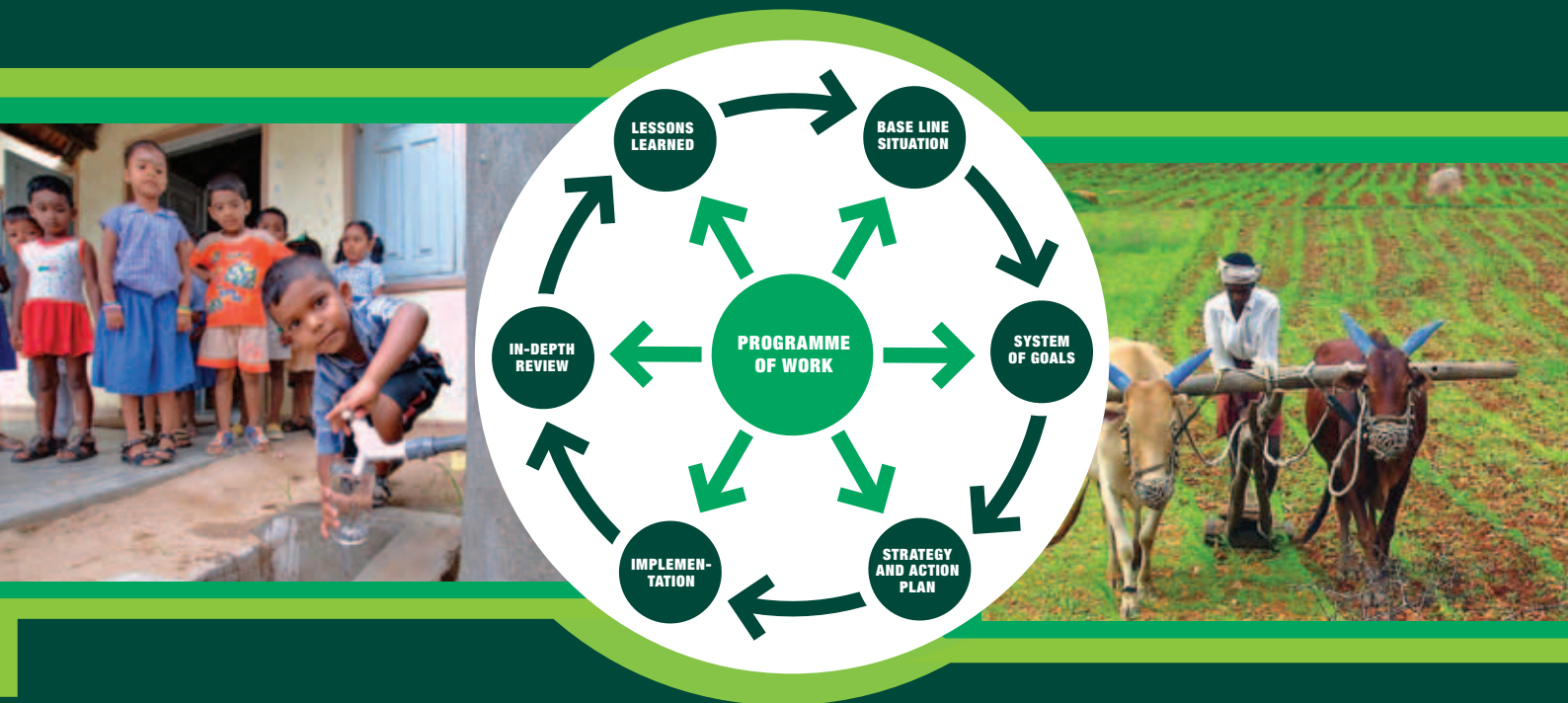


Linking the Thematic Programmes of Work of the Convention on Biological Diversity (CBD) to Poverty Reduction and Development



PREPARED BY THE UNEP WORLD CONSERVATION MONITORING CENTRE ON BEHALF OF THE CBD'S BIODIVERSITY FOR DEVELOPMENT INITIATIVE



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Correspondence

Correspondence on behalf of the Secretariat: Alberto Vega [alberto.vega@cbd.int]

Correspondence on behalf of the consultants, UNEP-WCMC:

Jessica Smith [Jessica.Smith@unep-wcmc.org]

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Mr. Oliver Hillel, Island Biodiversity

Mr. Sarat Babu Gidda, Mountains Biodiversity

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FOREWORD

The root-causes of poverty are related to how we organize and govern access to vital ecosystem services within the society. Access to sufficient, basic provisional ecosystem services like water, food, energy and shelter is essential to survival and a just livelihood.

The seven thematic Programmes of Work (PoWs) of the Convention on Biological Diversity (CBD) contribute to poverty eradication and specify provisions for the implementation of the CBD within the different biomes of the world, based on best-available knowledge and expertise. That information is a valuable monitoring instrument to measure progress in implementing the CBD within eco-regions and land use schemes.

In the context of the post-2010 CBD Strategic Plan the thematic PoWs will require adaptation and actualization in order to increase their effectiveness and coherence related to broader development and poverty reduction processes.

The analysis conducted by UNEP/WCMC on linkages between the seven thematic PoWs and poverty reduction reveals that the PoWs are still insufficiently linked to human well-being. Much more work is necessary to incorporate socio-economic dimensions into the PoWs in order to render them more relevant to policy-makers and stakeholders involved in development and poverty reduction processes. The consultancy formulates a “desired” programmatic approach, whereby all of the PoWs are coherently linked to poverty reduction, incorporating socio-economic data within the entire structure and including measurable indicators to monitor progress and impacts.

The consultancy proposes the incorporation of existing development and poverty reduction goals and indicators into the CBD PoWs. The challenge is this: how can the PoWs contribute through sustainable management of biodiversity and ecosystem services to the achievement of these socio-economic indicators and goals? Indeed, the effectiveness of the CBD’s contribution to the broader development process will determine, whether and to which extent development and poverty reduction are sustainable.

The identification of win-win scenarios between biodiversity conservation and poverty reduction is critical to mainstreaming biodiversity and ecosystem services into broader development processes, not only for developing countries, Small Island Developing States and countries with economies in transition, but also for developed countries.

Parties may consider these proposals to reinforce the effectiveness of the thematic PoWs at the various intervention levels in order to harmonize, synchronize, and create more coherence among the PoWs and within the broader goal of poverty reduction.



Dr. Ahmed Djoghla
Executive Secretary
Convention on Biological Diversity



ACRONYMS AND ABBREVIATIONS

2010 BIP	2010 Biodiversity Indicators Partnerships
ABS	Access and Benefit Sharing
BPoA	Barbados Programme of Action
CBD	Convention on Biological Diversity
CIFOR	Center for International Forestry Research
CoP	Conference of Parties
CSD	Commission on Sustainable Development
DAC	Development Assistance Committee
DfID	Department for International Development
DSHL	Dry and Sub-Humid Lands
EGS	Ecosystem Goods and Services
FAO	Food and Agriculture Organization
GEF	Global Environment Facility
GTZ	German Technical Cooperation
ICZM	Integrated Coastal Zone Management
IMCAM	Integrated Marine and Coastal Area Management
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
MA	Millennium Ecosystem Assessment
MDGs	Millennium Development Goals
MPA	Marine Protected Area
NBSAPs	National Biodiversity Strategies and Action Plans
OECD	Organisation for Economic Co-operation and Development
PoW	Programme of Work
PRSPs	Poverty Reduction Strategy Papers
REDD	Reducing Emissions from Deforestation and Forest Degradation
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
SCBD	Secretariat Convention on Biological Diversity
SIDS	Small Island Developing States
SLA	Sustainable Livelihoods Approach
SLF	Sustainable Livelihoods Framework
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNEP-WCMC	United Nations Environment Programme World Conservation Monitoring Centre
WCPA	World Commission on Protected Areas

EXECUTIVE SUMMARY

This report describes a consultancy carried out to determine the linkages between the Convention on Biological Diversity's (CBD) thematic Programmes of Work (PoWs) and poverty reduction. It is well understood (e.g., Roe and Elliot 2010; Tekelenburg *et al.* 2009; Sachs *et al.* 2009; Walpole and Wilder 2008) that the relationship between biodiversity and poverty reduction is complex and has multiple possible pathways, from 'win-win' outcomes (reducing poverty improves conservation outcomes), 'win-neutral' (conservation has no effect on poverty), 'trade-offs' (conservation action hurts the poor or poverty reduction damages biodiversity) (Walpole and Wilder 2008), or even 'lose-lose' situations (poverty increases and biodiversity declines).¹ The major challenge in this regard is that production systems should enhance human well-being, be sustainable in the future without degradation of the natural resource base (biodiversity), while maintaining productivity and being equitably distributed among people, avoiding poverty. This requires an incredibly delicate series of balances:

- Between effective uses of ecosystem services and effective investments in biodiversity to increase ecosystem resilience and productivity;
- Among the distribution of ecosystem services to various development sectors (inputs for production) of the economy in order to achieve an optimum of outcomes for human well-being; and
- Among the various segments of the society access to (or distribution of) ecosystem services in order to guarantee a minimum necessary access to vital ecosystem services in terms of poverty reduction and food security (including health and education).

In some cases, gains in development and the improvement of human well-being in the medium-term have been at the expense of the substantial biodiversity which is necessary for human survival over the longer-term. An ecosystem services lens helps us to better understand these dynamics.

Poverty exists across most ecosystems (see Figure 1). While all people need biodiversity for their livelihood or production systems, there can be a large difference in the type of "biodiversity management" that is needed for poverty reduction. The PoWs are instruments for implementing the Convention with biome-specific management challenges on agricultural biodiversity, dry and sub-humid lands biodiversity, forest biodiversity, inland waters biodiversity, island biodiversity, marine and coastal biodiversity, and mountain biodiversity.

WHY THIS REPORT?

The Preamble of the Convention confirms that poverty reduction and development are overriding priorities of developing countries, and should by extension be priorities through implementation of the Convention. The Programmes of Work are key tools (though by no means the only tools, nor to suggest the most important tools) for implementing the Convention and its strategic plan beyond 2010 and taking into account the specific ecological circumstances of the main biomes and ecosystem usages. Anecdotal evidence indicated that the spirit of poverty reduction did not sufficiently translate from the overall context of the Convention through to its implementation. As such, the CBD's Biodiversity for Development Initiative commissioned this review to better understand how coherent are the PoWs' linkages to poverty.

¹ See section 1.2 of this document for an overview.

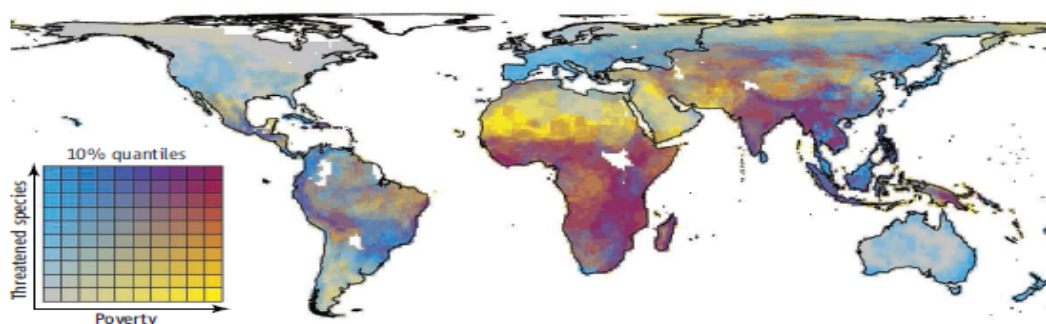


Fig. 1. Map of poverty and potential biodiversity loss, showing the level of poverty (proxied by the log rate of human infant mortality) combined with the log number of threatened species of mammals, birds, and amphibians per one-degree grid square (Behrmann equal-area projection). White areas represent missing data. Data from (14) and (15).

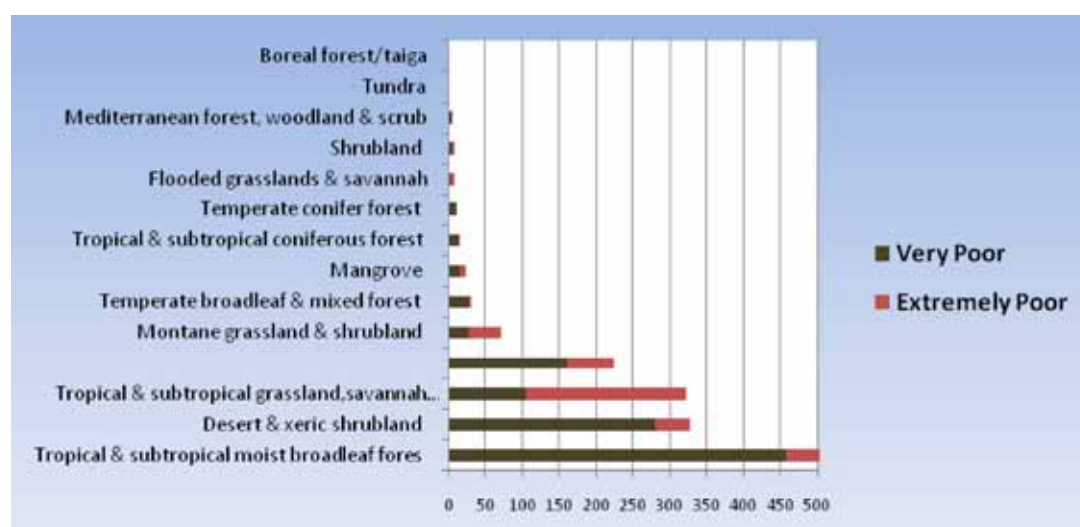


FIGURE 1: Poverty by biome and potential biodiversity loss

Yellow=Places with high poverty but no threatened species. Blue=Places with high threatened species but no poverty. Fuchsia= Places with high poverty and high biodiversity.

This figure and the table below show that poverty exists across most of the world's ecosystems but especially tropical forests, dry and sub-humid lands (including grasslands, savannah), islands, and coastal areas. Biodiversity is indicated using log number of threatened species of mammals, birds, and amphibians per one-degree grid square and poverty using log rate of human infant mortality. Ecosystem changes such as increased food production have helped to lift hundreds of millions of people out of poverty, but often at the expense of biodiversity (bright blue in Europe, North America and Australia). Mapping using an ecosystem services framework would help us to better understand the dynamics between biodiversity and human well-being; piloting of such mapping tools are underway.

Source: Sachs *et al.* 2009: 1502 and K. H. Redford, *et al.* 2008

APPROACH TO THE CONSULTANCY—RESEARCH QUESTIONS AND METHODS

The analysis sought to answer the following key research questions:

1. To what extent do the CBD thematic PoWs already address poverty linkages?
2. Where do evident linkages to poverty exist which are not explicitly mentioned in the PoW documentation?
3. What are the gaps that have to be addressed in order to link Programmes of Work coherently to development and poverty reduction processes?

A poverty analysis of this orientation has not been undertaken previously, therefore devising a sound, repeatable methodology for conducting the analysis was a major task of the consultancy. The authors devised, piloted and revised a methodology in close consultation with the CBD Biodiversity for Development Initiative on the basis of “content analysis” (see Methodology in Section 2 of the report), a quantitative and qualitative approach to analysing the meaning and intention of text.

The conceptual framework used is indicated in section 2, methodology. Focus on implementation outside of documented experiences was limited to targeted interviews, as a comprehensive review of implementation of the PoWs was (i) outside of the scope of the consultancy, and (ii) to a large degree covered by the available In-Depth Reviews and National Reports by the Secretariat’s own analysis of national reports. These sources were included through the guidance of the Secretariat.

FINDINGS

The key finding is that the CBD Programmes of Work have strong thematic links to poverty reduction, but these are unevenly interpreted in practice. Poverty reduction should appear throughout the PoW formulation and implementation because it is an over-arching priority for developing country Parties to the Convention. Our study revealed that sometimes poverty reduction appears in the intention of a PoW, but not through implementation. In other cases it appears in implementation but is not specifically called for in the PoW. The implication of this finding is not necessary to “retro fit” the PoWs with the suggested explicit links to poverty, but rather to ensure all PoWs are equipped with the tools and approaches to contribute to the over-riding poverty reduction objective.

TABLE 1: Summary of CBD PoW assessment of poverty mainstreaming

CBD Programme of Work	Strongest linkages are made to which dimensions of poverty?*	Assessment of poverty mainstreaming in the baseline, system of goals, strategy / action plan, evaluation, and lessons/case studies
Agricultural Biodiversity	Food and water, Health	Linkages to poverty reduction appear in the baseline of the PoW, but a strong relationship between poverty and food security, biofuels is not well reflected in text nor through implementation. The greater need is to consider how agriculture impacts the other forms of biodiversity, rather than strictly looking at agrobiodiversity.
Dry and Sub-Humid Lands Biodiversity	Environmental resources (provisioning services), Rights and freedoms, Income and education	Strong link to poverty well-reflected in PoW elements. Focus should be on implementation.
Forest Biodiversity	Environmental resources (provisioning services), Security, Rights and freedoms, Income and education	PoW does not make explicit reference to poverty despite the importance of forests and the services they provide to poverty reduction.
Inland Waters Biodiversity	Environmental resources (provisioning services), Food and Water, Health	Linkages to poverty handled through the Ramsar Convention for wetlands. Emphasis should improve for cross-cutting elements and drivers such as water availability, and not simply biodiversity itself.
Island Biodiversity	Environmental resources (provisioning services), Rights and freedoms, Income and education	Text is well-mainstreamed and implementation is ongoing.
Marine and Coastal Biodiversity	Environmental resources (provisioning services), Rights and freedoms, Income and education	Poverty is <u>not</u> highlighted in the PoW text, but poverty is in fact being addressed through the implementation of the integrated marine and coastal area management (Programme Element 1).
Mountain Biodiversity	Environmental resources (provisioning services), Rights and freedoms, Income and education	Underlying the PoW is the belief that sustainability will be achieved in mountain areas by reducing poverty, inequality, and marginalization. But more efforts to implement the PoW is key.

*According to conceptual framework and definitions expressed in Section 2, and Table 2.

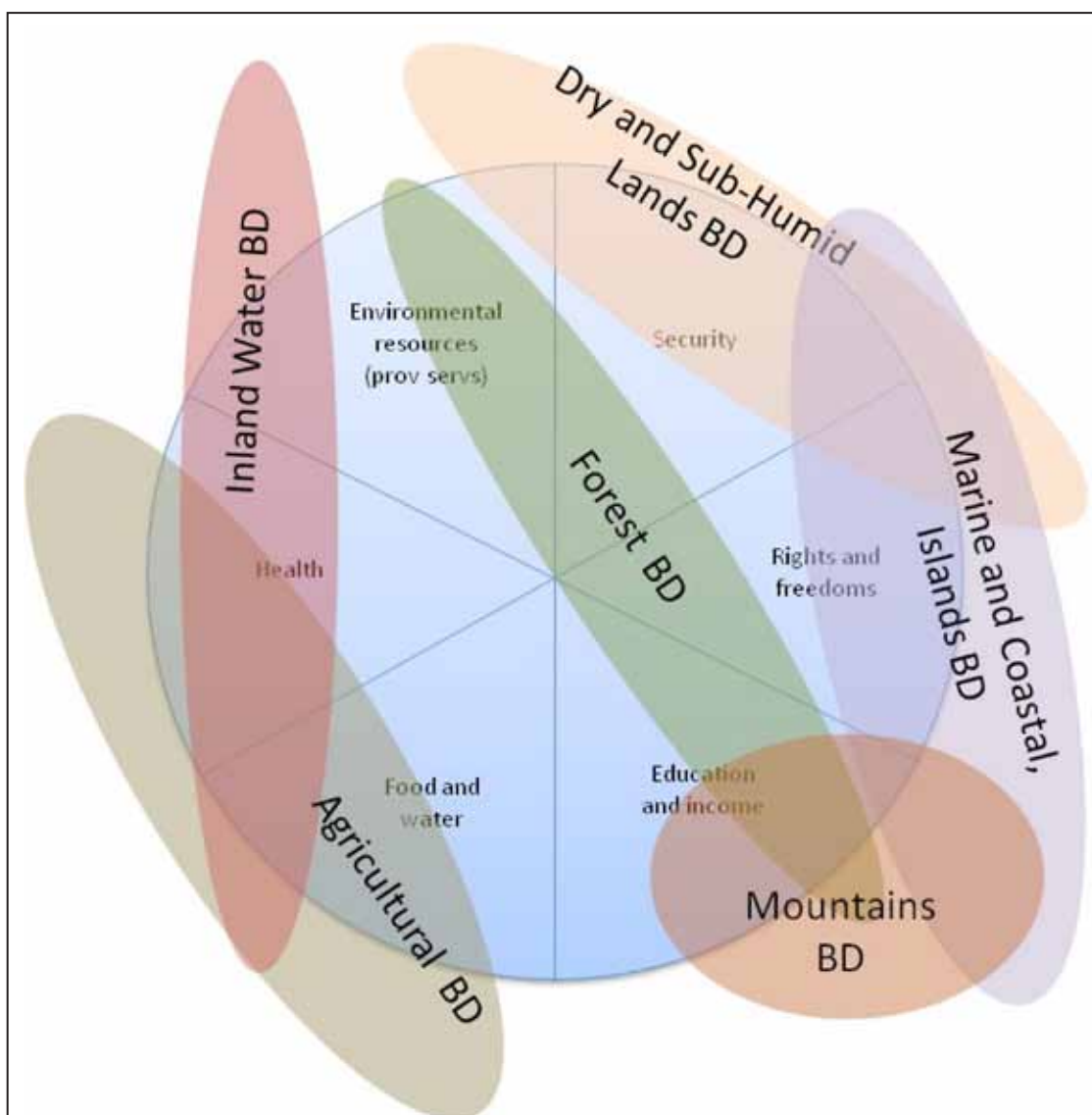


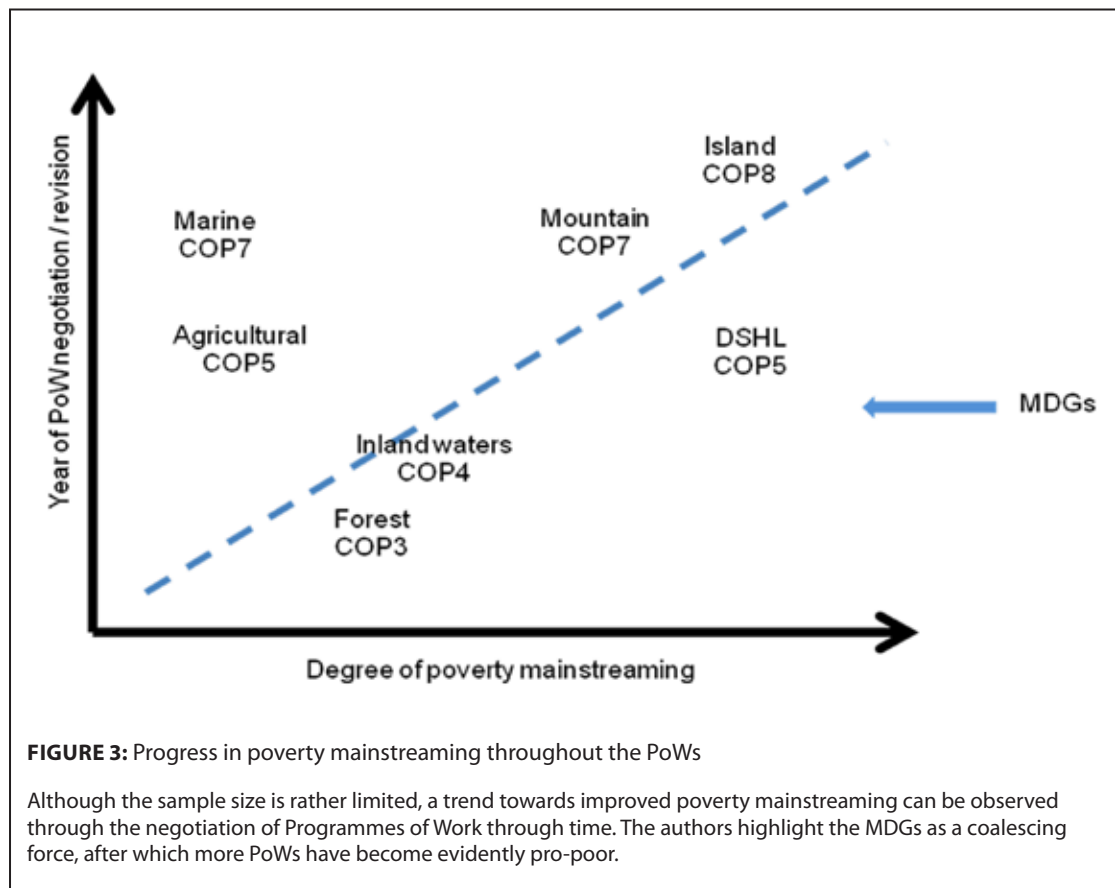
FIGURE 2: CBD PoW biome-specific themes overlaying the major elements of poverty reduction

This figure portrays the relationship between CBD thematic PoWs (which are based around important biomes) with their most significant contributions to the common dimensions of the international frameworks for poverty reduction and sustainable livelihood like Sustainable Livelihoods, Sen’s capability framework, the Millennium Development Goals, and so on. See Table 2 of the report for detail on how these common themes were derived. “Environmental resources” is used here as a generic term for provisioning services. The figure indicates that the CBD thematic PoWs are well-placed to make a substantive contribution to poverty reduction in the biomes that they address.

Another finding of the study is that “mainstreaming” language elaborating the linkages of biodiversity to ecosystem services and poverty reduction/sustainable livelihoods has increased through time in the PoWs (which result from negotiations and CoP decisions). The PoWs each have different structures but have evolved through time to become more complex and results-oriented. Also, the “newer” PoWs - notably Island Biodiversity - contain more explicit linkages to development paradigms. “Older” PoWs such as Agricultural Biodiversity, though have significant implications at the thematic level² for the various dimensions of poverty reduction, do not as explicitly reflect developmental or pro-poor thinking in the design of the programme. While many efforts may be responsible for an enhanced level of

² The topic (biome) of their specific biodiversity concern, distinct from the CBD Programme of Work designed to address it.

mainstreaming through time, the authors note the Millennium Development Goals (and subsequent inclusion of a biodiversity target) as one significant bridge between the international environment and development communities of practice.



Finally, a general finding is that the causal relationship from PoW to implementation is weak, though there are some notable exceptions (especially in the Mountain PoW). This suggests an emphasis on capacity building and implementation are warranted, rather than refinement (or renegotiation) of the PoW design to achieve the desired impact. The PoWs are extremely useful focal points for knowledge and information sharing on particular types of biodiversity and ecosystems with specific management challenges.

At the national level the PoWs should be adopted to the specific circumstances of the counties' ecosystems through National Biodiversity Strategy and Action Plans (NBSAPs). We should also consider whether additional instruments are necessary, for broader objectives such as synergistic implementation of the Rio Conventions and the range of biodiversity-related Multilateral Environmental Agreements.

RECOMMENDATIONS

More effective win-win or win-neutral³ pro-poor solutions are needed across the different biomes in order for the Convention to meet its over-riding objectives in light of the need for sustainable development and worldwide improvements in well-being of the world's poorest.

3 One finding of PBL's research is that locally created win-win situations can produce negative impacts (trade-offs) elsewhere, in the future or among other stakeholder groups. Win-win solutions should be promoted, but trade-offs elsewhere should be understood and avoided. Instead of promoting win-win only, we could also stimulate win-neutral situations in which one is improved while the other is not affected (PBL, reviewers comments).

The Consultants recommend:

1. An emphasis on ecosystem (goods and) services as a sound approach to linking biodiversity to development, using the language and indicators already accepted by the development community, and using existing targets and indicators, or developing new targets and indicators to monitor whether poverty is being incorporated into CBD's programs. This would be a systematic way to mainstream poverty;
2. Outreach and two-way interaction between the CBD and its stakeholders within the development community and representatives of economic sectors;
3. Further work demonstrating the contribution of biome-specific biodiversity to widely-used development indicators, especially the Millennium Ecosystem Assessment (MA) framework and the MDGs; and
4. Capacity building for pro-poor implementation of the Convention, including at the regional and/or trans-boundary level to allow effective learning through exchange of experience and cooperation between countries that share common ecosystems Any capacity building should be site-based focusing on demonstration (proof of concept) and opportunities to scale up.

For successful implementation, two major conditions are critical: (i) the strength of governance systems, and (ii) the ability to address market failure ascribing a value to the ecosystem services provided (see www.teebweb.org) and creating markets that commoditize ecosystem services. These markets should be structured to ensure an equitable access and distribution of the benefits among countries and among the different segments of the society within countries. A monitoring system with a solid baseline and a core set of indicators will be key to assessing the impacts of pro-poor Convention implementation across the different biomes. It is worth noting that there are many established measures of the various aspects of poverty, livelihoods, development and well-being that are deployed as indicators by the development community, particularly at the national level. However, for these to be of use in the context of the CBD they will in many cases need to be adapted to the specific thematic and geographical context of each PoW. A monitoring system with a solid baseline and a core set of indicators will be key to assessing the impacts of Convention implementation on the poor. This monitoring system should be in the interest of national governments and preferably carried out by Government entities (rather than a third party)—so that national governments can own the results and devise ways to address the findings. Monitoring is often an expensive exercise and therefore substantial resources should be set aside for it.⁴

⁴ Thank you to Nik Sekhran for input on UNDP's experience in monitoring.

1. INTRODUCTION

This report presents an analysis of the extent to which poverty⁵ considerations are integrated in the seven thematic Programmes of Work of the Convention on Biological Diversity, including the application of the provisional framework of goals and targets for 2010 to the thematic Programmes of Work of the Convention (Decision VIII/15, annex IV). The seven thematic Programmes of Work analysed are: Agricultural Biodiversity, Dry and Sub-humid Lands Biodiversity, Forest Biodiversity, Inland Waters Biodiversity, Island Biodiversity, Marine and Coastal Biodiversity and Mountain Biodiversity.

This analysis set out to address the following key research questions:

1. To what extent do the CBD thematic Programmes of Work already address poverty linkages?
2. Where do evident linkages to poverty exist which are not explicitly mentioned in the PoW documentation?
3. What are the gaps that have to be addressed in order to link Programmes of Work coherently to development and poverty reduction processes?

The synthesis provided by this report is mainly intended to assist the working process to “*elaborate a poverty umbrella framework linking the implementation of the thematic CBD Programmes of Work to development and poverty reduction processes*”, in other words to assist in formulating a proposal for enhancing the integration of poverty and socio-economic issues within each thematic Programme of Work. This proposed poverty umbrella framework, proposed by the CBD Biodiversity for Development Initiative, could be used for the following purposes:

1. Be discussed and formalized through a CoP Decision as an instrument showing how to systematically link the implementation of the CBD and its Programmes of Work to development and poverty reduction;
2. Contain substantial information and indicators suitable to enrich the Post 2010 Targets and the revised Strategic Plan; and
3. Be used as a framework to commit and measure contributions of the CBD to the Millennium Development Goals and other poverty reduction approaches.

1.1 BACKGROUND

The significance of biodiversity and the environment to poverty reduction and the livelihoods of the poor is widely recognized (e.g., Roe and Elliot 2010; Tekelenburg *et al.* 2009; Sachs *et al.* 2009; and others⁶). Studies ranging from household level inquiry to global review have demonstrated the high level of dependence of poor people on the various goods and services that ecosystems provide, from food and fuel to medicines, shelter and cultural and religious values (Narayan, 1999; Narayan, *et al.* 2000; Brocklesby, and Hinshelwood, 2001). *The Millennium Ecosystem Assessment (MA) (MA 2005) and other such evaluations, and also through the work of the United Nations Millennium Project (2005)* for the achievement of the Millennium Development Goals (MDG), emphasize the inextricable linkages between biodiversity, poverty reduction and sustainable development. The MA's emphasis on ecosystem services and their significance for human well-being is widely recognized as having made a major contribution to linking biodiversity conservation with poverty reduction.

However, efforts to link biodiversity and poverty reduction are facing a number of hurdles including a lack of information on the nature and extent of links, a related lack of political will to mainstream biodi-

⁵ Using an inclusive definition detailed in Section 2.

⁶ See general references in Section 7.

versity within development strategies (including by donors) and a weak framework for scaling-up good practices and lessons learned.

In response to these implementation gaps, the Secretariat of the Convention on Biodiversity (SCBD) will elaborate, in close cooperation with its institutional partners, a poverty umbrella framework as an input to: (i) the CBD Strategic Plan to be revised in 2010, and (ii) to support related Decisions to be considered by the Conference of the Parties in order to better link the implementation of the Convention to poverty reduction and other development processes.

In document UNEP/CBD/SP/PREP/1 on the Revision and Updating of the Strategic Plan, paragraph 32, the Executive Secretary stated that “A clear conceptual framework could help clarify how implementation of the Convention could contribute to poverty eradication”. As a first step for the formulation of such a “poverty framework” the CBD commissioned a study to analyze the extent to which socio-economic and poverty considerations are already integrated in each of the seven thematic Programmes of Work of the Convention (including the application of the provisional framework of goals and targets for 2010 to the thematic Programmes of Work of the Convention; Decision VIII/15, annex IV).

The term poverty is used in its widest sense, as interpreted by Sen (1999), World Bank (2001), Poverty Environment Partnership (DFID *et al.* 2002), OECD (2001), *Millennium Development Goals (2000) and the poor themselves (Naryan et al. 2000)*, to mean not just lack of income but also inadequate access to basic goods such as food and water; insufficient knowledge, health or skills to fulfil normal livelihood functions; poor housing, unhealthy or dangerous environment, and bad social relations; and lack of civil and political rights, assets and services. The CBD definition of biodiversity (i.e. “the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems”; article 2) is used in this study (decision IX/9). Detailed definitions of these two terms and other relevant concepts such as livelihoods, poverty reduction, human well-being, and ecosystem services are found in Section 2 (methodology) of this report.

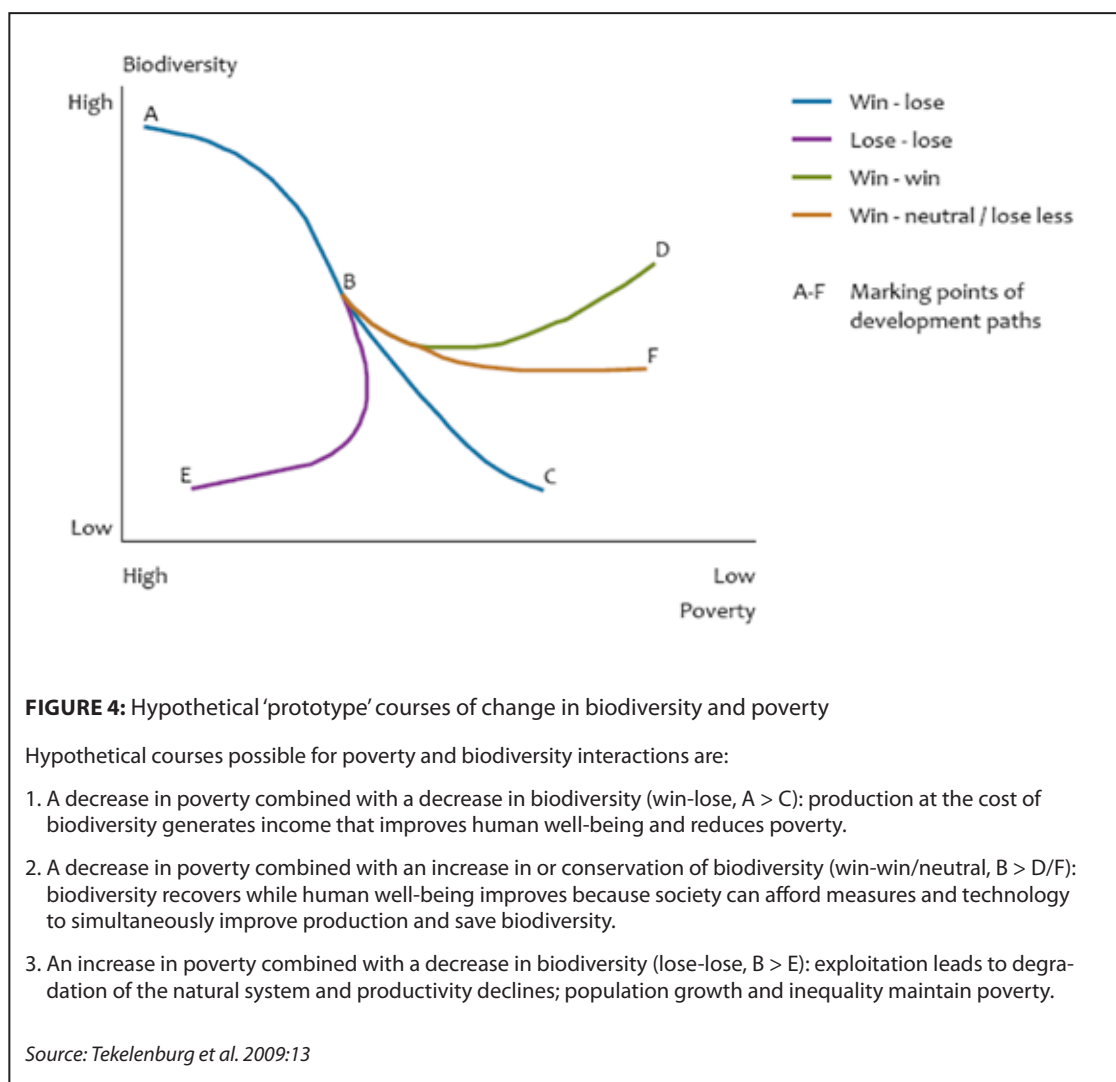
1.2 BIODIVERSITY AND POVERTY LINKAGES⁷

The biodiversity-poverty relationship is complex—it is a multi-domain (ecological, social and economic), multi-scale and multi-actor issue (Tekelenburg *et al.* 2009). Biodiversity and poverty linkages differ from case to case, depending on specific conditions, varying dimensions of poverty, the definitions used and the stage of social-economic development of the country and region in questions (Steele *et al.* 2004; Adam *et al.* 2004; Walpole and Wilder 2008; Tekelenburg *et al.* 2009). In particular, cross-cutting determinants such as governance, policies on poverty and biodiversity protection, and population growth and density, which are associated with the socio economic context, are critical in determining whether or not biodiversity leads to actual poverty reduction (Tekelenburg *et al.* 2009). Thus, the causal relationships are not so simple that one can say poverty causes biodiversity loss, or improvements in biodiversity reduce poverty. This suggests a need to be more specific in defining what types of poverty and biodiversity issues are being assessed (Steele *et al.* 2004; Walpole and Wilder 2008). We will aim to avoid generalisations on the relationships between poor people and biodiversity, but at an aggregate level such as this assignment, it is somewhat inevitable.

According to Tekelenburg *et al.* (2009) all *resource use systems* (exploitation of natural resources such as hunting, gathering and fishery or the conversion of natural habitat into cropping, grazing and forestry production systems) follow a limited set of basic patterns of change in biodiversity and poverty (see

7 A Symposium was held on the topic “Linking biodiversity conservation and poverty reduction: what, why and how?” on 28 and 29 April 2010 at the Zoological Society of London, UK. All materials are available online from the Poverty and Conservation Learning Group website: <http://povertyandconservation.info/en/>.

Figure 4). These may differ in absolute values and in the ratio of change, but in essence are thought to follow the same courses.



However, the Millennium Ecosystem Assessment contains a compelling argument that biodiversity underpins the ecosystem services that all people ultimately depend on at all scales, from the individual to the global, rich and poor alike (MA 2005). Millions of poor people worldwide still directly depend on ecosystems and natural resources for their incomes and livelihoods. In this respect, biodiversity potentially contributes directly to poverty reduction in at least five key areas namely food security, health improvements, income generation, reduced vulnerability and ecosystem services.

1.3 THE CONVENTION ON BIOLOGICAL DIVERSITY AND POVERTY

The CBD has three objectives namely: Conservation of biodiversity, sustainable use of the components of biodiversity, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. The Convention deals with an issue so vital to humanity's future that it stands as a landmark in international law. The Preamble of the Convention affirms that the conservation of biodiversity is a common concern of humankind and an integral part of the development process.

The Convention acknowledges the relationship of biodiversity to sustainable development and poverty reduction. Specifically, the need for poverty reduction has been identified in the Preamble to the CBD,

which recognizes that “economic and social development and poverty eradication are the first and overriding priorities of developing countries”. The Preamble to the Convention also states that “conservation and sustainable use of biodiversity is of critical importance for meeting the food, health and other needs of the growing world population, for which purpose access to and sharing of both genetic resources and technologies are essential”. Article 6(b) of the text of the CBD calls for the integration of the conservation and sustainable use of biological diversity into relevant sectoral and cross-sectoral plans, programmes and policies.

