment and rural development programmes, including support for biodiversity friendly farming, and more progress could be made in this area through further reform.

The benefits of developing positive incentives will include:

- Enhanced conservation of biodiversity;
- Increased delivery of ecosystem services, with benefits for people and the economy;
- Enhanced attitudes of land managers and local communities to biodiversity;
- Diversification of rural incomes and new opportunities to generate income through conservation activities;
- Improvements in economic efficiency, by creating markets for services that were previously under-priced and under-delivered.

### Benefits and funding of PES – the Pagos por Servicios Ambientales, Costa Rica

Set up in 1997, the national PSA programme remunerates landholders for providing carbon sequestration services, and hydrological services via watershed protection and for preserving biodiversity and landscape beauty. From 1997-2004, Costa Rica invested some US$ 200 million, protecting over 460,000 hectares of forests and forestry plantations and providing additional income to over 8,000 forest owners. By 2005, the programme covered 10% of national forest areas.

US$ 64 per hectare/year were paid for forest conservation in 2006 and US$ 816 per hectare over ten years for forest plantations.

The programme is based on partnerships at national and international level, contributing to long-term financial sustainability. The primary source of revenues is a national fossil fuel tax (US$ 10 million/year) with additional grants from the World Bank, Global Environment Facility and the German aid agency (Kreditanstalt für Wiederaufbau (KFW)). Funds are also provided through individual voluntary agreements with water users (US$ 0.5 million/year) which will increase with the gradual introduction of a new water tariff and potential new opportunities from carbon finance.

The PSA programme has helped slow deforestation, added monetary value to forests and biodiversity, increased understanding of the economic and social contribution of natural ecosystems and is generally considered a success. However, recent assessments suggest that many areas covered through the programme would have been conserved even without payments, for three main reasons: deforestation pressures were already much reduced by the time PSA was introduced; the use of uniform payments (fixed prices); and limited spatial targeting of payments in the early stages of implementation. The programme is being adjusted in response to these lessons.

Source TEEB (2009) *TEEB for Policy Makers* report, Chapter 5

### 3.6.3 Funding opportunities

Initial work to identify negative incentives and options for positive incentives may need to be funded primarily from core biodiversity budgets, as the required action is motivated primarily by biodiversity concerns.

Assessments of reform options for negative incentives, and development of action plans for reform may attract resources from other government departments, especially where a need for reform has been identified for financial, economic or social reasons – finance ministries and sectoral ministries (e.g. agriculture, fisheries, energy) may contribute to this process.

The development of positive incentives will deliver benefits for both the land management sector and for beneficiaries of ecosystem services (e.g. water companies, communities, property interests and the public at large). There may be opportunities for funding from beneficiaries through PES schemes (e.g. water sector, insurers, property interests), from a range of government departments (e.g. agriculture, forestry, water resources, energy) and from development agencies (because of the importance of natural capital and ecosystem services for development).

# 4 Aichi Target 4

**Aichi Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.**

## 4.1 Introduction

The Strategic Plan for Biodiversity recognises that many individuals, businesses and countries are currently making efforts to substantially reduce their use of fossil fuels, with a view to mitigating climate change, and calls for similar efforts to ensure that the use of other natural resources are within sustainable limits.

Target 4 calls for the development and implementation of plans for sustainable production and consumption, designed to keep the impacts of use of natural resources within safe ecological limits. In the context of this target *all levels* refers to the different sectors of society from local to international and from citizens and private entities to public institutions and government. CBD guidance also stresses that attaining SCP is a long term process and that the Target does not require that sustainable consumption and production is achieved by 2020 but that meaningful steps have been taken or measures put in place by 2020 to achieve it. The need for sectoral as well as cross sectoral actions is also emphasised.

Meeting this Target is likely to require the development of evidence about the ecological impacts of production and consumption patterns of governments, businesses and stakeholders, and the definition of safe ecological limits. Evidence is needed on the ecological impacts of the consumption and production of different types of products. Because achieving SCP requires co-ordinated global action, there is a strong case for international actions to collect shared evidence and agree priorities. Once evidence has been collated and priorities and limits defined at a global level, there is then a need for the development of plans by national governments and businesses.