The CBD covers all ecosystems, species, and genetic resources. It links traditional conservation efforts to the economic goal of using biological resources sustainably. While past conservation efforts were often aimed at solely protecting particular species and habitats, the Convention recognizes that ecosystems, species and genes can be used sustainably and for the benefit of humans. However, this should be done in a way and at a rate that does not lead to the long-term decline of biodiversity. In essence, the purpose and intention of the Convention on Biodiversity is to promote or support sustainable development.

The CBD has adopted the *Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization*. Following the call of the World Summit on Sustainable Development in 2002, the current task of the Parties to the Convention is to develop an international regime to promote the fair and equitable sharing of benefits arising out of their utilization. In addition, in 2000, the Cartagena Protocol on Biosafety was adopted under the auspices of the Convention. Importantly, the Convention is legally binding; countries that join it are obliged to implement its provisions. The CBD thus directly links environmental and development policy objectives, and explicitly calls for the support and recognition of indigenous peoples and traditional communities, who often live in areas that are hotspots of biodiversity.

Moreover, poverty *alleviation* is referred to explicitly in the CBD 2010 targets. In April 2002, the Parties to the Convention on Biological Diversity committed themselves to ‘achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and the benefit of all life on Earth’. This target was subsequently endorsed by the World Summit on Sustainable Development and the United Nations General Assembly and was incorporated as a new target under the Millennium Development Goals (MDGs; Sachs *et al.* 2009). In light of these commitments, the CBD is expected to address poverty issues through articles of the Convention, Principles and guidelines, the Strategic Plan for the Convention on Biodiversity, CoP Decisions and Programmes of Work (PoWs).

1.4 THE CONSULTANCY DELIVERABLES

The UNEP-World Conservation Monitoring Centre (www.unep-wcmc.org) were contracted to undertake this assignment through an openly advertised consultancy. The terms of reference of the assignment can be obtained from the CBD Secretariat. Expected products of the consultancy were:

1. Two matrices per PoW, with one showing the results of the analysis and another presenting a desirable matrix, showing how to fully / coherently link the PoW to poverty reduction (in Section 3);
2. Synthesis of the common elements of the matrices referred to in 1, which can be used for an umbrella framework (in Section 4.3); and
3. A final report (this document) and Power Point presentation showing the working process during the consultancy and a proposal for next steps (Section 6.1).
4. A conceptual development framework for the elaboration of poverty-biodiversity indicators to measure the PoW achievements to poverty reduction. (Annex 3)

2. THE APPROACH USED IN THE ANALYSIS

This section describes the approach and methodology of the assignment in general terms. A poverty analysis of this orientation has not been undertaken previously, therefore devising a sound, repeatable methodology for conducting the analysis was a major task of the consultancy. The authors devised, piloted and revised a methodology in close consultation with the CBD Biodiversity for Development Initiative on the basis of “content analysis” (see Methodology in Section 2 of the report), a quantitative and qualitative approach to analyzing the meaning and intention of text. Definition of terms was critical, since the CBD does not have official definitions of a number of key terms relevant to the analysis, which can be contentious or widely interpreted. Any specific details on the approach which have been omitted for the sake of brevity can be addressed through communication with the authors.

2.1. DEFINITIONS OF KEY TERMS AND CONCEPTS

Defining terms is an important aspect of analyzing the integration of socio-economic and poverty considerations within the seven thematic Programmes of Work (PoWs) of the CBD. A clear understanding of the key terms linking poverty and biodiversity more generally, and keywords linking each PoW theme to poverty specifically, will be required. The key concepts in this study are: poverty, livelihoods, poverty reduction and alleviation, human well-being, biodiversity, ecosystem services, environmental income, governance, markets and capacity. These are concepts that decision makers will want to improve or influence, as they are commonly associated and linked with policy objectives such as the Millennium Development Goals (objectives on poverty reduction) and the CBD goals (objectives of biodiversity conservation).

2.1.1. *Poverty*

When defining poverty, a distinction should be made between the traditional uni-dimensional approach and more recent multidimensional ones. Historically, poverty has been related to income, which still remains the core of the concept today. It has evolved from the 19th century idea about ‘subsistence needs’—what a person needs to survive, to the mid-20th century conceptualization of lacking ‘basic needs’, extending the subsistence idea by also including basic facilities and services such as healthcare, sanitation and education, to the late 20th century understanding of poverty as ‘relative deprivation’, including of income and other resources, as well as social conditions.

According to Sen (1999), poverty is an undesired state of human well-being, measured as a score below a certain level of human well-being. The poor generally lack a number of human well-being elements, such as income, food, education, access to land, health and longevity, justice, family and community support, credit and other productive resources, a voice in institutions, and access to opportunity. Being poor means having an income level that does not allow an individual to cover certain basic necessities, taking into account the circumstances and social requirements of the environment and society. The most basic necessity is food.

Recent socio-economic literature seem to agree that poverty is multidimensional and region-specific. What is considered as ‘poverty’ varies considerably between regions and between individuals, urban and rural areas, and between ecosystems. People in forest areas, for example, often do not need to spend up to a dollar a day to have a decent meal or acquire subsistence requirements. There is mounting evidence that the biodiversity around them is in itself a source of nourishment that people in other ecosystems pay dearly for.

Despite the difficulty in deciding its meaning, frameworks have been developed to help researchers identify the poor and the causes of poverty. The most widely used frameworks which form the basis

of this analysis are the Development Assistance Committee (DAC) guidelines on poverty reduction (OECD, 2001), Livelihood assets approach/five categories of capital (Carney *et al.* 1998), *Millennium Development Goals (MDGs)*, *World Bank Poverty Reduction Framework*, and Millennium Ecosystem Assessment (see Table 1). These frameworks were chosen not only because they capture the multidimensionality of poverty, but they are also recognized by a large constituency of multilateral and bilateral agencies and are widely used to define and classify poverty and poverty reduction efforts.

2.1.2 Livelihoods

A “livelihood” encompasses the ways and means by which a human being, or family or group/community, obtains the socio-economic benefits which sustain his/her/their social and economic well-being, including security. In the absence of social services—a livelihood is also the means to avoid poverty. Poverty and livelihoods are different concepts but of course closely linked. “Livelihood” is also a complex and multi-dimensional concept (World Bank 2000; Kusters *et al.* 2005) *and a number of conceptual frameworks have been developed to guide livelihood assessment. The sustainable livelihoods approach or framework (SLA or SLF) developed by DfID and OECD, uses the five capitals approach (human, social, natural, physical and financial) that recognizes that people’s livelihoods and well being are dependent on a complex mix of issues (DFID 1999; OECD 2001; Carney et al. 1998).* These assets are variously vulnerable to such things as shocks (economic or environmental), trends and seasonality.

Livelihood strategies lead to livelihood outcomes but this process is heavily influenced by the vulnerability context and policy and institutional processes. Influence upon and access to livelihoods’ assets is a critical aspect of livelihood outcomes. Lack of livelihoods’ assets is a major driver of poverty. The sustainable livelihoods framework is widely used in the development context and the approach, with appropriate modification has been used by organizations such as DfID, Save the Children, Oxfam GB and Oxfam South Africa, amongst others. Now, both development and conservation agencies use their own variations on this SLA theme. Kusters *et al.* (2005) *have used the five capitals approach in their method to assess the outcomes of forest products trade on livelihoods and developed indicators at the household and community levels.*

2.1.3. Human well-being

There is no single measure that captures people’s living conditions, quality of life or human development. The World Development Report uses criteria developed by the OECD Development Assistance Committee (DAC 2000; World Bank 2001):

1. **Economic capabilities** mean the ability to earn an income, to consume and to have assets, which are all key to food security, material well-being and social status. They are related to access to financial and physical resources.
2. **Human capabilities** are based on health, education, nutrition, clean water and shelter. These are core elements of well-being as well as crucial means to improve livelihoods.
3. **Political capabilities** include human rights, a voice and some influence over public policies and political priorities and freedom.
4. **Socio-cultural capabilities** concern the ability to participate as a valued member of a community. Important aspects are social status, dignity, geographic and social isolation.
5. **Protective capabilities** enable people to withstand economic and external shocks. Thus they are important for preventing poverty. Important aspects are vulnerability and insecurity. External shocks include natural disasters, economic crisis and violent conflicts.

These resemble the five dimensions of human well-being recognised by the MA (2003): i) basic material for a good life, ii) freedom and choice, iii) health, iv) good social relations, and v) security.

TABLE 2: Internationally recognized definitions and frameworks for poverty and poverty reduction

Livelihood Assets/ Five Categories of Capital (Carney et al. 1998)	Sen's Capabilities Approach (Sen 1999)	Millennium Development Goals (MDGs) (UN 2000)	World Bank Poverty Reduction Framework (World Bank 2001)	Development Assistance Committee (DAC) Guidelines on poverty reduction (OECD 2001)	Human Rights Approach to Poverty Reduction— Oxfam.	Millennium Ecosystem Assessment: Human Well-being and Poverty Reduction (MA 2005)	General thematic categories adopted in
		MDG7 (Environmental sustainability)		Environment (cross-cutting issue)	Right to a sustainable existence	Basic material for a good life	<i>Environmental resources (provisioning services)</i>
	Good health	MDGs 4, 5 and 6 (Health)		Human (Health, Education, Nutrition)		Health	<i>Health</i>
		MDG 1 (Eradicate hunger and poverty) MDG 8: Develop a Global Partnerships for Development	Facilitating empowerment			Freedom of choice and actions	<i>Food and Water</i>
Human capital Physical capital Financial capital	Economic facilities Access to education	MDG 2 (Education)	Promoting opportunity	Economic (Consumption, Income, Assets) Socio-cultural (Status and Dignity) Gender (cross-cutting issue)		Good social relations	<i>Education & Ability to generate income</i>
Social capital	Political freedom Basic human rights	MDG 3 (Gender equality and empowerment)		Political capabilities (human rights, influence over public policies and freedom) Gender (cross-cutting issue)	Right to social and political participation Right to identity Right to life and safety Right to basic social services		<i>Rights & Freedoms</i>
Natural capital			Enhancing security	Prospective (Security and Vulnerability)		Security	<i>Security</i>

In this study, all aspects of poverty are considered: this is reflected in the analysis of PoW linkages to all aspects of the internationally recognized definitions and frameworks for poverty and poverty reduction presented in Table 2.

2.1.4. Poverty reduction and alleviation

Poverty reduction is any process which seeks to reduce the level of poverty in a community, or amongst a group of people or countries (Tekelenburg *et al.* 2009). According to the FAO (2006) poverty reduction is defined as a collective responsibility to fight all avoidable forms of deprivation. It involves collaboration to: make poor people less poor (also referred to as poverty alleviation); enable poor people to escape from poverty; and to build institutions and societies that prevent people from becoming poor or from slipping further into poverty. Poverty reduction involves efforts ranging from the modest easing of some symptoms of poverty to radical transformations that enable people to escape poverty altogether. Because the transition is rarely sudden, reducing poverty first means alleviating it by gradually addressing the severity of some components. This aspect of poverty reduction should not be confused with helping people to escape from poverty altogether or building a poverty-free society.

Poverty reduction requires both practical and strategic changes at many levels and addresses direct and indirect causes of poverty. Escape routes from poverty are through multidimensional strategies that include social and institutional transformation. Poverty alleviation occurs primarily through practical and direct changes at the local level. Distinctions are sometimes made between practical and strategic approaches to poverty reduction. Practical changes tend to involve poor people at local levels to address the material aspects of poverty—mostly those related to subsistence needs—by changing the relations between humans and the non-human environment. Strategic changes address the indirect causes of poverty at local levels and higher, involve non-poor as well as poor people, and focus on social reform.

Poverty alleviation, a closely related though not identical concept, involves alleviating the symptoms of poverty and/or reducing the severity of poverty without transforming people from ‘poor’ to ‘non-poor’. This is a strategy used by, for example, the UK Department for International Development and others in the large Ecosystem Services and Poverty Alleviation multi-disciplinary research programme.

A similar, but again not entirely identical concept is livelihood improvements—or improvements in human well-being. In neither of these cases are the beneficiaries necessarily limited to those who are “poor”⁸.

2.1.5. Biodiversity

The CBD defines biodiversity as “the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic systems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems” (article 2). It is worth-noting that there are many definitions of biodiversity. They deal with different organisational levels (genetic, species, ecosystems), different types of ecosystems and species (wild and domesticated), different spatial scales and one or both of the key elements ‘richness’ and ‘abundance’ (Purvis and Hector 2000).

Biodiversity can be measured in many ways by using different indicators:

- Ecosystem diversity. Refers to the diversity of a place at the level of ecosystems. Ex; Forest Extend, Protected areas extend...
- Species diversity. Taxonomic richness of a geographic area, with some reference to a temporal scale (e.g. Species Richness, Simpson Index, Shannon index, Mean Species Abundance, Living Planet Index, Red List Index, etc.)
- Genetic diversity. The total number of genetic characteristics in the genetic makeup of a species.

Different indicators will tell a different story or view on the loss or restoration of different types of biodiversity. The 2010 Biodiversity Indicators Partnership (see www.twentyten.net/indicators) has a wealth of more detailed information in this regard.

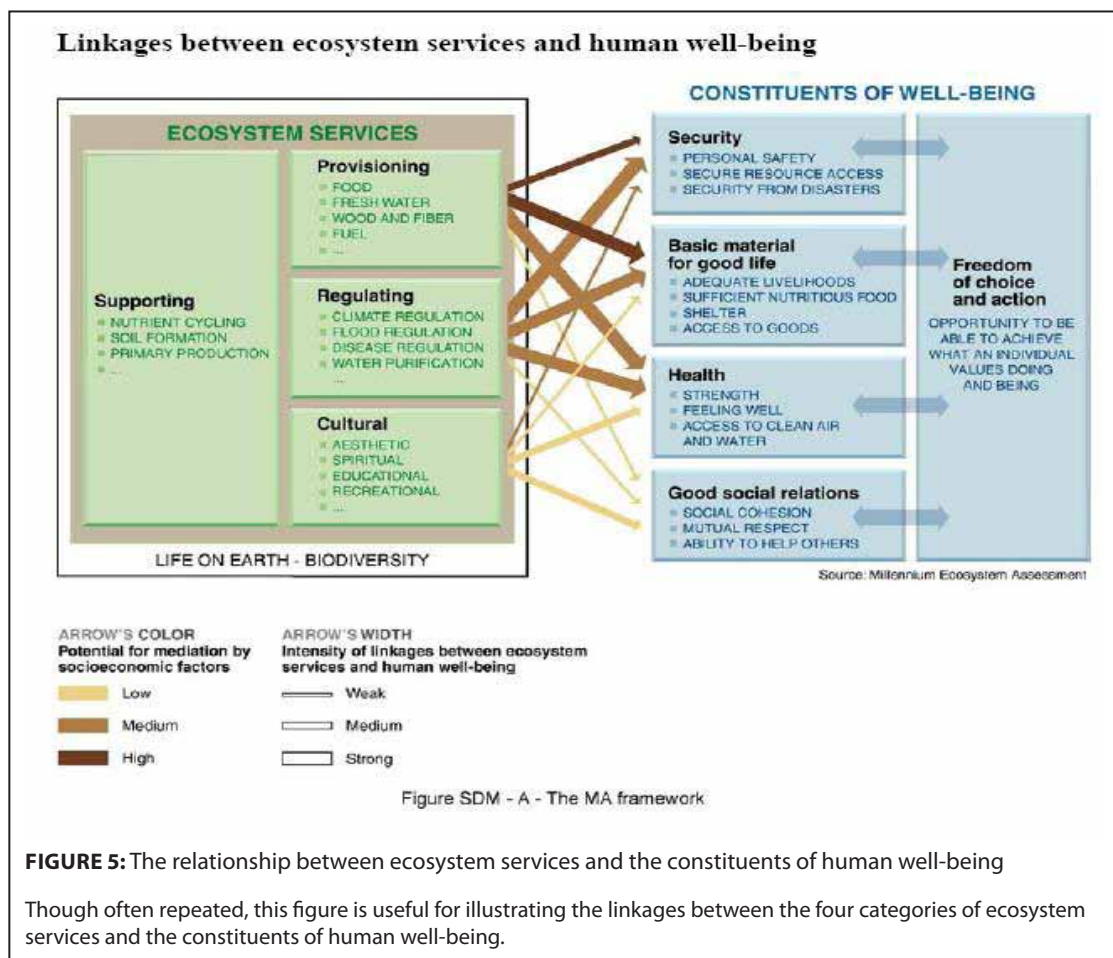
⁸ See introductory presentation “Linking poverty and biodiversity: how, what and when?” for more background information.

2.1.6. Ecosystem services, biomes and ecosystems

An ecosystem is a dynamic complex of plant, animal, and microorganism communities and their non-living environment interacting as a functional unit. Biomes are the largest unit of ecological classification that is convenient to classify (below the entire globe). Terrestrial biomes are typically based on dominant vegetation structure (e.g. forests, grasslands). Ecosystems within a biome function in a broadly similar way, although they may have very different species compositions. For example, all forests share certain properties regarding nutrient cycling, disturbance, and biomass that are different from the properties of grasslands. Marine biomes are typically based on biogeochemical properties. The WWF biome classification is commonly used, for example in the definitive Millennium Ecosystem Assessment (MA 2005: 599).

Ecosystem services are the benefits people obtain from ecosystems (MA 2005). The Millennium Ecosystem Assessment uses four different classes of ecosystem services. These are *provisioning services* such as food, water, timber, and fibre; *regulating services* that affect climate, floods, disease, wastes, and water quality; *cultural services* that provide recreational, aesthetic, and spiritual benefits; and *supporting services* such as soil formation, photosynthesis, and nutrient cycling (MA 2003). The concept “ecosystem goods and services” (EGS) is synonymous with ecosystem services. The relationship between ecosystem services and human well-being is commonly depicted as in Figure 5.

A great deal more information on this topic can be obtained from the MA website (www.maweb.org) as well as the forthcoming MA methods manual, *Assessing ecosystems and human well-being: a guide to the process*.



2.1.7 Environmental Income

Environmental income specifically refers to income generated from ecosystem goods and services, in other words the *value* that individuals or communities derive from natural resources (Sjaastad *et al.* 2005; WRI 2005). Though income types differs depending on the ecosystem, the community, and various other factors, environmental income has been found to be nearly universally important to poor households (WRI 2005). Like ecosystem services, environmental income can be derived in several distinct ways. It might accrue to households through direct use of the ecosystem services, for instance consuming bushmeat, or using wood products in home construction. Where markets exist, goods found in ecosystems can be sold for cash, or exchanged for goods like school fees. Finally, if appropriate governance regimes are in place, households can collect money from community-based resource management schemes, stumpage fees or through other taxes on the use of the natural environment in which they live. Environmental income is especially important for the poor because it often constitutes a large share of their cash income.

The concept of environmental income is used by many international environment and development organisations, notably the World Bank, UNEP, UNDP, and in the major study (calculated as GDP of the Poor), *The Economics of Ecosystems and Biodiversity* (see www.teebweb.org).

2.1.8 Closely linked concepts: governance, markets capacity

Three closely linked concepts—governance, markets and capacity—merit mention, based on their relevance to the intersection of biodiversity and poverty:

- **Governance** is the exercise of political, economic and administrative authority in the management of a country's affairs at all levels. It is a neutral concept comprising the complex mechanisms, processes, relationships and institutions through which citizens and groups articulate their interests, exercise their rights and obligations and mediate their differences. However, good governance is value laden. It addresses the 'correct' allocation and management of resources to respond to collective problems; it is characterised by participation, transparency, accountability, rule of law, effectiveness and equity.
- **Markets** are the institutions and interactions of buyers and sellers of a particular good or service with the purpose of facilitating trade. Even in a free market society, there is some governance of the markets.
- **Capacity** is the skills, knowledge and resources needed to perform a function. Capacity development is the process by which individuals, groups, organisations, institutions and countries develop their abilities, individually and collectively, to perform functions, solve problems and achieve objectives. Capacity building differs from capacity development in that the latter builds on a pre-existing capacity base. The objective of both capacity development and capacity building is to help governments, organisations and/or individuals to attain a level of self-sufficiency that enables them to effectively manage their own affairs.

The relevance of these concepts to the topic of the Consultancy is explored through the text box below, contributed by the United Nations Development Programme (UNDP).

TEXT BOX: UNDP approach to poverty and biodiversity

UNDP believes that there are two key factors that will ultimately determine the success or failure of human societies to manage their biodiversity, and avoid impoverishing the poor and already vulnerable segments of society:

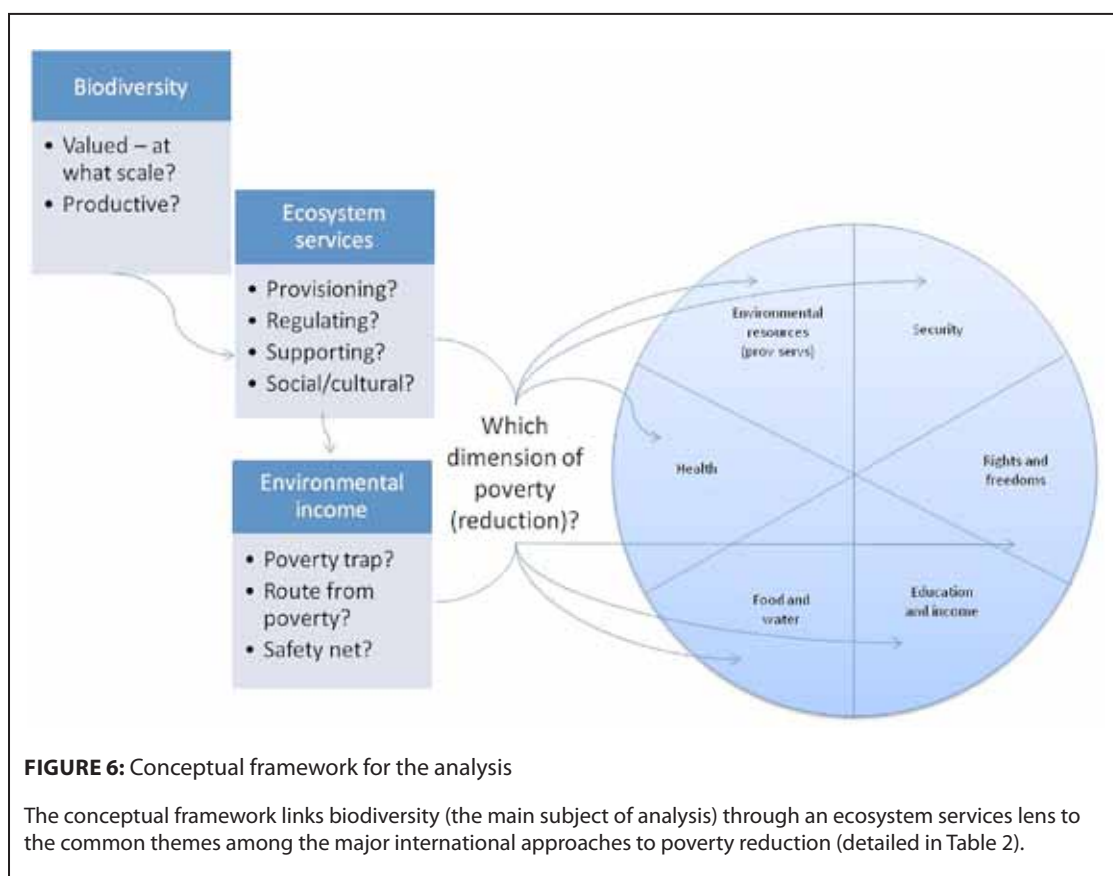
(i) **The strength of governance systems:** does the country have the policies and regulations, effective institutions, accountable decision making systems and property rights needed to manage ecosystems effectively? Does society have the capacity and the will, to ensure equitable development, for instance by re engineering benefit access arrangements for natural resource uses? Where there is a need to forgo current consumption of natural resources to avoid larger long-term costs associated with ecosystem loss and degradation, social safety nets need to be developed and financed. These should be designed to compensate the current costs of foregoing resource use (providing alternative sources of energy, providing savings and loan schemes for income diversification, etc.); and

(ii) **The ability to address market failure:** Market failure arises when the market fails to ascribe a value to the numerous services provided by ecosystems. This leads to the conversion of ecosystems (i.e. to farm land with market value) or the overharvest of economically important components of ecosystems (such as fish) without taking into account the broader ecosystem values that are being forfeited as a consequence. Like street lights and defense, many ecosystem services are public goods, and are non excludable; meaning that the supplier cannot prevent the public at large from becoming free riders and consuming them without paying for them. Accordingly, there is no incentive for the private sector to supply the service. Without a State acting in the public interest, street lights would not be funded. Similarly with biodiversity, there is a role for the State to regulate natural resource use and natural resource use change to maintain the supply of ecosystem services. Market failure can also be addressed by creating new markets that commoditize ecosystem services. The cap and trade markets for greenhouse gas emissions are an example of such an attempt; REDD (reducing emissions from deforestation and degradation) markets would place a value on carbon storage within forests. The key challenge is to structure these markets so that they benefit the poor, and not wealthier communities (several attempts at creating market mechanisms have failed on this score). The distributional consequences of reforms need to be assessed, and measures taken to ensure that the poor benefit.

Source: Nik Sekhran, reviewer comments

2.2 CONCEPTUAL FRAMEWORK

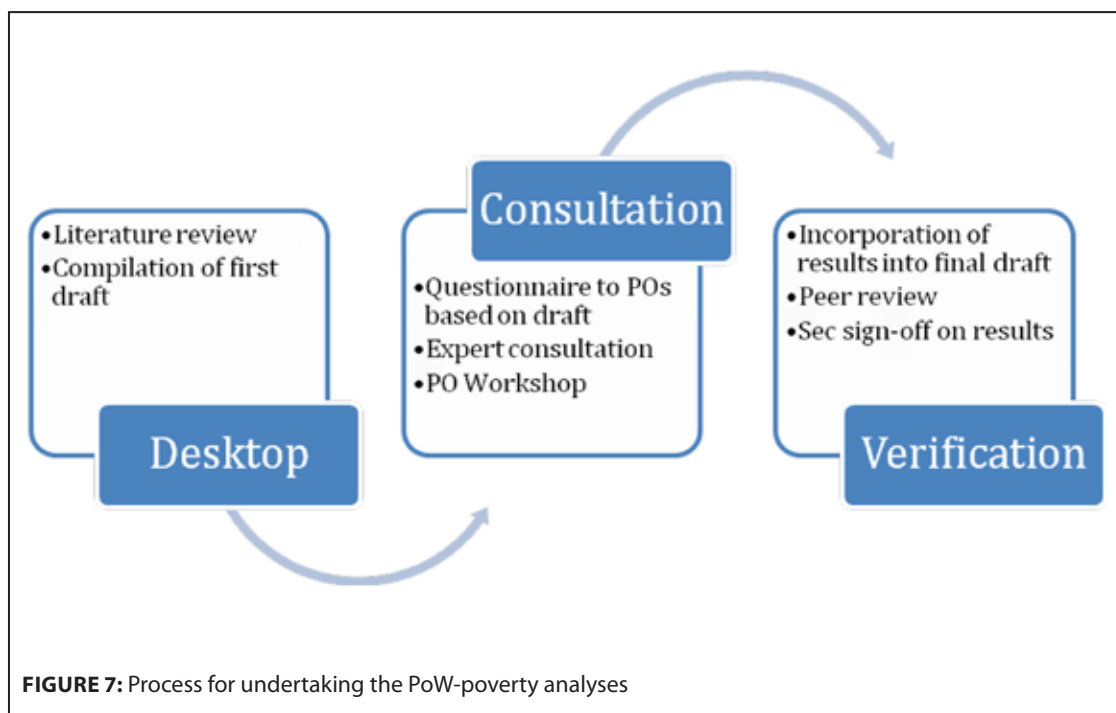
Based on the aforementioned definitions, the Consultants used the conceptual framework indicated in Figure 6 to guide their analysis of the different angles and relations between poverty and biodiversity addressed in each PoW.



2.3 ANALYTICAL ROAD MAP AND TIMELINE

For each of the PoWs, the following consistent approach was undertaken (as indicated in the simplified process diagram, Figure 7).

- A desktop review of relevant literature on the relationship between biodiversity and poverty and the Programme of Work theme;
- Consultation with the CBD Biodiversity for Development Initiative and revision to the draft;
- Questionnaire to the relevant Programme Officer (Annex 1) and subsequent revision to the document;
- Consultation with poverty and biodiversity experts ('mini-workshops'), including on the relevant thematic ecosystem, on the basis of a draft;
- Workshop with the Programme Officers and other Secretariat staff (Annex 2);
- Peer review by experts at the intersection of poverty and biodiversity ; and
- Acceptance of the document by the CBD Biodiversity for Development Initiative.



2.4. DETAILS ON THE APPROACH USED TO ANALYSE POW - POVERTY LINKAGES

The team devised a multi-method approach to analyse the extent to which poverty and socio-economic issues are integrated into the seven thematic programmes of work of the CBD. Four principal methods were employed in this study and these were:

1. A desktop review of relevant literature on the relationship between biodiversity and poverty and the Programmes of Work;
2. Content analysis of the seven CBD thematic PoWs text;
3. Questionnaire for CBD Programme Officers; and
4. Two workshops: (i) UNEP-WCMC staff with expertise on specific programmes of work, and (ii) CBD Programmes Officers and other staff at the CBD Secretariat.

2.4.1. Desktop review of relevant literature on biodiversity-poverty relationships

The team reviewed literature on the relationships between biodiversity and poverty in order to obtain a high level of understanding about the following issues:

1. Key terms and concepts;
2. Conceptual frameworks;
3. Discourse regarding poverty—biodiversity linkages, and
4. Ecosystem services provided by ecosystem types mirrored in the seven thematic PoWs (i.e. agricultural, dry and sub humid lands, forest, inland water, islands, marine and coastal and mountain biodiversity) and appropriate research methods for this type of study.

Literature was also reviewed in order to obtain appropriate research methods for this type of study and in search of a poverty analysis of an environmental Convention. The literature review provided useful background information on the poverty-biodiversity relationships and on the ecosystem services provided by different ecosystem types. Based on this information, the team undertook an analysis of: (i) the ecosystem services (as per the Millennium Ecosystem Assessment), provided by each ecosystem type

as mirrored in the seven thematic PoWs; and (ii) examples of linkages of the services to poverty reduction and sustainable livelihoods; and (iii) linkages between these and international poverty frameworks such as the Millennium Development Goals (MDGs) and their targets, sustainable livelihoods approach or framework (SLA or SLF), the World Bank Poverty Reduction Framework and the Development Assistance Committee (DAC) Guidelines on poverty reduction. However, we could not find a poverty analysis of an international environmental Convention. Literature reviewed for each PoW is contained in Section 7 of this report.

2.4.2. Review of the thematic Programmes of Work

2.4.2.1. Content analysis

As mentioned in the preceding section, we are not aware of a poverty analysis of an international environmental Convention. Thus, devising a sound and valid methodology for the analysis of the extent to which socio-economic issues and poverty are integrated into PoWs was a major task of the consultancy. The team proposed a methodology based on content analysis (Krippendorff 2004; Neuendorf 2002). Content analysis is an in-depth analytical technique using quantitative and/or qualitative methods to determine the presence of certain words or concepts within texts or sets of texts. Researchers quantify and analyse the presence, meanings and relationships of such words and concepts, then make inferences about the messages within the texts, the audience, and even the culture and time of which these are a part. Texts can be defined broadly as books, book chapters, interviews, discussions, historical documents, conversations, or any occurrence of communicative language. To conduct a content analysis on any such text, the text is coded, or broken down, into manageable categories on a variety of levels—word, word sense, phrase, sentence, or theme—and then examined using one of the content analysis basic methods: conceptual analysis or relational analysis. Content analysis asks the following questions which are considered in Table 3.

TABLE 3: Content analysis method - pilot

Question	Results
1. Which data are analyzed?	Key words indicating linkages from the PoW's thematic area to poverty
2. How are they defined?	Through literature review, PO and a limited number of expert interviews.
3. What is the population from which they are drawn?	PoW text: Annex to CoP Decisions; goals, targets, objectives within the PoW (including 2010 Target)
4. What is the context relative to which the data are analyzed?	Direction by CBD POs and in some cases expert opinion (senior UNEP-WCMC staff, other experts)
5. What are the boundaries of the analysis?	Key linkages to poverty defined at the outset and agreed for each PoW
6. What is the target of the inferences?	Degree to which the PoW addresses relevant linkages to poverty

In this study, content analysis was used to determine the presence of the words “poverty” and “livelihoods” in the PoW text. The PoW on inland water biodiversity was used as a pilot study. The team simply examined the frequency of the occurrence (word counts) of the terms “poverty” and “livelihoods” in the rationale, goals, targets, objectives, implementation, and, where available, indicators within the PoW. The preliminary content analysis undertaken did not yield the necessary information on poverty linkages and the words “poverty” and “livelihoods” did not feature in the PoWs text.

The team decided to broaden the search to include other words and sets of words or phrases that allude to poverty or elements of poverty either explicitly, directly and indirectly (e.g. gender, capacity-building, indigenous and local communities, participation, equity, sustainable use, benefit-sharing, fair and equitable sharing of benefits). The search returned a significant number of phrases that the team thought alluded to poverty reduction and livelihoods either directly or indirectly.

The team decided to analyze the text of the PoW on Inland Water Biodiversity as a pilot, line by line and word by word in order to ascertain the context in which poverty and poverty related words were used. However, upon close examination of the context in which most of these phrases were used in the Inland Water Biodiversity PoW, the team concluded that some of these words allude to poverty explicitly, some directly, and others indirectly or implicitly. Based on the pilot study, the team developed and subsequently used the following categories to classify the extent to which ‘poverty’ issues are addressed in each of thematic Programme of Work (Table 4). The content analysis approach undertaken and refined through the pilot study of the Inland Water Biodiversity PoW was subsequently applied to all PoW reviews.

TABLE 4: Categories of the extent to which poverty is address in the Po

Degree of reference to poverty	Description
Explicit	Poverty is clearly and intentionally articulated in the PoW as one of the implementation aims of the PoW.
Direct	Poverty and poverty related concepts and activities are stated/referenced in the PoW.
Indirect	Poverty is not mentioned but concepts that are related to it are.
Implicit	No explicit, direct or indirect reference to poverty, related concepts and activities. But implicit meaning or linkages to poverty identified by the consultants.

2.4.2.2 Revisions to the approach and template

A series of revisions were made to the approach in order to accommodate the lessons learned during the pilot exercise in order to maintain some consistency in the analysis of each PoW. Between UNEP-WCMC and the CBD Biodiversity for Development Initiative, a template for consistent analysis between the PoWs was devised (see Table 4).

The approach to the analysis matrices was also clarified, as each of the PoWs have their own structure and may be very different when compared to one another. To keep a certain logic of what we wanted to analyze, we focused on the following “more or less implicit” content of each PoW:

- a. Baseline of the PoW:** The analysis presented to justify the PoW. What is written in the PoW as justification? In other words, the baseline is the description of the problems / challenges (related to poverty) that the PoW wants to deal with; this is what justifies the existence of the PoW. This includes supporting CoP decisions. Without problems the PoW has no justification. Therefore baseline and justification, in this context, are essentially the same.
- b. System of goals:** Objectives, targets, goals, presented within the PoW addressing poverty. In general we should find indicators (outcome indicators or impact indicators) for goals and objectives and integrate them in a monitoring system in order to track implementation.
- c. PoW Strategy (or implementation strategy of the PoW):** Which poverty alleviation related activities, measures or implementation mechanisms are suggested by the PoW? What is the PoW’s strategy to achieve the goals?
- d. Monitoring / Evaluation / Lessons learned (including indicators or indicator discussion):** What are the indicators or parameters used for evaluation of the PoW impacts on poverty (In-Depth Reviews)?

These four components are therefore the four columns of the analytical matrices for analysis of the PoWs. Two matrices were deemed necessary by the client for the assignment:

1. A matrix showing the results of the poverty analysis; and
2. A proposal of a desirable matrix, showing how to fully / coherently link the PoW to poverty reduction (drafted in order to be discussed and designed during the workshop with the Programme Officers).

Finally, each PoW was analyzed with the revised content analysis framework in its entirety (see Section 3). In addition, the material is presented in summary matrices which were designed by the CBD Biodiversity for Development Initiative. These matrices summarize the actual current status of each PoW as well as the “desired state” of the PoW, in order to better mainstream poverty into the various elements of each PoW (Table 5)⁹

TABLE 5: Content analysis method—revised

Question	Results
(What is the) Description of the Programme of Work	The basic description of the PoW and its aims.
(What are the) Linkages of the PoW theme to poverty (inferred, assumed or demonstrated)?	Explanation of how the PoW theme links to poverty alleviation. Includes a table describing the links between the ecosystem services of the type of biodiversity to recognized international poverty frameworks.
a) What is the) Baseline ¹ of the Programme of Work	The baseline (or justification) of the Programme of Work is the description of the problems and challenges that the PoW wants to address. This is the problem statement that justifies the existence of the PoW. In other words, without problems, the PoW has no justification.
i) Does the baseline analysis of the PoW consider poverty (including the indirect effects of the PoW on poverty)?	The question of whether the baseline of the PoW considers poverty issues is important since, if the PoW does not consider poverty issues in the problem analysis, it will not have any basis to establish objectives/goals/targets/purposes related to poverty reduction within the system of goals—the vertical coherence of the PoW. The opposite is also possible: if the PoW considers poverty concerns in the baseline and then these poverty concerns are not reflected in the system of goals, there will be also a lack of vertical coherence within the PoW. The desirable situation is to have poverty analysed in the baseline and then addressed in the system of goals.
b) (What is the PoW's) System of goals	The system of goals means all the elements that describe what the PoW wants to achieve through purposes, goals, objectives, targets, etc. of the PoW. As mentioned previously, each of the PoWs has a slightly different formulation of its system of goals, which are explained in turn.
i) (What are the PoW's) Targets	Some of the PoWs contain targets, especially those which are newer. If there are no targets within the PoW itself, the goals, objectives or even activities that contribute to the 2010 Targets and Strategic Plan are considered, but only in terms of targets and goals that address poverty issues.
ii) Does the system of goals of the PoW consider poverty reduction?	Assessment of whether or not the purposes, goals, objectives, targets, etc. of the PoW address poverty. If poverty considerations exist within the baseline of the PoW, it is especially important that this consideration is reflected in the system of goals.
c) (What is the) Implementation strategy of the PoW	The strategy of the PoW is the Activities of the Parties, supporting activities involving main partners and other collaborators.
i) (What are the) Activities, measures and/or implementation mechanisms	These are the strategic proposals of the PoW to achieve the goals and objectives. Analyzing the full strategy helps to understand the vertical coherence of poverty related elements in the PoW.
ii) (What are the) Tools for implementation	The tools and methods used by Parties and other partners and collaborators in order to carry out the activities. Some examples are: payment for ecosystem services, Community-Based Natural Resources Management, and Integrated Water Resources Management. In some cases, In-Depth Reviews and National Reports can be analyzed in order to gather this data. In others, we can consider the guidance that the COP provides to the GEF. In accordance with Article 21 of the CBD, the COP determines the policy, strategy, program priorities, and eligibility criteria for access to and utilization of the financial resources available for biodiversity by the GEF.
iii) Does the implementation strategy of the PoW (sufficiently) consider poverty reduction?	Assessment of how well poverty considerations are reflected through the implementation strategy of the PoW.

⁹ The baseline is the description of the problems / challenges that the PoW wants to deal with (this is what justifies the existence of the PoW).

Question	Results
d) (What are the) Monitoring, Evaluation and Lessons learned	If the In-Depth Review of the PoW is a monitoring and evaluation instrument of the PoW, then the findings and lessons learned of the In-Depth Review should lead to an update of the PoW. The In-Depth Review is simultaneously the new baseline closing the planning cycle and providing a new starting point for the design of updated or reformulated goals, objectives, implementation strategy, etc.
l)(What are the) Indicators or parameters used for evaluation	An objective or goal without a measurable indicator cannot be monitored. In general, indicators (outcome, performance or impact indicators) are necessary for goals and objectives in order to integrate them into a monitoring system and thereby to track implementation.
ii) Does the monitoring / evaluation system consider poverty reduction?	In-Depth Reviews and their contents related to poverty reduction / human-wellbeing, livelihoods, etc.
e) (What is the) scope for mainstreaming poverty into the PoW	Assessment based on authors understanding, input from the PO of that thematic PoW and peer review from poverty and biodiversity experts.
i) (What are potential or actual) Mainstreaming indicators	Proposal of indicators which may be used in order to improve poverty mainstreaming into the PoW. Some of these have been developed, others are proposals of indicators which are likely to be feasible based on UNEP-WCMC's work on indicators, especially the Biodiversity Indicators Partnership.
Conclusions	Summary of the presence of poverty in the thematic PoW, including the "vertical coherence" from the justification or problem statement of the PoW, through the system of goals and implementation.