The United Nations Conference on Sustainable Development (Rio+20) adopted the 10-Year Framework of Programmes on Sustainable Consumption and Production (10YFP). This is a concrete and operational outcome that responds to the 2002 Johannesburg Plan of Implementation (JPOI) which calls to all stakeholders to "Encourage and promote the development of a 10-year framework of programmes (10YFP) in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production to promote social and economic development within the carrying capacity of ecosystems...".[13]

Defra provided funding to UNEP to develop a publication: "Planning for Change, a guideline for national programmes on sustainable consumption and production" (2008) as well as to deliver regional and national training in Latin America and Asia Pacific and develop an online clearinghouse on national SCP action plans (which soon will be upgraded to a Global SCP Clearinghouse). This guideline has been the basis for developing over 20 national SCP actions plans, or in some cases integration of SCP objectives and tools in existing national plans. The publication calls for integration with existing strategies, including, among others, National Biodiversity Strategies and Action Plans. The document also proposes a scoping exercise, to evaluate the ecological, economic and social impact of SCP patterns, before identifying priorities, providing guidelines on the necessary policy mix and actions to protect the environment and change SCP patterns, through a multi-stakeholder approach. UNEP has worked with more than 20 countries in the establishment of national SCP action plans, or SCP mainstreaming in existing strategies.

The 10YFP will continue and expand current support to country level work, including SCP actions plans. UNEP is currently working under the SWITCH Asia Programme of the EC, supporting implementation of Brazil's national strategy on SCP, and conducting workshops

[13] http://www.unep.fr/scp/

and capacity building sessions on mainstreaming SCP and/or developing national SCP action plans in a number of African countries.

While a number of initiatives have been undertaken at international and national level to develop evidence about SCP and to identify priorities for achieving it, much of this work has focused on other environmental issues (e.g. greenhouse gas emissions) and there has been relatively little targeted work dealing with biodiversity. More focused work to evidence the impacts of production and consumption of different products on biodiversity, to define ecological limits, and to develop plans that seek to tackle the impacts of production and consumption on biodiversity, would therefore be of benefit.

While the 10YFP considers ecosystems and biodiversity on an equal footing with other environmental areas, UNEP sees Aichi target 4 as a major opportunity to develop the link between the achievement of SCP and conserving and sustainably using biodiversity, in a more systematic and widespread manner. The 10YFP can therefore be an important mechanism for the delivery of Target 4. It will be important for actions under this Target to work with existing initiatives – integrating biodiversity considerations into SCP plans and strategies – rather than duplicating them.

Since this Target focuses on the development of plans and strategies for SCP rather than the achievement of SCP itself, the required investment is likely to be relatively modest. However, much larger investments will be required to actually achieve sustainable production and consumption. For example, the UNEP Green Economy report estimated that the annual investment needed to green the global economy would be in the range of $1.05 to $2.59 trillion.[14]

Possible milestones for this Target have been specified as follows:

- By 2014, Governments and major private-sector actors, at sector or company level, have developed assessments of their ecological footprint, and have developed sustainability plans to reduce it;
- By 2018, Governments and major private-sector actors can demonstrate progress towards sustainability.

Target 4 links with other Targets relating to natural resource use, including those for agriculture, forestry and fisheries. There are also significant links with Target 1, which deals with raising awareness of biodiversity, particularly because of the importance in SCP plans of raising the awareness of both consumers and producers about biodiversity and wider sustainability issues. Actions in pursuit of Target 4 are likely to complement, rather than duplicate or overlap with those undertaken for other Targets. It is assumed that the relevant awareness raising actions related to the biodiversity impacts of consumers and producers are delivered through Target 1 and other sector specific Targets, so to avoid double counting they are not separately assessed here. Instead this assessment focuses on the evidence and strategic actions required to guide awareness raising activities.

Like all of the Aichi Targets, implementation of Target 4 will depend on effective institutional arrangements, governance structures and capacity building measures. While this analysis focuses on actions designed to develop SCP plans, the effectiveness of these will depend on the capacity to implement them. As noted above, actual achievement of SCP will require much larger investments across the economy with very substantial resource implications.