TABLE 6: Analytical matrix analysis

Element of the PoW:	Linkages to Poverty, Livelihoods and Human Well-Being:	Indicators used for Biodiversity-Ecosystem Services-Poverty linkages:
1. Baseline approach (COP Decisions/ background)	<i>Existing COP Decisions and baseline data (problem analysis)</i>	<i>Baseline indicators included in the PoW</i>
2. System of Goals	<i>Existing purposes, goals, targets, objectives within the PoW (including 2010 Target and Strategic Plan)</i>	<i>Impact indicators included in the PoW</i>
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	<i>Summary of existing strategies and actions to address human well being and poverty reduction through PoW</i>	<i>Performance Indicators included in the PoW. Any impact chains available</i>
4. Evaluation / In-Depth Reviews	<i>Baseline data actualized, monitored or evaluated impact and/or performance, impact chain analyzed, further discussion of improved options for interventions</i>	<i>Indicators used in the in-depth review?</i>
5. Lessons learned / Case Studies / Evidence	<i>Lessons learned documented, case studies available for the PoW</i>	<i>Lessons learned documented, case studies available specifically for the indicators</i>

Following the Programme Officer workshop, the final column was deleted due to lack of available information in most cases and a consensus that the indicators should support the overall CBD implementation of the strategy as part of the already defined biodiversity indicators framework.¹⁰

¹⁰ See www.twentyten.net for details.

TABLE 7: “Desirable matrix”

Component of the PoW:	Linkages to poverty, livelihoods, human well-being:	Indicators used for Biodiversity-Ecosystem Services-Poverty linkages:
1. Baseline approach (COP Decisions/ background)	<i>The desirable baseline information to address poverty and socio-economic, cultural concerns</i>	<i>Poverty related, socio-economic-environmental linkage aspects are necessary to assess in order to have a proper baseline</i>
2. System of Goals	<i>The system of goals (purposes, goals, targets, objectives) are necessary to address the poverty, socio-economic and cultural concerns identified in the baseline (streamlined with the new Strategic Plan)</i>	<i>Indicators that are appropriate to measure the formulated goals, objectives, targets included in the system of goals</i>
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	<i>The proper or adequate means, activities, supporting mechanisms, actors (stakeholders) involved within an implementation strategy to achieve the formulated goals, objectives, targets (formulated system of goals)</i>	<i>The key parameters or performance indicators to measure and track the completion of main activities of the implementation strategy</i>
4. Evaluation / In-Depth Reviews	<i>Indicators (outcome indicators, performance indicators) that have to be monitored / evaluated: frequency, data Collection, stakeholders involved</i>	<i>Key questions and indicators to be evaluated and monitored</i>
5. Lessons learned / Case Studies / Evidence	<i>Outline and guiding questions to be answered and documented for lessons learned, dissemination, capacity building, implication for the update of the PoW</i>	<i>Key guiding questions to generate the lessons learned on the indicators</i>

The right-hand column was also deleted from the “desirable matrix” following the CBD workshop. The development of integrated Poverty-Biodiversity indicators specifically for the PoWs would require information and preconditions which were not possible to generate within the scope of the consultancy. Development of new integrated indicators would involve steps such as: conceptualizing poverty relations in each PoW, elaborating poverty-related targets according to the PoW goals, consolidating a set of poverty and biodiversity indicators to monitor the achievement of those targets and ensuring periodic updating of the indicators. The consultants recommend further elaboration of the intentions of the Convention and its PoWs with regard to poverty, following on which appropriate indicators could be developed under the overarching CBD strategy. Poverty-Biodiversity Indicators are part of the monitoring process and should serve to achieve established objectives—they are not ends in themselves¹¹.

Finally, the authors found the ecosystem services approach important to emphasize—*how critical biodiversity is to underpinning the ecosystem services that people depend on, and which are necessary to achieve development goals and targets set by the international community. The team was inspired by the framework prepared by Cromwell, Cooper and Mulvany (1999) and adapted it for this purpose. Each section therefore also contains an analysis of the linkages of the PoW theme to relevant ecosystem services, and to some of the existing international development frameworks.*

¹¹ While the development of such a set of integrated indicators for the PoWs was not feasible within the scope of the consultancy, should anyone in future wish to develop integrated Poverty-Biodiversity Indicators (for the PoWs or other uses), a how-to guide can be found in Annex 4. In general, indicators should be consistent with existing frameworks such as the MDGs and those of the 2010 Biodiversity Indicators Partnership, but indicators as described in Annex 4 are feasible. Integrated indicators can complement established development and biodiversity indicators through a richer understand of the contribution of biodiversity to poverty reduction and vice versa.

TABLE 8: Ecosystem services approach to complement the analysis

Table section:	Ecosystem services provided by Agricultural biodiversity	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
				MDGs and Targets	SLA Capitals	WB Pillars	Development Assistance Committee (DAC) Guidelines on poverty reduction
Contains:	Category	Description	Specific examples or illustrations of the linkages	Mention of relevant goals (G) or targets (T) in the MDG framework	Relevant types of capital highlighted: Financial (F), Human (H), Natural (N), Social (S), and Physical (P)	Relevance to the World Bank's three pillars to attacking poverty: Increasing opportunity (O), enhancing empowerment (E), and strengthening security (S)	Economic capabilities (E), Human capabilities (H), Socio-cultural capabilities (S), Political capabilities (PC), Protective capabilities (P)

In the Programme Officers workshop, one participant noted that it would be useful to then link back each aspect of poverty linkage back to the specific element of the Programme of Work. While this would indeed yield interesting results and the consultants would encourage another party to undertake that level of analysis, it was deemed too far outside the scope of work to be undertaken within this assignment.

2.4.2. Questionnaire for Programme Officers

A short but comprehensive open-ended questionnaire (consisting of 8 questions) for PoW Programme Officers tailored to each Programme of Work was designed by the research team at UNEP- WCMC in consultation with the CBD Biodiversity for Development Initiative. The questionnaire was designed to solicit information from the Programme Officers on the extent which poverty reduction objectives are already reflected in the PoW design and, wherever possible, implementation. A sample generic questionnaire is attached as Annex 1 to this document. It is intended to both supplement the desktop analysis with case-based information, as well as to 'validate' or clarify any points from the first draft of the desktop analysis from the responsible officers' perspectives.

2.4.3. Consultative Workshops

Consultative workshops formed a key part of data collection and analysis on the seven thematic PoWs of the CBD. Two sets of workshops were held.

a) Mini- workshops at UNEP-WCMC

Mini-workshops with UNEP-WCMC staff with relevant thematic expertise on each of the seven PoWs were held at UNEP-WCMC's premises. The mini-workshops reviewed the "actual" state of poverty integration within each PoW, and proposed some elements of the "desirable" framework.

b) Workshop with CBD Programme Officers

A workshop was held on 9 March at the CBD Secretariat in Montréal with a representative of the UNEP-WCMC consulting team and CBD staff including the Programme Officers. The objectives of the workshop were to:

- Familiarise Programme Officers and other key Secretariat staff with the consultancy and its preliminary findings on the extent to which poverty is mainstreamed into the CBD thematic Programmes of Work (PoW);
- To gain feedback and elaborate a common viewpoint by Programme Officers on:
 - To what extent do the CBD thematic PoWs already address poverty linkages?
 - Where do evident linkages to poverty exist which are not explicitly mentioned in the PoW documentation?
 - What are the gaps that have to be addressed in order to link PoWs coherently to development and poverty reduction processes, both individually (per PoW) and overall?
- Validate the preliminary results of the thematic PoW analysis consultancy commissioned by the CBD Secretariat; and
- Identify ways to link biodiversity and poverty reduction within the (existing and proposed post-2010) framework of the CBD, including the common elements of a poverty umbrella framework.

Key outcomes were:

- Shared understanding of the scope of the consultancy, its preliminary findings, and implications for further mainstreaming of poverty in the Convention framework;
- Technical input to the working process to “elaborate a poverty umbrella framework linking the implementation of the thematic CBD Programmes of Work to development and poverty reduction processes”, including common elements necessary for an umbrella framework;
- Programme Officer views/perspectives on the key questions listed above, as well as lessons learned from previous mainstreaming experience; and
- Common agreement on next steps to improve poverty mainstreaming in the CBD framework, with particular reference to a possible agreement on a poverty umbrella framework at COP10.

The workshop report is included as Annex 2 to this document.

3. THE POW ANALYSES

Each of the thematic Programmes of Work were analyzed using the methodology described in Section 2 of this report. The results are summarized in this section, and are analyzed in section 4.

3.1 AGRICULTURAL BIODIVERSITY

TABLE 8: Analytical matrix—Agricultural Biodiversity (See text below for further explanation)

Element of the PoW:	Linkages to Poverty, Livelihoods and Human Well-Being:
1. Baseline approach (COP Decisions/ background)	Linkages to poverty reduction appear in the baseline of the PoW (www.cbd.int/agro/whatstheproblem.shtml), including several CoP decisions of the PoW, as evidenced by explicit reference to elements of poverty and poverty reduction such as food security and the need to respect farmers' traditional knowledge. However, explicit reference to poor people themselves, their food security, nutrition and livelihoods, is missing in the baseline.
2. System of Goals (Overall objectives, approach and guiding principles; programme elements and Operational objectives)	Direct reference to elements of poverty (e.g. capacity building) are made in the PoW. However, the poor people themselves are not explicitly referenced in the PoW. Additionally, the PoW does not have goals and targets adopted from framework of goals and targets for 2010.
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	The majority of activities recommended by the PoW to parties under Programme element 3 (Capacity-building) make explicit reference to the elements of poverty such as participation of farmers and local communities (only correct if the participants are "poor") and benefit sharing arrangements. Other activities under Programme elements 1, 2 and 4 make indirect reference to elements of poverty. However, explicit reference to poor people is absent from the activities recommended to Parties.
4. Evaluation / In-Depth Reviews	In-Depth Review of implementation of the PoW was carried out in 2008 (UNEP/CBD/SBSTTA/13/INF/2).
5. Lessons learned / Case Studies / Evidence	Many available.

TABLE 9: Desirable matrix—Agricultural Biodiversity

Component of the PoW:	Linkages to poverty, livelihoods, human well-being:
1. Baseline approach (COP Decisions/ background)	Poverty, poverty reduction and poor people should be explicitly analyzed in the baseline of the PoW together with clear actions on how poverty reduction will be achieved through the PoW on agricultural biodiversity. The principles of pro-poor agricultural policies, “at least do no harm” to poor people and respect for human rights must be observed in the conservation of agricultural biodiversity.
2. System of Goals	The PoW should have clear objectives, goals and targets on agricultural biodiversity and poverty issues as well as indicators against which these will be monitored. The PoW should adequately address the impacts of agriculture on other areas (i.e. on other ecosystem services such as water use, water quality, etc.) Agricultural biodiversity (in practice) tends to be limited to biodiversity of direct use for agriculture and not impacted by it.
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	<ul style="list-style-type: none"> • <i>Activities to ensure food security, adequate nutrition and stable livelihoods;</i> • Community-based management; • Agricultural Empowerment of Rural People; • Integration of climate change considerations including adaptation with a link to poverty; • Access and benefit sharing (ABS) of genetic resources from agricultural biodiversity where poor people are beneficiaries; • Active participation of poor people and respect for their knowledge in agricultural biodiversity management practices; • Payment for ecosystem services from agricultural practices and PES services supplied to agriculture (e.g. pollinators); • Mainstreaming of agricultural biodiversity issues into national development strategies; • Food provision to urban areas to affordable prices; • Export/import policies avoiding externalization of environmental costs and footprint to other countries
4. Evaluation / In-Depth Reviews / national reports / other sources	Indicators are needed in addition to the In-Depth Reviews. Currently the format of the PoW and absence of targets makes it difficult to come up with indicators. The existing CBD related indicator is “Areas of agricultural ecosystems under sustainable management”.

DESCRIPTION OF THE PROGRAMME OF WORK

Biodiversity and agriculture are interrelated. In recognition of this, the Conference of the Parties to the Convention on Biological Diversity established a Programme of Work (PoW) on Agricultural Biodiversity in 1996. This was further elaborated and endorsed in May 2000 (decision V/5, Annex), on the basis of the main findings of an assessment of ongoing activities and instruments on agricultural biodiversity carried out by the Secretariat and the FAO (UNEP/CBD/SBSTTA/5/INF/10) and the recommendation of SBSTTA at its fifth meeting (recommendation V/9).

According to the PoW agricultural biodiversity is “a broad term that includes all components of biological diversity of relevance to food and agriculture, and all components of biological diversity that constitute the agro-ecosystem: the variety and variability of animals, plants and micro-organisms, at the genetic, species and ecosystem levels, which are necessary to sustain key functions of the agro-ecosystem, its structure and processes...” (CBD 2009). This definition excludes proper consideration of the impacts of agriculture outside agriculture. Agricultural biodiversity is complex, and involves a range of components. The PoW was structured in such a way as to address this complexity. It is mainly composed of four elements (assessment, adaptive management, capacity building and mainstreaming); three International Initiatives (on pollinators, soil biodiversity and biodiversity and nutrition) were subsequently developed as issues requiring specific attention. The four elements of the Programme of Work do not act in isolation, rather are closely linked to each other and are intended to be mutually reinforcing. The linkages between and

among elements taking into account spatial and temporal scales and management levels is a reflection of the main approach within which agricultural biodiversity operates, namely the Ecosystem Approach.

i) Linkages of agricultural biodiversity to poverty

Agricultural biodiversity provides a myriad of ecosystem services that are essential to poverty reduction and economic development. Agricultural biodiversity is the basis of sustainable food production and livelihood systems, especially for traditional farmers. Agricultural biodiversity also provides ecosystem services such as soil and water conservation, maintenance of soil fertility and biota, and pollination, all of which are essential to human survival. In addition, genetic diversity of agricultural biodiversity provides species with the ability to adapt to a changing environment and evolve, by increasing their tolerance to frost, high temperatures, drought and water-logging, as well as their resistance to particular diseases, pests and parasites for example. This is particularly important regarding climate change.

In addition, experts have stated that the conservation and sustainable use of the whole range of crop varieties and farm animal breeds is a key to the global reduction of poverty (GTZ 2009). In this respect, agricultural biodiversity is essential to achieving the Millennium Development Goals (MDGs) (particularly Goal 1: to halve, by 2015, the proportion of the world's people whose income is less than a dollar a day and the proportion of people who suffer from hunger).

TABLE 10: Links of the ecosystem services provided by agricultural biodiversity to international poverty frameworks

Ecosystem services provided by Agricultural biodiversity	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)**	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Provisioning services:						
Food	Of the 270,000 species of higher plants, about 7,000 species are used in agriculture, but only three (wheat, rice and maize) provide half of the world's plant-derived calorie intake.	Agricultural biodiversity is the basis of sustainable food production and livelihood systems, especially for traditional farmers. It is also the basis of the food industry. Food is produced intentionally for sale or direct consumption.	Most	F, H, S	P, E	Most
Fresh water	Agricultural diversity aids water storage and retention for irrigation and agricultural use.	Freshwater is an ecosystem service upon which agriculture depends. There are some linkages (through e.g. soil moisture content etc.) but by and large water supports agro-ecosystem functioning and not the other way round. This one is a good example of how agriculture interferes with other ecosystem services and the ability of ecosystems to deliver ES.	G1, T1, G4, T5, G5, T6, G7, T10, T11	H, N	O, S	E, H, S
Fibre & Fuel	Production of logs, fuel wood and fodder	Produced intentionally for sale or direct consumption	Most	F, H	O, S	Most

Ecosystem services provided by Agricultural biodiversity	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Biochemicals (Medicinal plants)	Use of wild plants and animals for medicines and as a source of income is well documented. For example, about 400 indigenous medicinal plants species are sold in Kwazulu Natal in South Africa. In Machakos in Kenya, 120 species of medicinal plants are used	Traditional medicines derived from agricultural biodiversity are an important source of income through trade, health provision as well as creating employment.	Most	F, H, N	O, S	Most
Regulating services:						
Water purification and regulation	Watershed protection At present tends to reduce watershed protection. More attention to impacts on watershed protection needed.	Benefits of services appropriated at various levels, from local to global	Most	H, N	S	Most
Biological control	Predators, parasitic wasps and micro-organisms play a key role in controlling agricultural pests and diseases. For example, more than 90% of potential crop insect pests are controlled by natural enemies living in natural and semi-natural areas adjacent to farmlands. CAST (1999). They have estimated the substitution of pesticides for natural pest control services at a cost of US\$54 billion per year. Many methods of pest control, both traditional and modern, rely on biodiversity.	Essential support to sustainable food production and livelihood systems for all types of farmers. Benefits largely accrue at a local level.	G1, T1, T2	H, N	O, S	E, H, S
Pollination and seed dispersal	There are more than 100,000 known pollinator species (bees, butterflies, beetles, birds, flies and bats). Pollination mediated by components of agricultural biodiversity is an important function in agro-ecosystems. The global financial value contributed to agriculture each year by pollinators, representing 9.4% of the world agricultural production used for human food in 2005, or approximately €153 billion.	Pollination is critical for food production and human livelihoods, and directly links wild ecosystems with agricultural production systems. Benefits largely accrue at a local level.	G1, T1, T2	H, N	O, S	E, H, S
Climate regulation	Carbon sequestration	The issue here is storage in soils. Additional consideration is carbon balance aspects of land conversion and use.	Most	H, N	S	H, S
Cultural services:						
Aesthetic	Scenic landscapes; species (especially of charismatic animals), crop varieties of cultural importance	Direct use value (recreation), indirect use value, existence value. Benefits of services accrue at a various levels, from local to global.	Most	S	O, E	E, H, S,

Ecosystem services provided by Agricultural biodiversity	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Supporting services:						
Soil development (conservation, formation)	Microbes contribute a wealth of gene pools that could be a source of material for transfer to plants to achieve traits such as stress tolerance and pest resistance, and large-scale production of plant metabolites.	Soil development provides essential support to sustainable food production and livelihood systems for all types of farmers. Moreover, agricultural biodiversity is important for the protection and conservation of soil and water resources, for example through vegetative cover and appropriate management practices, and the consequent maintenance of the integrity of landscapes and habitats. Benefits largely accrue at a local and regional level. This is mostly related to nutrient cycles. There is a role of BD in "soil development" but the process is largely physical (more ecosystem level functions).	G1, T1, T2	H, N	O, S	E, H, P
Nutrient cycling	Nutrient cycling	Breakdown of organic matter and recycling of nutrients to maintain soil fertility and sustain plant and consequently animal growth. It provides essential support to sustainable food production and livelihood systems for all types of farmers. Benefits largely accrue at a local level.	G1, T1, T2, G4, T5, G5, T6, G7, T10, T11	H, N	S	E, H, P

* Financial (F), Human (H), Natural (N), Social (S), and Physical (P)

** Increasing opportunity (O), enhancing empowerment (E), and strengthening security (S).

*** Economic capabilities (E), Human capabilities (H), Socio-cultural capabilities (S), Political capabilities (PC), Protective capabilities (P).

Source: adapted from the Millennium Ecosystem Assessment (MA year?) and Cromwell, Cooper and Mulvany 1999 with authors' own analysis.

a) Baseline of the Programme of Work

According to the agricultural biodiversity PoW, agriculture faces two main challenges in relation to biodiversity:

- To sustain agricultural biodiversity and ecosystem services provided by, and necessary for, agriculture, and to mitigate the negative impacts of agricultural systems and practices on biodiversity that is not used directly, whether in the same or other ecosystems¹².

¹² This is not captured by the term "agricultural biodiversity" which can cause conceptual confusion about what we are talking about.

To address these challenges, agriculture is required to take into account different drivers of change such as:

- Indirect drivers such as demography (and the expected major growth of world population and food demand), economy (e.g. globalization, market, and trade forces), socio politics (e.g. consumption choices, and policy, institutional and legal frameworks), and science and technology;
- Direct drivers, e.g. climate change, natural resource availability (in particular water), overuse of agricultural chemicals and land-use changes.

All these drivers contribute to the loss of biodiversity both in agricultural and other ecosystems, food and livelihood security.

The CBD has recognized “the special nature of agricultural biodiversity, its distinctive features, and problems needing distinctive solutions” (CoP decision V/5, appendix). Indeed, a key reason that agricultural biodiversity is essential is that it is necessary to satisfy basic human needs for food and livelihood security. The following CoP decisions are relevant to the agricultural biodiversity PoW.

- Decision III/11: Conservation and sustainable use of agricultural biological diversity.
- Decision IV/6 (see also SBSTTA recommendation III/4): Agricultural biological diversity.
- Decision V/5: Agricultural biological diversity: review of phase I of the Programme of Work and adoption of a multi-year work programme.
- Decision VI/5: Agricultural biological diversity.
- Decision VII/3: Agricultural biological diversity.
- Decision VIII/23: Agricultural biodiversity.

i) Does the baseline analysis of the PoW consider poverty?

The linkages to poverty reduction appear in the baseline of the PoW, as evidenced by explicit reference to elements of poverty and poverty reduction namely human well-being, food security, livelihoods and the need to respect farmers’ traditional knowledge. For example, the PoW recognizes that “*the major challenge for agriculture is to ensure food security, adequate nutrition and stable livelihoods for all, now and in the future, by increasing food production while adopting sustainable and efficient agriculture, sustainable consumption of resources, and landscape-level planning to ensure the preservation of biodiversity*” (CBD 2010). *The PoW also asserts that “modern agriculture has enabled food production to increase, contributing much to improving food security and reducing poverty”.* While these concerns can be considered to be linked to poverty reduction, if they are applied equally to all individuals (i.e. that there is an element of reduction of inequalities), there is no explicit and direct reference to the poor people in the baseline with regards to their food security, nutrition and livelihoods. Reference to well-being does not specify poor people.

Additionally, several CoP decisions of the PoW make explicit reference to elements of poverty. In particular CoP 5 Decision V/5 paragraph 5, CoP 7 Decision VII/3 paragraph 13 and various paragraphs of CoP 6 Decision VI/5, Annex II and CoP 8 Decision VIII/23 make reference to elements of poverty such as the need to recognize the contribution of farmers, indigenous and local communities to the conservation and sustainable use of agricultural biodiversity and the importance of agricultural biodiversity to their livelihoods; these CoP decisions emphasize the importance of farmers’, indigenous and local communities’ participation in the implementation of the Programme of Work, and that the conservation and sustainable use of plant genetic resources is essential to hunger reduction and poverty alleviation. This is not necessarily poverty related—only if these groups are poor.

b) System of goals (overall objectives, approach and guiding principles, programme elements and operational objectives)

The PoW has three specific objectives:

- (a) To promote the positive effects and mitigate the negative impacts of agricultural systems and practices on biological diversity in agro-ecosystems and their interface with other ecosystems;
- (b) To promote the conservation and sustainable use of genetic resources of actual and potential value for food and agriculture;
- (c) To promote the fair and equitable sharing of benefits arising out of the use of genetic resources.

The Programme of Work on agricultural biodiversity is based on four mutually reinforcing programme elements and operational objectives for each element:

1. Assessments: to provide an overview of the status and trends of the world's agricultural biodiversity, their underlying causes, and knowledge of management practices.
2. Adaptive Management: to identify adaptive management practices, technologies and policies that promote the positive effects and mitigate the negative impacts of agriculture on biodiversity, and enhance productivity and the capacity to sustain livelihoods by expanding knowledge, understanding and awareness of the multiple goods and services provided by the different levels and functions of agricultural biodiversity.
3. Capacity Building: to strengthen the capacities of farmers, indigenous and local communities, and their organizations and other stakeholders, to manage agricultural biodiversity sustainably so as to increase their benefits, and to promote awareness and responsible action.
4. Mainstreaming: to support the development of national plans and strategies for the conservation and sustainable use of agricultural biodiversity and to promote their mainstreaming and integration in sectoral and cross-sectoral plans and programmes.

The four elements of the Programme of Work do not act in isolation; rather, they are closely linked to each other and are intended to be mutually reinforcing. The linkages between and among elements taking into account spatial and temporal scales and management levels is a reflection of the main approach within which agricultural biodiversity operates, namely the Ecosystem Approach. The PoW has few indicators (e.g. nitrogen loading) which to monitor and measure progress on overall objectives and programme elements.

i) Targets (within the PoW and with the framework of goals and targets for 2010)

There are no targets within the Agricultural Biodiversity PoW.

Furthermore, the PoW does not have goals and targets adopted from the framework of goals and targets for 2010 (CBD 2006: UNEP/CBD/COP/DEC/VIII/15). As the targets do not exist, the PoW does not have indicators to monitor and measure progress against targets.

ii) Does the system of goals of the PoW consider poverty reduction?

Indirect reference to elements of poverty (i.e. fair and equitable sharing of benefits arising out of the use of genetic resources) is made in specific objective (c) of the PoW and in Programme elements 2, 3 and 4 on adaptive management, capacity building and mainstreaming, respectively. These are not necessarily direct references (e.g. "livelihoods" need not necessarily refer to the poor), and poor people themselves are not explicitly referenced in the PoW. The PoW on Agricultural Biodiversity does not have goals and

targets adopted from the framework of goals and targets for 2010. The absence of targets may be impacting the extent to which poverty issues are addressed by the Agricultural Biodiversity PoW.

c) Implementation strategy of the PoW

i) Activities, measures and/or implementation mechanisms

For each of the four programme elements (assessment, adaptive management, capacity building and mainstreaming), the PoW provides activities for Parties to support its implementation as well as ways and means through which the PoW is implemented. Under Programme element 1 (assessments) there are 5 activities (1.1–1.5). Programme element 2 (Adaptive management) has 2 activities (2.1–2.2), Programme element 3 (Capacity-building) has 6 activities (3.1–3.2) and Programme element 4 (Mainstreaming) has 4 activities (4.1–4.4).

ii) Tools for implementation

The following adopted tools (including approaches, principles and guidelines) support the implementation of the PoW on agricultural biodiversity:

- The Principles of the CBD ecosystem approach
- The Addis Ababa Principles and Guidelines for the Sustainable use of Biodiversity

iii) Does the implementation strategy of the PoW (sufficiently) consider poverty reduction?

The majority of activities recommended by the PoW to parties under Programme element 3 (Capacity-building) make indirect reference to the elements of poverty such as participation of farmers and local communities and benefit sharing arrangements. For instance, activity 3.3 recommends “*providing opportunities for farmers and local communities, and other stakeholder groups, to participate in the development and implementation of national strategies, plans and programmes for agricultural biodiversity, through decentralized policies and plans, and local government structures*”. Activity 3.4 calls for the need to “*identify and promote possible improvements in the policy environment, including benefit-sharing arrangements and incentive measures, to support local-level management of agricultural biodiversity*”. Other activities under Programme elements 1, 2 and 4 make direct reference to elements of poverty. However, explicit reference to poor people themselves is absent from the activities recommended to Parties.

d) Monitoring, evaluation and lessons learned

i) Indicators or parameters used for evaluation

The Programme of Work on agricultural biodiversity was reviewed by SBSTTA 13 for the ninth meeting of the Conference of the Parties in 2008 (UNEP/CBD/SBSTTA/13/INF/2) with the full participation of the Parties, relevant international and other organizations, the private sector, civil society, and local and indigenous communities. SBSTTA concluded that the programme is a relevant framework for achieving the objectives of the Convention on Biological Diversity, and to address emerging issues such as climate change.

Conclusions

While poverty is alluded to and referenced in the PoW, explicit mention of the poor and their poverty and well-being is largely lacking.

3.2 DRY AND SUB-HUMID LANDS BIODIVERSITY

TABLE 11: Analytical matrix– Dry and Sub-Humid Lands Biodiversity (See text below for further explanation)

Element of the PoW:	Linkages to Poverty, Livelihoods and Human Well-Being:
1. Baseline approach (COP Decisions/ background)	Poverty highly apparent in the baseline (www.cbd.int/drylands/problem/) and in particular in CoP 5 Decision V/23; CoP 7 VII/2; CoP 8 VIII/2 and CoP 7 IX/17. Explicit reference is made to livelihood development, poverty alleviation, income diversification, indigenous and local communities, strengthening institutions for land tenure and conflict resolution.
2. System of Goals	Direct reference to elements of poverty is made in the operational objective under part B on “Targeted actions in response to identified needs”. Within the goals and targets for the PoW provided in the annex to CoP 8 Decision VIII/2, Goal 8, target 8.2 makes explicit reference to poverty.
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	Under part A, “Assessments” (Decision V/23, annex I, section II, part A), Activity 5 explicitly mentions poverty alleviation. Under part B on “Targeted actions in response to identified needs” (decision V/23, annex I, section II, part B), activities 7, 8 and 9 make direct reference to poverty issues. Some of the actions and ways and means of implementation include: economic valuation; payment for ecosystem services; sustainable pastoralism; decentralization and devolution of resource rights; institutions for land tenure and conflict resolution and mainstreaming, among others.
4. Evaluation / In-Depth Reviews	In-Depth Review of implementation of the PoW was carried out (UNEP/CBD/SBST-TA/11/4). Activities aimed at supporting poverty related issues in Activity 5 of the PoW have been achieved. These include information on local and global benefits derived from dry and sub-humid lands biodiversity; economic valuation of priority specific sites—World Bank; assessment of the socio-economic impacts of biodiversity loss and linkages to poverty and case-studies on inter-linkages between biodiversity loss and poverty.
5. Lessons learned / Case Studies / Evidence	Mainstreaming poverty and development issues in dry and sub-humid lands within the PoW (e.g. Namibia case study on Mainstreaming Environment with a particular focus on drylands issues into Development Frameworks).

TABLE 12: Desirable matrix—Dry and Sub-Humid Lands Biodiversity

Component of the PoW:	Linkages to poverty, livelihoods, human well-being:
1. Baseline approach (COP Decisions/ background)	The PoW should include the drylands development paradigm in its baseline analysis. Emphasis could be placed on the links between pastoralism and agriculture in dry and sub-humid lands including, crucially, potential conflicts between different land uses. The principles of “at least do no harm” to poor people and respect for human rights must be observed in conservation of dry and sub-humid biodiversity. This baseline approach has already been included in COP 9 decision and / or suggested Recommendations to the upcoming SBSTTA.
2. System of Goals	UNCCD 10-year Strategic Plan Strategic Objectives 1 & 2 (and related elements) integrated into the CBD PoW. UNCCD has proposed a core set of indicators to measure its progress. Greater synergies with the UNCCD including improved implementation of the joint work programme. Greater focus on drylands in South-South cooperation work (recognizing that drylands are often politically marginalized). Greater presence at CSD meetings.
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	<ul style="list-style-type: none"> • Integration of climate change considerations including adaptation with a link to poverty; • Pastoralists engaged in implementation of the PoW; • Access and benefit sharing (ABS) of genetic resources from dry lands; • Active participation of indigenous communities and respect for their knowledge and lifestyle in dryland management practices; • Carbon sequestration to become a viable source of financing for dry lands development; • Work on the valuation of ecosystem services; • Payments for ecosystem services; • Mainstreaming of dry lands issues into national development strategies. • Further work on identifying and documenting medicinal plants in dry and sub-humid lands; • Better integrate agricultural biodiversity into the PoW.
4. Evaluation / In-Depth Reviews	<p><i>Integration of CBD and UNCCD impact indicators.</i></p> <p><i>Harmonization of CBD indicators and UNCCD indicators especially for totally dryland countries/ regions.</i></p>
5. Evidence	<p>The benefits to biodiversity from locally governed pastoral systems</p> <p>Marketing sustainable products</p> <p>Linking livestock marketing to pastoral livelihoods</p>

Description of the Programme of Work

The Programme of Work on the Biological Diversity of Dry and Sub-humid Lands provides guidance on actions to maintain, sustainably use and restore biodiversity and combat land degradation in drylands. It seeks to fill gaps in knowledge by assessing the status of, and threats to, the biodiversity in dry and sub-humid lands; to support best management practices through targeted actions; to promote partnerships among countries and institutions; and to enhance synergies among related conventions, in particular with the United Nations Convention to Combat Desertification (UNCCD). Dry and sub-humid lands, including arid and semi-arid regions, grasslands, savannahs, and Mediterranean landscapes, encompass approximately 47% of the Earth’s terrestrial area, with the largest areas found in Australia, China, Russia, the United States of America, and Kazakhstan. There are six countries with at least 99% of their area classified as dry and sub-humid lands: Botswana, Burkina Faso, Iraq, Kazakhstan, the Republic of Moldova, and Turkmenistan. Many are threatened by desertification.

The CoP adopted the Programme of Work on dry and sub-humid lands (Decision V/23) at its fifth session in 2000. It has not been updated since the findings of the Millennium Ecosystem Assessment, Land Degradation Assessment in Drylands, and other significant drylands assessments that have taken place. The implementation of this PoW is expected to reduce the rate of loss of biological diversity in drylands by the year 2010 and beyond.

The Programme of Works on the biodiversity of dry and sub-humid lands, as contained in annex I to decision V/23 of the Conference of the Parties, is divided into two parts: part A, “Assessments”; and part B, “Targeted actions in response to identified needs”. It comprises nine main activities with a number of actions describing ways in which they should be implemented. The annex to decision VII/2 of the Conference of the Parties provides, by activity, expected outcomes, timeframes, key actors, and indicators of progress in implementation of the Programme of Work.

i) Linkages of the dry and sub-humid lands biodiversity to poverty

Conservation and sustainable use of dry and sub-humid lands biodiversity is central to livelihoods, development and poverty alleviation. Ninety percent of people inhabiting dry and sub-humid lands live in developing countries. The proportion of Africans and Asians living within drylands is also high, at about 42 per cent in each region—over 1.4 billion people in Asia, and 270 million people in Africa. Some of the highest population densities in drylands occur in sub-humid zones in China, India, the Middle East and West Africa. Half of the approximately two billion people living in drylands are in dire poverty (MA 2005). While dry and sub-humid lands are productive ecosystems supporting large numbers of people, these people are vulnerable to climate-induced uncertainty associated with inter- and intra-seasonal rainfall variability and to rainfall limitations and seasonality which characterize drylands. Effectively managing these areas and preventing desertification in them will be a major step towards poverty reduction and biodiversity conservation in a significant portion of our world (Mortimore *et al.* 2008).

TABLE 13: Links of the ecosystem services provided by Dry and Sub-Humid Lands Biodiversity to International Poverty Frameworks

Ecosystem services provided by dry and sub-humid lands biodiversity	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Provisioning services:						
Food	Drylands produce forage for domestic livestock, Drylands are used extensively for the production of food. Many of our major food crops such as wheat, barley sorghum and millet originated in drylands. Wild crop varieties from drylands serve as sources of genetic plant material for developing drought-resistant crop varieties.	Domestic livestock in drylands support human livelihoods with meat, dairy products, and clothing materials such as wool and leather. Many of our major food crops such as wheat, barley sorghum and millet are a major source of food and income.	Most	F, H, N	O, S	Most
Fresh water	Water basins in drylands are found on every continent, ranging from small (52 thousand km ²) to very large (3 million km ²), from low population densities (1 person/km ²) to high population densities (nearly 400 people/km ²). While the number of wetlands in these basins in drylands is generally low, many contain wetlands listed as internationally important.	Freshwater resources in drylands, often limited and variable in availability are important water sources for drinking, irrigating crops, and supporting wetland flora and fauna.	G1, T1, T2, G4, T5, G5, T6	H, N	O, S	Most

Ecosystem services provided by dry and sub-humid lands biodiversity	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Fibre & Fuel	Woodfuels and a variety of fuel minerals	Energy resources supply local people with daily heating and cooking fuels. In fact, in Africa, households use more woodfuel than the industry or commercial sectors.	Most	F, H	O, S	Most
Biochemicals	Medicinal plants used by local and indigenous communities can ensure the provision of local medicines for health problems.	Sustainable harvesting of medicinal plants can be a potential source of income and employment as well as health provision for local people.	Most	F, H, N	O, S	Most
Regulating services:						
Water purification and regulation	Water is the limiting resource for dryland biological productivity, and thus water regulation is of major significance.	Water regulation in drylands determines the allocation of rainfall for primary production (enrichment of soil moisture); for irrigation, livestock watering, and domestic uses (storage in groundwater and surface reservoirs); and for the occurrence of flash-floods and associated damage (soil erosion, reduced groundwater recharge, excessive clay and silt loads in downstream water bodies).	G1, T1, T2, G4, T5, G5, T6	N	S	H, P
Pollination and seed dispersal	Provide habitat for pollinators. For example, bees for pollination of cultivated crops	Pollination is critical for food production and human livelihoods, and directly links wild ecosystems with agricultural production systems.	G1, T1, T2	H, N	O, S	E, H, S
Climate regulation (local through vegetation cover and global through carbon sequestration)	Vegetation cover	Local example: Native trees in arid regions of the Sultanate of Oman create cooler temperatures compared to the open surrounding desert by increasing the availability of nutrients for other plants and by increasing the abundance and diversity of animals.	Most	N	S	H, S
	Drylands, as an ecosystem with extensive surface area across the globe, can store large amounts of carbon, most of it in the soil rather than in vegetation.	Carbon markets are a large potential source of untapped income for drylands populations.	Most	F, N	S	H, S

Ecosystem services provided by dry and sub-humid lands biodiversity	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Cultural services:						
Spiritual & Inspirational	Cultural and religious services, including spiritual enrichment, cognitive development, knowledge systems, social relations	Drylands provide spiritual enrichment to human populations who inhabit these areas. For example, a Vicuña, quirquincho and the Andean ostrich provide “cultural and religious services” to people living in dryland areas of Bolivia, Chile and Peru through their use in traditional costumes and cultural activities involving medicine, handicrafts and religion.	Most	S, H	0	H, S
Recreational	Drylands have become major tourist destinations	Community-Based Natural Resource Management schemes enable poor communities to benefit from wildlife tourism and associated products and services.	G1, T1	F, H, S, P, N	O, E, S	Most
Aesthetic	Aesthetically, drylands are often open, vast, and picturesque landscapes and many people find beauty in dryland landscapes and wildlife.	Many people find beauty and aesthetic values in drylands landscapes.	Most	S, H	0	S
Supporting services:						
Soil development (conservation, formation)	Soil formation and soil conservation are key supporting services of dryland ecosystems, the failure of which is one of the major drivers of desertification.	Soil properties in drylands determine how much of the rainfall will be stored and subsequently become available during dry periods. The availability of moisture in soil is also an important factor in nutrient cycling, a requisite for primary production and resulting benefits to people.	G1, T1, T2, G4, T5, G5, T6, G7, T10, T11	N	S	P
Primary production	Drylands (41 and 35% of global land and population, respectively) have the lowest biological productivity of any ecosystem, contain populations with the highest growth rates on earth, and share a significant proportion of global poverty, for which desertification is implicated.	A global assessment of available information indicates that the inherent low productivity of drylands, when combined with other adverse factors, can generate poverty. It additionally indicates that while the drylands may exist in a locally stable and sustainable state, this is readily destabilised by non-linear, threshold-crossing transitions to an alternative steady-state leading to desertification, poverty and conflicts.	G1, T1, G7, T9, T10	N	S	P

Ecosystem services provided by dry and sub-humid lands biodiversity	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Nutrient cycling	Storage, recycling, processing and acquisition nutrients	The growing of trees like <i>Senna siamea</i> ear maize in drylands boosts the number of microorganisms essential for making soil nutrients available to the crops. Further, the improved nutrient status of the soil also helps reduce erosion by enabling other species of trees to establish.	G1, T1, T2, G4, T5, G5, T6, G7, T10, T11	H, N	S	E, H, P

* Financial (F), Human (H), Natural (N), Social (S), and Physical (P)

** Increasing opportunity (O), enhancing empowerment (E), and strengthening security (S).

*** Economic capabilities (E), Human capabilities (H), Socio-cultural capabilities (S), Political capabilities (PC), Protective capabilities (P).

Source: adapted from the Millennium Ecosystem—Drylands synthesis through author's own analysis.

a) Baseline of the Programme of Work

The problem that the dry and sub-humid lands biodiversity PoW aims to address is that 2,311 known dry and sub-humid lands species are endangered or threatened with extinction. The main pressures that impact on dry and sub-humid lands biodiversity are:

- Habitat conversion: The most common transformation is conversion to cropland.
- Climate change
- Grazing pressures: Wildlife and livestock
- Introduced species
- Changes in fire regimes
- Water: since water is a limiting factor in dry and sub-humid lands, changes in water availability through water abstraction or irrigation can have disproportionate effects on biodiversity
- Over-harvesting
- Soil management

The following CoP decisions are relevant to the dry and sub-humid lands biodiversity PoW.