## 4.2 Actions

Meeting Target 4 is likely to involve the following actions:

1. International collaborative studies to assess the impacts of production and consumption of different products on biodiversity, to define ecological limits, and to specify action that governments, businesses and other stakeholders can take to better take account of biodiversity impacts in SCP plans.

[14] UNEP (2011) Towards a Green Economy - Pathways to Sustainable Development and Poverty Eradication. http://www.unep.org/greeneconomy/Portals/88/documents/ger/GER_synthesis_en.pdf

2. National level studies focusing on key impacts of consumption and production patterns on biodiversity at the national level, in order to identify priorities for action in integrating biodiversity considerations into SCP plans and strategies, and the potential role of different actors in the public and private sectors.
3. Integration of biodiversity concerns into national SCP action plans, involving collaboration between government, businesses and stakeholder groups, designed to ensure that national production and consumption respects ecological limits. Development of national public procurement strategies designed to ensure that government purchasing helps to keep the impacts of use of natural resources within safe ecological limits.

## 4.3 Method of assessment

Based on consultations with international experts and stakeholders, and a review of relevant documentation, we propose the following approach to assessing the costs of meeting this Target.

### 1. International collaborative studies

As a basis for action by governments, businesses and other stakeholders, an evidence base is required that assesses the impacts of consumption and production on biodiversity, identifies priorities for action, identifies safe ecological limits, and specifies actions that need to be taken to integrate biodiversity concerns into SCP plans. Since biodiversity is impacted by global patterns of production, consumption and trade, international analyses are required examining the impact of different product types and/or sectors. Such an approach will help to identify priorities in the global context, avoid duplication of effort at national level, and provide a means of engaging with international companies keen to take steps to understand and address their impacts on biodiversity. The evidence gained can also help to inform analyses and strategies at the national level.

These international studies could focus on key products and services – these could be defined in terms of broad product groups known to impact on biodiversity (such as timber, fish, meat, biofuels, textiles, metals, etc.) and/or more specific product types (such as tuna, tropical shrimp, palm oil etc.). Key services such as tourism and construction could also be included.

The studies could be overseen by international working groups involving governments, businesses, international agencies (including UNEP) and stakeholder groups, helping to engage businesses and key stakeholders in the process. [15]

The work would build on existing SCP initiatives such as the 10-Year Framework of Programmes on Sustainable Consumption and Production, focusing more specifically on impacts on biodiversity (rather than wider resource use, waste and emissions) and how these should be addressed. The outputs of this work will include guidance about actions that should be taken by governments and businesses to keep the use of natural resources within safe ecological limits.

The resources required for these studies will be assessed through a review of relevant work undertaken internationally, and/or by estimating costs based on daily fee rates and the costs of organising meetings and events.

Between 10 and 20 studies could be undertaken, focusing on different products and/ or sectors. Each study could be steered by a partnership of businesses and government representatives, and involve a dissemination event. The work would be co-ordinated by a project officer over a period of two years.

[15] A similar approach has been taken at national level by the UK government which has worked with businesses in different sectors to develop "product roadmaps" ( http://www.defra.gov.uk/environment/economy/products-consumers/) although these have so far focused on other environmental issues and paid limited attention to biodiversity impacts.

## 2. National SCP studies

National efforts to develop and implement action plans for sustainable consumption and production need to be based on a robust evidence of the current impacts of production and consumption patterns on biodiversity. This will help to identify priorities for action to integrate biodiversity considerations into national plans and strategies, the key sectors and actors that need to be involved, the current initiatives that are contributing to these priorities and the further actions required, and the indicators that can be used to monitor progress.

CBD guidance makes clear that evidence will be needed of sectoral impacts as well as cross sectoral impacts at the national level. This would provide a means of engaging businesses at the national level, helping them to understand the impacts on biodiversity of sectoral production and consumption patterns, and to identify priorities for change.

This will therefore require a one off investment in research contracts and expenses for workshops, conferences and events.

## 3. National SCP action plans

Target 4 requires governments, businesses and other stakeholders to develop and implement action plans to achieve sustainable production and consumption. Building on the national and international studies, this could involve the formation of collaborative working groups at national level to develop and implement SCP action plans and to integrate biodiversity issues into existing plans. Depending on national circumstances and priorities, these could involve sectoral working groups involving businesses and government coming together to agree actions for key product groups, and/or broader, cross-sectoral approaches to the development of national plans.

It will be important for this work to build synergies and avoid duplication with existing programmes. UNEP, within the context of the Marrakech Process has been supporting the development of methodologies and the implementation of national SCP actions plans and sustainable public procurement strategies in over 30 countries. These efforts are expected to be replicated and scaled up by the recently adopted 10YFP. Actions 1 and 2 would enable a biodiversity module to be developed that can be used in national and regional SCP training and implementation projects.

The resources required to developing these plans would include staff time (e.g. a project officer to provide a secretariat for the working group(s)) and expenses for training, events and publications.

The GEF6 needs assessment proposes allocating resources to actions to create enabling conditions for the development of plans, through action such as setting up joint platforms, policy improvement, better implementation and enforcement, improved governance and transparency, supporting the establishment of different sectors' sustainability standards, and disseminating best innovative business initiatives.

## 4. National public procurement strategies

Building on the evidence base developed in actions 1-3, governments can then take steps to ensure that public procurement strategies contain measures to ensure that public purchasing is consistent with maintaining the use of resources within safe ecological limits, taking particular account of biodiversity impacts.

The actions required will vary by country, according to administrative structures and existing public procurement rules and procedures. However, they are likely to include:

- Feasibility studies (including analysis of procurement options, sourcing of supplies, and specification of proposed rules and requirements);
- Engagement and consultation across national, regional and local authorities;
- Development of guidelines and communication of requirements; and
- Monitoring of implementation.

The resources required will include consultancy fees, training, staff time and publications.

There would then be an ongoing need to support the implementation of the strategy. This could be achieved by employing an adviser to act as a central contact point, to monitor progress, issue guidance and provide advice.

Public procurement is one of the 5 initial programmes indicated in the 10YFP document adopted at Rio+20, so this action would need to link closely with that programme.

## 4.4 Assessment of resource needs

### 1. International collaborative studies

The costs of this action might include:

- Research – consultancy fees and expenses of $100,000 per study for 10-20 product/ sector based studies;
- Events – organisation of a meeting to disseminate the findings of each study, at an average cost of $20,000 per study;
- Project management – appointment of a project officer at a cost of $100,000 per year (including salary, expenses, overheads and support costs) for two years.

The above would involve a total investment of $1.4 million for 10 studies (Scenario 1) or $2.6 million to undertake 20 studies (Scenario 2).

### 2. National SCP studies

Discussions with UNEP suggest that a typical budget for national SCP studies is in the order of $100,000 per country. A study of this scale would provide an overall analysis of the impacts of different sectors on biodiversity, examining the effects of both production and consumption patterns and identifying options to reduce these impacts.

Undertaking studies in 100 countries globally would require a one-off investment of $10 million (Scenario 1), while undertaking studies in all 195 countries across the world would involve an investment of $19.5 million (Scenario 2).

### 3. National SCP action plans

The GEF 6 needs assessment notes that the costs of enabling actions will vary by country and proposes an average allocation of $200,000 per country.

Such a budget could, for example, meet the costs of further consultancy fees to support the development of a national action plan, and/or the employment of a policy adviser responsible for plan development and/or to provide a secretariat for sectoral working groups, as well as expenses for meetings and workshops. Since the evidence required would be developed under action 2 above, the main costs would relate to enabling, facilitative and engagement activities.

Based on this average cost per country, developing action plans for 100 countries globally would require an investment of $20 million (Scenario 1), while developing these action plans in all 195 countries would require an overall investment of $39 million (Scenario 2).

There would be an ongoing need to review and update these action plans periodically. A three yearly review at a cost of $100,000 per country would suggest ongoing annual expenditures of $3.3 million for 100 countries (Scenario 1) or $6.5 million for 195 countries (Scenario 2).