- Decision V/23 - Consideration of options for conservation and sustainable use of biological diversity in dryland, Mediterranean, arid, semi-arid, grassland and savannah ecosystems
- Decision VI/4 - Biological diversity of dry and sub-humid lands
- Decision VII/2 - Biological diversity of dry and sub-humid lands
- Decision VIII/2 - Biological diversity of dry and sub-humid lands
- Decision IX/17 - Biodiversity of dry and sub-humid lands

i) Does the baseline analysis of the PoW consider poverty?

Given the strong linkages to poverty and disenfranchisement evident in the drivers of loss of drylands biodiversity, it would be expected that poverty figures highly in the baseline. In fact, in its Preamble (Decision V/23), the PoW acknowledges that dry and sub-humid lands biodiversity is central to

livelihood development and poverty alleviation. Explicit reference is made to income diversification, maintaining the socio-cultural diversity of communities, strengthening institutions for land tenure and conflict resolution, sustainable use of plant and animal biomass, implementation of sectoral and cross-sectoral plans to conserve dry and sub-humid lands ecosystem goods and services, conservation of drought resistant crop varieties, rehabilitation and/or restoration of degraded lands, sustainable management of production systems, and cooperation for integrated catchment management.

Admirably, the PoW baseline and in particular, the Annex to CoP decision VII/2, Activities 5, 6, 8, 7 and 9 in the synthesis table of expected outcomes and timeframes, potential actors, and indicators of progress in the implementation of the PoW on biodiversity of dry and sub-humid lands (Decision VII/2) recommend parties to address poverty and livelihoods issues in drylands.

COP 5 Decision V/23 paragraph 1, 7 (a) and (b), COP 7 Decision VII/2, paragraph 5 (c) (i) and (vi); COP 8 Decision VIII/2 paragraph 6 and COP 9 Decision IX/17 paragraphs 1, 3, 4 and 16 make explicit reference to poverty and actions for poverty reduction such as correcting the disenfranchisement of drylands people, including securing local land rights as well as related issues of self-determination, education, and health; decentralizing natural resource management including establishment of community-based agreements and enabling local people to be compensated for the nationally and globally-enjoyed benefits (through payments for ecosystem services provided by drylands); and strengthening the resilience of dryland residents, including pastoralists in drylands, through relevant policy frameworks and action. This confirms due attention is given to poverty alleviation issues in this PoW.

b) System of goals (operational objectives and elements)

In the case of dry and sub-humid lands, the PoW was adopted in 2000 and therefore does not contain many of the newer conventions for more recent PoW systems of goals. The PoW has two operational objectives under Part A, “Assessments”, paragraph 5:

“To assemble and analyse information on the state of the biological diversity of dry and sub-humid lands and the pressures on it, to disseminate existing knowledge and best practices, and to fill knowledge gaps, in order to determine adequate activities”.

And under part B, “Targeted actions in response to identified needs”, paragraph 8:

“To promote the conservation of the biological diversity of dry and sub-humid lands, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of its genetic resources, and to combat the loss of biological diversity in dry and sub-humid lands and its socio-economic consequences”.

It is worth noting that UNCCD 10-year Strategic Plan Strategic Objective 1 makes explicit reference to poverty reduction.

i) Targets

The PoW itself does not contain targets, given that this was not the predominant way of formulating PoWs when this particular Programme was adopted. However, the annex to CoP 8 Decision VIII/2 of the Conference of the Parties provides provisional goals (10) and targets (19) for the Programme of Work on the biological diversity of dry and sub-humid lands.

Notably, however, the UNCCD’s 10-year strategic plan includes numerous targets to address poverty in drylands (Strategic Objective 1). Though these are not necessarily linked to biodiversity, they should be mutually supportive with the Strategy’s second Strategic Objective, which is to improve the condition of

affected ecosystems. Taken together, these goals suggest an improvement in drylands biodiversity and ecosystem services, with increased well-being in dryland populations and poverty reduction as a result.

ii) Does the system of goals of the PoW consider poverty reduction?

Poverty is not mentioned in the operational objective under part A on “Assessments”. This gap contrasts starkly with the prevalence of poverty and livelihood considerations within the baseline of the PoW. The operational objective under part B on “Targeted actions in response to identified needs”, makes direct reference to elements of poverty and in particular promoting fair and equitable sharing of benefits arising out of the utilization of genetic resources in dry and sub-humid lands biodiversity.

Within the goals and targets for the Programme of Work on the biological diversity of dry and sub-humid lands provided in the annex to COP 8 Decision VIII/2, Goal 8, target 8.2 makes explicit reference to poverty:

Goal 8, “*Target 8.2 Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people living in dry and sub-humid lands, maintained*”.

In addition, the UNCCD’s 10-year strategic plan includes numerous targets with corresponding indicators to address poverty in drylands (Strategic Objective 1).

c) Implementation strategy of the PoW

i) Activities, measures and/or implementation mechanisms (Activities and Ways and means)

The PoW provides activities for Parties for its implementation as well as ways and means through which the PoW is implemented. Under part A, “Assessments”, six activities are identified, all concerning assessments in dry and sub-humid lands and identification and dissemination of good practices in dryland management (Decision V/23, annex I, section II, part A, activities 1-6). Examples of Activities under “Assessments” include:

- Activity 1 on “*Assessment of the status and trends of biological diversity of dry and sub-humid lands...*”
- Activity 2 on “*Identification of specific areas within dry and sub-humid lands of particular value for biological diversity ...*”
- Activity 3 on “*Further development of indicators of the biological diversity of dry and sub-humid lands and its loss...*”,
- Activity 5 on “*Identification of the local and global benefits..., assessment of the socio-economic impact of its loss, and the undertaking of studies on the interrelationship between biodiversity and poverty, including analysis of: (i) the benefits from biodiversity for poverty alleviation; and (ii) the impact of biodiversity conservation on the poorest*”.

Under part B on “Targeted actions in response to identified needs”, three clusters of activities are identified (decision V/23, annex I, section II, part B, activities 7-9). Activity 7 focuses on “*promotion of specific measures for the conservation and sustainable use of the biological diversity of dry and sub-humid lands*”. *Actions through which this can be achieved are highlighted in Activity 7 paragraphs (a)–(m)*. Activity 8 focuses on “*promotion of responsible resource management, at appropriate levels, applying the ecosystem approach, through an enabling policy environment*”. *Actions through which this can be achieved are highlighted in Activity 8 paragraphs (a)–(e)*. Activity 9 focuses on “*support for sustainable livelihoods*”. *Actions through which this can be achieved are highlighted in Activity 8 paragraphs (a)–(c)*.

ii) Tools for implementation of the PoW

The following adopted tools (including approaches, principles and guidelines) support the implementation of the PoW on dry and sub-humid lands biodiversity:

- Economic Valuation and Payment for Ecosystem Services;
- Mainstreaming of drylands issues into national development strategies;
- Sustainable Pastoralism;
- Agricultural Use;
- Decentralisation and Devolution of Resource Rights;
- Institutions for land tenure and conflict resolution;
- Land Tenure Reform;
- The Ecosystem Approach; and
- Joint Programme of Work with UNCCD.

iii) Does the implementation strategy of the PoW (sufficiently) consider poverty reduction?

While poverty is overlooked in the PoW's own system of goals, it makes a reappearance in the implementation strategy (activities for the Parties; and ways and means of implementing these activities of the POW). Under part A, "Assessments", (Decision V/23, annex I, section II, part A, activities 1-6), activity 5 explicitly mentions poverty alleviation and it recommends "...assessments of the socio-economic impact of dry and sub-humid lands biodiversity loss, and the undertaking of studies on the interrelationship between biodiversity and poverty, including analysis of: (i) the benefits from biodiversity for poverty alleviation; and (ii) the impact of biodiversity conservation on the poorest".

Under part B on "Targeted actions in response to identified needs", (Decision V/23, annex I, section II, part B, activities 7-9), activities 7, 8 and 9 make direct reference to poverty issues and one makes direct reference to livelihoods. In particular, Activity 7 paragraph (a) states "*The use and the establishment of additional protected areas and the development of further specific measures for the conservation of the biological diversity of dry and sub-humid lands, including the strengthening of measures in existing protected areas; investments in the development and promotion of sustainable livelihoods, including alternative livelihoods; and conservation measures; mention investments in the development and promotion of sustainable livelihoods, including alternative livelihoods; and conservation measures*".

Activity 8, paragraphs (a), (b) and (c) make direct reference to strengthening local institutional structures and fostering the use of indigenous and local techniques, decentralization of management of biodiversity, and institutions for land tenure and conflict resolution. Activity 9 mentions support for sustainable livelihood and this is to be achieved through actions mentioned in Activities 9 paragraphs (a), (b) and (c). These three paragraphs make direct reference to actions essential for poverty reduction in drylands such as income diversification, sustainable harvesting (including harvesting of wildlife), innovations for local income generation and fair and equitable sharing of the benefits.

The activities of part B are to be carried out through, "*capacity-building, particularly at the national and local levels, as well as investments in the development and promotion of sustainable livelihoods, including alternative livelihoods, and conservation measures, through participatory and bottom-up processes, with funding from bilateral and multilateral sources, and catalytic support from international organizations*" (Decision V/23, annex I, section II, part B). All of these activities support poverty alleviation and sustainable livelihood development.

In regard to implementation tools (including principles, guidelines and approaches), the PoW on dry and sub-humid lands biodiversity mentions the following: economic valuation, payment for ecosystem

services, mainstreaming of drylands issues into national development strategies, sustainable pastoralism, decentralization and devolution of resource rights for agricultural use, institutions for land tenure and conflict resolution, land tenure reform. All of these provide a sound platform for the participation of dry lands people in decision making and natural resource management and therefore poverty reduction in dry and sub-humid lands.

d) Monitoring, evaluation and lessons learned

Since its adoption, the Programme of Work was considered for In-Depth Review at the eighth meeting of the Conference of the Parties (COP) (UNEP/CBD/SBSTTA/11/4). This In-Depth Review revealed that good progress is being made towards the achievement of adequate coverage of protected areas with the exception of the temperate grasslands biome. The review did reveal that implementation is weak when considering trends in the abundance and distribution of selected species and the status and trends of linguistic diversity, including the numbers of speakers of indigenous languages in dry and sub-humid lands. Decision VIII/2 of COP 8 calls for increased attention to climate change and governance and highlights the need for more detailed assessments to measure progress towards the achievement of the 2010 Biodiversity Target in dry and sub-humid lands. A joint work programme with the United Nations Convention to Combat Desertification on dry and sub-humid lands was also adopted by the COP to both Conventions in acknowledgement of the fact that biodiversity loss can be both a cause and a consequence of desertification. The joint work programme seeks to address the multiple and increasing threats to dry and sub-humid lands biodiversity, including climate change.

e) Scope for mainstreaming poverty into the PoW

Despite the predominance of poverty considerations within this PoW, there is still wide scope for further work, evidenced by the continuing loss of drylands biodiversity and high rates of poverty in this ecosystem globally. Given the involvement of central governments in the Convention through the COP and national focal points, there is a strong need to better engage pastoralists in implementation of the PoW, including the development of national policies. There is a need to better explore the links between pastoralism and agriculture in dry and sub-humid lands including potential conflicts between different land uses. There is a need for additional work on the valuation of ecosystem services in dry and sub-humid lands as a precursor to further action on payments for ecosystem services. Finally, there is a need to explore the mechanisms necessary for carbon sequestration to become a viable source of financing for drylands development.

Conclusions

Poverty considerations in general are found throughout the Dry and Sub-Humid Lands PoW. The PoW is formulated in a 'dated' fashion; and though this does not necessarily prevent implementation that incorporates poverty considerations, it does make monitoring and evaluation of these efforts more difficult. The CBD should work closely with UNCCD, while the latter pilots the first iteration of indicator-based National Reporting in 2010, with a potential area of collaboration between the Conventions on drylands well-being and ecosystem monitoring.

3.3 FOREST BIODIVERSITY

TABLE 14: Analytical matrix—Forest Biodiversity

Element of the PoW:	Linkages to Poverty, Livelihoods and Human Well-Being:
1. Baseline approach (COP Decisions/background)	The problem analysis of the PoW does not make explicit reference to poverty despite the importance of forests and the services they provide to poverty reduction (www.cbd.int/forest/problem.shtml). However, several CoP decisions make explicit reference to elements of poverty, in particular COP 6 V1/22 paragraphs 31 and 32 , COP 7 Decision VII/1, paragraph 11 ; and COP 9 Decision IX/5, paragraphs 1(d), (f), (m), 2(d), (h) .
2. System of Goals	The programme elements, goals and objectives of the PoW system of goals contain no explicit mention of poverty reduction and/or livelihoods. However, some of the linked concepts (access and benefit-sharing of forest genetic resources and the ecosystem approach) could suggest poverty reduction in practice (Programme element 1, goals 1 and 5). Within the 2010 targets “livelihoods of the poor” are referred to both directly (Target 8.1) and indirectly (Targets 3.1; 4.1; 4.2, 8.2; 9.1; 9.2 and 10.2).
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	Explicit reference to poverty and elements of poverty and poverty reduction are made in the Activities within the PoW. Programme element 1, Objective 1.4, Activities (a)—(f) and Objective 1.5.1, Activities (a)–(b) make reference to participation of indigenous and local communities in forest management and negotiating benefit sharing arrangements as well as establishment of mechanisms to facilitate the sharing of benefits at local, national, regional and global levels. In addition, Programme element 2, Objective 2.1.2, Activity (a); Objective 2.1.3, Activities (b), (e) and (h) and Objective 2.1.3, Activity (f) make explicit reference to elements of poverty such as resolving land tenure and resource rights and responsibilities for indigenous and local communities, carrying out environmental and socio-economic impact assessment prior to land-conversion decisions and developing alternative sustainable income generation programmes for indigenous and local communities,
4. Evaluation / In-Depth Reviews	In-Depth Review of implementation of the PoW was carried out (UNEP/CBD/SBSTTA/13/3).]
5. Lessons learned / Case Studies / Evidence	

TABLE 15: Desirable matrix—Forest Biodiversity

Component of the PoW:	Linkages to poverty, livelihoods, human well-being:
1. Baseline approach (COP Decisions/background)	The PoW should emphasise a forest-based poverty alleviation strategy which should include the following elements: establishing a people-centered agenda; removing tenure and regulatory restrictions; improving marketing arrangements for marginal people; creating partnerships between the poor and forest enterprises; redesigning transfer payments, and integrating forest-based poverty efforts into rural development and poverty reduction strategies.
2. System of Goals	The PoW needs clear objectives, goals and targets on forest biodiversity and poverty issues as well as indicators against which these will be monitored.

Component of the PoW:	Linkages to poverty, livelihoods, human well-being:
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	<ul style="list-style-type: none"> • Integration of climate change considerations in forest management including adaptation with a link to poverty; • Indigenous forests communities engaged in implementation of the PoW; • Access and benefit-sharing (ABS) of genetic resources from forest biodiversity; • Active participation of indigenous communities and respect for their knowledge and lifestyle in forest management practices; • Carbon sequestration to become a viable source of financing for the development of forest communities and countries; • Work on the valuation of ecosystem services; • Payments for ecosystem services; • Mainstreaming of forests issues into national development strategies; • Decentralisation; • Forest tenure change; • PES and REDD mechanism for poverty alleviation; • Capacity building for sustainable forest management. Replication of successful forest community-based projects; • Monitoring and sustainable use of non-timber forest products (NTFP) used by the poor; • Participation of local communities in forest monitoring.
4. Evaluation / In-Depth Reviews	Indicators are needed in addition to the In-Depth Reviews. Currently the format of the PoW and absence of targets makes it difficult to come up with indicators.
5. Case Studies	Document lessons learned, disseminate these lessons as well as case studies and update the PoW to reflect new lessons and evidence from case studies.

Description of the Programme of Work

At its sixth meeting in 2002 the Conference of the Parties (CoP) adopted the expanded Programme of Work on forest biological diversity (decision VI/22, paragraph 10, annex), which was developed by the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) (recommendation VII/6, annex). The CBD defines forest biodiversity as a broad term that refers to “*all the life forms found within forested areas and the ecological roles they perform. As such, forest biodiversity encompasses not just trees but the multitude of plants, animals and micro-organisms that inhabit forest areas and their associated genetic diversity*”. The expanded Programme of Work on forest biological diversity consists of three programme elements, 12 goals, 27 objectives and 130 activities. Programme element 1 covers conservation, sustainable use and benefit-sharing; Programme element 2 deals with the institutional and socio-economic environment of forest biological diversity. The third element covers assessments and monitoring.

i) Linkages of forest biodiversity to poverty

Forest biodiversity is interlinked to a web of socio-economic factors, providing an array of goods and services that range from timber and non-timber forest resources to mitigating climate change and genetic resources. The World Bank estimates that roughly a quarter of the world’s poor and 90 percent of the poorest depend substantially on forests for their livelihoods (World Bank 2001). Almost 70 million people—many indigenous—live in remote areas of closed tropical forests. Another 735 million rural people live in or near tropical forests and savannas, relying on them for much of their fuel, food, and income—or are clearing them down for crops and pasture (World Bank 2007).

Forests support much of the world’s biodiversity and provide a range of ecosystem services that are fundamental to the planet’s well-being. They help to stabilize soils, discourage erosion and maintain a steady supply of clean, fresh water. Because they lock up atmospheric carbon, forests also reduce the

main greenhouse gases that fuel global climate change. In 2003, the international trade in sawn wood, pulp, paper and boards was worth almost US\$ 150 billion—over 2 per cent of world trade (CIFOR 2010). Two-thirds of the production and consumption of these forest products occurred in developing countries, where forest enterprises employ large numbers of rural people. Hunting and fishing provide over 20 percent of household protein requirements in 62 developing countries, and much of it forest-based (CIFOR 2010). Tropical, temperate and boreal forests also harbour the vast majority of the world's terrestrial species; only a fraction of known species has been examined for potential medicinal, agricultural or industrial value. Therefore, forests and forest biological diversity can play a potential important role in poverty reduction.

TABLE 16: Links of the ecosystem services provided by forest biodiversity to International Poverty Frameworks

Ecosystem services provided by Forests	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Provisioning services:						
Food	Forests harbour a significant number of edible non-timber forest products e.g. vegetables, fruits, nuts, seeds, roots, mushrooms, spices, bushmeat, bee products, insects, eggs, nests, and so on. These are particularly important in tropical and sub-tropical regions.	Bushmeat and fish provide more than 20% of the protein in 62 least developed countries. And in rural areas of many countries, a significant relationship exists between food security and the degree of contribution of non-timber forest products to households. From 8% to 46% of indigenous tree species serve as a source for food and fodder in the Pacific region.	Most	F, H, N	O, S	Most
Fresh water	Forested watersheds are exceptionally stable hydrological systems. Healthy forests strongly influence the quantity of water yielded from watersheds; discharge the highest quality of water; discharge lower storm flow peaks and volumes for a given input of rainfall; moderate variation in stream flow between the high and low flows during a year; provide the greatest soil stability and the lowest levels of soil mass movement, gully erosion and surface erosion and export the lowest levels of sediments downstream.	Dependable freshwater supplies and the ability to cope with the extremes of too little or too much water are requisites for sustainable human development. Worldwide, freshwater supports about 40 percent of all food crop production via irrigation, supports 12 percent of all fish consumed by humans and generates 20 percent of all electric power.	G1, T1, T2, G4, T5, G5, T6	H, N	O, S	Most

Ecosystem services provided by Forests	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Fibre & Fuel	Production of logs, fuel wood and fodder.	Wood is currently the most economically important forest product. Fuel wood meets about 7% of energy demand worldwide, including about 15% in developing countries and 2% in industrial countries. Globally, about 1.8 billion cubic meters of wood is used annually for fuel (including charcoal production). Fodder is of great importance in many regions, particularly in the arid and semiarid zones and in animal-based production systems. In many developing countries, 30–40% of domestic animals depend on forests for grazing and fodder.	Most	F, H	O, S	Most
Biochemicals	Medicinal plants used by local and indigenous communities can ensure the provision of local medicines for health problems	About three quarters of the people in developing countries use traditional medicines, and the ratio of traditional healers to western-trained doctors reaches 150:1 in some African countries. Medicinal plant species (mostly from the forest) used by local populations and as trade products number in the thousands, and some 4,000 commercially important medicinal plant species are used in Southeast Asia alone. The value of the world trade in medicinal plants in 1992 was approximately \$17 million. Forest plants are also widely used in the development of modern medicines for heart disease, cancers, leukemia and HIV/ AIDS.	Most	F, H, N	O, S	Most
Regulating services:						
Water purification and regulation	Protecting watersheds, maintaining water supply, and protecting the marine environment. Regulation of hydrological cycles and processes is one of the important services provided by forests at large scales.	Increasing precipitation and decreasing evaporation; regulating the total and distribution of surface and belowground runoff; smoothing out the seasonal course of river discharges; increasing total annual river runoff; protecting landscapes against soil erosion and landslides, in particular in mountains; preventing and mitigating the consequences of floods; maintaining water quality; protecting river banks against destruction (abrasion); and preventing siltation of reservoirs, which are central to livelihoods and poverty reduction.	G1, T1, T2, G4, T5, G5, T6	N	S	H, P

Ecosystem services provided by Forests	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Pollination and seed dispersal	Provide habitat for pollinators f(e.g. bees for pollination of cultivated crops).	Pollination is critical for food production and human livelihoods and directly links wild ecosystems with agricultural production systems.	G1, T1, T2	H, N	O, S	E, H, S
Climate regulation (local through vegetation cover and global through carbon sequestration)	Forests play an important role in the global carbon cycle and consequently in regulating the global climate system.	Carbon markets and Reduced Emissions from Degradation and Deforestation (REDD) projects have a large potential source of untapped income for forest populations.	Most	Most	F, N	E, S
Erosion regulation	In many regions forest is a major stabilizing component of natural landscapes, providing protection for soil and fields and reducing or preventing floods and landslides.	Preventing and mitigating the consequences of floods and maintaining water quality all of which are key to poverty reduction.	G1, T1, T2, G4, T5, G5, T6	N	S	H, P
Natural hazard regulation	Preventing floods and landslides	Poor people are vulnerable to both natural and human-induced disasters.	Most	Most	F, N	E, S
Cultural services:						
Spiritual & Inspirational	For many indigenous and traditional societies forests are sacred and sometimes supernatural places, linked to both religious beliefs and the very identity of some communities and peoples	The widespread existence of “sacred groves” in many societies is a physical manifestation of this spiritual role and has contributed to forest conservation.	Most	S, H	0	H, S
Recreational	Forests provide spiritual and recreational services to millions of people through forest-related tourism. Nature-based tourism has increased more rapidly than the general tourism market, evolving from a niche market to a mainstream element of global tourism, with annual growth rates estimated to be in the range of 10–30%.	Community-Based Forest Resource Management schemes enable poor communities to benefit from wildlife tourism and associated products and services.	G1, T1	F, H, S, P, N	O, E, S	Most
Aesthetic	Many people find natural beauty in many forests	As for spiritual, inspirational and recreational.	Most	S, H	0	S

Ecosystem services provided by Forests	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Supporting services:						
Soil development (conservation, formation)	Forest impacts soils in numerous ways. It can prevent erosion from rain or surface runoff. It shades soils, keeping them cooler and slowing evaporation of soil moisture. Or it can cause soils to dry out by transpiration. Forests can form new chemicals that break down or build up soil particles.	Soil resources are critical to the environment, as well as to food and fiber production. Soil provides minerals and water to plants. Soil absorbs rainwater and releases it later thus preventing floods and drought. Soil cleans the water as it percolates.	G1, T1, T2, G4, T5, G5, T6, G7, T10, T11	N	S	P
Primary production	Forests and plants are mainly responsible for primary production.	All life on earth is directly or indirectly reliant on primary production.	G1, T1, G7, T9, T10	N	S	P
Nutrient cycling	Storage, recycling, processing and acquisition nutrients	Large proportions of nutrients absorbed by forests are returned annually to the soil in leaf and fine root litter and are reabsorbed after biological breakdown of litter materials. Also, a large portion of nutrient requirements of trees are met through internal cycling. This is key to the supply of goods and services such as food, fiber and wood fuel that are essential to poor people.	G1, T1, T2, G4, T5, G5, T6, G7, T10, T11	H, N	S	E, H, P

* Financial (F), Human (H), Natural (N), Social (S), and Physical (P).

** Increasing opportunity (O), enhancing empowerment (E), and strengthening security (S).

*** Economic capabilities (E), Human capabilities (H), Socio-cultural capabilities (S), Political capabilities (PC), Protective capabilities (P).

Source: Millennium Ecosystem Assessment, with authors' own analysis.

a) Baseline of the Programme of Work

The problem that the forest biodiversity PoW aims to address is the loss of forests globally. In the last 8000 years about 45% of the Earth's original forest cover has disappeared, most of which was cleared during the past century (CBD 2009). The Food and Agriculture Organization of the United Nations (FAO) recently estimated that about 13 million hectares of the world's forests are lost due to deforestation each year (FAO 2009). The annual net loss of forest area between 2000 and 2005 was 7.3 million hectares (equivalent to the net loss of 0.18 percent of the world's forests (FAO 2009).

The mechanisms that cause deforestation, fragmentation and degradation are varied and can be direct or indirect. However, the most important factors associated with the decline of forest biological diversity are of human origin. The conversion of forests to agricultural land, overgrazing, unmitigated shifting cultivation, unsustainable forest management, introduction of invasive alien plant and animal species, infrastructure development (e.g. road building, hydro-electrical development, urban sprawl), mining and oil exploitation, anthropogenic forest fires, pollution, and climate change are all having negative

impacts on forest biological diversity. And as forests are degraded, so too is biological diversity. This degradation lowers the resilience of forest ecosystems and makes it more difficult for them to cope with changing environmental conditions.

The following CoP decisions are relevant to the forest biodiversity PoW:

- Decision II/9: Forests and biological diversity
- Decision III/12: Programme of Work for terrestrial biological diversity: forest biological diversity
- Decision IV/7: Forest biological diversity
- Decision V/4: Progress report on the implementation of the Programme of Work for forest biological diversity
- Decision VI/22: Forest biological diversity
- Decision VII/1: Forest biological diversity
- Decision VIII/19: Forest biological diversity: implementation of the Programme of Work
- Decision IX/5: Forest biodiversity

i) Does the baseline analysis of the PoW consider poverty?

Several CoP decisions make explicit reference to poverty and elements of poverty, in particular COP 6 VI/22 paragraphs 31 and 32, COP 7 Decision VII/1, paragraph 11, COP 9 Decision IX/5, paragraphs 1(d), (f), (m), 2 (d), (h). COP 9 Decision IX/5, paragraph 1 (m) calls for the “*full involvement of indigenous and local communities and, where appropriate, partner with the private sector and other relevant stakeholders in the implementation of the Programme of Work ...*” and paragraph 1 (h) asserts that the PoW should ensure that “programmes and measures taken for the conservation and sustainable use of forest biodiversity support efforts to eradicate poverty and improve livelihoods”. The explicit reference to poverty and poor people is vital as forests undoubtedly provide a myriad of ecosystem services that are potentially important to poverty reduction, food security, income and employment.

b) System of goals (programme elements, goals and objectives)

The expanded Programme of Work on forest biological diversity consists of three programme elements, 12 goals, 27 objectives and 130 activities.

1. Conservation, sustainable use and benefit-sharing

5 Goals:

1. *Apply the Ecosystem Approach to the management of all types of forests*
2. *Reduce the threats and mitigate the impacts of threatening processes on forest biodiversity*
3. *Protect, recover and restore forest biodiversity*
4. *Promote the sustainable use of forest biodiversity*
5. *Access and benefit-sharing of forest genetic resources*

2. Institutional and socio-economic enabling environment

3 Goals:

1. *Enhance the institutional enabling environment*
2. *Address socio-economic failures and distortions that lead to decisions that result in loss of forest biodiversity*
3. *Increase public education, participation and awareness*

3. Knowledge, assessment and monitoring

4 Goals:

1. *Characterize and analyse from forest ecosystem to global scale and develop general classification of forests on various scales in order to improve the assessment of status and trends of forest biodiversity*
2. *Improve knowledge on and methods for the assessment of the status and trends of forest biodiversity*
3. *Improve understanding of the role of forest biodiversity and ecosystem functioning*
4. *Improve the infrastructure for data and information management for accurate assessment and monitoring of global forest biodiversity.*

The goals, objectives and activities of the Programme of Work are contained in the three program elements: conservation, sustainable use and benefit-sharing; institutional and socio-economic enabling environment; and knowledge, assessment and monitoring.

i) Targets

There are no targets within the Forest Biodiversity PoW. However, the PoW has goals and targets adopted from the framework of goals and targets for 2010. COP 8 Decision VIII/2 paragraph 12 adopted the goals and targets for the Programme of Work on forest biodiversity contained in the annex to this decision—11 goals and 21 targets. Elements of poverty such as local food security and health care and the livelihoods of poor people are referred to both directly in (Goal 8, Target 8.1) and indirectly (Goal 3; Target 3.1; Goal 4, Target 4.1 and 4.2, Goal 8, Target 8.2, Goal 9, Target 9.1 and 9.2 and Goal 10, target 10).

ii) Does the system of goals of the PoW consider poverty reduction?

The three programme elements, 12 goals and 27 objectives of the PoW on forest biodiversity does not make explicit reference to poverty and livelihoods of the poor. However, goal 1.4, specific objective 1.4.3 states: “enable indigenous and local communities to develop and implement adaptive community-management systems to conserve and sustainably use forest biological diversity”. Goal 1.5, specific objective 1.5.1 states, “promote the fair and equitable sharing of benefits resulting from the utilization of forest genetic resources and associated traditional knowledge”. These specific objectives clearly make direct reference to elements of poverty reduction such as fostering fair and equitable benefit sharing, respecting traditional knowledge and adaptive management of forests by indigenous and local communities.

Other aspects from the Programme of Work on forest biological diversity suggest that poverty reduction involves addressing socio-economic failures and distortions that result in loss of forest biodiversity (programme element 2, goal 2). In general, activities on use, conservation, and benefit-sharing of forest biological diversity within the Programme of Work will contribute to overall environmental sustainability and poverty reduction if properly implemented.

In addition, within the 2010 targets “to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth” (Decision VI/26), target 8.2 of Goal 8 makes direct reference to elements of poverty such as livelihoods, local food security and health care, especially of poor people dependent upon forests. Poverty is also indirectly referenced in the following goals (Goal 3; Target 3.1; Goal 4, Target 4.1 and 4.2, Goal 8, Target 8.2, Goal 9, Target 9.1 and 9.2 and Goal 10 target 10).

c) Implementation strategy of the PoW

i) Activities, measures and/or implementation mechanisms

The expanded Programme of Work on forest biological diversity consists of three programme elements, 12 goals, 27 objectives and 130 activities. Activities for the Parties within the Programme of Work range from those aimed at supporting conservation, sustainable use and benefit-sharing (such as “*developing guidance for applying the ecosystem approach in forest ecosystems and developing and implementing appropriate mechanisms for the participation of all stakeholders in ecosystem-level planning and management*”); to activities aimed at establishing an institutional and socio-economic enabling environment (such as “*formulating appropriate policies and adopting sets of priority targets for forest biological diversity to be integrated into national forest programmes, national sustainable development strategies, poverty reduction strategy papers, related non-forest programmes and national biological diversity strategies and action plans*”); and activities aimed at knowledge, assessment and monitoring (such as “*developing and selecting international, regional and national criteria and where appropriate quantifiable indicators for forest biological diversity, taking into account, as appropriate, existing work and processes on criteria and indicators on sustainable forest management, as well as the knowledge held by indigenous and local communities*”).

ii) Tools for implementation

The following adopted tools (including approaches, principles and guidelines) support the implementation of the expanded Programme of Work on forest biological diversity.

- The Ecosystem Approach
- Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization
- Sustainable forest management
- Guiding principles on invasive alien species
- Sustainable use principles and targets

iii) Does the implementation strategy of the PoW (sufficiently) consider poverty reduction?

Explicit reference to poverty and elements of poverty and poverty reduction is made in the Activities within the PoW. Programme element 1, Objective 1.4, Activities (a)—(f) and Objective 1.5.1, Activities (a) –(b) make reference to participation of indigenous and local communities in forest management and negotiating benefit-sharing arrangements as well as establishment of mechanisms to facilitate the sharing of benefits at local, national, regional and global levels.

In addition, Programme element 2, Objective 2.1.2, Activity (a); Objective 2.1.3, Activities (b), (e) and (h) and Objective 2.1.3, Activity (f) make explicit reference to elements of poverty such as resolving land tenure and resource rights and responsibility for indigenous and local communities, carrying out environmental and socio-economic impact assessment prior to land-conversion decisions and developing alternative sustainable income generation programmes and facilitating self-sufficiency programmes of indigenous and local communities.

d) Monitoring, evaluation and lessons learned

i) Indicators or parameters used for evaluation

At its eighth meeting, in decision VIII/19 C, the Conference of the Parties requested the Executive Secretary to carry out an In-Depth Review of the expanded Programme of Work on forest biological diversity. The In-Depth Review revealed that despite many efforts to implement the Programme of Work,

the loss of forest biodiversity continues at a highly alarming rate. Effective implementation in many countries is hampered by a range of obstacles, such as lack of forest biodiversity data, and a lack of capacity and coordination. Poverty, in particular in indigenous and local communities was also highlighted as obstacles to implementation of the PoW (UNEP/CBD/SBSTTA/13/3 page 14).

e) Scope for mainstreaming poverty into the PoW

Given the evidence pointing to human drivers of forest biodiversity loss, and in particular the pressure of the poor on forest resources, there is extensive scope for further complementarity between the forest PoW and poverty reduction.

Conclusions

The PoW on Forest Biodiversity does not adequately handle the important linkages to poverty as might be expected. Further work on livelihoods, especially through implementation, is recommended.

3.4 INLAND WATERS BIODIVERSITY

TABLE 17: Analytical matrix—Inland Waters Biodiversity

Element of the PoW:	Linkages to Poverty, Livelihoods and Human Well-Being:
1. Baseline approach (COP Decisions/ background)	Poverty is not mentioned in the problem analysis of the PoW (www.cbd.int/waters/problem/). However, the role of inland waters biodiversity in poverty alleviation and sustainable livelihoods is mentioned explicitly (Decision VII/4 and annex) in paragraph 25.
2. System of Goals	Contains no explicit mention of poverty reduction and/or livelihoods, though some linked concepts (the ecosystem approach, Programme element 1, goal 1.1) could imply poverty reduction in practice. In addition, references to elements of effective participation of indigenous and local communities will allow capturing needs and interests from poor and vulnerable groups.
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	Activities of the Parties and supporting activities (i.e. Activities 1.4, 2.5.3, 2.5.3; 2.5.4; 3.2.3; 3.2.7; and 3.3.2) cover elements of poverty such as good governance, participation of indigenous and local communities in decision making, capacity building to empower local communities and indigenous people and conducting cultural, environmental, and social impact assessments regarding developments to identify and mitigate potential negative impact and maximize potential positive impacts.
4. Evaluation / In-Depth Reviews	In annex II of decision VIII/10, the COP decided to undertake the In-Depth Review of the Programme of Work on inland waters biodiversity at its 10th meeting. Accordingly, SBSTTA considered the In-Depth Review of implementation of the Programme of Work on inland waters biodiversity at its 14th meeting, in Nairobi, Kenya (10 - 21 May 2010). The main outcome of this is that the PoW does not adequately address the issue of water as an ecosystem service. But it also points out that “water” is a cross-cutting issue and is not adequately addressed in other PoWs. Water provides by far the strongest links to sustainable development and poverty reduction.
5. Lessons learned / Case Studies / Evidence	Many available. Most demonstrate that the solutions centre on integrated land/water management encompassing all PoWs.

TABLE 18: Desirable matrix—Inland Waters Biodiversity

Component of the PoW:	Linkages to poverty, livelihoods, human well-being:
1. Baseline approach (COP Decisions/background)	The PoW should include the importance of inland water biodiversity to poverty and poverty reduction and how efforts to conserve biodiversity could support poverty reduction and conservation coherently. The principles of “at least do no harm” to poor people and respect for human rights must be observed in conservation of inland waters biodiversity.
2. System of Goals	Poverty needs to be better and explicitly integrated into the current programme elements, goals and objectives. Within the 2010 framework of targets adopted at COP 8 Decision VI/26, Annex IV), poverty and livelihoods of the poor are explicitly mentioned in Goal 8 target 8.2. Elements of poverty are also indirectly referenced in targets of Goals 3, 9 and 10.
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	Integration of climate change considerations including adaptation with a link to poverty ¹³ and pro-poor wetland conservation; Spatial analysis/Poverty Mapping; Access and benefit-sharing of inland water and its biodiversity in a sustainable manner (not undermining the resources) ; Active participation of indigenous communities and respect for their knowledge, lifestyle in inland waters biodiversity management practices; Recognise the links between inland waters biodiversity and agriculture; Work on the valuation of ecosystem services provided by inland waters biodiversity; Payments for ecosystem services; Mainstreaming of inland water issues into national development strategies/poverty reduction strategies (PRSPs); The big need is to recognize the role of water in sustainable development and poverty reduction and to align the PoWs to work collectively towards that end; Ensure sustainable access to inland water resources by the poor; Capacity building for sustainable inland water management.
4. Evaluation / In-Depth Reviews	Ramsar's livelihood indicators utilized.
5. Evidence	From the In-Depth Review

Description of the Programme of Work

Inland water systems are located within continental and island boundaries and comprise both fresh and saline systems. They include lakes, rivers, ponds, streams, groundwater, springs, cave waters, floodplains, as well as bogs, marshes and swamps, which are traditionally grouped as inland wetlands. They are valuable for biodiversity and associated ecosystem services that provide sources of water, food and income. Inland waters was adopted as a CBD thematic area at the fourth meeting of the Conference of the Parties (Decision IV/4). At its seventh meeting, the CoP adopted a revised and elaborated Programme of Work on the biological diversity of inland water ecosystems (Decision VII/4). The Convention's inland waters programme promotes the ecosystem approach, including integrated watershed management, as the best way to reconcile competing demands with dwindling supplies of inland waters. It also identifies the actions that Parties need to carry out to halt the trend of inland waters biodiversity loss.

i) Linkages of inland waters biodiversity to poverty

No poverty alleviation is possible without water. The multitude of living aquatic resources from inland waters which are the products of fisheries are significantly important for human health (food and nutrition), particularly for the rural poor in developing countries. Lack of access (opportunity) to those

¹³ This also identified as a weakness in the current PoW

resources and empowerment over their exploitation and management contribute to poverty. Declining inland fishery resources promote food insecurity. Likewise, water (as a physical resource itself) has critical linkages with poverty. Water is both a key input to many types of livelihood activities and a determinant of the health and productivity of ecosystems on which the poor depend. Ensuring continuity in water flows and minimum levels of water quality is essential for maintaining the integrity of ecosystems, which in turn is critical for activities such as fishing, grazing and fuel wood gathering on which many poor people depend. Making sure that adequate and reliable water supplies are available for agricultural activities (including livestock, aquaculture, horticulture and other types of production) is essential to poverty reduction throughout the developing world. The significant inter-linkages between poverty and the state of the environment, including those between poverty and the shortage of water, are getting increased recognition, but insufficient consideration is being given to the fact that protecting ecosystems directly or indirectly related to water is essential to sustainable development.