### 4. National public procurement strategies

The costs of integrating biodiversity considerations into public procurement strategies could include:

- Employment of a policy adviser for a three year period at a cost of $135,000 per country;[16]

[16] Based on global average costs of $45,000 per country per year, as in section 2.4 above

- Expenses for feasibility studies, workshops and expenses averaging $100,000 per country.

Total investment would therefore average $235,000 per country. The investments required to develop strategies for 100 countries (Scenario 1) or 195 countries (Scenario 2), depending on needs and the degree to which existing strategies address biodiversity priorities, would be $23 million or $46 million respectively.

There would then be an ongoing need to support the implementation of the strategy. This could be achieved by employing an adviser to act as a central contact point, to monitor progress, issue guidance and provide advice. This could be achieved through annual expenditure averaging $45,000 per country per year (including support costs), involving total annual expenditures of $5 million for 100 countries (Scenario 1) or $9 million for 195 countries (Scenario 2).

## 4.5 Results

### 4.5.1 Estimate of Investment Needs and Ongoing Expenditures

Delivery of Aichi Target 4 is estimated to require a total investment of $55 million and on-going annual expenditures of $7.8 million, under Scenario 1, the lower investment scenario (Table 4.1). Total resource needs for this scenario over the 2013-2020 period are estimated at $94 million, requiring an average of $12 million per year to be allocated to relevant actions over this period. Under the higher investment scenario, Scenario 2, overall investment requirements are estimated at $107 million with annual recurrent expenditures of $15 million, giving a total resource requirement over the period of $183 million at an annual average of $23 million (Table 4.2).

The largest expenditures are required for action 4 – national public procurement measures – which accounts for 49% of the estimated overall resource requirements.

**Table 4.1 Estimated resource needs for Target 4- breakdown**

| Activity | Investment needs (total period, 2013 – 2015) | | Recurrent annual expenditure (2016 onwards) | | Recurrent total (total period, to 2020) | |
|---|---|---|---|---|---|---|
| | Scenario 1 | Scenario 2 | Scenario 1 | Scenario 2 | Scenario 1 | Scenario 2 |
| 1. International studies | 1.4 | 2.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2. National studies | 10.0 | 19.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3. National action plans | 20.0 | 39.0 | 3.3 | 6.5 | 16.7 | 32.5 |
| 4. National public procurement measures | 23.5 | 45.8 | 4.5 | 8.8 | 22.5 | 43.9 |
| **Total** | **54.9** | **106.9** | **7.8** | **15.3** | **39.2** | **76.4** |

**Table 4.2 Total resource needs for Target 4**

| Activity | Total for the whole period (2013 – 2020) | | Average annual (for period 2013 – 2020) | |
|---|---|---|---|---|
| | Scenario 1 | Scenario 2 | Scenario 1 | Scenario 2 |
| 1. International studies | 1.4 | 2.6 | 0.2 | 0.3 |
| 2. National studies | 10.0 | 19.5 | 1.3 | 2.4 |
| 3. National action plans | 36.7 | 71.5 | 4.6 | 8.9 |
| 4. National public procurement measures | 46.0 | 89.7 | 5.8 | 11.2 |

| Activity | Total for the whole period (2013 – 2020) | | Average annual (for period 2013 – 2020) | |
|---|---|---|---|---|
| **Total** | **94.1** | **183.3** | **11.8** | **22.9** |

### 4.5.2 Additional Resource Needs

Current expenditures relating to sustainable consumption and production are not known. However, while a number of relevant initiatives are on-going, there appears to be limited activity focusing on impacts on biodiversity and ecosystems. The required resources would therefore be largely additional to current allocations.

## 4.6 Discussion

### 4.6.1 Discussion of estimates of resource needs

The cost assessment is somewhat speculative and should not be regarded as providing a precise estimate of the resources required. There is some flexibility in the scale of effort that could be devoted to these different activities, which could result in different cost estimates. However, the costs of meeting the Target are relatively small, so that the assumptions employed will not have a large impact, in absolute terms, on the overall assessment of the resources required to meet the Aichi Targets.

The estimates are conservative given the scale of the challenge in achieving sustainable consumption and production. The analysis focuses only on the steps to be taken to develop plans for achieving this goal, particularly to integrate biodiversity considerations into these plans. This would need to be followed by substantial investments to change production and consumption systems across the economy, which UNEP has estimated at up to $2.59 trillion annually.

### 4.6.2 Benefits of delivering the Target

Achieving sustainable consumption and production offers a wide range of benefits. As well as helping to conserve biodiversity and maintain ecosystem services (which will deliver a range of benefits for people and the economy), SCP aims to contribute to achieving patterns of economic development that are sustainable in the long term. More sustainable use of resources should yield gains in efficiency and reduce costs to producers and consumers. Businesses benefit from developing and implementing SCP policies through reputational benefits, cost savings, market positioning, and access to finance.

Implementation of plans for sustainable consumption and production in various key sectors (such as food, energy, building and construction) will have a range of benefits, including:

- Environmental benefits: more efficient use of natural resources, reduced pollution, enhanced conservation of biodiversity, and maintenance of ecosystem services.
- Social benefits: improved quality of life, meeting the basic needs, creating jobs and contributing to poverty alleviation.
- Economic benefits: wide potential for increases in resource productivity, and as a consequence, for reductions in production costs - enabling business to "do more with less".

The 2011 Human Development Report (HDR) made projections on how environmental damage and risks associated with current consumption and production patterns (a "Business as Usual Case") would impact the development path of developing countries. The projections showed that those environmental impacts could prevent any further increase in some the Human Development Index of some developing countries from 2030 onwards.

### Example of benefits of Sustainable Consumption and Production: waste and biogas in China

In China, a wide-scale distribution of biogas digesters, supported by a government subsidy, has helped to turn waste into a resource, reducing greenhouse gas emissions and other forms of air and water pollution. China is a leading country for the development of anaerobic digestion for the production of biogas with the largest number of household gas

plants in the world. By 2009, there were 30.5 million biogas plants producing 12.4 billion $m^3$ of gas annually, which is equivalent to 19.0 million tons of standard coal. This rapid expansion of biogas in China is due to the accumulated knowledge and experience in developing biogas, the availability of large amounts of fermentation materials, and state support in the form of financial subsidies.

Bio- digesters can help farmers to reduce the environmental impact of their activity and increase their income, by reducing waste and generating their own supply of energy for cooking and heating. The amount of biogas produced is more or less sufficient to supply energy for cooking and lighting for a family of 3-5 persons as the thermal efficiency of biogas is much higher than traditional biomass. The produced biogas can be equivalent to 1,400 kg of firewood; or 68% of coal and 74% of wood consumed by the household. When comparing between users and non-users of biogas digesters, the users consume 10% less energy because of the high thermal efficiency of biogas.

The payback time on the initial investment in the digester ranged between 4 and 10 years, based on the savings made on fuel, electricity, fertilizer and pesticides by the farmers who used them. In total, a biogas digester can directly bring a rural family about 1,000 yuan ($157) per annum in economic benefits. Furthermore, there is a need for trained biogas technicians, creating a potential employment opportunity for people in rural areas. Biogas digesters also bring social benefits, such as the reduction of indoor pollution, and upgraded sanitation. Finally, environmentally speaking, the use of biogas reduces a significant amount of usage of biomass, thereby preventing soil erosion and water loss. Biogas is clean energy as it is carbon neutral and does not discharge toxic components, hence the substitution of biogas for traditional biomass and coal reduces the emissions of $CO_2$ and $SO_2$.

*Source: UNEP (2012) – Sustainable Consumption and Production for Poverty Alleviation*

### 4.6.3 Funding opportunities

As well as core biodiversity budgets, this Target has opportunities to attract funding from businesses. Engagement of businesses will be important in the development of SCP plans for different sectors, and this should provide opportunities to secure business funding for research and action planning, helping businesses to develop the evidence base and identify the actions they need to take to achieve sustainable business models that reduce their impacts on biodiversity over time.