TABLE 19: Links of the ecosystem services provided by inland waters biodiversity to international poverty frameworks

Ecosystem services provided by inland BD	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Provisioning services:						
Food	Production of fish, edible aquatic plants and animals, etc.	Direct consumption of foods to support livelihoods. Trading of foodstuffs for income generation, e.g. livelihoods of fisherfolk. Food is of course very relevant to poverty and livelihoods. The biological resources derived from inland waters are very important in many areas particularly for poor rural communities.	G1, T1, T2 G4, T5 G5, T6	F, H, N	O	E, H, S, P
Fresh water	Storage and retention of water for domestic, industrial and agricultural use	Access to clean potable water is an indicator of human development. Deprivation of freshwater is an indicator of poverty.	G4, T5 G5, T6 G7, T10, T11	H, N	S	E, H, S, P
Fibre & Fuel	Production of logs, fuel wood, peat, fodder	Same as for food (above). Provisioning of shelter and energy, including trading in fibre and fuel.	G1, T1 G4, T5 G5, T6	F, N	O, S	Most
Biochemicals	Extraction of medicines and other materials from biota	Direct use of local and traditional medicines by poor communities. Potential provision of new commercial drugs to treat diseases.	G6, T8 G8, T17	F, H, N	O, S	Most
Genetic materials	Genes for resistance to plant pathogens	Contributions of inland water biological resources to sustainable agriculture, forestry and fisheries. Adaptation to climate change. Improved varieties for the benefit of poor communities.	G1, T1, T2 G4, T5 G5, T6	F, H, N	O, S	E, H, S, P
Regulating services:						
Climate regulation	Source of and sink for greenhouse gases; influence local and regional temperature, precipitation, and other climatic processes	Poor communities are particularly vulnerable to climate change. The impacts of human-induced extreme climatic events are a significant driver of poverty and vulnerability. Poorly managed peatlands, for example, are a major source of carbon emissions.	Most	N	S	H, S, P
Water regulation (hydrological flows)	Groundwater recharge/discharge	Unsustainable groundwater use is a significant driver of poverty	Most	F, N, H	S	E, H, P
	Wetland hydrological functioning	Impacts most other ecosystem services and therefore most other linkages with poverty/livelihoods	Most	F, N, H	S	E, H, P

Ecosystem services provided by inland BD	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Water purification and waste treatment	Retention, recovery and removal of excess nutrients and other pollutants	Sustainable water resources for agriculture, drinking and sanitation. Reductions in pollutants mitigate toxic effects on poor communities. Almost 80% of diseases in developing countries are associated with water, causing about 1.7 million deaths every year.	Most	H	S	H,S, P
Erosion regulation	Retention of soils and sediments	Contributes to sustainable agriculture and food security for rural poor.	G1, T1, T2 G4, T5, G5, T6	F, H, N	O, S	E, H, P
Natural hazard regulation	Flood control, storm protection	Poor communities are extremely vulnerable to natural (and human induced) hazards.	Most	Most	S	Most
Pollination	Habitat for pollinators	Inland water-dependent pollinators contribute to sustainable agriculture and food security for the rural poor.	G1, T1, T2	H, N	O, S	E, H,S
Cultural services:						
Spiritual & Inspirational	Source of inspiration and cultural heritage/identity.	Many religions attach spiritual and religious values to aspects of wetland ecosystems. Religion is one source of social and community stability. Loss of cultural identity can lead to social unrest and livelihood insecurity.	Most	S, H	O	H, S
Recreational	Opportunities for recreational activities	Revenue from recreational activities (undertaken by the more affluent), e.g. recreational fisheries with earnings accruing to poor communities. "Recreation" is also important for poor communities by providing relaxation and social cohesion. Inland waters often provide zero-cost recreational activities for poor communities (e.g. fishing, swimming).	Most	F, S, H	O	E, H, S
Aesthetic	Many people find beauty or aesthetic value in aspects of wetland ecosystems	As for spiritual and inspirational.	Most	S	O	H, S
Educational	Opportunities for formal and informal education and training	The value of traditional and local knowledge of the biological diversity of inland water ecosystems for long-term human well-being, particularly for sustainable agriculture, forestry and fisheries. Knowledge required to achieve food security (e.g. how to exploit biological resources in times of crisis).	most	S, H	S	H, S
Supporting services:						
Soil formation	Sediment retention and accumulation of organic matter	Sustainable agriculture (and food security) for the rural poor.	G1, T1, T2	H, N	S	P
Nutrient cycling	Storage, recycling, processing and acquisition of nutrients	Sustainable goods and services (e.g. food, fibre, construction materials) for the poor. Also related linkages to the provision of clean drinking water and sanitation (recycling human wastes). See also water purification and waste treatment.	G4, T5 G5, T6 G7, T10, T11	N	S	P

* Financial (F), Human (H), Natural (N), Social (S), and Physical (P)

** Increasing opportunity (O), enhancing empowerment (E), and strengthening security (S)

*** Economic capabilities (E), Human capabilities (H), Socio-cultural capabilities (S), Political capabilities (PC), Protective capabilities (P).

Source: adapted from the Millennium Ecosystem—Wetlands synthesis, and UNEP/CBD/COP/8/INF/15, with author's own analysis.

a) Baseline of the Programme of Work

The problem that the inland water biodiversity PoW aims to address is that the rate of loss of freshwater species diversity is the fastest for any of the world's major biomes. Taxonomic groups with the highest proportion of threatened species tend to be those that rely on freshwater habitats. For example, according to the Living Planet Index, the rate of loss of freshwater biodiversity (1970-2000) was almost double that of marine and terrestrial biomes (CBD 2009). In view of the above regarding loss of inland water services and water-poverty links, the question really is why do policy makers not pay more attention to this PoW.¹⁴

The comparative rate of loss of area of inland water habitat is difficult to assess but data confirm that the loss mirrors that for species. Over half of the 14 biomes that the Millennium Ecosystem Assessment surveyed have experienced a 20–50% conversion to human use, but the study did not include inland wetlands. Accurate quantitative data for the historical and current global extent of inland waters are difficult to obtain. Where reasonable data do exist, more than 50% of specific types of inland wetlands were lost during the twentieth century, suggesting a loss at least equivalent to that of forests and approximately 2.5 times the rate of loss of coral reefs (MA 2005; more recent data available from other sources).

The aim of the revised Programme of Work on biological diversity of inland water ecosystems is to “*further enhance the implementation of the Convention on Biological Diversity in this area at the catchment/watershed/river basin levels, and to fulfill its leadership role in international biodiversity issues relating to inland water ecosystems*” (Decision V11/4, Annex paragraph 5 (CBD 2010)).

The following CoP decisions are relevant to the inland waters biodiversity PoW:

- Decision IV/4: Status and trends of the biological diversity of inland water ecosystems and options for conservation and sustainable use
- Decision V/2: Progress report on the implementation of the Programme of Work on the biological diversity of inland water ecosystems (implementation of decision IV/4)
- Decision VI/2: Biological diversity of inland waters
- Decision VII/4: Biological diversity of inland water ecosystems
- Decision VIII/20: Biological diversity of inland water ecosystems: reporting processes, improving the review of implementation and addressing threats
- Decision IX/19 : Biological diversity of inland water ecosystems

i) Does the baseline analysis of the PoW consider poverty?

Poverty and livelihood are not mentioned in the problem analysis of the PoW on Inland water biodiversity. There is no explanation on how conservation of inland water biodiversity will benefit poor people. In regard to specific CoP Decisions relevant to poverty in the text of the Programme of Work on the biological diversity of inland water ecosystems, Decision VII/4 and annex, paragraph 25 recommends a study on poverty-inland water biodiversity linkages. In this paragraph, the COP emphasized the “*critical role of inland water biodiversity for sustainable livelihoods ...and, accordingly, requested the Executive Secretary, in collaboration with the FAO and other relevant organizations, to prepare a study of the linkages between conservation and sustainable use of inland water biodiversity and poverty alleviation/sustainable livelihoods, including human health considerations, for consideration by the Conference of the Parties at its eighth meeting*”. The result was in line with the analysis above, concluding that the services provided by inland water ecosystems are central to the achievement of sustained economic well-being; and therefore provided offer strong arguments for expanded attention to the Programme of Work (UNEP/CBD/COP/8/INF/15).

¹⁴ One reviewer notes the answer (in part) is that policy attention is not based on facts or science. The PoWs get investment based on people's perceptions of importance (and personal interest)—not on the evidence base alone.

In addition, paragraph 8 recommends that the Strategic Plan of the Convention on Biological Diversity and the Plan of Implementation of the World Summit on Sustainable Development should guide the implementation of the revised Programme of Work on inland water biological diversity.

Furthermore, the Ramsar Convention has a specific resolution on wetlands and poverty reduction (Ramsar Resolution IX.14 paragraphs 7 and 8). Paragraph 11 instructs the Convention's Scientific and Technical Review Panel to develop guidelines for the implementation of this Resolution. Ramsar is the lead implementation partner for wetlands.

b) System of goals (guiding principles, programme elements, goals and objectives)

The PoW on inland water biodiversity has the following fundamental guiding principles (COP 7 Decision VII/4, Annex paragraph 5):

(a) To promote the conservation and sustainable use of inland water biological diversity including by appropriate transfer and development of technologies and by appropriate funding;

(b) To apply the ecosystem approach to the management of inland water ecosystems;

(c) To support indigenous and local communities to re-establish, develop and implement traditional approaches and/or adaptive management approaches to conserve and sustain the use of the biological diversity of inland water ecosystems;

(d) To promote the fair and equitable sharing of benefits gained from the use of inland water genetic resources and associated traditional knowledge based on prior informed consent in accordance with national laws;

(e) To use and draw upon scientific, technical and technological knowledge of indigenous and local communities and relevant stakeholders, with their participation and prior informed consent in accordance with national laws, in the implementation of all programme elements.

The goals and objectives of the Programme of Work are contained in the three program elements: conservation, sustainable use and benefit-sharing; institutional and socio-economic enabling environment; and knowledge, assessment and monitoring.

i) Targets

Decision VIII/15 applies targets to the PoW. The revised Programme of Work identifies goals, objectives and activities within the three programme elements. Programme element 1 addresses the need for “*conservation, sustainable use and benefit sharing*”. Programme element 2 addresses the need to create an “*institutional and socio-economic enabling environment*” in order to reach the goals and objectives. Programme element 3 addresses the need to improve “*knowledge, assessment and monitoring*” including *inter alia*, for elaborating the linkages between the biological diversity of inland water ecosystems and sustainable development (and hence with the attainment of Millennium Development Goals).

Within the 2010 targets “to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth” (Decision VI/26), adopted at CoP 8 Decision VI/26, Annex IV (UNEP/CBD/COP/DEC/VIII/15), the PoW has 10 goals and 21 targets.

ii) Does the system of goals of the PoW consider poverty reduction?

None of the stated guiding principles explicitly mention poverty. However, the principles mention indigenous and local communities and equitable sharing of benefits of inland water genetic resources can be rightfully regarded as elements of poverty and poverty reduction. Additionally, within the three programme elements of the PoW there is no explicit reference to poverty. Only one goal 2.5 “*Promote the effective participation of indigenous and local communities and relevant stakeholders in the conservation and sustainable use of biological diversity of inland water ecosystems in accordance with national laws and applicable international obligations*” can be interpreted as targeting poverty alleviation, though it may not have been the intention of the Parties. Effective participation of indigenous and local communities (not necessarily the rural poor; and the rural poor are not necessarily ILCs) will allow them to represent their needs and interests including poverty. In addition, reference to application of the ecosystem approach in implementing the PoW, as well as capacity building of local communities, and consideration of local communities in for example environmental and social impact assessments, can be interpreted as implying poverty reduction in practice.

Within the 2010 targets “to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth”, adopted at COP 8 Decision VI/26, Annex IV, poverty and livelihoods of the poor are explicitly mentioned in Goal 8 target 8.2 “*Inland water biological resources that support sustainable livelihoods, local food security and health care, especially of poor people, maintained and, where depleted, restored*”. Elements of poverty are also indirectly referenced in targets of Goals 3, 9 and 10.

c) Implementation strategy of the PoW

i) Activities, measures and/or implementation mechanisms

This PoW contains activities for the Parties, and supporting activities. None of these explicitly mentions poverty, though some concepts might be interpreted as such for example Activities 1.1.4, 2.5.3, 2.5.3, 2.5.4, 3.2.3, 3.2.7, and 3.3.2.

TABLE 20: Inland Waters PoW—Programme elements and Activities of the Parties

Programme Element	Activities of the Parties:
1. Conservation, Sustainable Use and Benefit-Sharing	1.1.4. Promote effective collaboration among scientists, local stakeholders, planners, engineers, and economists, including indigenous and local communities with their prior informed consent (both within and among countries) in the planning and implementation of development projects to better integrate the conservation and sustainable use of inland water biological diversity with water resource developments.
2. Institutional and Socio-Economic Enabling Environment	2.5.3. Promote the full and effective participation and involvement of indigenous and local communities and relevant stakeholders as appropriate, in policy-making, planning and implementation in accordance with national laws. 2.5.4. Implement capacity-building measures to facilitate the participation of indigenous and local communities and the application of traditional knowledge favourable to the conservation of biodiversity, with their prior informed consent in accordance with national laws, in the management, conservation and sustainable use of biological diversity of inland water ecosystems.
3. Knowledge, Assessment and Monitoring	3.2.3 Adopt an integrated approach in the assessment, management and, where possible, remedial actions of inland water ecosystems, including associated terrestrial and in-shore marine ecosystems. It should be noted that: (a) Assessments should involve all stakeholders, including indigenous and local communities, should be cross-sectoral and should make full use of indigenous knowledge based on prior informed consent; 3.2.7 Promote, in close cooperation with indigenous and local communities, the development of global social indicators in accordance with decision VII/30 relevant to the implementation of the Programme of Work on inland water biological diversity and its review through the Ad Hoc Open-ended Inter-Sessional Working Group on Article 8(j) and Related Provisions. 3.3.2. Apply the recommendations for the conduct of cultural, environmental, and social impact assessments regarding developments proposed to take place on, or which are likely to impact on, sacred sites and on lands and waters traditionally occupied or used by indigenous and local communities.

ii) Tools for implementation

The following adopted tools (including approaches, principles and guidelines) support the implementation of the Programme of Work on inland waters biodiversity.

- Application of principles of the ecosystem approach¹⁵ and
- Practical principles for sustainable use¹⁶.
- Guidelines (e.g. for the control of invasive alien species),¹⁷
- Integration of biodiversity considerations in environmental impact assessment and strategic environment assessment¹⁸, and
- Various methods (e.g. rapid assessment methods for inland water biodiversity¹⁹ and marine and coastal biodiversity²⁰) adopted or to be considered for adoption by the Conference of the Parties.
- The Akwé: Kon Voluntary Guidelines for the Conduct of Cultural, Environmental and Social Impact Assessment regarding Developments Proposed to Take Place on, or which are Likely to Impact on, Sacred Sites and on Lands and Waters Traditionally Occupied or Used by Indigenous and Local Communities.

iii) Does the activities of the PoW (sufficiently) consider poverty reduction?

While the word poverty is not explicitly mentioned, some activities of the PoW (i.e. Activities 1.4, 2.5.3, 2.5.3, 2.5.4, 3.2.3, 3.2.7, and 3.3.2) cover elements of poverty such as good governance, participation of indigenous and local communities in decision making, capacity building to empower local communities and indigenous people, and conducting cultural, environmental, and social impact assessments to identify and mitigate potential negative impacts and maximize potential positive impacts of developments.

The ongoing work of the Ramsar Convention, its Secretariat, Scientific and Technical Review Panel, international organization partners and other stakeholders, on wetlands and poverty is a very relevant opportunity to achieve the further contribution of the PoW to poverty alleviation and sustainable livelihoods. The ninth meeting of the Contracting Parties to the Ramsar Convention made substantial progress in highlighting the linkages between poverty and wetlands and clearly signaled the importance of that Convention in contributing to the achievement of human development targets. Resolution IX.14, paragraph 11, of the Ramsar Convention instructs its Scientific and Technical Review Panel to develop guidelines for the implementation of that resolution.

d) Monitoring, evaluation and lessons learned

i) Indicators or parameters used for evaluation

None of the indicators for the PoW on inland waters biodiversity relate to poverty. However there is potential for using Ramsar Indicators of Ecological Effectiveness.

In Annex II of Decision VIII/10, the CoP decided to undertake an In-Depth Review of the Programme of Work on Inland Waters Biodiversity at its 10th meeting. Accordingly, SBSTTA considered the In-Depth Review of implementation of the Programme of Work on inland waters biodiversity at its 14th meeting, in Nairobi, Kenya (10 - 21 May 2010). This has recently been completed (UNEP/CBD/SBSTTA/14/3 and

15 Decision V/6 of the Conference of the Parties and the note by the Executive Secretary on further elaboration of guidelines for implementation of the ecosystem approach and its relationship with sustainable forest management (UNEP/CBD/SBSTTA/9/8), prepared for the ninth meeting of SBSTTA.

16 UNEP/CBD/SBSTTA/9/9.

17 Decision VI/23 of the Conference of the Parties.

18 Decision VI/7 of the Conference of the Parties.

19 UNEP/CBD/SBSTTA/8/8/Add.5.

20 UNEP/CBD/SBSTTA/9/14/Add.3.

UNEP/CBD/SBSTTA/14/3 INF/3) and the main conclusion is that the PoW needs to be more poverty focused through relationships with water, with reference to the MDGs and sustainable development.

e) Scope for mainstreaming poverty into the PoW

There is enormous scope for mainstreaming poverty considerations throughout the PoW, notably since the baseline of the PoW²¹ involves considerations of power, access, political economy, distributional impacts and related root-causes, in particular as the PoW relates to wetlands. To reiterate, the disenfranchisement of affected people from decision-making processes is among the widely accepted reasons why many types of wetlands continue to be lost, converted, or degraded. The main entry point for this work should be water availability.

A major area in which progress can be made without re-negotiating the PoW or producing new guidelines is for Parties, in their review of and implementation of existing NBSAPs, to pay particular attention to ensuring appropriate and effective linkages with poverty. Notably, the linkages should appear between water use and planning and their Poverty Reduction Strategy Papers, and associated implementation activities. However, a decision to this effect is required and appropriate guidance from the Convention is required.

Conclusions

Water availability is a cross-cutting issue that should be handled across all of the PoWs, and more widely across the work of the Convention. In the specific case of inland waters biodiversity, efforts should be aimed at the implementation level to ensure relevant activities carried out with the objective of biodiversity conservation/sustainable use/equitable access and benefit-sharing are pro-poor and cognizant of issues of political economy.

21 See <http://www.cbd.int/waters/problem/>.

3.5 ISLAND BIODIVERSITY

TABLE 21: Analytical matrix—Island Biodiversity

Element of the PoW:	Linkages to Poverty, Livelihoods and Human Well-Being:
1. Baseline approach (COP Decisions/background)	There is no explicit mention of poverty in the problem analysis of the PoW on island biodiversity (www.cbd.int/island/problem/). However, poverty and elements of it (such as equitable sharing of benefits and capacity building) are mentioned in COP Decision IX/21: paragraph 6 and constitute a key rationale for forming the PoW.
2. System of Goals	Several reference poverty and livelihoods (Goals 3, 8, 9, 10 and related targets).
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	<ul style="list-style-type: none"> • Multiple-Use Protected Areas • Eco-tourism including community-based enterprises • Marine Protected Areas • Integrated Coastal Zones Management • Social Resilience
4. Evaluation / In-Depth Reviews	GEF review finds livelihood considerations essential for conservation of island biodiversity.
5. Lessons learned / Case Studies / Evidence	Lessons learned documented, case studies available for the PoW

TABLE 19: Desirable matrix—Island Biodiversity

Component of the PoW:	Linkages to poverty, livelihoods, human well-being:
1. Baseline approach (COP Decisions/background)	The PoW should include the importance of island biodiversity to poverty and poverty reduction and how efforts to conserve the biodiversity could support poverty reduction and conservation coherently. The principles of “at least do no harm” to poor people and respect for human rights must be observed in conserving island biodiversity.
2. System of Goals	Poverty needs to be better and explicitly integrated into the current programme elements, goals and objectives.
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	<ul style="list-style-type: none"> • Integration of climate change considerations including adaptation and mitigation with a link to poverty; • Pro-poor wetland conservation; • Spatial analysis/Poverty Mapping; • Access and benefit sharing (ABS) of genetic resources from island biodiversity; • Active participation of indigenous communities and respect for their knowledge, lifestyle in island biodiversity management practices; • Work on the valuation of ecosystem services provided by island biodiversity; • Payments for ecosystem services; • Mainstreaming of islands’ national development strategies/poverty reduction strategies (PRSPs); • Capacity building for sustainable biodiversity management by local communities;
4. Evaluation / In-Depth Reviews	The PoW does not have indicators.
5. Lessons learned / Case Studies / Evidence	Document lessons learned, disseminate these lessons as well as case studies and update the PoW to reflect new lessons and evidence from case studies.

Description of the Programme of Work

Islands are home to a large number of endemic species per unit of surface area, as well as unique ecosystems. However, island biodiversity faces a number of threats, including climate variability, natural disasters and the impact of economic development, particularly mass tourism. At its seventh meeting, the Conference of the Parties decided to establish a new thematic Programme of Work on Island Biodiversity (Decision VII/31). At the eighth CoP a Programme of Work was adopted (Decision VIII/1). The overall purpose of this Programme of Work is the significant reduction of island biodiversity loss by 2010 and beyond at global, regional and national levels, through the implementation of the three main objectives of the Convention, for the benefit of all forms of life on islands and, in particular, as a contribution to poverty alleviation and the sustainable development of small island developing States.

i) Linkages of island biodiversity to poverty

Poverty is clearly evident in the theme of island biodiversity, given that many island-dwelling populations are among the world's poorest. Island biodiversity is essential for many island populations, particularly those living in traditional societies, in order to meet their daily needs for food, tools, industry, medicine, transport, and waste disposal, regardless of new technologies and lifestyles. This is the case for many of the Pacific islands, including the Marshall Islands, Kiribati, and Tuvalu, which together contain some of the highest coastal biodiversity in the world (UNEP 2004c). Biodiversity is a particularly essential component of food security in small, isolated islands. For many islands, and especially small oceanic islands and island states, fish provide an almost indispensable source of animal protein. In the Philippines, some 1,500 coastal communities (70% of the population) account for 40–60% of national fish capture (Wong *et al.* 2005).

Perhaps one of the most important roles of fisheries is the employment opportunities they offer for thousands of people in a region where the high levels of unemployment continue to be a major concern. The fisheries sector provides stable full-time and part-time direct employment for more than 200,000 people and indirect employment for another approximately 100,000 in the secondary sector (processing and marketing), boat building, net making and other support industries (MA 2005). In addition, it is estimated that each person in the fisheries industry has five dependents, making the total number of people who depend on fisheries for their livelihood approximately 1.5 million (MA 2005). Traditional ecological knowledge is an integral part of the dynamics of island systems and the islanders who live there. For example, Indonesia has a strong history of traditional medicine and many varieties are practiced, the oldest being the *Jamu* system of herbal medicine (Erdelen *et al.* 1999). *Some 10% of Indonesia's total flora is estimated to have medical value, and some 40 million Indonesians depend directly on biodiversity (Erdelen et al. 1999).* Tourism based on the natural environment is an important contributor to, or dominates, the economies of many small island states. The Caribbean is the most tourism-dependent region in the world and accounts for about 50% of world cruise tourism berths, while the Maldives is the most tourism-dependent country (MA 2005).

TABLE 22: Links of the ecosystem services provided by island biodiversity to international poverty frameworks

Eco-system services provided by inland BD	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Provisioning services:						
Food	Production of fish, edible aquatic plants and animals, etc.	Direct consumption of foods to support livelihoods. Trading of foodstuffs for income generation e.g. livelihoods of fisher folk. Food is of course very relevant to poverty and livelihoods. The biological resources derived from islands are particularly important for their poor rural communities.	G1, T1, T2 G4, T5 G5, T6	F, H, N	O	E, H, S, P
Fresh water	Storage and retention of water for domestic, industrial and agricultural use	Access to clean potable water is an indicator of human development. Deprivation of freshwater is an indicator of poverty. Islands may face distinct freshwater challenges.	G4, T5 G5, T6 G7, T10, T11	H, N	S	E, H, S, P
Fibre & Fuel	Production of logs, fuelwood, peat, fodder	As for food. Provisioning of shelter and energy, including trading in fibre and fuel.	G1, T1 G4, T5 G5, T6	F, N	O, S	Most
Bio-chemicals	Extraction of medicines and other materials from biota	Direct use of local and traditional medicines by poor communities. Potential provision of new commercial drugs to treat diseases.	G6, T8 G8, T17	F, H, N	O, S	Most
Genetic materials	Genes for resistance to plant pathogens	Contributions of island water biological resources to sustainable agriculture, forestry and fisheries. Adaptation to climate change. Improved varieties for the benefit of poor communities.	G1, T1, T2 G4, T5 G5, T6	F, H, N	O, S	E, H, S, P
Regulating services:						
Climate regulation	Source of and sink for greenhouse gases; influence local and regional temperature, precipitation, and other climatic processes	Islands, notably SIDS, are particularly vulnerable to climate change. The impacts of human-induced extreme climatic events are a significant driver of poverty and vulnerability. Some islands face the threat of inundation, e.g. Tuvalu, Vanuatu, Kiribati, Samoa, Solomon Islands	Most	N	S	H, S, P
Water regulation (hydrological flows)	Groundwater recharge/discharge	Unsustainable groundwater use is a significant driver of poverty. Groundwater resources on islands are particularly limited.	Most	N, H	S	E, H, P
	Wetland hydrological functioning	Impacts most other ecosystem services and therefore most other linkages with poverty/livelihoods	Most	F, N, H	S	E, H, P
Water purification and waste treatment	Retention, recovery and removal of excess nutrients and other pollutants	Sustainable water resources for agriculture, drinking and sanitation. Reductions in pollutants mitigate toxic effects on poor communities.	Most	H	S	H, S, P
Erosion regulation	Retention of soils and sediments	Contributes to sustainable agriculture and food security for the rural poor. Again, major limitations on islands in terms of substitutability of soil services.	G1, T1, T2 G4, T5, G5, T6	F, H, N	O, S	E, H, P
Natural hazard regulation	Flood control, storm protection	Poor communities are extremely vulnerable to natural (and human-induced) hazards. Islands face the notable threat of inundation, vulnerability to natural disasters and inability to migrate by land.	Most	Most	S	Most

Eco-system services provided by inland BD	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Pollination	Habitat for pollinators	Pollinators contribute to sustainable agriculture and food security for the rural poor.	G1, T1, T2	H, N	O, S	E, H, S
Cultural services:						
Spiritual & Inspirational	Source of inspiration and cultural heritage/identity.	Many islands religions attach spiritual and religious values to aspects of their ecosystems, e.g. Rapa Nui (Easter Island). Religion is one source of social and community stability. Loss of cultural identity can lead to social unrest and livelihood insecurity.	Most	S, H	O	H, S
Recreational	Opportunities for recreational activities	Revenue from recreational activities (undertaken by the more affluent), e.g. recreational fisheries, with earnings accruing to poor communities. "Recreation" is also important for poor communities by providing relaxation and social cohesion. Islands often provide zero-cost recreational activities for poor communities (e.g. diving, beaches, fishing, swimming). The recreational opportunities on islands are a major contributor to their tourism potential, which can have poverty-reduction linkages.	Most	S, H	O	E, H, S
Aesthetic	Many people find beauty or aesthetic value in aspects of wetland ecosystems	As for spiritual and inspirational, the major aesthetic advantages of islands contribute to their attractiveness as tourism destinations. Tourism, particularly eco-tourism can contribute to poverty alleviation if managed effectively.	Most	S	O	H, S
Educational	Opportunities for formal and informal education and training	The value of traditional and local knowledge of the biological diversity of island ecosystems for long-term human well-being, particularly for sustainable agriculture, forestry and fisheries. Knowledge required to achieve food security (e.g. potatoe varieties of Papua New Guinea).	Most	S, H	S	H, S
Supporting services:						
Soil formation	Sediment retention and accumulation of organic matter	Sustainable agriculture (and food security) for the rural poor.	G1, T1, T2	H, N	S	P
Nutrient cycling	Storage, recycling, processing and acquisition of nutrients	Sustainable goods and services (e.g. food, fibre, construction materials) for the poor. Also related linkages to the provision of clean drinking water and sanitation (recycling human wastes). See also water purification and waste treatment.	G4, T5, G5, T6, G7, T10, T11	N	S	P

* Financial (F), Human (H), Natural (N), Social (S), and Physical (P)

** Increasing opportunity (O), enhancing empowerment (E), and strengthening security (S)

*** Economic capabilities (E), Human capabilities (H), Socio-cultural capabilities (S), Political capabilities (PC), Protective capabilities (P)

Source: adapted from the Millennium Ecosystem—Current States and Trends through author's own analysis.

a) Baseline of the Programme of Work

The unique characteristics that make island biodiversity so special also leave it particularly fragile and vulnerable. Despite the high levels of biodiversity and the prevalence of endemism, island species are present in relatively small numbers, making them very vulnerable to extinction. Furthermore, because island species have diminished dispersal capability and evolve in competition with relatively few other species, they develop survival strategies based on interdependency, co-evolution, and mutualism rather than defence mechanisms against a broad range of predators and competitors. As a result, many island species have become rare or threatened, and islands have a disproportionate number of recorded species extinctions when compared to continental systems. Of the 724 recorded animal extinctions in the last 400 years, about half were of island species. At least 90% of the bird species that have become extinct in that period were island-dwellers (www.cbd.int/island/problem/)

Biodiversity loss is a particular concern on islands. The Report of the Global Conference on the Sustainable Development of Small Island Developing States (also known as The Barbados Programme of Action for the Sustainable Development of Small Island Developing States (BPoA)), referred to the biological diversity of island ecosystems as “among the most threatened in the world”, due to their small size, isolation and fragility (Bridgetown, Barbados, 25 April-6 May 1994, Annex II, preamble, paragraph 6). More recently, the Millennium Ecosystem Assessment concluded that the main drivers of island biodiversity loss would either continue or increase rapidly. It projected that the impacts of climate change and pollution from nutrient loading will become increasingly severe and that the impacts associated with habitat change, over-exploitation and, particularly, invasive species will continue to be high or, in the latter case, very high.

Over the past century, island biodiversity has been subject to intense pressure from:

- Invasive alien species
- Tourism development
- Climate change and variability
- Natural disasters
- Overexploitation and unsustainable uses
- Pollution and waste disposal

These pressures are keenly felt by island economies. Among the most vulnerable of the developing countries, small island developing States (SIDS) depend on the conservation and sustainable use of island biodiversity for their sustainable development.

The following CoP decisions are relevant to the island biodiversity PoW:

- Decision VII/31: Request to develop a preparatory process for the work of the Subsidiary Body on Scientific Technical and Technological Advice on island biodiversity. Decision to establish a new thematic Programme of Work on island biodiversity
- Decision VII/31, Annex II: Terms of reference of the Ad Hoc Technical Expert Group on Island Biodiversity
- Decision VIII/1: Programme of Work on Island Biodiversity
- Decision IX/21: Island biodiversity

i) Does the baseline analysis of the PoW consider poverty?

There is no explicit mention of poverty in the problem analysis of the PoW on islands biodiversity (www.cbd.int/island/problem/). The problem analysis focuses more on threats and drivers to islands biodiversity without linking these threats to poverty. However, poverty and elements of it (such as

equitable sharing of benefits and capacity building) are mentioned in COP Decision IX/21, paragraph 6: “stresses that the management and eradication of invasive alien species, climate-change adaptation and mitigation activities, establishment and management of marine protected areas, capacity-building, access to, and fair and equitable sharing of the benefits arising out of the utilization of genetic resources, and poverty alleviation require particular efforts in the implementation of the Programme of Work”. Interviews reveal that the vulnerability and occasionally the marginalization of SIDS, in particular, were main driving forces for establishment of this PoW.

b) System of goals (overall purpose and scope of the Programme of Work, goals, targets)

The Programme of Work sets out almost 50 island-specific priority actions arranged under 11 goals, which are in turn organised under seven focal areas:

1. Protect the components of biodiversity
2. Promote sustainable use
3. Address threats to biodiversity
4. Maintain goods and services from biodiversity to support human well-being
5. Protect traditional knowledge and practices
6. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources
7. Ensure provision of adequate resources

Some of the goals of the PoW are relevant to poverty, and these are detailed below with particularly relevant portions highlighted in bold:

Goal	Goal Text
3	Promote the conservation of the biological diversity of ecosystems, habitats and biomes
8	Maintain capacity of ecosystems to deliver goods and services and support livelihoods
9	Maintain socio-cultural diversity of indigenous and local communities
10	Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources

i) Targets

As expected from a newer PoW, the Programme of Work on Island Biodiversity contains targets. “Global targets” in this PoW are defined as the desired outcomes/results to be achieved within a specific time-frame. These should be measurable and achievable. The global targets relevant to poverty are as follows, with especially relevant portions highlighted in bold:

Target	Target Text
3.1	<i>Genetic diversity of crops, livestock, and other valuable island species conserved, and associated indigenous and local knowledge maintained.</i>
8.1	<i>Capacity of island ecosystems to deliver goods and services maintained or improved.</i>
8.2	Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people living on islands, maintained.
9.1	Measures to Protect traditional knowledge, innovations and practices associated with island biological diversity implemented, and the participation of indigenous and local communities in activities aimed at this promoted and facilitated.
9.2	Traditional knowledge, innovations and practices regarding island biodiversity respected, preserved and maintained, the wider application of such knowledge, innovations and practices promoted with the prior informed consent and involvement of the indigenous and local communities providing such traditional knowledge, innovations and practices, and the benefits arising from such knowledge, innovations and practices equitably shared.
10.2	Benefits arising from the commercial and other utilization of island biodiversity genetic resources shared in a fair and equitable way with the countries providing such resources in line with the Convention on Biological Diversity and its relevant provisions.

ii) *Does the system of goals of the PoW consider poverty reduction?*

This PoW's system of goals has explicit references to poverty reduction, livelihoods, equitable distribution of benefits arising from island biodiversity. This implies a "vertical coherence" at this level with the baseline of the PoW. Poverty is explicitly mentioned in the overall purpose of the PoW baseline, in Paragraph 14: *"The overall purpose of the Programme of Work on island biodiversity is the significant reduction of island biodiversity loss by 2010 and beyond at global, regional and national levels, through the implementation of the three main objectives of the Convention, for the benefit of all forms of life on islands and, in particular, as a contribution to poverty alleviation and the sustainable development of small island developing States. The implementation of the Programme of Work thereby contributes to the objectives of the Strategic Plan of the Convention on Biological Diversity, the Barbados Programme of Action, the Plan of Implementation of the World Summit on Sustainable Development and the Millennium Development Goals"*.

Additionally, some adopted island biodiversity PoW goals and targets within the 2010 biodiversity target explicitly mention poverty and its elements. These include goal 3 target 3.1; goal 8, targets 8.1 and 8.2; goal 9 targets 9.1 and 9.2; and goal 10 target 10.2.

c) *Implementation strategy of the PoW*

i) *Activities, measures and/or implementation mechanisms*

The PoW on island contains "island-specific priority actions for the Parties which are defined as a major action that must be implemented and will contribute significantly to achieving the target. It answers the question, "What must we do to achieve this target?" Poverty reduction appears in several of the priority actions of the PoW, for example, priority action 8.2.1: *"Develop policies, programmes and actions to ensure the capacity of island ecosystems to deliver goods and services and biological resources that support sustainable livelihoods, local food security and health care, especially of poor people". The rationale behind this being that Island communities are largely dependent on local biodiversity for food and livelihoods.*

Priority action 9.1.1. mentions the need to *"recognize and protect island traditional knowledge, innovations and practices which improve the understanding, conservation and sustainable use of biodiversity"* while priority action 9.1.2. mentions the need to *"develop and implement measures and legislation, where appropriate and in keeping with national laws and relevant international obligations, for the respect and protection of indigenous and local communities' rights over their traditional knowledge innovations and practices"*. Poverty is also explicitly mentioned within Priority actions 4.1.1, 4.1.1.3: *"Support indigenous and local communities in developing sustainable resource-based livelihoods and economic activities, including appropriate research and capacity-building"*; and 4.1.1.5 *"Assess the current and potential contribution of biodiversity to island peoples in terms of sustaining livelihoods, economic activity and cultural value"*.

ii) *Tools for implementation*

This PoW has many tools for implementation, which include:

1. **Multiple-Use Protected Areas.** The trend in the number and coverage of protected areas in SIDS has been almost exponential in the last 10 years. The management objectives have also been shifting from strict conservation to managed resource protected areas, which allow for the multiple uses of natural resources within those areas. Multiple-use protected areas on islands can encourage poverty reduction (Scherl *et al.* 2004).
2. **Eco-tourism including community-based enterprises.** Tourism in SIDS is by no means synonymous with poverty reduction, in fact, in some cases it entrenches existing inequalities. If tourism is to contribute significantly to the reduction of poverty in SIDS, a broad approach that values so-

cial sustainability as well as the more popular environmental sustainability and economic growth will be necessary. In addition, governments need to establish an effective policy environment and play a stronger regulatory role if sustainable, equity-enhancing tourism is to emerge (Scheyvens and Momsen 2008). Eco-tourism, including community-based enterprises on islands, has shown promise for both biodiversity conservation and poverty alleviation.

- 3. Marine Protected Areas.** A Marine Protected Area (MPA) is any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment (Wells 2008). Leisher *et al.* (2008) find that the benefits of MPAs extend to poverty reduction, notably through improved fish catches, new jobs, mostly in tourism, stronger local governance, benefits to health, and benefits to women.
- 4. Integrated Coastal Zone Management.** The overall goal of Integrated Coastal Zone Management (ICZM) is to create conditions suitable for the reduction of poverty, development of sustainable livelihoods and the integration of the coastal zone into national processes. ICZM is a continuous process of administration which seeks, through more efficient management, to establish and maintain the best use and sustainable levels of development and activity in coastal zones, and, over time, to improve the physical status of the coastal environment.
- 5. Social Resilience.** Social resilience refers to communities' capacity to adapt to the consequences of change and manage themselves without losing critical social relations, economic options and political stability. This concept has been examined as it relates to reef management, MPA network establishment and management by Abesamis *et al.* 2006.

iii) Does the implementation strategy of the PoW (sufficiently) consider poverty reduction?

Poverty is explicitly mentioned within the "island-specific priority actions" for the Parties. Poverty elements explicitly mentioned include support for sustainable livelihoods, local food security and health care, especially of poor people; respect and protection of indigenous and local communities' rights over their traditional knowledge innovations and practice; and support for indigenous and local communities in developing sustainable resource-based livelihoods and economic activities.

d) Monitoring, evaluation and lessons learned

An in-depth review of the Island Biodiversity Programme of Work will be carried out by the 15th meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA); the COP will consider the review at its 11th meeting in 2012.

The GEF has produced a brief document on lessons learned through its support to islands which is operationalised through Integrated Management for Conservation and Sustainable Use. Lessons learned include:

- Approaches that integrate biodiversity within the development agenda are fundamental to addressing conservation and the sustainable use of island biological resources;
- It is important to integrate biodiversity planning processes into key policies and institutions, especially those that drive the national development-planning process;
- Linkages among biodiversity, health, and climate change issues need to be made and reflected in National Biodiversity Strategy and Action Plans and national development planning documents.

On the topics of "Social Issues" and "Civil Society Participation", the GEF finds that key elements for successfully incorporating local communities into the conservation action process often include their active involvement in the design and implementation of conservation and sustainable use measures, the

establishment and operation of sustainable economic opportunities, awareness raising, education, and sound communication plans.

Within MPA projects, the GEF finds that key elements of successful marine protected area programmes include active participation and involvement of all key stakeholders, complete information exchange, fair decision making, efficient administration, and positive participant interactions.

e) Scope for mainstreaming poverty into the PoW

Poverty is well-mainstreamed within the island biodiversity PoW. Further scope might be considered via re-orienting the focus from conservation to the sustainable and equitable use of island ecosystems where poverty reduction is a central theme rather than a means towards an end. This requires a large degree of awareness raising, consensus building, policy reform and the uptake of a new array of policy instruments. These need to be based on a much better understanding of the issues facing the island poor.

There is a need for substantial capacity building in island community development and poverty reduction approaches. Many of the approaches that need to be applied have still to be developed, some are currently being developed and others exist but need to be brought together and applied in practice. There is already a large amount of information out there but this has rarely been brought together to provide a cohesive body of knowledge that can inform policy (see Whittingham *et al.* 2003 for reef-specific recommendations).

Conclusions

This PoW is vertically coherent with poverty considerations found throughout from the rationale through to the tools for implementation. The interactions with climate change, however, are a major gap.

3.6 MARINE AND COASTAL BIODIVERSITY

TABLE 23: Analytical matrix—Marine and Coastal Biodiversity

Element of the PoW:	Linkages to Poverty, Livelihoods and Human Well-Being:
1. Baseline approach (COP Decisions/background)	No explicit reference to poverty in the baseline of the PoW (www.cbd.int/marine/problem.shtml). However, several paragraphs of COP 8 Decision VIII/22 and COP 8 Decision VIII/24 make explicit reference to elements of poverty such as participation of indigenous and local communities (if they are poor) in the management of marine and coastal biodiversity.
2. System of Goals	Basic principles within the PoW make explicit reference to poverty alleviation (COP 7 Decision VII/5, Annex, Paragraph 8). Within the 2010 framework of goals and targets for the PoW, several references to poverty and livelihoods are made in Goals 3, 4, 8, 9, 10 and related targets.
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	Activities to be carried out by the Parties, assisted by regional and international organizations, do not make reference to poverty or related elements.
4. Evaluation / In-Depth Reviews	In-Depth Review will be undertaken by COP 10. The In-Depth Review is provided in document UNEP/CBD/SBSTTA/14/4. Background information is provided in document UNEP/CBD/SBSTTA/14/INF/2.
5. Lessons learned / Case Studies / Evidence	Lessons learned and case studies are provided in the background document of the In-Depth Review (UNEP/CBD/SBSTTA/14/INF/2).

TABLE 24: Desirable matrix—Marine and Coastal Biodiversity

Component of the PoW:	Linkages to poverty, livelihoods, human well-being:
1. Baseline approach (COP Decisions/background)	The PoW should include background information on how biodiversity degradation is linked with poverty and why and how conserving marine and coastal biodiversity could support poverty reduction and conservation coherently. The principles of “at least do no harm” to poor people and respect for human rights must be observed in conservation of marine and coastal biodiversity.
2. System of Goals	Poverty and conservation of marine and coastal biodiversity need to be better and explicitly integrated into the current programme elements, goals and objectives.
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	Integration of a poverty alleviation strategy into the planning and implementation of integrated marine and coastal area management; Integration of poverty concerns into the development, establishment and management of marine and coastal protected areas; Integration of poverty concerns into the marine spatial planning; Integration of climate change considerations including adaptation and mitigation with a link to poverty; Access and benefit-sharing (ABS) of genetic resources from marine and coastal biodiversity; Active participation of indigenous communities and coastal communities, respect for their knowledge and lifestyles in the management of marine and coastal biodiversity; Work on the valuation of ecosystem services provided by marine and coastal biodiversity; Payments for ecosystem services; Mainstreaming of marine and coastal issues into national development strategies/poverty reduction strategies (PRSPs); Better alignment of poverty reduction efforts and conservation of marine and coastal biodiversity; Capacity building to local communities to support the sustainable management of marine and coastal biodiversity.
4. Evaluation / In-Depth Reviews	The PoW does not have indicators.
5. Evidence	Document lessons learned, disseminate these lessons as well as case studies and update the PoW to reflect new lessons and evidence from case studies.

Description of the Programme of Work

Oceans make up the majority of the world’s surface area and are home to some of the most numerous species on the planet. Marine ecosystems also play an important role in regulating the global climate and nutrient circulation. Coastal biodiversity has important economic, social and cultural roles, as well as contributing to flood prevention. Some examples of marine and coastal habitats include mangrove forests; coral reefs; sea grass beds; estuaries in coastal areas; hydrothermal vents; and seamounts and soft sediments on the ocean floor a few kilometres below the surface.

In view of concern for the conservation and sustainable use of marine and coastal biodiversity, the Parties to the CBD agreed on the Jakarta Mandate on Marine and Coastal Biological Diversity in 1995. A Programme of Work to implement the Jakarta Mandate was adopted in 1998 (Decision IV/5), and was reviewed and updated in 2004 (Decision VII/5). The marine and coastal biodiversity thematic work programme includes oceans, regional seas, intertidal areas and estuaries. The programme includes five thematic issues: integrated marine and coastal area management, marine and coastal living resources, marine and coastal protected areas, mariculture and alien species.

i) Linkages of marine and coastal biodiversity to poverty

The oceans cover 70% of the planet's surface area, and marine and coastal environments contain diverse habitats that support an abundance of marine life. Life in our seas produces a third of the oxygen that we breathe, offer a valuable source of protein and moderate global climatic change. According to the CBD (2009) marine fish and invertebrates are among the last sources of wild food on the planet, providing over 2.6 billion people with at least 20% of their average per capita protein intake. More than 3 billion people depend on marine and coastal biodiversity for their livelihoods. Moreover, the world's oceans host 32 of the 34 known phyla on Earth and contain somewhere between 500,000 and 10 million marine species (CBD 2009). Species diversity is known to be as high as 1,000 species per square metre in the Indo-Pacific Ocean, and new oceanic species are continuously being discovered, particularly in the deep sea. It is therefore not surprising that the genetic resources in oceans and coasts are of actual and potential interest for commercial uses.

TABLE 25: Links between ecosystem services provided by marine and coastal biodiversity and international poverty frameworks

Eco-system services provided by inland BD	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G and Targets (T))	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Provisioning services:						
Food	Production of fish, edible aquatic plants and animals, etc.	Direct consumption of foods to support livelihoods. Trading of foodstuffs for income generation e.g. livelihoods of fisherfolk. Food is of course very relevant to poverty and livelihoods. The biological resources derived from marine and coastal areas are very important on islands, in particular for their poor rural communities.	G1,T1, T2 G4,T5 G5, T6	F, H, N	O	E, H, S, P
Fibre & Fuel	Production of logs, fuel wood, peat, fodder	As for food. Provisioning of shelter and energy, including trading in fibre and fuel.	G1, T1 G4, T5 G5, T6	F, N	O, S	Most
Biochemicals	Extraction of medicines and other materials from biota	Direct use of local and traditional medicines by poor communities. Potential provision of new commercial drugs to treat diseases.	G6, T8 G8, T17	F, H, N	O, S	Most
Genetic materials	Genes for resistance to plant pathogens	Contributions of marine and coastal biological resources to sustainable fisheries and adaptation to climate change.	G1, T1, T2 G4, T5 G5, T6	F, H, N	O, S	E, H, S, P
Regulating services:						
Climate regulation	Source of and sink for greenhouse gases; influence local and regional temperature, precipitation, and other climatic processes	Marine and coastal areas are particularly vulnerable to climate change. The impacts of human-induced extreme climatic events are a significant driver of poverty and vulnerability. Some islands face the threat of inundation.	Most	N	S	H,S, P
Water regulation (hydrological flows)	Coastal wetland hydrological functioning	Impacts most other ecosystem services and therefore most other linkages with poverty/livelihoods.	Most	F, N, H	S	E, H, P
Water purification and waste treatment	Retention, recovery and removal of excess nutrients and other pollutants	Sustainable water resources for agriculture, drinking and sanitation. Reductions in pollutants mitigate toxic effects on poor communities.	Most	H	S	H,S, P

Eco-system services provided by inland BD	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Erosion regulation	Retention of sediments	Retention of sediments would help habitat protection. Contributes to food security for the rural poor.	G1, T1, T2 G4, T5, G5, T6	F, H, N	O, S	E, H, P
Natural hazard regulation	Flood control, storm protection	Poor communities are extremely vulnerable to natural (and human induced) hazards. Marine and coastal area communities face the notable threat of inundation, vulnerability to natural disasters, inability to migrate by land.	Most	Most	S	Most
Cultural services:						
Spiritual & Inspirational	Source of inspiration and cultural heritage/identity.	Many coastal areas' religions attach spiritual and religious values to aspects of their ecosystems. Religion is one source of social and community stability. Loss of cultural identity can lead to social unrest and livelihood insecurity.	Most	S, H	O	H, S
Recreational	Opportunities for recreational activities	Revenue from recreational activities (undertaken by the more affluent), e.g. recreational fisheries, with earnings accruing to poor communities. "Recreation" is also important for poor communities by providing relaxation and social cohesion. Islands often provide zero-cost recreational activities for poor communities (e.g. diving, beaches, fishing, swimming). The recreational opportunities in marine and coastal areas are a major contributor to their tourism potential, which can have poverty-reduction linkages.	Most	S, H	O	E, H, S
Aesthetic	Many people find beauty or aesthetic value in aspects of coastal and marine ecosystems	As for spiritual and inspirational values, the aesthetic advantages of marine and coastal areas contribute to their attractiveness as tourism destinations. Tourism, particularly eco-tourism can contribute to poverty alleviation if managed effectively.	Most	S	O	H, S
Educational	Opportunities for formal and informal education and training	The value of traditional and local knowledge of the biological diversity of marine and coastal area ecosystems for long-term human well-being, particularly for fisheries.	Most	S, H	S	H, S
Supporting services:						
Soil formation	Sediment retention and accumulation of organic matter	Sustainable agriculture (and food security) for the rural poor.	G1, T1, T2	H, N	S	P
Nutrient cycling	Storage, recycling, processing and acquisition of nutrients	Sustainable goods and services (e.g. food, fibre, construction materials) for the poor. Also related linkages to the provision of clean drinking water and sanitation (recycling human wastes). See also water purification and waste treatment.	G4, T5 G5, T6 G7, T10, T11	N	S	P

* Financial (F), Human (H), Natural (N), Social (S), and Physical (P)

** Increasing opportunity (O), enhancing empowerment (E), and strengthening security (S)

*** Economic capabilities (E), Human capabilities (H), Socio-cultural capabilities (S), Political capabilities (PC), Protective capabilities (P)

NB: This table gives insufficient attention to deep sea biodiversity, on which the author's struggled to find information.

Source: adapted from the Millennium Ecosystem—Current States and Trends through author's own analysis.

a) Baseline of the Programme of Work

The problem that the marine and coastal biodiversity PoW aims to address are the major threats to marine and coastal ecosystems:

- land-based pollution and eutrophication;
- overfishing, destructive fishing, and illegal, unreported and unregulated fishing;
- alterations of physical habitats;
- invasions of exotic species; and
- global climate change.

Overfishing is widely acknowledged as the greatest single threat to marine wildlife and habitats. The Food and Agriculture Organization of the United Nations reports that nearly 70% of the world's fish stocks are now fully fished, overfished or depleted (CBD 2009). As far as the world's coral reefs are concerned, about 20% of them have been effectively destroyed and show no immediate prospects for recovery; about 16% of them were seriously damaged by coral bleaching in 1998, but of these about 40% have either recovered or are recovering well; about 24% of the remaining reefs are under imminent risk of collapse through human pressures; and a further 26% are under a longer-term threat of collapse (CBD 2009).

The following CoP decisions are relevant to the marine and coastal biodiversity PoW:

- Decision II/10 B (see also SBSTTA recommendation I/8): Conservation and sustainable use of marine and coastal biological diversity
- Decision IV/5: Conservation and sustainable use of marine and coastal biological diversity, including a Programme of Work
- Decision V/3 Implementation of decision IV/5: Progress report on the implementation of the Programme of Work on marine and coastal biological diversity (implementation of decision IV/5)
- Decision VI/3: Marine and coastal biological diversity
- Decision VII/5: Marine and coastal biodiversity
- Decision VIII/21: Marine and coastal biological diversity: conservation and sustainable use of deep seabed genetic resources beyond the limits of national jurisdiction
- Decision VIII/22: Marine and coastal biological diversity: enhancing the implementation of integrated marine and coastal area management
- Decision VIII/24: Protected areas: Options for cooperation for the establishment of marine protected areas in marine areas beyond the limits of national jurisdiction
- Decision IX/20: Marine and coastal biodiversity

i) Does the baseline analysis of the PoW consider poverty?

It is clear that the marine and coastal PoW problem analysis (justifying the PoW) does not make explicit reference to poverty. It only focuses on the major threats to marine and coastal ecosystems without highlighting how these threats and efforts to reduce or eliminate them affect poverty of coastal communities and beyond, and how poverty can further exacerbate these threats or vice versa.

However, COP 8 Decision VIII/22 makes explicit reference to poverty through references to participation of indigenous people in the management of marine and coastal biodiversity. For example, Paragraph 3(a) states "...encouraging participation by indigenous and local communities and relevant stakeholders, to provide input into consideration of integrating the recommendations of Integrated Marine and Coastal Area Management (IMCAM) into national and regional processes"; and Paragraph 4(b) "...encourage[s] indigenous and local communities and relevant stakeholders to use resources sustainably, consistent with

Articles 8(j) and 10(c); and, where required, to diversify their economic and livelihood base". COP 8 Decision VIII/24 Paragraph 6, "Agrees on the importance of undertaking consultation processes including indigenous and local communities and relevant stakeholders on reporting on the implementation of the Programme of Work on protected areas".

Other paragraphs within COP 8 Decision VIII/24 make reference to elements of poverty such as full and effective participation of indigenous and local communities, respecting rights, and the integration of marine and coastal biodiversity conservation in poverty reduction strategies (paragraph 18 (c), (d) (g) and (j), 21, 22 (e), 24 (c), 26, 21, 22 (e), 33, and COP 9 Decision IX/20 paragraph 26 and 27).

b) System of goals

The CBD work programme on Marine and Coastal Biodiversity has a vision, mission, basic principles, five key programme elements and goals and operationable objectives under each element. The five key elements reflect global priorities.

Programme element 1: Implementation of integrated marine and coastal area management (IMCAM).
Goal: *To promote and improve the implementation of IMCAM at the local, national and regional level.*

Operational objectives

- 1.1: *To apply appropriate policy instruments and strategies, including building of capacity, for the effective implementation of IMCAM*
- 1.2: *To undertake direct action to protect the marine environment from negative impacts*
- 1.3: *To develop guidelines for ecosystem evaluation and assessment, paying attention to the need to identify and select indicators, including social and abiotic indicators that distinguish between natural and human-induced effects.*

Programme element 2: Marine and coastal living resources

Goal: *To ensure the conservation and sustainable use of marine and coastal living resources*

Operational objectives

- 2.1: *To promote ecosystem approaches to the conservation and sustainable use of marine and coastal living resources, including the identification of key variables or interactions, for the purpose of assessing and monitoring, first, components of biological diversity; second, the sustainable use of such components; and, third, ecosystem effects.*
- 2.2: *To make available to the Parties information on marine genetic resources in marine areas beyond national jurisdiction and, as appropriate, on coastal and marine genetic resources under national jurisdiction from publicly available information sources.*
- 2.3: *To gather and assimilate information on, build capacity to mitigate the effects of, and to promote policy development, implementation strategies and actions to address: (i) the biological and socio-economic consequences of physical degradation and destruction of key marine and coastal habitats including mangrove ecosystems, tropical and cold-water coral-reef ecosystems, seamount ecosystems and seagrass ecosystems including identification and promotion of management practices, methodologies and policies to reduce and mitigate impacts upon marine and coastal biological diversity and to restore mangrove forests and rehabilitate damaged coral reef; and in particular (ii) the impacts of mangrove forest destruction, coral bleaching and related mortality on coral-reef ecosystems and the human communities which depend upon coral-reef services, including through financial and technical assistance.*
- 2.4: *To enhance the conservation and sustainable use of biological diversity of marine living resources in areas beyond the limits of national jurisdiction*

Programme element 3: Marine and coastal protected areas

Goal: The establishment and maintenance of marine and coastal protected areas that are effectively managed, ecologically-based and contribute to a global network of marine and coastal protected areas, building upon national and regional systems, including a range of levels of protection, where human activities are managed, particularly through national legislation, regional programmes and policies, traditional and cultural practices and international agreements, to maintain the structure and functioning of the full range of marine and coastal ecosystems, in order to provide benefits to both present and future generations.

Operational objectives

- 3.1: *To establish and strengthen national and regional systems of marine and coastal protected areas integrated into a global network and as a contribution to globally agreed goals.*
- 3.2: *To enhance the conservation and sustainable use of biological diversity in marine areas beyond the limits of national jurisdiction*
- 3.3: *To achieve effective management of existing marine and coastal*
- 3.4: *To provide support for and facilitate monitoring of national and*
- 3.5: *To facilitate research and monitoring activities that reflect identified global knowledge gaps and priority information needs of management of marine and coastal protected areas.*

Programme element 4: Mariculture

Goal: To prevent or minimize the negative impacts of mariculture on marine and coastal biodiversity and to enhance any positive effects of mariculture using native species.

Operational objectives

- 4.1: *To promote use of techniques, which minimize adverse impact of mariculture on marine and coastal biological diversity.*

Programme element 5: Invasive alien species

Goal: To prevent the introduction of invasive alien species into the marine and coastal environment, and to eradicate to the extent possible those invasive alien species that have already been introduced.

Operational objectives

- 5.1: *To achieve better understanding of the pathways and the causes of the introduction of alien species and the impact of such introductions on biological diversity.*
- 5.2: *To put in place mechanisms to control all pathways, including shipping, trade and mariculture, for potential invasive alien species in the marine and coastal environment.*
- 5.3: *To maintain an incident list on introductions of alien species*

Programme element 6. General

Operational objectives

- 6.1: *To assemble a database of initiatives on programme elements through a cooperative approach with relevant organizations and bodies, with special emphasis on integrated marine and coastal areas management.*
- 6.2: *To undertake effective collaboration, cooperation and harmonization of initiatives with relevant conventions, organizations and agencies while recognising their independent mandates.*

The Programme of Work on Marine and Coastal Biodiversity is based on several basic principles. These include the ecosystem approach, the precautionary approach, the importance of science, and the related knowledge of local and indigenous communities.

Basic principles within the PoW state that “in accordance with the Millennium Development Goals, the implementation of the Programme of Work aims to make a direct contribution to poverty alleviation. Its successful implementation will require national and regional capacity-building and financial resources for developing country Parties, in particular the least developed and small island developing States among them” (COP 7 Decision VII/5, Annex, Paragraph 8).

i) Targets

There are no targets within the Marine and Coastal Biodiversity PoW.

However, the PoW has goals and targets adopted from framework of goals and targets for the 2010 biodiversity target. COP 8 Decision VIII/2 paragraph 12 adopted the goals and targets for the Programme of Work on the marine and coastal biodiversity contained in the annex to this decision. The goals and targets that make direct reference to elements of livelihoods and poverty reduction include Goal 3, Target 3.1; Goal 4, Targets 4.1 and 4.2; Goal 8, Targets 8.1 and 8.2; Goal 9, Targets 9.1 and 9.2; and Goal 10, Target 10.

ii) Does the system of goals of the PoW consider poverty reduction?

The basic principles of the PoW make explicit reference to poverty alleviation (COP 7 Decision VII/5, Annex, Paragraph 8). However, poverty and livelihoods are not mentioned in the vision, mission, five key programme elements and goals and operational objectives within elements of the PoW. The question is, if we consider poverty alleviation as an overarching principle for the PoW, would we need to mention poverty for every elements of PoW?

With the 2010 framework of goals and targets, the PoW on marine and coastal biodiversity has goals and targets that make reference to the livelihood of the poor and elements of poverty. These include Goal 3; Target 3.1; Goal 4, Targets 4.1 and 4.2; Goal 8, Targets 8.1 and 8.2; Goal 9, Targets 9.1 and 9.2; and Goal 10, Target 10. It is worth noting that Goal 8, Target 8.2 explicitly mentions the sustainable livelihoods, local food security and health care in relation to poor people.

TABLE 26: Goals and targets for 2010 that are relevant to the Marine and Coastal Biodiversity thematic Programme of Work and poverty

Goal	Goal Text	Target	Target Text
3	Promote the conservation of the biological diversity of ecosystems, habitats and biomes	3.1	Further losses of known genetic diversity of exploited wild fish and other wild and cultured marine and coastal species prevented, and associated indigenous and local knowledge maintained.
4	Promote sustainable use and consumption	4.1	4.1.1: All exploited fisheries products derived from sources that are sustainably managed, and unsustainable uses of other marine and coastal species minimized. 4.1.2: All mariculture facilities operated consistent with the conservation of biodiversity and social equity.
4	Promote sustainable use and consumption	4.2	Aspects of this target are addressed under target 4.1.1 and 4.1.2.

Goal	Goal Text	Target	Target Text
8	Maintain capacity of ecosystems to deliver goods and services and support livelihoods	8.1	Capacity of marine and coastal ecosystems to deliver goods and services maintained or enhanced.
8	Maintain capacity of ecosystems to deliver goods and services and support livelihoods	8.2	Marine and coastal biological resources that support sustainable livelihoods, local food security and health care, especially of poor people, maintained and, where depleted, restored.
9	Maintain socio-cultural diversity of indigenous and local communities	9.1	Measures to protect traditional knowledge, innovations and practices associated with marine and coastal biological diversity implemented, and the participation of indigenous and local communities in activities aimed at this promoted and facilitated.
9	Maintain socio-cultural diversity of indigenous and local communities	9.2	Traditional knowledge, innovations and practices regarding marine and coastal biodiversity respected, preserved and maintained, the wider application of such knowledge, innovations and practices promoted with the prior informed consent and involvement of the indigenous and local communities providing such traditional knowledge, innovations and practices, and the benefits arising from such knowledge, innovations and practices equitably shared.
10	Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources	10.2	Benefits arising from the commercial and other utilization of genetic resources derived from marine and coastal biological diversity shared with the countries providing such resources.

c) Implementation strategy of the PoW

i) Activities, measures and/or implementation mechanisms

The programmes of work contain suggested activities to be carried out by Parties, assisted by regional and international organizations. Activities under **programme element 1** cover issues related to the implementation of integrated marine and coastal area management (IMCAM). These include operational objective 1.1, Activities (a) - (j); Operational objective 1.2, Activities (a) - (e); and Operational objective 1.3, Activities (a) - (g).

Activities under **programme element 2** focus on actions related to marine and coastal living resources. These include Operational objective 2.1, Activities (a)–(j); Operational objective 2.2, Activities (a)–(b); Operational objective 2.3, Activity (a); and Operational objective 2.4, Activities (a)–(b).

Activities within **programme element 3** cover issues related to marine and coastal protected areas. These include Operational objective 3.1, Activity(a); Operational objective 3.2, Activity (a); Operational objective 3.3, Activities (a)–(c); Operational objective 3.4, Activities (a)–(c); Operational objective 3.5, Activities (a)–(c).

Activities within **programme element 4** on mariculture include Operational objective 4.1, Activities (a)–(e).

Activities under **programme element 5** focus on Invasive alien species in regard to marine and coastal biodiversity. These include Operational objective 5.1, Activities (a)–(c); Operational objective 5.2, Activities (a) - (f); and Operational objective 5.3, Activity (a).

Programme element 6 focuses on general issues relevant to implementing the PoW on marine and coastal biodiversity. These include Operational objective 6.1, Activities (a)–(c); and Operational

objective 6.2, Activities (a)–(b). Additionally, enabling activities (a)–(i) in section IV of the PoW also cover a wide range of activities such as financial assistance, capacity building, strengthening existing legislation and institutions dealing with marine and coastal issues, and scientific, technical and technological collaboration which are central in supporting conservation and sustainable use of marine and coastal biodiversity.

ii) Tools for implementation

The following tools (not all of these are adopted) including approaches, principles and guidelines) support the implementation of the Programme of Work on marine and coastal biodiversity:

- Ecosystem approach;
- The precautionary approach;
- The importance of science, and the related knowledge of local and indigenous communities;
- Integrated marine and coastal management.
- Marine protected areas guidance—Interactive Map (IMAP) of High Seas Marine Protected Areas (MPAs) and key habitat distribution: Spatial databases containing information on marine areas beyond the limits of national jurisdiction;
- Technical Advice on the Establishment and management of a national system of marine and coastal protected areas. CBD Technical Series No. 13.
- Guides to fully-protected marine reserves: a guide.
- Guides on Marine and Coastal Protected Areas: A guide for planners and managers.
- Guidelines for Marine Protected Areas. WCPA Best Practice Protected Area Guideline.
- A practical guide on how monitoring can support effective management of MPAs. Australian Institute of Marine Sciences.
- A Guidebook of Natural and Social Indicators for Evaluating Marine Protected Area Management Effectiveness.
- Socio-economic Manual for Coral Reef Management. Global Coral Reef Monitoring Network publication.
- A sourcebook for managers of coral reefs, mangroves and sea grasses.
- A menu of options for financing marine conservation—a menu of options.

iii) Does the implementation strategy of the PoW (sufficiently) consider poverty reduction?

The activities to be carried out by the Parties, assisted by regional and international organizations, do not make reference to poverty or elements of poverty whatsoever. This can be misleading as at the implementation level, poverty is in fact being addressed through integrated marine and coastal management (Programme Element 1). This is also in contrast to some COP decisions relevant to the PoW and within the Basic principles of the PoW, that make explicit reference to poverty alleviation and elements of it (e.g. full and effective participation of indigenous and local communities, respecting rights, integration of marine and coastal biodiversity conservation in poverty reduction strategies).

Conclusions

The Marine and Coastal Biodiversity PoW is not strongly mainstreamed through its design, but relevant linkages to poverty are handled through implementation. Within IMCAM, local communities plan for sustainable development and address the issue of poverty and livelihoods of local communities. Marine Protected Areas are also increasingly pro-poor. In this case the emphasis should be on lesson sharing and dissemination of best practices.

3.7 Mountain Biodiversity

TABLE 27: Analytical matrix—Mountain Biodiversity

Element of the PoW:	Linkages to Poverty, Livelihoods and Human Well-Being:
1. Baseline approach (COP Decisions/background)	Explicit reference is made to poverty alleviation and livelihoods in COP 7 Decision VII/27, Annex, paragraph 7 . Underlying the goals of the PoW is the belief that sustainability will be achieved in mountain areas by reducing poverty, inequality, and marginalization, and improving the capabilities of institutions and organizations to promote conservation and sustainable use of biological diversity (www.cbd.int/mountain/problem.shtml).
2. System of Goals	Elements of poverty (e.g. access to, and sharing of benefits arising from the utilisation of genetic resources, preservation and maintenance of traditional knowledge and practices) are referenced explicitly. In addition, within the 2010 framework of goals and targets for the PoW, explicit reference is made to supporting poor people in regard to their livelihoods, local food security and health care).
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	Suggested actions to be carried out by Parties and the supporting activities of the Executive Secretary, within the elements of the PoW, make explicit reference to elements of poverty.
4. Evaluation / In-Depth Reviews	In-Depth Review of implementation of the PoW is forthcoming at SBSTTA 14 and COP 10.
5. Lessons learned / Case Studies / Evidence	

TABLE 28: Desirable matrix—Mountain Biodiversity

Component of the PoW:	Linkages to poverty, livelihoods, human well-being:
1. Baseline approach (COP Decisions/background)	The PoW should include the importance of mountain biodiversity to poverty and poverty reduction and how efforts to conserve biodiversity could support poverty reduction and conservation coherently. The principles of “at least do no harm” to poor people and respect for human rights must be observed in conservation of mountain biodiversity.
2. System of Goals	The PoW needs clear objectives, goals and targets that reflects better alignment of poverty reduction and mountain biodiversity.
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	<p>Integration of climate change considerations in mountain biodiversity management including adaptation, with a link to poverty;</p> <p>Indigenous mountain inhabitants actively and genuinely engaged in the implementation of the PoW;</p> <p>Access and benefit sharing (ABS) of genetic resources from mountain biodiversity;</p> <p>Active participation of indigenous communities and respect for their knowledge, lifestyle in mountain biodiversity and management practices;</p> <p>Carbon sequestration to become a viable source of financing for the development of mountain inhabitants;</p> <p>Work on the valuation of ecosystem services from mountains and their biodiversity;</p> <p>Payments for ecosystem services;</p> <p>Mainstreaming of mountain biodiversity issues into national development strategies;</p> <p>Capacity building for sustainable management of biological resources by local communities.</p>
4. Evaluation / In-Depth Reviews	Indicators are needed
5. Evidence	Document lessons learned, disseminate these lessons as well as case studies and update the PoW to reflect new lessons and evidence from case studies.

Description of the Programme of Work

The world's mountains encompass some of the most spectacular landscapes, a great diversity of species and habitat types, and distinctive human communities. Mountain ecosystems are important for biological diversity and host some of the world's most complex agro-cultural gene pools and traditional management practices. Since mountains include other ecosystem types, such as forests and inland waters, mountain biodiversity is cross-cutting in nature and all the other articles of the Convention and many decisions apply to mountain biological diversity. At its seventh meeting, the Conference of the Parties adopted a Programme of Work on mountain biological diversity as a set of actions addressing characteristics and problems that are specific to mountain ecosystems.

The overall purpose of the PoW is the significant reduction of mountain biological diversity loss by 2010 at global, regional and national levels, through the implementation of the three main objectives of the CBD. The implementation of the PoW aims at making a significant contribution to poverty alleviation in mountain ecosystems and in lowlands dependent on the goods and services of mountain ecosystems, and thereby contributes to the objectives of the Strategic Plan of the CBD, the Plan of Implementation of the World Summit on Sustainable Development, and the Millennium Development Goals. Mountain systems, covering about 27 per cent of the world's land surface and directly supporting 22 per cent of the world's people, are the water towers of the world, providing for the freshwater needs of more than half of humanity. The world's mountains encompass some of the most spectacular landscapes, a wide variety of ecosystems, a great diversity of species, and distinctive human communities. The world's principal biome types—from hyper-arid hot desert and tropical forest to arid polar icecaps—all occur in mountains. Mountains support about one quarter of world's terrestrial biological diversity, with nearly half of the world's biodiversity “hotspots” concentrated in mountains. Almost every area that is jointly important for plants, amphibians, and endemic birds is located within mountains. Of the 20 plant species that supply 80 per cent of the world's food, six species (maize, potatoes, barley, sorghum, tomatoes, and apples) originated in mountains. A large portion of domestic mammals—sheep, goats, domestic yak, llama, and alpaca—originated in mountain regions. Genetic diversity tends to be higher in mountains associated with cultural diversity and extreme variation in local environmental conditions.

However, mountains are vulnerable to a host of natural and anthropogenic threats, including seismic hazards, fire, climate change, land cover change and agricultural intensification, infrastructure development, and armed conflict. These pressures degrade mountain environments and affect the provision of ecosystem services and the livelihoods of people dependent upon them. The fragility of mountain ecosystems represents a considerable challenge to sustainable development, as the impacts of unsuitable development are particularly intense, more rapid and more difficult to correct than in other ecosystems.

In response, the CoP adopted the PoW on Mountain Biological Diversity in 2004, as a set of actions addressing characteristics and problems that are specific to mountain ecosystems. The PoW aims to conserve mountain biological diversity and maintain the goods and services of mountain ecosystems, and contribute to poverty alleviation and the achievement of the Millennium Development Goals.

Underlying the goals of the PoW on Mountain Biodiversity is the belief that sustainability will be achieved in mountain areas by reducing poverty, inequality, and marginalisation, preventing deterioration of natural resources and environments, and improving the capabilities of institutions and organizations to promote conservation and sustainable use of biological diversity. Achieving environmental and human sustainability in mountains means finding ways to manage mountain resources and systems so that they can provide critical ecosystem services. Implementation of the PoW on Mountain Biodiversity is of paramount importance for this.

i) Linkages of mountain biodiversity to poverty

The conservation and sustainable use of mountain biodiversity is essential to the livelihoods of many impoverished people who live in mountain areas. Twenty percent of the world's population—about 1.2 billion people—live in mountains (MA 2005). Most of them inhabit lower mountain elevations, and almost half are concentrated in the Asia-Pacific region. Of the 8% living above 2,500 meters, almost all—about 90 million—live in poverty and are considered highly vulnerable to food insecurity (MA 2005). However, they have significant impact on larger populations living at lower elevations through their influence on catchments.

Mountain biological diversity is of high importance for a number of ecological functions. The integrity of soils is the prime focus for ecosystem services and human needs. Mountains have often been referred to as “natural water towers” because they contain the headwaters of rivers that are also vital for maintaining human life in densely populated areas downstream. Natural and semi-natural vegetation cover on mountains helps to stabilize headwaters, preventing flooding, and maintaining steady year-round flows by facilitating the seepage of rainwater into underwater aquifers. Mountain forests are an important carbon pool; and they provide timber for fuelwood and non-timber products, including game and medicinal plants. Mountain biodiversity contributes to human well-being well beyond its immediate vicinity and is essential to the management of water flows over entire river basins. Soil retention and slope stability are closely connected with the extent of above-ground and below-ground vegetation, both essential to ecosystem resilience after disturbance. The high plant functional diversity of mountain ecosystems may also add to their resiliency and, should extreme disturbances occur, often provides effective barriers to high-energy events such as rock falls and avalanches. It also may reduce extensive damage levels at lower elevations. Mountains are also used for grazing and subsistence farming. Mountain ecosystems are significant for global biodiversity, and in addition they have intrinsic spiritual and aesthetic value.

TABLE 29: Links of the ecosystem services provided by Mountain Biodiversity to International Poverty Frameworks

Ecosystem services provided by Forests	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Provisioning services:						
Food	Mountains are also used for grazing, subsistence farming and hunting	Sparsely vegetated high lands support about 5 million people; 29 million live off grazing land, interspersed with other land cover types; and 4 million live in protected areas. Forests above 2,500 meters provide home for another 2 million people. Mixed land use patterns—such as crop agriculture combined with exploitation of forest resources and herding of small livestock—are characteristic of some locations between 2,500 and 3,500 meters (mountain class 3) in Central and South America, in the East African and Ethiopian Highlands, and in Nepal. A large portion of domestic mammals—sheep, goats, yak, llama, and alpaca—originated in mountain regions.	Most	F, H, N	O, S	Most

Ecosystem services provided by Forests	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Fresh water	Mountains contain the headwaters of rivers that are vital for maintaining human life in densely populated areas downstream. The water is essential for drinking and irrigation.	Water is becoming a limiting constraint to development in many parts of the world, and in some cases to life itself. Mountains play a crucial role in water supply, availability, or quality.	G1, T1, T2, G4, T5, G5, T6	H, N	O, S	Most
Fibre & Fuel	Mountains provide timber for fuelwood and non-timber products.	Wood is currently the most economically important forest product. Fuel wood meets about 7% of energy demand worldwide.	Most	F, H	O, S	Most
Biochemicals	Medicinal plants from mountain forests used by local and indigenous communities can ensure the provision of local medicines for health problems	In nearly all mountain regions, non-timber forest products are an important adjunct to traditional agriculture, often providing the major source of medicine for local people. Medicinal plant species (mostly from mountain forests) used by local populations and as trade products number in the thousands, and some 4,000 commercially important medicinal plant species are used in Southeast Asia alone.	Most	F, H, N	O, S	Most
Regulating services:						
Water purification and regulation	Maintaining steady year-round flows by facilitating the seepage of rainwater into underwater aquifers.	PES schemes can generate income for local communities	G1, T1, T2, G4, T5, G5, T6	N	S	H, P
Pollination and seed dispersal	Provide habitat for pollinators. For example, bees for pollination of cultivated crops	Pollination is critical for food production and human livelihoods, and directly links wild ecosystems with agricultural production systems.	G1, T1, T2	H, N	O, S	E, H, S
Climate regulation (local through vegetation cover and global through carbon sequestration)	Mountains play a key role in the water cycle, with feedback to the regional climate. Mountain forests are an important carbon pool	Carbon markets and Reduced Emission from Degradation and Deforestation (REDD project)s have a large potential source of untapped income for mountain populations	Most	Most	F, N	E, S
Erosion regulation	Soil retention and slope stability are closely connected with the extent of above-ground and below-ground vegetation, both essential to ecosystem resilience after disturbance	Leaf litter, understory vegetation, and forest debris protect the soil from splash erosion—reducing surface, rill, and gully erosion.	G1, T1, T2, G4, T5, G5, T6	N	S	H, P

Ecosystem services provided by Forests	Example(s) of the service provided	Examples of linkages to poverty reduction and sustainable livelihoods	Linkage to international poverty reduction frameworks:			
			MDGs (G) and Targets (T)	SLA Capitals (F, H, S, N, P)*	WB Pillars (O, E, S)**	Development Assistance Committee (DAC) Guidelines on poverty reduction (E, H, S, PC, P)***
Natural hazard regulation	Mountain vegetation and soils play a significant role in reducing or mitigating risks from natural hazards	Poor people are vulnerable to both natural and human-induced disasters	Most	Most	F, N	E, S
Cultural services:						
Spiritual & Inspirational	For many indigenous and traditional societies, mountains have an intrinsic spiritual value	The widespread existence of "sacred groves" in many societies is a physical manifestation of this spiritual role and has contributed to conservation of mountain ecosystems such as the Caucasuses, the Himalaya, and the mountains of New Guinea.	Most	S, H	0	H, S
Recreational	Mountains provide recreational services to millions of people through nature-based tourism	Mountain-based tourism can provide income that could support livelihoods for mountain people and helps maintain environmental quality.	G1, T1	F, H, S, P, N	O, E, S	Most
Aesthetic	For many indigenous and traditional societies, mountains have an aesthetic value	As for spiritual, inspirational and recreational.	Most	S, H	0	S
Supporting services:						
Primary production	Mountain forests and plants are mainly responsible for primary production.	All life on earth is directly or indirectly reliant on primary production.	G1, T1 G7, T9, T10	N	S	P
Nutrient cycling	Storage, recycling, processing and acquisition nutrients	Mountain biodiversity plays an essential role in nutrient cycling.	G1, T1, T2, G4, T5, G5, T6, G7, T10, T11	H, N	S	E, H, P

* Financial (F), Human (H), Natural (N), Social (S), and Physical (P)

** Increasing opportunity (O), enhancing empowerment (E), and strengthening security (S)

*** Economic capabilities (E), Human capabilities (H), Socio-cultural capabilities (S), Political capabilities (PC), Protective capabilities (P)

Source: adapted from the Millennium Ecosystem—Current States and Trends through author's own analysis.

a) Baseline of the Programme of Work

The Programme of Work focuses on addressing a number of serious and growing challenges facing mountain biodiversity. These include habitat degradation, seismic hazards, fire, climate change; land cover change, agricultural conversion, infrastructure development and armed conflict. Habitat degradation caused by unsustainable clearing of land results in erosion of fertile soil and increases the threat of avalanches, landslides and flooding. With this change in habitat, rare species of plants and animals can face extinction. This environmental degradation often means increasing poverty and hunger for mountain people, already amongst the world's poorest and hungriest. As resources become scarce, conflicts

over their use can arise. Many men, women and families have no choice but to migrate to lowland cities. Mountain communities disintegrate and entire cultures and languages disappear.

There are many challenges to overcome in order to successfully and sustainably use mountain biodiversity. The growing demand for water, the consequences of global climate change, the growth in tourism, and the pressures of industry and agriculture in a world of increased globalization are just some of these challenges. Chapter 13 of Agenda 21 on Sustainable Mountain Development recognized that mountain ecosystems are rapidly changing and that the proper management of mountain resources and socio-economic development of the people affected deserved immediate action. The United Nations General Assembly proclaimed 2002 as the International Year of Mountains with the main objective to increase awareness of the importance of sustainable mountain development. The 2002 World Summit on Sustainable Development included in its Plan of Implementation considerations for the sustainable development of mountain regions (paragraph 40).

The following CoP decisions are relevant to Mountain Biodiversity PoW:

- Decision I/2, paragraph 4 and Annex I paragraph 4 (k): Financial resources and mechanism
- Decision III/13, paragraph 2: Future Programme of Work for terrestrial biological diversity: dry-land, mountain and inland water ecosystems
- Decision III/11, Annex paragraph 7: Conservation and sustainable use of agricultural biological diversity
- Decision IV/16, paragraph 16 and Annex: Institutional matters and the Programme of Work
- Decision V/25, paragraph 2: Biological diversity and tourism
- Decision V/25, paragraph 7: Biological diversity and tourism
- Decision VII/27: Mountain biological diversity
- Decision VIII/3 Annex, Additional Planned Activities
- Decision IX/22 Annex, Planned activity 13: Mountain biological diversity

i) Does the baseline analysis of the PoW consider poverty?

In its preamble, the PoW on Mountain Biodiversity explicitly mentions poverty and in particular that the degradation of mountain biodiversity often exacerbates poverty and hunger for mountain people, already amongst the world's poorest and hungriest. In addition, the overall purpose and scope of the PoW specifically mentions that the overall "*aim of implementation of the Programme of Work is to make a significant contribution to poverty alleviation in mountain ecosystems and in lowlands dependent on the goods and services of mountain ecosystems and thereby contribute to the objectives of the Strategic Plan of the Convention on Biological Diversity, the Plan of Implementation of the World Summit on Sustainable Development, and the Millennium Development Goals*" (COP 7 Decision VII/27, Annex, paragraph 7). As a result, safeguarding mountain biodiversity in order to ensure a sustainable supply of ecosystem services and the livelihoods of people dependent upon them is central to the PoW.

b) System of goals;

The PoW on Mountain Biodiversity (VII/27) has three programme elements and fourteen goals. The goals and objectives of the PoW are contained in the three program elements: conservation, sustainable use and benefit-sharing; institutional and socio-economic enabling environment; and knowledge, assessment and monitoring :

Programme Element 1: *Direct actions for conservation, sustainable use, and benefit sharing*

Goal 1.1: To prevent and mitigate the negative impacts of key threats to mountain biological diversity

Goal 1.2: To protect, recover, and restore mountain biological diversity

Goal 1.3: To promote the sustainable use of mountain biological resources

Goal 1.4: To promote access to, and sharing of, benefits arising from the utilisation of genetic resources related to mountain biological diversity in accordance with national legislation where it exists

Goal 1.5: To maintain genetic diversity in mountain ecosystems in particular through the preservation and maintenance of traditional knowledge and practices

Programme Element 2: Means of implementation for conservation, sustainable use, and benefit sharing

Goal 2.1: To enhance the legal, policy, institutional, and economic framework

Goal 2.2: To respect, preserve, and maintain knowledge, practices, and innovations of indigenous and local communities in mountain regions

Goal 2.3: To establish regional and transboundary collaboration and the establishment of cooperative agreements

Programme Element 3: Supporting actions for conservation, sustainable use, and benefit sharing

Goal 3.1: To develop work on identification, monitoring and assessment of mountain biological diversity

Goal 3.2: To improve knowledge on and methods for the assessment and monitoring of the status and trends of mountain biological diversity based on available information

Goal 3.3: To improve the infrastructure for data and information management for accurate assessment and monitoring of mountain biological diversity and develop associated databases

Goal 3.4: To improve research, technical and scientific cooperation, and other forms of capacity-building related to mountain biological diversity

Goal 3.5: To increase public education, participation, and awareness in relation to mountain biological diversity

Goal 3.6: To promote the development, validation, and transfer of appropriate technologies for mountain ecosystems, including indigenous technologies in accordance with Article 8(j) of the CBD and related provisions.

The programme elements and the system of goals contain no explicit or intentional mention of poverty reduction and/or livelihoods, though some of the linked concepts such as promoting access to, and sharing of benefits arising from the utilisation of genetic resources (Goal 1.4), the preservation and maintenance of traditional knowledge and practices (Goal 1.5), and respecting, preserving, and maintaining knowledge, practices, and innovations of indigenous and local communities in mountain regions (Goal 2.2) may allude to it.

i) Targets

There are no targets within the Mountain Biodiversity PoW.

However, the PoW has goals and targets adopted from framework of goals and targets for the 2010 biodiversity target. COP 8 Decision VIII/2 paragraph 12 adopted the goals and targets for the Programme of Work on the biological diversity of Mountain Biodiversity contained in the annex to this decision.

The goals and targets that make direct reference to livelihoods and poverty reduction include Goal 3, Target 3.1; Goal 4, Targets 4.1 and 4.2; Goal 8, Targets 8.1 and 8.2; Goal 9, Targets 9.1 and 9.2; and Goal 10, target 10.2.

TABLE 30: Goals of the Programme of Work on Mountain Biodiversity

Goal	Goal Text	Target	Target Text
3	Promote the conservation of biological diversity of ecosystems, habitats and biomes	3.1	Genetic diversity of crops, livestock, and of harvested species of trees and other species providing non-timber forest products, fish, and wildlife and other valuable mountain species conserved, associated indigenous and local knowledge is protected and maintained.
4	Promote sustainable use and consumption	4.1	Mountain biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity.
4	Promote sustainable use and consumption	4.2	Unsustainable consumption of biological resources, and its impact upon mountain biodiversity, reduced.
8	Maintain capacity of ecosystems to deliver goods and services and support livelihoods	8.1	Capacity of mountain ecosystems to deliver goods and services maintained or improved.
8	Maintain capacity of ecosystems to deliver goods and services and support livelihoods	8.2	Mountain biological resources that support sustainable livelihoods, local food security and health care, especially of poor people living in mountains, maintained.
9	Maintain socio-cultural diversity of indigenous and local communities	9.1	Measures to protect traditional knowledge, innovations and practices associated with mountain biological diversity implemented, and the participation of indigenous and local communities in activities aimed at this promoted and facilitated.
9	Maintain socio-cultural diversity of indigenous and local communities	9.2	Traditional knowledge, innovations and practices regarding mountain biodiversity respected, preserved and maintained; the wider application of such knowledge, innovations and practices promoted with the prior informed consent and involvement of the indigenous and local communities providing such traditional knowledge, innovations and practices, and the benefits arising from such knowledge, innovations and practices are equitably shared.
10	Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources	10.2	Benefits arising from the commercial and other utilization of mountain genetic resources shared in a fair and equitable way with countries providing such resources are in line with the Convention on Biological Diversity and its relevant provisions.

ii) Does the system of goals of the PoW consider poverty reduction?

As noted earlier, elements of poverty (such as access to, and sharing of benefits arising from the utilisation of genetic resources, the preservation and maintenance of traditional knowledge and practices, and respecting, preserving, and maintaining knowledge, practices, and innovations of indigenous and local communities in mountain region) are referenced. In addition, the PoW goals and targets adopted from framework of goals and targets for 2010 has explicit references to livelihoods and equitable distribution of benefits arising from mountain biodiversity. These include specific references to the poor people (i.e. support for their livelihoods, local food security and health care).

c) Implementation strategy of the PoW

i) Activities, measures and/or implementation mechanisms

The PoW contains suggested activities to be carried out by Parties and supporting activities of the Executive Secretary.

Actions **under programme element 1** cover issues related to direct actions for conservation, sustainable use and benefit-sharing. These include Goal 1.1, Actions 1.1.1 - 1.1.9; Goal 1.2 Actions, 1.2.1 - 1.2.13; Goal 1.3, Actions 1.3.1 - 1.3.9; Goal 1.4, Actions 1.4.1 - 1.4.3; Goal 1.5, Actions 1.5.1 - 1.5.4.

Actions within **programme element 2** focus on means of implementation for conservation, sustainable use and benefit-sharing. These include Goal 2.1, Actions 2.1.1 -2.1.12; Goal 2.2, Actions 2.2.1 - 2.2.6; Goal 2.3. Actions, 2.3.1—2.3.5.

Actions within **programme element 3** contain activities aimed at supporting actions for conservation, sustainable use and benefit-sharing. These include Goal 3.1, Actions 3.1.1—3.1.6; Goal 3.2, Actions 3.2.1 - 3.2.8; Goal 3.3, Actions 3.3.1 - 3.3.4; Goal 3.4, Actions 3.4.1- 3.4.9; Goal 3.5, Actions 3.5.1 - 3.5.7; Goal 3.6, Actions 3.6.1 - 3.6.3.

ii) Tools for implementation

Tools for implementing this PoW include:

- Ecosystem approach;
- Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization.

iii) Does the implementation strategy of the PoW (sufficiently) consider poverty reduction?

There are elements of the PoW on Mountain Biodiversity that contain suggested actions to be carried out by Parties as well as supporting activities of the Executive Secretary, which make explicit reference to elements of poverty. For instance:

- Respecting rights and allowing full participation of indigenous and local communities in the implementation of the PoW, e.g. Action 1.2.5: “Establish and strengthen adequate, effective national, regional and international networks of mountain protected areas, in accordance with decisions of the Conference of the Parties on protected areas, while respecting the rights and full participation of indigenous and local communities”.
- Human livelihoods, e.g. Action 1.3.1: “Promote sustainable land-use and water resource management practices in relation to human livelihood needs (agriculture, pastoralism, animal husbandry, forestry, aquaculture, inland water fisheries, etc.) in mountain ecosystems, taking into account the Convention principles for sustainable use and the ecosystem approach”; and Action 1.4.3, “Promote actions that are beneficial for conservation through generating employment and/or income particularly for marginal communities”.
- Community-based management systems, e.g. Action 1.3.2: “Promote sustainable land-use practices, techniques and technologies, including those of indigenous and local communities and community-based management systems, for the conservation and sustainable use (including pastoralism, hunting and fishing) of wild flora and fauna and agro-biodiversity in mountain ecosystems, including biological pest control”.
- Capacity building for income-generating activity for the local inhabitants including tourism, e.g. Action 1.3.7: “Strengthen local capacity for sustainable tourism management, in order to ensure that benefits derived from tourism activities are shared by indigenous and local communities, while preserving natural and cultural heritage values”; and Action 1.3.8, “Promote the sustainable use of economically valuable wild plants and animals, as an income-generating activity for the local inhabitants”; and Action 2.1.3, “Promote the diversification of income-generating activities in support of conservation and sustainable use of mountain biological diversity and poverty reduction, including methods to share economic wealth, i.e., within mountain regions through regional development plans and between regions through “upland-lowland contracts”.
- Access and benefits of genetic resources for mountain biodiversity, Action 1.4.1: “Strengthen the

capacity of indigenous and local communities to engage in equitable benefit-sharing arrangements, taking into account the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization, bearing in mind their voluntary character and that they do not purport to replace national legislation.”

Conclusions

Poverty reduction is inherently included in this PoW. There is little scope for further mainstreaming post 2010 except through strengthening the implementation of the PoW. The suggested recommendations for SBSTTA 14 include linkages to poverty reduction.

4. FINDINGS

This section reviews the key findings of the study, which are based on the evidence detailed in section 3, complemented by analysis of the 4th national reports conducted by the Secretariat. It follows the three key research questions posed in section 1, and provides the basis for the recommendations found in section 5.

4.1 TO WHAT EXTENT DO THE CBD THEMATIC PROGRAMMES OF WORK ALREADY ADDRESS POVERTY LINKAGES?

To some degree poverty is addressed through all of the Programmes of Work, with a trend towards improved mainstreaming through time, evidenced by the direct references to the Millennium Development Goals in those PoWs adopted after CoP5. The authors conclude that the Millennium Summit captured policy-makers attention and helped improve the prospects for mainstreaming, particularly once the biodiversity target was adopted within the MDGs.

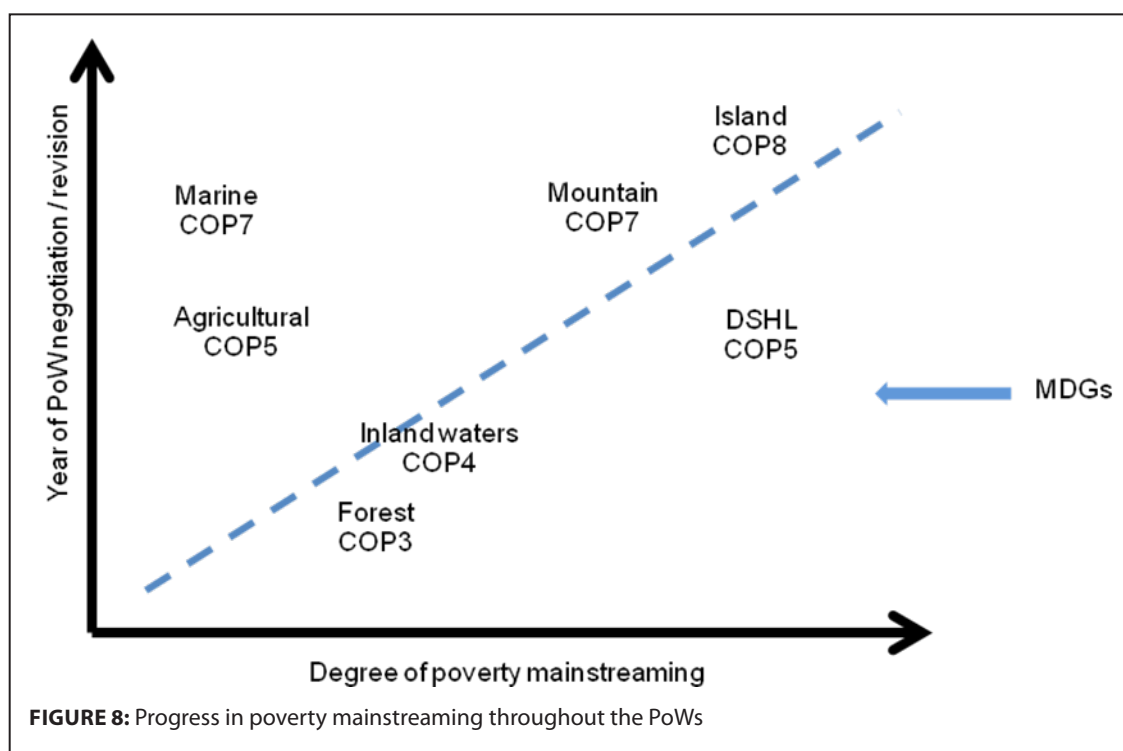


FIGURE 8: Progress in poverty mainstreaming throughout the PoWs

Most of the interviewees noted that the PoW design themselves is not the issue, but the key bottleneck is in fact implementation. The PoWs all serve the overriding purpose of the Convention. The preamble of the Convention affirms that the conservation of biodiversity is an integral part of a development process that recognizes that “economic and social development and poverty eradication are the first and overriding priorities of developing countries”. Furthermore, the preamble also states that “conservation and sustainable use of biodiversity is of critical importance for meeting the food, health and other needs of the growing world population, to which purpose access to and sharing of both genetic resources and technologies are essential”. Therefore, Article 6(b) of the text of the CBD calls for the integration of the conservation and sustainable use of biological diversity into relevant sectoral and cross-sectoral plans, programmes and policies. This statement needs to now move from intention to implementation.

Further evidence to support a focus on implementation is that many respondents noted that the PoW may have had little influence on what was eventually implemented (an assessment based on anecdotal evidence). In many cases, Parties “retro-fit” activities which are already taking place to report on the PoW for the In-Depth Review and National Reports. In just two cases was it felt that the PoW has a strong link to implementation on the ground and that guidance was well-integrated. Many respondents felt this indicates a great need to strengthen communication with the donor community, and notably the Global Environment Facility. Actions based on CoP decisions are often funded, but these have generally failed to link very strongly to the PoW activities.

Evidence from the 4th national reports indicates that mainstreaming efforts—across all the PoWs—are beginning but have not yet been taken up sufficiently. At the time of writing, 85 national reports were available for review. An analysis conducted by the Secretariat reveals that:

- 70 Parties reported the recognition that biodiversity is linked to human well-being, while 15 Parties did not provide any information about this issue;
- 73 Parties reported that activities related to mainstreaming, synergies and integration are being taken, though 70 Parties reported a lack of mainstreaming, fragmented decision making, communication, and coordination. The additional 15 Parties did not provide any information about the impacts of mainstreaming efforts; and
- None reported strong mainstreaming evidence or case studies, integrated decision-making, fruitful communication or strong coordination between biodiversity and development sectors.

Capacity building, especially for NBSAP implementation, is frequently mentioned as the most important next step for mainstreaming efforts to be taken up in practice.

4.2 WHERE DO EVIDENT LINKAGES TO POVERTY EXIST WHICH ARE NOT EXPLICITLY MENTIONED IN THE POW DOCUMENTATION?

The PoW documentation lacks an ecosystem goods and services view of biodiversity, which would facilitate the clear linkages of biodiversity to human well-being, livelihoods and poverty reduction. Equitable access and distribution of resources, beyond the issue of genetic resources, is not adequately handled through the PoWs. Issues of general political economy are not well-addressed in the Convention, for example uneven trade relationships, domestic power imbalances, and access to non-genetic biological resources.

Common barriers to implementation of the PoWs which warrant further attention are:

- Understanding the importance of biodiversity at global, national and local levels;
- The complementarities between activities of all the PoWs;
- The absence of suitable and consistent indicators to measure progress and impacts of the implementation;
- Political commitment and support to pro-poor biodiversity approaches;
- Mainstreaming and integration of biodiversity issues into other sectors, especially through an economic lens;
- Institutional, policy, human technical resources and capacity;
- Financial resources for implementation at national and sub-national levels;
- Suitable data, knowledge and information;
- Public awareness on mainstreaming and the contribution of biodiversity to development objectives;
- Training in the use of guidelines and tools, adequate dissemination of such materials and networking;

- Increased involvement of the poor in Convention processes at various levels (including national, sub-national); and
- Improved emphasis on market mechanisms for implementation.

4.3 SYNTHESIS OF THE COMMON ELEMENTS OF THE MATRICES, WHICH CAN BE USED FOR A UMBRELLA FRAMEWORK

Through the consultancy, a common “desirable matrix” was elaborated. This is a tool for mainstreaming of poverty considerations through a Programme of Work, and could be equally applied to the cross-cutting PoWs of the Convention. It aims for continuous review through a poverty lens of the PoWs, taking on board experiences to modify the PoW through growing understanding via implementation. It is meant to be applied informally and adopted gradually as PoWs develop, for informational purposes only.

TABLE 31: Common “Desirable Matrix”

Structure of the PoW:	Linkages to Poverty, Livelihoods and Human Well-Being:	Indicators used for Biodiversity-Ecosystem Services-Poverty linkages:
1. Baseline approach (COP Decisions/ background)	<p>a) Incorporate socio-economic data to address the poverty dimension in the baseline study. (Sources: In-Depth Review, National Reports, scientific findings, traditional knowledge, etc.)</p> <p>b) Adapt and update baseline studies considering the results and lessons learned from the most recent In-Depth Review.</p>	Establish an adapted core set of indicators from the CBD indicator framework (building from the 2010 Biodiversity Indicator Partnership), from other agreed and tested socio-economic indicator frameworks (MDGs, HDI, etc.), and new emerging indicators related to the value of ecosystem services in order to focus the base-line study.
2. System of Goals	<p>a) Incorporate explicit goals (targets, objectives) related to resolving the identified socio-economic problems or challenges within the base line analysis. .</p> <p>b) Comprehensively formulate the PoW's contribution to the selected socio-economic indicators.</p>	To measure the contributions of the PoWs to development/poverty reduction/livelihood/human well-being, select the appropriate socio-economic indicators from the agreed and tested indicator frameworks (see Table 2) and coherently describe the contributions of the PoW in achieving them. Use—if already available—new indicators related to the value of ecosystem services to balance costs and benefits of biodiversity management to development and poverty reduction.
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	<p>a) Incorporate explicit strategy elements, actions, measures, etc., describing how to achieve the goals (targets, objectives).</p> <p>b) Define which actors will be involved to achieve the goals and implement the measures (implementation structure).</p> <p>c) Define who will be the beneficiaries and who will lose benefits and will likely need compensation.</p>	<p>Highlight the PoW's contribution to improving the socio-economic situation of the poor, referring explicitly to the gains and advantages obtained from the application of specific biodiversity related instruments and the sustainable and pro-active management of biodiversity and ecosystem services.</p> <p>Elaborate a timeframe with milestones, which become indicators to measure the performance of the PoW and progress made in achieving the goals.</p>
4. Evaluation / In-Depth Reviews	<p>a) Incorporate explicitly socio-economic issues within the In-Depth Review or evaluation of the PoW, using a check list of relevant conservation and socio-economic indicators</p> <p>b) Use practical case studies, failures and success stories for illustration purposes.</p>	<p>Assess, monitor and evaluate the specific socio-economic and environmental indicators selected in the baseline study, the system of goals (impact/outcome indicators) and the strategy (performance indicators) of the PoW.</p> <p>Select the most strategic impact and performance indicators to be assessed or evaluated with more emphasis within the In-Depth Review.</p>
5. Lessons learned / Case Studies / Evidence	<p>a) Identify and explore poverty and/or development-oriented lessons learned in practice and conceptually</p> <p>b) Contribute to the overall learning process and deliver the findings to the Clearing-house mechanism and for capacity building purposes.</p>	Contribute lessons learned to the indicator discussion: e.g. how to improve effectiveness of the monitoring and evaluation system, and how to better mainstream biodiversity and ecosystem services indicators into broader development and poverty reduction plans and strategies.

4.4 LESSONS LEARNED THROUGH THE ANALYSIS

The consultants learned numerous lessons through the process of the consultancy, which are useful to share for future efforts at mainstreaming. We found that:

- Each of the PoWs is unique and takes a different approach, both through the format and the type of topic it approaches;
- The PoWs are sometimes incoherent given that they are added to through negotiated text, and revised rarely;
- Negotiation is lengthy and expensive. However, its critical importance for establishing official mandates should not be under-estimated nor should its importance for reflecting the true views of the Parties be dismissed.
- The negotiated text travels a long distance through to implementation; it may be worthwhile in some cases to focus more attention on calls for actions with specific targets than on revising PoWs;
- Most of the PoW wording is such that they can be widely interpreted; and
- There are no references given for the scientific knowledge underpinning biodiversity and poverty in the CBD PoWs. Stronger linkages to the evidence base could help to avoid generalization of the complex pathways described in section 1.2;
- Poverty may not be considered as a PoW specific concern rather than an overarching issue; and
- The PoWs do not have a suitable suite of indicators to measure their achievements in a consistent manner. None have especially poverty-relevant indicators.

5. CONCLUSIONS

There is at least a triple challenge for poverty reduction for the ecosystem services associated with biodiversity:

- The balance between effective uses of ecosystem services and effective investments in biodiversity to increase ecosystem resilience and productivity;
- Balanced distribution of ecosystem services among the various development sectors (inputs for production) of the economy in order to achieve an optimum of outcomes for human well-being; and
- Balanced distribution of ecosystem services among the various segments of the society in order to guarantee minimum necessary access to vital ecosystem services in terms of poverty reduction and food security (including health and education).

Poverty reduction is reflected as a high priority of the Convention in text, and within the intention of the draft Strategic Plan, though it often fails to travel through to practice. This may be partly due to our lack of understanding of the complex nature of biodiversity and development linkages, which necessitates various approaches to be adopted through temporal and spatial scales. The key conundrum is how more emphasis can be placed on how poverty is addressed within the implementation processes, using the official mandate of the Convention as a lever for action.

6. RECOMMENDATIONS

Practical immediate next steps which can be taken based on the results of the study are²²:

- Commission a review of the Convention's current implementation instruments to assess their suitability to promote implementation;
- Carry out an analysis of the cross-cutting PoWs in reference to addressing poverty reduction; and
- With the above two studies complete, prepare a much more detailed and informed analysis of the implementation bottlenecks in-country and what actions are should be undertaken at the global level to resolve these.

At a broader or longer-term scale, key recommendations for action by the CBD and its stakeholders are:

- Encouraging a comprehensive and strong joint effort of all international instruments with similar concerns (e.g. UNFCCC, UNCCD, CBD, amongst a long list of others) to have environmental considerations included in national development planning;
- Building capacity within the environment and development communities to implement poverty reduction objectives across the Convention and in the PoWs. NBSAPs are essential tools of the Convention for implementation. However, we cannot only rely on NBSAPs for the implementation of the CBD and we should also question if there are other instruments which are needed;
- Mainstreaming PoW actions into development agendas and capacity building as the common concern of all the PoWs;
- Enhancing cross-sectoral coordination and policy planning, and planning between levels of government, with emphasis on local implementation;
- Developing and strengthening stakeholder networks;
- Increase of knowledge and empirical data to improve the understanding of the poverty and biodiversity interlink;
- Demonstrating concretely and defensibly the economic and social value of biodiversity to encourage and inspire political commitment and support;
- Undertaking periodic review of the adequacy of policies and legislation and their implementation;
- Scaling up promising demonstration projects and successes (e.g. those showcased by the Equator Initiative);
- Improve synergies in implementation among the Rio Conventions and other Multilateral Environmental Agreements. At a minimum implementation among the biodiversity-related conventions should be better integrated;
- Strengthening regional collaboration to address scientific information needs; Development of a conceptual framework that not only describes the step by step process on research and implementation, but also a conceptual framework that offers understanding and insights on the linkages between biodiversity and poverty; and
- Enhancing international scientific processes such as IPBES with capacity building efforts at the regional (trans-boundary), national and sub-national levels, clearly linked to a poverty reduction aim.

On the specific question of indicators, the consultants assert that it would not be cost effective to monitor all the different ways in which the poor are affected by the different PoW biomes. But the question remains as how to identify and measure the key poverty- and biodiversity-relevant interactions. First, existing development targets should be considered and elaborated with relevant biodiversity information

²² With thanks and recognition to Juliane Zeidler.

for communication with the development community²³. Within the biodiversity community, discussion on indicators should be preceded by the development of a specific conceptual framework (see Annex 3). An ecosystem approach should be taken in which the interactions and trade-offs between different ecosystems and the occasional circular connection between poverty and natural resource degradation could be entirely captured.

When considering indicators to monitor the 'poverty impacts' of the PoWs, it is worth noting that there are many existing/established measures of the various aspects of poverty, livelihoods, development and well-being that are deployed as indicators by the development community, particularly at national level. However, for these to be of use in the context of the CBD they will often need to be adapted to the specific thematic and geographical context of each PoW. In some cases it may be possible to extract appropriately targeted data from existing datasets, for example by using a geographical mask or filter to extract data for people living in (and therefore likely dependent upon) forests or coastal areas. In other cases, the resolution of the data may be too coarse to enable such extraction, and other approaches to indicator development may be required. Recognising that new data collection is expensive and time consuming, many indicators inevitably rely on existing data sources. Where this is the case it is important to understand the limits of existing data in terms of what they can say about change in the context of a specific PoW or a specific biome. As far as possible, the finer the scale at which data can be sourced, the more valuable it is likely to be for identifying PoW-relevant change.

23 Reports focusing on the contributions of MDG7: Environmental Sustainability are examples in this regard.

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ANNEX 1

Questionnaire for Program Officer of the Dry and Sub-Humid Lands Programme of Work
11 February 2010

Dear Jaime,

As indicated by Ravi Sharma in his message of 26 October 2009, we have engaged a team of consultants from UNEP-WCMC to support the elaboration of poverty umbrella framework. This initiative by the Secretariat intends to link the implementation of the thematic CBD Programs of Work more explicitly to development and poverty reduction processes. It begins with an analysis of all seven thematic PoWs to determine to what degree poverty reduction objectives are already reflected in the PoW design and, wherever possible, implementation.

A questionnaire has been designed for you, the Programme Officer for the thematic Programme of Work on Dry and Sub-Humid Lands, to reflect your views on this topic. If you prefer to discuss these issues with a consultant over the phone, we will arrange a telephone interview either in addition to or in lieu of the questionnaire. The process is flexible, with the intention of getting your input to the analysis of your thematic PoW's linkages to poverty.

The following documents are included with this questionnaire:

1. An explanation of the methodology used in the poverty analysis
2. A draft synthesis and matrix of the desktop analysis of your thematic Programme of Work's linkages to poverty
3. A full text version of this analysis

Your general comments on these documents are welcome, but given limited time, the consultants' key questions for you are listed below. Please kindly consider these questions to the best of your knowledge, and share your response with me by **3 March 2010**.

The specific section on Dry and Sub-Humid Lands is found on pages 33 through 44, though you may find it useful to scan the introduction and methodology for context of this work.

The next step following the desktop review and consultations with POs and experts on the draft analysis, is a review workshop this 10 March 2010 with the POs and potentially selected experts in attendance to review the findings of the assignment. From the basis of this improved understanding of how poverty is already integrated into the thematic PoWs, we should develop a potential and desirable approach on how to link the PoW more coherently with poverty reduction and development adapting the PoW simultaneously to the challenges included in the new strategic plan.

I thank you in advance for your support to this initiative.

Sincerely,

Alberto Vega

KEY QUESTIONS FOR THE DRY AND SUB-HUMID LANDS PROGRAMME OFFICER

Do you think the main linkages between your Programme of Work's theme and poverty are well captured by the drafted desktop analysis (attached)? Please elaborate.

Who do you feel are the key experts (or sources, organisations, etc) for your thematic PoW and poverty who could input to and validate this poverty analysis? (additional to those reflected in the draft, attached)

Do you have general comments on the suitability of the analytical approach to understanding the poverty dimensions of your thematic PoW? If not, what aspects of its interaction with poverty were not suitably captured?

In addition to the in-depth review [if available], can you provide information on the PoW's implementation? What interesting results or cases did Parties report during the 4th national reporting cycle which are relevant to poverty, poverty alleviation, poverty reduction, livelihoods or development?

Are you aware of case studies or lessons of how poverty was considered in PoW implementation, or where it was not considered where it could have been?

What do you think the possible scope for poverty reduction within your thematic PoW could be (post-2010)? How else might the Convention successfully address its linkages to poverty?

Do you feel the analysis conducted by the consultants adds value to the PoW and your work as its Program Officer? Please elaborate, noting opportunities to add value to ongoing work.

Do you have any other comments on this assignment? Please elaborate.

Thank you for taking the time to complete this questionnaire. Please share the results with Alberto Vega.

ANNEX 2

Internal Work shop on Linking the thematic Programmes of Work to poverty reduction and development (10th of March 2010, Montreal)

Prepared by Alberto Vega, Biodiversity for Development Programme

1. BASIC CONCEPTS TO JUSTIFY THE LINKAGES BETWEEN THE THEMATIC POW AND POVERTY REDUCTION

1992: The Convention on Biological Diversity (Declarations)

2. The preamble of the Convention affirms that the conservation of biodiversity is a common concern of humankind and an integral part of the development process that recognizes that “*economic and social development and poverty eradication are the first and overriding priorities of developing countries*”.
3. Furthermore, the preamble to the Convention also states that “*conservation and sustainable use of biodiversity is of critical importance for meeting the food, health and other needs of the growing world population, to which purpose access to and sharing of both genetic resources and technologies are essential*”.
4. Therefore, Article 6(b) of the text of the CBD calls for the integration of the conservation and sustainable use of biological diversity into relevant sectoral and cross-sectoral plans, programmes and policies.

2002: Hague Ministerial Declaration from COP VI (Lessons learned after 10 years)

5. “...the most important lesson of the previous decade was that the objectives of the Convention would be impossible to meet until consideration of biodiversity was fully integrated into other sectors. The need to mainstream the conservation and sustainable use of biological resources across all sectors of the national economy, society and through policy-making frameworks was recognized as a complex challenge standing at the heart of the biodiversity conservation agenda.”

2008: COP Decision IX/8 paragraph 4: (Situation after 16 years)

6. “Notes with concern, the inadequate mainstreaming of biodiversity, in particular in sectoral planning processes and in national development and poverty eradication strategies, and the paucity of information in relation to the implementation of national biodiversity strategies and action plans”.

2009/2010: Assessment of 85 4th National Reports (Actual situation after 18 years)

7. Within the assessment of 85 4th **National Reports** regarding to the implementation of the CBD, 70 Parties reported a “*lack of mainstreaming, fragmented decision making, communication and coordination*”, 51 Parties a “*lack of studies and information about the economic value of biodiversity and ecosystem services*”.

8. Conclusions of the internal Workshop (10th of March 2010)¹

- a) Poverty reduction and development is not a cross-cutting issue but an **overarching priority** of the Convention.
- b) That has to be explicitly reflected within the PoWs inside the whole structure from the base-line, system of goals, strategy components, evaluation (in-depth review) and finally in the lessons learned (**vertical coherence** of the PoW).
- c) This development/poverty reduction/livelihood/human well-being/ will not substitute, but complement the actual contents (related to biodiversity conservation, sustainable use and benefit sharing) of the PoWs.
- d) EGS is the proper language and concept to link biodiversity concerns with development/poverty reduction/livelihood/human well-being/. Keeping in mind the MA
 - i. “Ecosystem Services, valuation and price discovery is the language of the development community and is appealing in logic to all actors (economic, scientific and political), whose compliance to environmental provisions is of more practical and utilitarian concern. By this logic, it just might be possible that we will witness a higher likelihood of equitable sharing and ethical business and development.
 - ii. This new understanding is applicable to all ecosystem services, for example water (a non-biotic service) provided by ecosystems in watersheds and wetlands that is indispensable for sectoral, commercial and household uses. Genetic resources traded in the context of an international regime, food provided by productive agro-ecosystems and critical for food security, or recreational ecosystem services provided by conserved and protected areas for the tourism sector.”
- e) To measure the contributions of the PoWs to development/poverty reduction/livelihood/human well-being/ we should **use the already existing indicators form the development community** and demonstrate coherently our contributions to them. The added value of “our” contribution should be the “environmental sustainability” (respecting the ecological limits) in achieving these development and poverty reduction indicators. Not creating new poverty indicators.
- f) The delivery mechanism for those contributions and to enable implementation should be **capacity development** of the specific target groups (policy-makers, practitioners, civil society, scientists, local communities, indigenous people, business, etc.). That mechanism should be organized **around regional nodes, hosted by existing regional organisations** - which already have a political mandate from their member states for regional integration, to catalyze south-south and north-south cooperation. (see WGRI 3 Document: UNEP/CBD/WG-RI/3/2/Add.2).
- g) Instead of deciding individual and parallel **in depth reviews for each PoW, COP should decide the common strategic issue**, that needs to be addressed in one overarching the in-depth review, e.g. ecosystem-based climate change adaptation, cooperation with other Rio conventions, etc. It would be important to discuss during COP 10, whether the next strategic issue to be incorporated in the next in depth-review should be development/poverty reduction/livelihood/human well-being/. That procedure will not only be useful to address strategic issues of the Convention, but also strengthen the interrelations and **horizontal coherence** between the different PoWs. That procedure requires to synchronize the in-depth reviews of the thematic PoWs and elaborate them collaboratively in team-work.

9. COP – Draft decision and lobbying

- A strategy is needed for lobbying aiming to become a decision that turns the PoWs in **flexible, adaptive and coherently interlinked planning instruments** within the CBD planning cycle (including the contribution to the Strategic Plan beyond 2010), without the need of time consuming and expensive re-negotiations.

¹ Equivalent procedure could be fully link the Strategic Plan to development and poverty reduction

10. Indications for a desirable common and individual matrices to link the PoW coherently with development/poverty reduction/livelihood/human well-being/

COMMON DESIRABLE MATRIX

Structure of the PoW:	Linkages to Poverty, Livelihoods and Human Well-Being:	Indicators used for Biodiversity-Ecosystem Services-Poverty linkages:
1. Baseline approach (COP Decisions/ background)	<p>a) Incorporate socio-economic data to address the poverty dimension in the baseline study. (Sources: In-Depth Review, National Reports, scientific findings, traditional knowledge, etc.)</p> <p>b) Adapt and update baseline studies considering the results and lessons learned from the most recent In-Depth Review.</p>	<p>Establish an adapted core set of indicators from the CBD indicator framework (building from the 2010 Biodiversity Indicator Partnership), from other agreed and tested socio-economic indicator frameworks (MDGs, HDI, etc.), and new emerging indicators related to the value of ecosystem services in order to focus the base-line study.</p>
2. System of Goals	<p>a) Incorporate explicit goals (targets, objectives) related to resolving the identified socio-economic problems or challenges within the base line analysis. .</p> <p>b) Comprehensively formulate the PoW's contribution to the selected socio-economic indicators..</p>	<p>To measure the contributions of the PoWs to development/poverty reduction/livelihood/human well-being, select the appropriate socio-economic indicators from the agreed and tested indicator frameworks (see Table 2) and coherently describe the contributions of the PoW in achieving them. Use – if already available – new indicators related to the value of ecosystem services to balance costs and benefits of biodiversity management to development and poverty reduction.</p>
3. Strategy / Action plan (Actions, supporting measures or Operational Plan)	<p>a) Incorporate explicit strategy elements, actions, measures, etc., describing how to achieve the goals (targets, objectives).</p> <p>b) Define which actors will be involved to achieve the goals and implement the measures (implementation structure).</p> <p>c) Define who will be the beneficiaries and who will lose benefits and will likely need compensation.</p>	<p>Highlight the PoW's contribution to improving the socio-economic situation of the poor, referring explicitly to the gains and advantages obtained from the application of specific biodiversity related instruments and the sustainable and proactive management of biodiversity and ecosystem services.</p> <p>Elaborate a timeframe with milestones, which become indicators to measure the performance of the PoW and progress made in achieving the goals.</p>
4. Evaluation/ in-depth reviews	<p>a) Incorporate explicitly socio-economic issues within the In-Depth Review or evaluation of the PoW, using a check list of relevant conservation and socio-economic indicators</p> <p>b) Use practical case studies, failures and success stories for illustration purposes.</p>	<p>Assess, monitor and evaluate the specific socio-economic and environmental indicators selected in the baseline study, the system of goals (impact/outcome indicators) and the strategy (performance indicators) of the PoW.</p> <p>Select the most strategic impact and performance indicators to be assessed or evaluated with more emphasis within the In-Depth Review.</p>
5. Lessons learned/ Case Studies/ Evidence	<p>a) Identify and explore poverty and/ or development-oriented lessons learned in practice and conceptually</p> <p>b) Contribute to the overall learning process and deliver the findings to the Clearing-house mechanism and for capacity building purposes.</p>	<p>Contribute lessons learned to the indicator discussion: e.g. how to improve effectiveness of the monitoring and evaluation system, and how to better mainstream biodiversity and ecosystem services indicators into broader development and poverty reduction plans and strategies.</p>

ANNEX 3

Monitoring poverty linkages in the CBD PoWs: A development framework for Poverty-Biodiversity indicators

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KEY MESSAGES

An indicator can be defined as, “a measure based on verifiable data that conveys information about more than itself”. A Poverty-Biodiversity (P&B) indicator is a measure of the linkages between their different dimensions.

The mutual interaction between poverty and biodiversity cannot be monitored in each PoW if poverty is not deliberately targeted.

The complexity of poverty and biodiversity interactions cannot be captured by a single indicator. An integration of the overlapping factors and an adaptation to the PoW biomes should be done. The P&B Indicators should be arranged hierarchically to tell a coherent story addressing why biodiversity loss is affecting poverty in the context of each PoW ecosystem/sector.

The development of a Poverty-Biodiversity indicators set requires some information needs and preconditions which involves steps like: conceptualizing poverty relations in each PoW, elaborate poverty related targets according with the PoW goals, consolidate a set of P&B indicators to monitor the achievement of those targets and ensure the periodic up to date of the indicators.

Poverty-Biodiversity Indicators are part of the monitoring process and should lead on to other things – they are not ends in themselves.

INTRODUCTION

There is an intense debate about the biodiversity conservation impacts on poverty alleviation and the impacts of poverty alleviation projects to biodiversity. A clear conceptual framework is needed if policies in these two areas are to be combined. The recognition of the different starting points in the way in which biodiversity conservation and poverty elimination goals are prioritized is essential if there is to be success in identifying common ground and differences between biodiversity and development organizations. (Adams et al, 2004).

Therefore, poverty reduction and biodiversity agendas need to identify joint efforts to effectively address their complex interaction in order to being able to measure the mutual impacts of their separated interventions. The challenge lying ahead is to effectively develop concrete mechanisms for monitoring these multi-faceted relationships. One of the possible solutions for this challenge is the identification of an integrated Poverty – Biodiversity (P&B) umbrella set of indicators to measure the impacts of the CBD implementation across its Programmes of Work.

However, how can we monitor the mutual impacts between poverty and biodiversity within each PoW if poverty is not specifically targeted? An indicator responds to the need of monitoring the level of achievement of a specific target, goal or activity. Without clear poverty related elements, goals or targets within the PoWs it is not possible to identify meaningful indicators for a coherent monitoring system. It is not tactical proposing an infinite list of poverty-biodiversity indicators if they are not conceived as part of a broader poverty alleviation strategy.

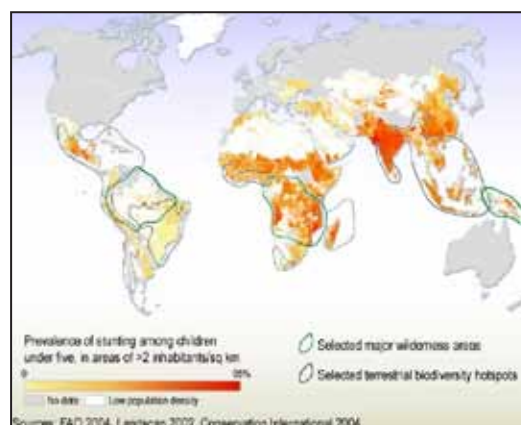
For that reason, this document tries to step back into the preconditions for the development of an effective P&B indicators set which can be adapt to the specific monitoring of poverty linkages in each PoWs. This document should be considered as a guidance note for the PoW Officers to identify their information needs and to provide a feasible development frameworks, giving some directions on how they could develop their own indicators set.

MONITORING POVERTY AND BIODIVERSITY

What is an Indicator?

An indicator can be defined as, “**a measure based on verifiable data that conveys information about more than itself**”. This means that **indicators are purpose dependent** - the interpretation or meaning given to the data depends on the purpose or issue of concern. For example, data on poverty within high biodiversity areas could be interpreted in different ways depending on the agenda:

- Number of poor people dependant on high biodiversity ecosystems.
- High biodiversity places threaten by poverty.
- Priority areas for poverty alleviation strategies.
- Priority areas for win-win solutions. Localizing areas for biodiversity conservation practices contributing to poverty alleviation strategies.



Therefore the selection of any indicator should start with identifying the issue or decision-making need that the indicator is expected to address. Each PoW should previously identify their needs for monitoring poverty-biodiversity linkages.

What is a successful indicator?

There are several definitions of what a successful indicator should be like. The literature talks about **SMART** targets which are **S**pecific, **M**easurable, **A**ttainable, **R**elevant and **T**ime bound. However indicators should be also cost-effective, replicable, simple and easy to be updated frequently.

Other characteristics identified by the 2010 Biodiversity Indicators Partnership during its regional workshops are:

- **Scientifically valid**—a) there is an accepted theory of the relationship between the indicator and its purpose, with agreement that change in the indicator does indicate change in the issue of concern; b) the data used is reliable and verifiable.
- **Based on available data** – so that the indicator can be produced over time.
- **Responsive to change in the issue of interest.**
- **Easily understandable**—a) conceptually, how the measure relates to the purpose, b) in its presentation, and c) the interpretation of the data.
- **Relevant to user’s needs.**
- They can **have widespread use** in measuring progress, early warning of problems, gaining an understanding of an issue, reporting, awareness-raising, etc.

POVERTY INDICATORS

Poverty has many dimensions, manifesting itself in different forms from place to place and across time. It has been described in many ways as a situation that people want to escape. As poverty has so many faces, it has to be looked at through a variety of indicators due to how different models of poverty require different indicators. Monetary metric models requires information on income and consumption, vulnerability models use indicators of wealth and exposure to risk as well as income; models related with

capability and functioning present indicators of life expectancy or educational achievement; models of wellbeing or social exclusion will include measures like the degree of social support. Attempts have been made since the 1960's to identify indices which combine different elements of poverty, for example: Human Development Index combining life expectancy, literacy rate and standard of living measures such as the GDP or Purchasing Power Parity.

Composite indicators simplify the presentation of poverty dimensions, however decisions about which indicators should be included, weighted and how the index should be constructed can substantially change the outcomes. Some challenges for the selection and use of poverty Indicators include:

- **Dimensions of poverty.** To capture the complexity of poverty within countries it is needed to collect a wide range of indicators related with the different dimensions such as: economics, health, education, freedom of choice, autonomy, self-esteem participation etc.
- **Snapshot or timeline.** Many indicators captures poverty at a point in time, however we need to think about poverty indicators in terms of life cycle experience related to the environment people are living in, seasonal stress and shocks. People move in and out poverty and that flow is important to distinguish between chronic and transitory poverty.
- **Actual or potential poverty.** Some studies consider as poor those who are highly sensitive to natural shocks or lacking resilience. Small-scale pastoralism exposed to the risk of drought is a common example, whereby current income may be adequate but vulnerability is high.
- **Poverty perceptions.** There is not a unique definition of poverty. What may be seen as a clear deprivation of freedom to choice in one community could be seen as a dependency on traditional structure in others. Some communities in the Amazon do not consider them self as "poor", they think they have all what they need for a good life.

Defining and measuring poverty barely starts the process. Only by understanding the drivers related with the biodiversity loss and ecosystem degradation can the different PoWs begin to design, implement and evaluate interventions. In designing poverty alleviation indicators it is important to respect the vision of poverty articulated by poor people themselves. In some cases it could mean implementing a Payment for Ecosystem Services scheme to increase income of households, strengthen women's autonomy by improving the land tenure system, or improve the access of poor to key natural resources.

Several poverty indicators have been used to monitor poverty. The latest global effort is the Millennium Development Goals, which consist of a set of eight goals break down into 21 quantifiable targets that are measured by 60 indicators which range from halving extreme poverty to halting the spread of HIV/AIDS and providing universal primary education, all by the target date of 2015.

BIODIVERSITY INDICATORS

For promoting biodiversity conservation and sustainable use there are many issues and levels of detail which are necessary for decision-making. Biodiversity indicators can help to understand the current and past status of biodiversity and why it may be changing. However, indicators by themselves provide little understanding of an issue and they always need some analysis and interpretation of what they are indicating.

One of the common uses of biodiversity indicators is to track progress towards global and national targets¹. These targets range from action plans at a local level to National Biodiversity Strategies and Action Plans (NBSAPs), to the decisions of international agreements such as the CBD. The use and the international profile of biodiversity indicators has increased considerably since the Parties to the CBD committed themselves in 2002 to, "achieve by 2010 a significant reduction of the current rate of biodi-

¹ Biodiversity indicators can also be used at site-level scales. Two common examples are protected areas indicators and wetland indicators.

versity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth”.

At the national and regional scales, the requirement to report on progress in meeting the 2010 Biodiversity Target has been a major force in promoting the development of biodiversity indicators. In some cases countries have adapted existing data and indicators to the CBD framework of goals, targets, focal areas and global indicators for their reports to the Convention.

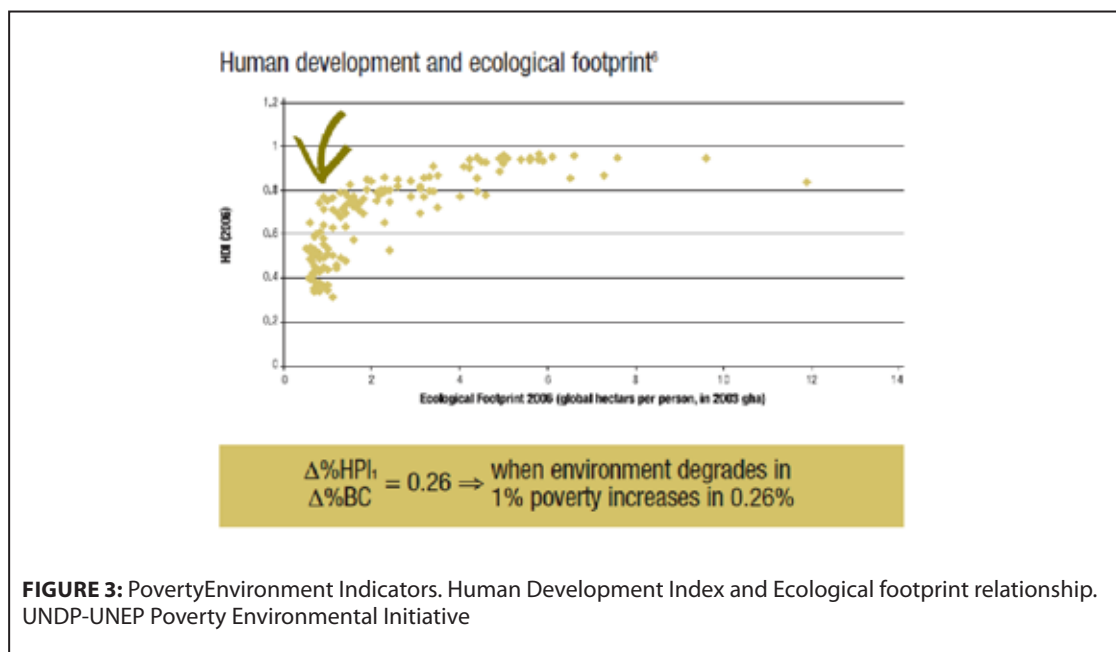
Decision-making regarding biodiversity is not just the setting of targets and objectives, but also the design of policies and actions to achieve these aims. Indicators therefore provide an important interface between policy and biodiversity-related science.

Each PoW responds to different elements, goals, targets and actions aligned with the CBD main targets. The PoW achievements are not monitored in a consistent manner by a disaggregated set of specific biodiversity indicators. There are some exceptions like Inland Waters Biodiversity or the Dry and Sub-humid Lands Biodiversity PoWs which are developing a particular set of indicators in alliance with the Ramsar² Convention and the UNCCD³ respectively.

POVERTY & BIODIVERSITY INDICATORS

It is widely accepted that biodiversity loss and poverty are linked problems but the relationship is not well understood. Biodiversity underpins the ecosystem services that all people ultimately depend on at all scales. Due to the complex nature of these inter-linkages one poverty-biodiversity indicator will try to measure a specific aspect of this mutual interaction.

The literature provides many examples of poverty and human well-being indicators and their linkages with specific environmental variables. Those indicators are trying to establish a connection between environmental degradation and the consequences to human well-being.



2 ²The Ramsar Convention on Wetlands and its indicators of effectiveness. <http://www.cbd.int/doc/meetings/ind/emind-02/official/emind-02-08d-en.pdf>

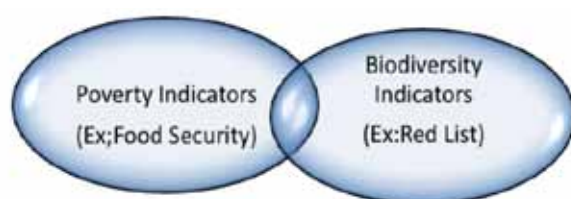
3 UNCCD Recommended Minimum set of Impact Indicators. <http://www.unccd.int/regional/rcm/docs/UNCCD%20Min%20Set%20of%20Impact%20Indicators%20Final%20Report%20June%202004.pdf>

Many international organizations like the World Bank, the UNDP-UNEP Poverty and the UK Department For International Development (DFID) have worked on developing Poverty & Environment (PE) indicators. The World Bank has developed indicators that can be applied from local to global levels and that can also be used to monitor changes globally, through cross-country comparisons. The indicators cover two distinct fields, addressing the relationship between environmental conditions and human health, such as quality of water supply and levels of pollution and wastes and monitoring the impact of resource loss as a determinant of poverty. Examples of these indicators are deforestation, water scarcity, overfishing, and land degradation.

WWF's Macroeconomics Programme Office has been working on developing PE indicators at the local level and the UNDP-UNEP Poverty-Environment Initiative have also developed an important contribution in defining PE indicators by summarizing series of indicators and describing new methodologies for elaborating poverty and environment integrated indicators.

However, there are not that many indicators measuring how biodiversity loss could affect (positively or negatively) certain dimensions of poverty and which is the threshold level of biodiversity to guarantee the provision of key ecosystem services that avoid poverty. The existing poverty or biodiversity indicators can only partially solve the problems of 'integration' between their different dimensions.

An integrated P&B Indicator is built from an integrated perspective from the start, with original variables representing factors that overlap between poverty and biodiversity. For example, if a PoW wants to address food security issues it can develop a subset of Red Listed species existing in the PoW biome used for food by local communities.



The complexity of poverty and biodiversity interactions cannot be captured by a single indicator and it would not be cost effective to monitor all the different ways in which the poor are affected by the different PoW biomes. But the question remains as how can we identify and measure the key poverty and biodiversity relevant interactions?

Each PoW should select the linkages in which they want to be focused by developing an specific conceptual framework (see following section). Then an ecosystem approach should be taken in which the interactions and trade off between different ecosystems and sometimes the circular connection between poverty and natural resource degradation could be entirely captured.

In an attempt to measure the socioeconomic dimensions of biodiversity loss, the CBD has included some headlines indicators under different focal areas which can be related with poverty alleviation and potentially adapted to the different PoW monitoring systems. However most of them are under development or do not have the necessary data available in order to compile them. (see. Table 1).

Consequently, the identification of a poverty-biodiversity set of indicators per each CBD Program of Work is not a simple task. It will require a previous reflection on how each PoW wants to address poverty and an identification of the information needs to develop a comprehensive umbrella of indicators. The next section will present a flexible development framework to assist the PoWs in the identification of key Poverty-Biodiversity indicators in accordance with their specific goals.

TABLE1. CBD Indicators potentially related with Poverty

CBD Focal Area	Headline Indicator	Specific Indicator	Status	Potentials for Adaptation to each PoW
Sustainable Use	Proportion of products derived from sustainable sources.	Wildlife commodity Index. Measure the: Living Planet Index (WWF/ZSL) and the index will compare population trends in the vertebrate species in the 'basket' versus non-utilised vertebrates.	In development	The data for this global indicator consists of national and population level measures, and can therefore potentially be disaggregated to look at trends at national and regional scales.
Ecosystem integrity and ecosystem goods and services	Health and well being of communities directly dependant on ecosystem goods and services	Poor Population directly dependant on vulnerable ecosystems	In development	The global data can be disaggregated per biome, trends and regional scales.
	Biodiversity for food and medicine	Nutrition indicator for biodiversity related to food composition	Developed	Can be expressed at national, regional or international level and adapted to PoW biomes.
		Biodiversity for food and medicine: A Red List Index (RLI) for birds, mammals and amphibians used for food and medicine	In Development	These data can be disaggregated to show regional patterns of use and trends in species extinction risks.
	Water quality of freshwater ecosystems	The Water Quality Index for Biodiversity (WQIB)	Developed	As data for the WQIB originate from individual monitoring sites, this indicator can be applied at the national, regional and global levels. The WQIB can also be disaggregated to look at trends in different habitats.
	Human Induce ecosystem failure	No specific Indicator to measure how human activities reduce the resilience of ecosystems to withstand or recover from disasters, whether natural or human-induced disasters.	To be developed	It could measure the impacts of poverty to the PoW ecosystems failure.
Status of traditional Knowledge, innovations and practices	Traditional knowledge	Status & trends of linguistic diversity & numbers of speakers of indigenous languages	In development	Data will largely be available at national and regional scales, and by 2010 it is expected that the basis for estimating trends will most likely be regional case studies.
		Other proposed indicators: Status and trends in the practice of traditional occupations; b) Status and trends in land-use patterns in the traditional territories of indigenous and local communities; c) Demographic trends based on disaggregated data on the basis of gender and ethnicity in national census and statistics;	To be developed	These Indicators could be potentially disaggregated per PoW biome.
Status of Access and Benefit Sharing	Access and Benefit Sharing	To be determined		

POVERTY-BIODIVERSITY INDICATOR DEVELOPMENT FRAMEWORK

The Poverty-Biodiversity Indicators Development Framework presented in Figure 2 contains the key steps or components in the production of successful indicators. It is important to recognise that this is an adaptation of the Biodiversity Indicator Development Framework based on the experience of UNEP-WCMC and its partners (2010BIP⁴). Some additional steps to integrate poverty into the PoW have been added as well as specific process-related issues. This is an *idealised framework* and it is certainly not a requirement to include all of the steps in the development of poverty-biodiversity indicators. However, the more of the steps that are covered in the process of developing and using poverty-biodiversity indicators, the more likely it is that the indicators will be successful in meeting the objectives.

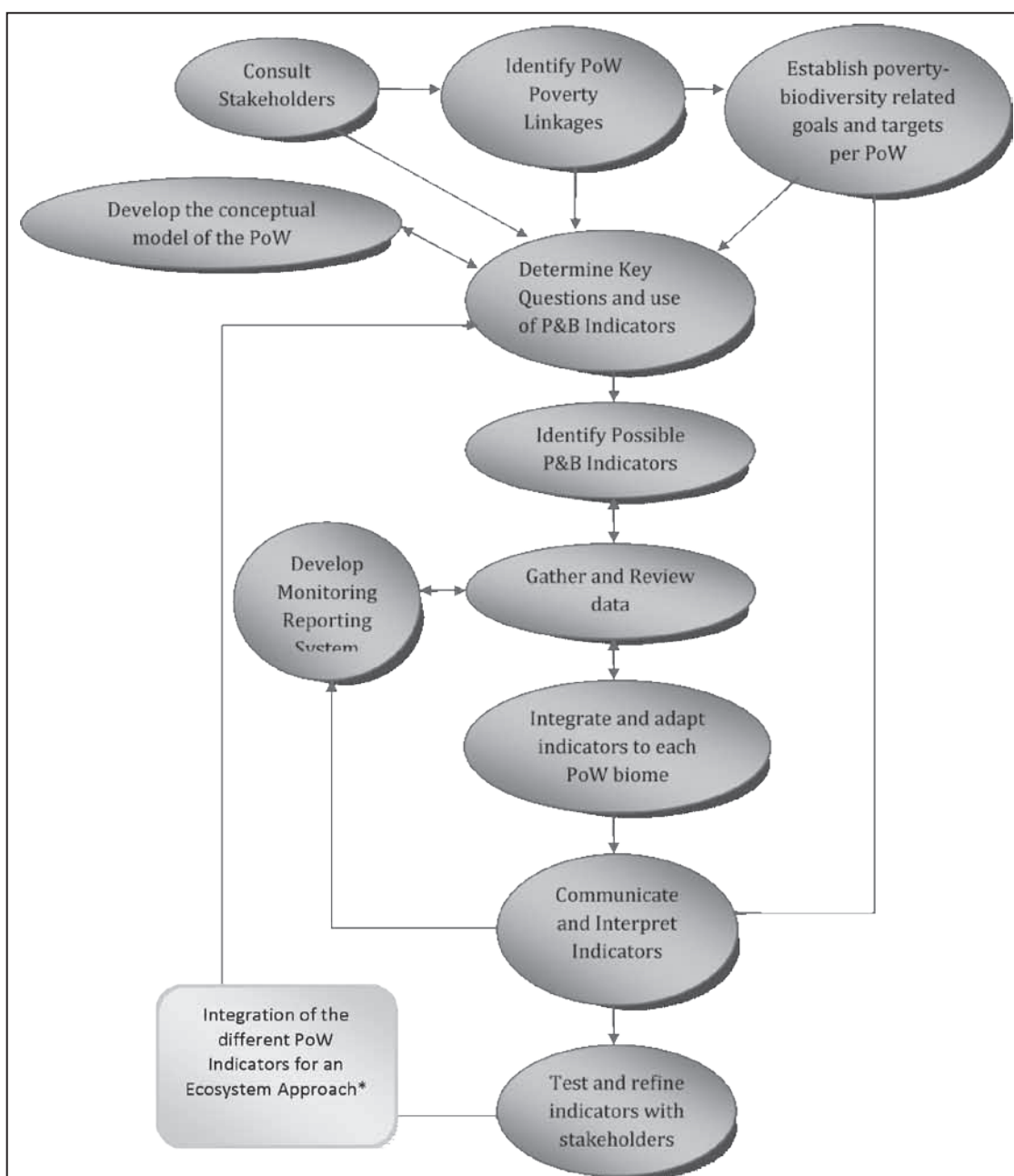


FIGURE 2. Poverty-Biodiversity Development Framework

**Ideally after each PoW identifies their key Poverty-Biodiversity Set of Indicators they should be integrated in a unique umbrella to be used in ecosystem approaches.*

CONSULT THE STAKEHOLDERS

Indicators should be chosen to meet the needs of specific users.

The development of P&B related indicators per each PoW will need, in the first instance, to identify the different stakeholders which will potentially use the indicators, as they will be different depending on the PoW. It is strongly recommended that stakeholders are consulted as early in the indicator development process as possible in order to determine the purpose of the indicator and its audience.

There are many different groups with an interest in poverty and biodiversity inter-linkages who could use the information generated from the PoW indicators. Some of these are obvious such as governmental development agencies, governmental biodiversity conservation agencies, international cooperation, NGOs, and relevant institutions involved in rural development, and indigenous peoples groups. On the one hand we have those with a broader interest in the issues surrounding it, and those holding relevant data. Consulting with these groups and identifying their needs will also help to define how simple or complicated the indicator can be, and the most appropriate ways of communicating and interpreting it.

These are potentially some of the most important groups to reach in communicating information about poverty and biodiversity mutual impacts and involving them in relevant decision-making for the national and local implementation of the PoW activities.

The PoWs in the first instance are not clear about what questions they have regarding poverty related policies and management. They also differ widely in their awareness and understanding of the relationships between poverty and biodiversity. The presentation of existing poverty-biodiversity information and potential indicators can help to stimulate the PoWs common thinking and awareness of how poverty affects the implementation of the PoW and vice versa.

This requires the Programme Officer of each PoW leading the process to take a proactive role, which inevitably means that the PoW has an interest and a concern of poverty related issues.

Questions to ask during this step:

- Who are the relevant stakeholders interested in poverty related issues in each PoW and do they all need to be consulted?
- What questions do the stakeholders want to answer regarding poverty biodiversity interactions?
- How will the stakeholders want to use the indicator(s)? E.g. for decision-making, for reporting, for education.
- Have the inputs, expectations and outputs of the indicator development process been clearly defined for the stakeholders?
- How much ownership and decision-making power are different stakeholders going to have over the choice of indicators?

IDENTIFY POW POVERTY LINKAGES

The consultation of the stakeholders will provide valuable information to establish the PoW linkages with poverty. Meanwhile the output of the present consultancy is a valuable base line for this connection and to identify the key poverty and biodiversity conflicts to be targeted in each Programme of Work. However, the PoWs still need to identify the poverty linkages they have particular interest in monitoring.

For that reason it is useful to develop a conceptual framework to help clarify and focus thinking about the poverty-biodiversity complex relationships, including how those relationships may be changing

over time. A conceptual framework is a concise summary in words or pictures of relationships between poverty and biodiversity—in other words, among the key components of interactions between humans and the ecological systems represented per each PoW.

The steps in developing a conceptual framework (based on the Millennium Ecosystem Assessment Manual) for assessment in this kind of “Robinson Crusoe” assessment would include the following:

1. Identify the key elements of poverty, well-being or “quality of life”, whether or not they are shaped by the PoW ecosystem services.
2. Identify the elements of biodiversity and the ecosystem goods and services that matter the most for the elements of well-being.
3. Sketch a diagram of the factors that directly affect biodiversity loss and the supply of the ecosystem goods and services to poors: these can be called “direct drivers.”
4. Then, move back one level and add the “indirect drivers” that influence the direct drivers.
5. Finally, see if there are any connections from the elements of Robinson’s well-being in back to the direct drivers or indirect drivers that the PoW has identified.

The next step is to consider the spatial scale at which key influences occur: Are they imposed at scales much larger than the assessment? Or do they bubble up from much finer scales (smaller than the minimum resolution of the assessment)?

The conceptual framework developed in this way is a helpful place to start the larger process, with the understanding that it will change. These connections can help build the shared understanding needed for a successful collaborative process between the different PoWs what finally should lead to an holistic umbrella set of PB indicators by applying the ecosystem approach.

Questions to ask during this step:

- Which are the main direct connections between the PoW ecosystem/services and the level of poverty?
- Can we establish a causal relationship?
- Which is the rationale underpinning these relations?
- Which indicators could measure these connections?

ESTABLISH POVERTY-BIODIVERSITY RELATED GOALS AND TARGETS PER PoW

The role of the poverty-biodiversity indicators is in adaptive management towards the objectives and targets of the PoWs

Biodiversity-related policies often lack clearly stated objectives, explicit targets or specified mechanisms for measuring poverty progress, so the definition of poverty-biodiversity indicators needs is not always straightforward.

In such cases indicators may still serve to raise awareness and understanding of the policy issue and support future definition of objectives and strategies.

This indicator development step leads onto the step “Determine key questions and indicator use”. If this step has not identified relevant management objectives and targets then it may need to be combined with the step “Identify and consult stakeholders/audience” to obtain more information. However if we aim to measure the impacts on poverty across the different PoWs, specific targets should be addressed. One of the main difficulties for setting a consistent poverty-biodiversity set of indicators is the structural heterogeneity between the PoW and their different perception of poverty. Some PoWs address poverty

alleviation within their targets, others even have poverty alleviation activities. Nevertheless, it is necessary a more clear position on how each PoW wants to target poverty deliberately.

All countries have management objectives and policies with direct or indirect impacts on biodiversity and reporting on progress towards these is a major role for biodiversity indicators. Key biodiversity management governance tools include National Biodiversity Strategy and Action Plans (NBSAPs), protected areas systems management plans, and endangered species legislation. The inclusion of a comprehensive set of integrated P&B indicators for national reporting would be an step in building bridges between international agreements such as the CBD and the Millennium Development Goals. In this way the NBSAPs could be better mainstreamed into the national development agendas.

Questions to ask during this step:

- Is the PoW interested in address poverty alleviation issues related with the represented biome/sector? If yes,
- Does the PoW have any goal and target related to poverty? If the program of work has already a poverty related targets we can start defining the questions and the use of the indicators. If not,
- Does the PoW have interest in formulate a poverty related target?
- If the PoW is only interested in Poverty-Biodiversity indicators for awareness-raising and general understanding about the linkages and not for measuring progress, early-warning of problems, or supporting management decisions, then go to the step “Determine key questions and indicator use”.
- Who wants to know (or should know?) about progress in reaching these objectives and targets?
- Are countries going to report on that indicator?

DETERMINE KEY QUESTIONS, REPORTING AND INDICATOR USE

Key Questions

It is strongly recommended to develop and communicate poverty-biodiversity indicators in response to key questions. A key question describes what the user or audience for the indicator wants to know about the subject. It helps to define what the purpose of the indicator is, and since indicators are purpose dependent this is very important. Key questions can be very general, such as:

Is poverty threatening biodiversity?

How many poor people depend on forest ecosystems?

What is the effect of biodiversity conservation on poverty?

What is the current status and distribution of poverty and biodiversity worldwide?

There may be several indicators and data sets that help to answer a single key question. One of the benefits of defining a key question is that it naturally encourages the selection and communication of the indicators in a form that aids their interpretation. If key questions are more specific this gives more guidance for the selection and development of suitable indicators. More specific key questions are often about management issues, such as:

What are the key ecosystem services used by local communities in this forest?

What is the sustainable catch level for this fishery?

What is the status of the important wildlife used for food by locals?

Objectives and targets can be rephrased as questions to help identify indicators for them. For example:

Have we achieved a significantly reduce of the rate of island biodiversity loss by 2010 and beyond as a

contribution to poverty alleviation and the sustainable development of islands?

Have we achieved our target of at least 70% of people living within protected areas lives above the poverty line?

The definition and prioritisation of key questions should ideally be an iterative process of consultations with stakeholders and audience for the indicator(s). Initially a great variety of questions may be identified, and some of them may so broad or complex in their scope that they may not be best answered using indicators. The indicator development team may need to build shared understandings of the issue and manage the expectations of all involved. It may be that the agreed need is not just the development of indicators, but for the PoW uses as part of a detailed analysis and report in response to the key questions, or the need is for the gathering of field data.

Reporting Frameworks

The OECD (1994) designed the Pressure-State-Response (PSR) model to assess environmental change. The PSR does offer a relatively straightforward way of monitoring the impact of resource degradation on the poor and identifying policy measures to stem the problems faced by the poor.

A slight modification of this model would allow one to track the poverty impacts of degradation. This model, referred to as the Pressure-State-Poverty-Response (PSPR) model, tracks the impact of pressure factors not only on natural resources but also on the poor. The PSPR framework is based on a model of the world that human activities exert pressures (such as pollution emissions or land use changes) on the environment, which can induce changes in the state of the environment (for example, pollutant levels, habitat diversity, water flows), what finally impact specially on the human well being of the poor. Society then responds to changes in environmental pressures or state with policies and programs intended to prevent or reduce environmental damage.

The structure of many reports on the state of the environment, and the framework of focal areas and indicators for reporting on the CBD's 2010 Target (see www.twentyten.net), have been organised using a PSR framework and its variants. If analytical and reporting frameworks such as PSR are being used there is often a tendency to try and assign particular indicators to one or other of the categories.

Each program of work could also adopt this frame for reporting the Poverty-Biodiversity indicators results according with their conceptual framework. However, we will find difficult to classify some PB indicators as a pressure when depending on the angle they could be considered as an impact or state indicator. Consequently the classification of complicated issues as poverty and biodiversity interactions into specific categories could contributes to misleading conclusions and oversimplification of the reality. Therefore if there is not a clear understanding of the causal relations, therefore an “unpacked” reporting of the PB indicators would be recommended.

Indicator use

The definition of a key question helps to determine the purpose of an indicator and this should be accompanied with the definition of its use. Will it be used for measuring progress of the PoW targets, early-warning of problems, understanding how poverty and biodiversity interact in the PoW biome/sector, reporting, or awareness-raising? If it is to be used for management decision-making, will it be used on specific occasions when decisions are made or progress reported, such as an annual review of a PoW? Who specifically will be using this information? What levels of education and familiarity with the subject does the intended audience already have?

The more the intended use of an indicator can be detailed the easier the subsequent steps of indicator development and communication will be, and the greater likelihood of the indicator having an impact and being used over time.

Questions to ask during this step:

- What are the key questions that the PoW have about the poverty and biodiversity relations?
- Can the key questions be made more specific or focused?
- How will the indicator be used?
- Who will be using the indicator?
- What levels of education and familiarity with the subject does the intended audience already have?

IDENTIFY POSSIBLE INDICATORS

New and existing indicators can help to answer a key question, and each of these must be reviewed and the most feasible and sustainable ones selected

Identifying indicators that respond to specific key questions and PoW needs is most successful with a combination of creative thinking and scientific rigour. Appropriate indicators also need to be responsive to change in the issue of interest and easily understandable to the users. This step will probably be carried out in combination with the step “gather and review data”, as the data searches will be guided by needs for possible indicators, whilst actual data availability and suitability will limit the number of feasible indicators.

The conceptual model diagram designed per each PoW linking poverty and biodiversity helps to guide the selection of suitable indicators and data sets.

One consideration in the identification and creation of possible indicators is how they will be presented to the users. Most biodiversity indicators can be classified into two fundamental types: either map-based and spatial indicators or graph and index-based indicators. However, poverty-biodiversity indicators is a different concept and map-based data sets often do not exist as time series, but rather as single data sets that cannot demonstrate how poverty and ecosystem change are related over time. Nonetheless, reliable snapshot maps can be useful as baselines against which to monitor future change.

An important aspect of indicator development and use it to think of this work in terms of a ‘story’ or narrative that the PoW wants to tell about how poverty and biodiversity is related in the specific PoW biome/sector. The previous steps in the process will have started to outline the scope of the ‘story’ that will seek to answer the key question(s). It is also important to remember that one indicator will never tell the complex relations between the poor and the ecosystem, as it is just indicating another, often more complex, issue.

It is worth bearing in mind throughout this development step that no solution or approach is perfect and there will probably always be some criticisms of it. It is important for each PoW to have an overview of their Poverty-Biodiversity indicator development process. Afterwards all the PoWs will be able to make a final decision about which Poverty-Biodiversity umbrella set of indicators will be selected.

Questions to ask during this step:

- Are there existing indicators that can help to answer the key question(s)?
- How well does each of the potential indicators help to answer the key question(s)? Which one answers it the best?

- How easily will it be understood by the intended users?
- Is there suitable data for the possible indicators, or can existing data be transformed into appropriate indicators?
- What are the resources available now and in the future for producing the possible indicators?
- Who will decide which indicators will be calculated?

GATHER AND REVIEW DATA

Data needs to be found and reviewed for its suitability

Since the production of indicators is dependent on data this step is likely to be conducted iteratively with the step “Identify possible indicators”. Data searches will be guided by the PoW key questions and possible indicators. Each potentially useful dataset will need to be reviewed to determine its suitability. The review process should also include standardising the scale of the data, and ensuring that the methods used to collect it are comparable. Such a review should ideally be carried out periodically to maintain the quality and consistency of the data.

Consistency is essential, not only between datasets, but between years in the same dataset so that valid comparisons can be made between different points in time. Because poverty and biodiversity are multi-faceted data must be gathered from multiple sources, a rigorous referencing system is essential to be able to keep track of data sources and be able to refer back to the original source data if needed. If multiple institutions are collecting data, this process needs to be standardised across all of them. The production and reporting of poverty-biodiversity indicators may require capacity, data and/or technical expertise from more than one agency or organisation. Forming partnerships and collaborations between multiple partners like UNDP, OECD, World Bank, UNEP or FAO to produce a single output such as an indicator can be challenging.

Lack of suitable data is widely identified as a major constraint in the production of Poverty-Biodiversity indicators. Whilst this is undoubtedly the case, it is worth considering that many aspects of biodiversity conservation and sustainable use overlap with other sectors, such as farming, forestry, fishing, outdoor recreation, tourism and infrastructure development. Such sectors are likely to have policy-making and management procedures that produce information that directly impacts biodiversity and the state of poverty and can help to answer aspects of the key questions. For example, catch statistics collected by the national fisheries department from Lake Victoria in Uganda could provide information on the quality of the water in the lake, how dependent people are on fisheries for their livelihoods, whether the lake’s resources are being used sustainably and how an invasive species, the Nile perch (*Lates niloticus*), may be affecting the ecosystem. Such indicators not only have the advantage of using already existing information, they can help to develop cross-sectoral interactions and awareness of issues related to poverty and biodiversity.

Questions to ask during this step:

- Are the available data suitable for the intended use?
- Are the data accessible and likely to continue to be produced in the future?
- Are the data collected in a consistent and comparable manner over time?
- If an indicator is required to detect change, are the data collected with sufficient frequency to give the desired sensitivity to change?
- Are the necessary agreements in place to allow the data to be collected and used?

CALCULATE INDICATORS

Document the criteria and methods used to calculate the indicator to ensure consistency, transparency and sustainability

Several potential P&B indicators may be identified to help answer a PoW key question, and the use of more than one may well be appropriate. The selection and development of a particular indicator may consider the following factors:

- How well does it help to answer the PoW key question(s)?
- How easily will it be understood by the intended users?
- What is the demand or need for this indicator?
- Are the methods of data collection and analysis scientifically valid and defensible (considering the conceptual model)?
- Are the available data suitable for the intended use?
- Are the data accessible and likely to continue to be produced in the future?
- Is there sufficient institutional technical capacity and resources to produce the indicator now and in the future?
- Is the indicator also used for international reporting?

Choosing which indicator should be taken forward must take into consideration both what is **feasible** and what is **sustainable**. An assessment of the feasibility of an indicator needs to include a review of what data are available, what data can and cannot be accessed, and what institutions hold the data.

The calculation of an indicator must be accompanied by detailed documentation outlining methods used and data sources. These both ensure that the method used is clear and systematic, and that the calculation is transparent and open. Potentially suitable data may often also require some form of editing or transformation to make it suitable for the selected indicator calculation method. Whatever methodologies are used, it is of fundamental importance that the indicator is scientifically defensible, particularly as many issues related to biodiversity can be contentious and may involve conflict between different interest groups. Indicators that are pressed into service in such conflicts are likely to be subjected to close and sometimes hostile scrutiny. To counter these criticisms it is essential that the methods used to produce it, and the data underlying the indicator, are scientifically defensible. In general, procedures used in indicator generation must be transparent and testable, sources of data verifiable and any potential weaknesses or biases acknowledged.

Questions to ask during this phase:

- Are the methods of data collection and analysis scientifically valid and defensible (considering the conceptual model)?
- Have all the steps during calculating the indicator been documented clearly and simply? Can these methods be followed without prior experience of the indicator?

COMMUNICATE AND INTERPRET INDICATORS

Indicators as communication tools need investment in their effective presentation and explanation

In some ways indicators can be seen as primarily a communication tool to help people understand the complex relations between poverty and biodiversity. They therefore need to be communicated and interpreted appropriately for their intended audience. A number of the steps in the Poverty-Biodiversity

Indicator Development Framework can help in this process. For example, one of the benefits of defining a key question is that it naturally encourages the selection and communication of the indicators in a form that aids their interpretation. The explanation may be part of the legend below a figure or within the text surrounding it including the purpose of the indicator and how to interpret any trends.

Overall, it is recommended that the communication of indicators be designed in the form of a 'story' or narrative about the poverty and biodiversity linkages, in response to the key question(s). The narrative surrounding an indicator is essential, as indicators by themselves provide only a partial understanding of an issue. They always need some analysis and interpretation of why they are changing and how those changes relate to the system or issue as a whole. Additional information allows the reader to put the indicator in context and see how it relates to other issues and areas. Information to support and explain the indicator should therefore be collected as the indicator is developed.

Creative thinking is needed in developing methods for presenting data to decision makers and non-specialists. However, the art in communicating indicators is to simplify the message without losing scientific credibility. This requires a thorough understanding of the concepts being dealt with and knowledge of the boundaries and limitations of the data and how it can be interpreted.

The results of the indicator may only be presented to only one audience, so the way the results are portrayed and explained can be very much tailored to the information the needs and background knowledge of that audience. However, it is more likely that the results will be communicated to a many different audiences, for example policy makers, scientists, businesses and the news media. This presents a challenge for those formulating the communication strategy as they have to choose between producing a single report which will provide general information and context for all readers, or multiple products each of which tailored to a different audience. Which of these strategies is chosen is often based on resource availability. However, seeking advice and review of any communication materials relating to the indicator from people external to the development process can be very useful in developing and 'honing' the messages from it.

Questions to ask during this phase:

Target audience

- Who is the target audience?
- Why are they being targeted?
- Why should the audience care and think the indicator and its interpretation is important?
- How familiar with the subject is the audience?

Strengthening how the messages are communicated

- What other information is available in the same area?
- Is the argument presented in the indicator convincing?
- Is there a strong scientific basis for the indicator and any conclusions made?
- What medium will be used to communicate messages from the indicator? Will there be a stand-alone printed report, a document on line, a static or interactive web-page or a short summary within a larger chapter or report?

TEST AND REFINE THE INDICATOR WITH STAKEHOLDERS

Testing and refining the indicator in consultation with stakeholders helps to ensure that the indicator is useful and sustained

In the experience of UNEP-WCMC and its partners (2010BIP), a key step in the production of successful biodiversity indicators is to test and refine the indicator at intervals during indicator development. This is a particularly important step for indicators which involve the development of new methods of analysis or new combinations of existing datasets. To ensure that the Poverty-Biodiversity indicator development remains on target it is important to test and refine the indicator while referring back to the key questions addressed by each PoW.

Those producing and presenting the indicators should be ready to make changes in response to this feedback. This consultation should therefore be regarded as an ongoing, iterative process. One of the ultimate measures of success of any indicator or suite of indicators is that they are incorporated and referenced within policy documents and decisions. Therefore, continuing to seek guidance from users beyond the initial stages of development increases awareness of the work and is fundamental to ensuring that the indicators are appropriate and promotes its uptake and continued use.

Local communities and resource users could be mainly interested in the end results of the poverty and biodiversity umbrella set of indicators this information could empower them in decision making and resource use. Policy makers and regulators could be also primarily interested in the end results of the P&B indicators as it provides them with background information on the state of the poverty rates and biodiversity status. In contrast, resource management and research institutions who could be actively involved in the indicator development process, could use it to build their own capacity and understanding. NGOs are also often interested in the process as much as in the end-product, seeing it as a possible way of enhancing the participation of the wider conservation and development community in decision making. The opinions or needs of these organisations may differ, and there are practical limits to the extent to which indicator developers can make changes to accommodate all their needs. It is important for the organisation or group leading the development of the indicator to manage these expectations, and to co-ordinate the review of the indicator in such a way so that stakeholders provide appropriate input and review it in constructive and positive way.

Questions to ask during this phase:

- Does the indicator answer the PoW key questions(s) and is it fit for purpose?
- No indicator is perfect, so what are the strengths and weaknesses of the indicator and how could it be improved (within reason)?
- What improvements could be made to the indicator in the future?

DEVELOP MONITORING AND REPORTING SYSTEMS

Monitoring provides consistent data over time and a reporting system enables regular production of the indicator(s)

A lack of suitable data, especially data with comparable time series, is often given as a reason preventing the production of poverty-biodiversity related indicators. If valuable P&B indicators are identified and chosen for use over time then an investment is required in the monitoring systems to produce trustworthy and accessible data.

The ongoing production and reporting indicators also requires establishing the institutional and technical capacity for this work. This capacity may not exist within a single agency, and may involve both

NGOs and government agencies working in partnerships to generate indicators. The need for capacity may not solely be in scientific analysis but also in such areas as communication and writing skills. Therefore, teams with diverse backgrounds and training may be most effective in generating and communicating indicators. Working in partnerships and different organizational configurations makes even more important the need to document carefully the work that is done, and especially the data that are collated. Careful management of data and their associated metadata is a vital part of this process, and this is outlined in more detail in the next section. National Indicator developers have found that producing a fact sheet or brief summary in a standardised format which outlines the aims, methods and results of each indicator is a useful way to provide an overview of all stages of indicator development.

Adding information under these categories can help to clarify the design and the use of the indicator within its production team, and the drafting process may sometimes highlight methodological problems that need to be resolved. Experience has shown that the existence of such clear documentation is a major factor in ensuring the uptake and sustainability of indicators. An example template of a P&B indicator fact sheet is provided in Annex 1.

The consistent production and reporting of an indicator over time requires one institution to have lead responsibility, although this may not be the same institution that produces and uses the indicator. One way to promote the sustainable production of an indicator is for it to be recognised and adopted by a national statistical agency. This endorsement and demand for its regular calculation provides a strong case for the necessary long-term investment of resources. This investment must include the maintenance of a monitoring system to produce reliable data over time. Also, the more an indicator meets a real decision-making need and is effectively communicated, then the greater the likelihood that resources will be found for its continued production.

Questions to ask during this phase:

- Is there sufficient institutional technical capacity to produce the indicator now and in the future?
- Is the indicator also used for international reporting?

ANNEX.1 POVERTY-BIODIVERSITY INDICATOR DEVELOPMENT FACT SHEET

Program of Work:	
Indicator Name:	
Lead Agency	Institution & person responsible for calculating and communicating the indicator
Key question(s) which the indicator helps to answer	
Use of the indicator	
Users of the indicator	
Scale of appropriate use	
Potential for aggregation	Meaning of upward or downward trends ("good or bad")
Possible reasons for upward or downward trends	
Implications for biodiversity management of change in the indicator	Units in which it is expressed (e.g. km ² , number of individuals, % change)
Implications for poverty alleviation	Units in which it is expressed (e.g. km ² , number of individuals, % change)
Description of source data	Origins, dates, units, sample size and extent, custodians)
Calculation procedure	Inc. appropriate methods and constraints for aggregation
Most effective forms of presentation	Graph types, maps, narratives, etc. – give examples where possible
Caveats, Limits to usefulness and accuracy:	E.g. slow change in response to pressures, poor quality data, limited scope for updating
Updating the indicator	How often? process
Closely related indicators	

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