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INTERNATIONAL WORKSHOP ON THE REMOVAL AND MITIGATION OF PERVERSE, AND THE PROMOTION OF POSITIVE, INCENTIVE MEASURES

Paris, 6–8 October 2009

REPORT OF THE INTERNATIONAL WORKSHOP ON THE REMOVAL AND MITIGATION OF PERVERSE, AND THE PROMOTION OF POSITIVE, INCENTIVE MEASURES

INTRODUCTION

1. In paragraph 6 of decision IX/6, on incentive measures, the Conference of the Parties requested the Executive Secretary to convene an international workshop on the removal and mitigation of perverse, and the promotion of positive, incentive measures, consisting of government-nominated practitioners with balanced regional representation, as well as experts from relevant organizations and stakeholders. In the same paragraph, the workshop was tasked to:

(a) Collect, exchange and analyse information, including case-studies on, good practices for, and lessons learned from, concrete and practical experiences in identifying and removing or mitigating perverse incentive measures, and in promoting positive incentive measures; and to

(b) Identify a limited number of good-practice cases from different regions.

According to the decision, the work of the workshop will be considered by the Subsidiary Body on Scientific, Technical and Technological Advice at its fourteenth meeting, to be held in May 2010, and reviewed by the Conference of the Parties at its tenth meeting.

2. In paragraph 7 of the same decision, the Conference of the Parties requested the Executive Secretary to compile and analyse relevant information, including analyses and studies from relevant international organizations, such as the Organisation for Economic Co-operation and Development (OECD), on the impacts of positive and perverse incentive measures, to disseminate this information through the clearing-house mechanism of the Convention, and to make it available to the workshop on the removal and mitigation of perverse incentive measures.

3. Pursuant to these requests, the Executive Secretary issued notifications 2009-045 of 1 May 2009 and 2009-070 of 30 June 2009, inviting Parties, relevant international organizations and stakeholders to nominate experts and observers for the international workshop.

4. By the same notifications, Parties, relevant international organizations and stakeholders were also invited to submit any relevant information, including analyses and studies, which would be of use for the work of the experts. Submissions were subsequently received from Cuba, Egypt, the European Commission and India as well as from the Food and Agriculture Organization of the United Nations

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(FAO), the Organisation for Economic Co-operation and Development (OECD), the initiative “The Economics of Ecosystems and Biodiversity” (TEEB), the German League for Nature and Environment, and the Institute for Environmental Decisions of the Swiss Federal Institute of Technology (ETH) Zurich.

5. The compilation of relevant information requested by paragraph 7 of decision IX/6 was made available through a dedicated website, accessible under <http://www.cbd.int/incentives/workshop.shtml> . The compilation includes the submissions received pursuant to the notifications, as referenced in the previous paragraph, as well as other relevant information on the impacts of positive and perverse incentive measures. The website also provides a link to the online database on incentive measures, which provides relevant information, collected over the past years, on the reform of perverse incentives and the design and implementation of positive incentive measures, including earlier submissions received from Parties as well as relevant organizations and initiatives on these topics.

6. An analysis of the relevant information compiled was made available to the expert workshop as document UNEP/CBD/WS-Incentives/3/2. The document is available in electronic form under <https://www.cbd.int/doc/?meeting=WSIM-03> .

7. The participants in the workshop were selected from among government-nominated practitioners, taking into account their expertise and the need to ensure balanced regional distribution, and with due regard to gender balance. Representatives of stakeholder organizations and international organizations and initiatives were also attending the meeting. Notification 2009-098 of August 2009 informed Parties as well as relevant international organizations and stakeholders of the selection of experts. Annex II of the present report provides a list of participants.

8. The Executive Secretary convened the international workshop on the removal and mitigation of perverse, and the promotion of positive, incentive measures on 6-8 October 2009, with the financial assistance from the Government of Spain. The workshop was hosted by the Division of Technology, Industry and Economics of the United National Environment Programme (UNEP-DTIE) in Paris.

ITEM 1. OPENING OF THE MEETING

9. The meeting was opened by the representative of the Executive Secretary, Mr. Markus Lehmann, at 10 a.m. on Tuesday, 6 October 2009. Welcome remarks were also provided by Mr. Leo Heileman of UNEP-DTIE, as the host of the meeting.

10. Referring to earlier decisions of the Conference of the Parties and its programme of work on incentive measures, as well the two earlier workshops on incentives measures, held in 2002 and 2004, Mr. Lehmann noted that work on incentive measures, in order to implement Article 11 of the Convention on Biological Diversity, has a long history under the Convention. He explained that the absence of economic incentives was identified by Parties in their third national reports as one of the most important challenges in implementing many Articles of the Convention, and expressed his hope that the workshop would make a significant positive contribution towards more effective implementation of Article 11 of the Convention.

11. Mr. Heileman welcomed participants at the UNEP-DTIE premises in Paris. He recalled the history, development and signing of the Convention in 1992, and the tenure of interim Executive Secretary Ms. Angela Cropper, now Deputy Executive Director of UNEP. Mr. Heileman reviewed the long history of cooperation between UNEP and the Convention on Biological Diversity, and registered his pleasure at seeing further collaborative work. Referring to the topic of the workshop, he recalled the recent work undertaken by UNEP on fisheries and energy subsidies, and explained that this work would be presented in detail by the representative of UNEP during the workshop. In closing, he expressed his hope that UNEP’s contribution would be useful and valuable, and expressed his best wishes for a successful workshop.

12. Following the welcome remarks, participants of the workshop introduced themselves. A list of participants is provided in annex II of the present report.

ITEM 2. ORGANIZATIONAL MATTERS

2.1. Election of officers

13. The workshop elected Mr. Asish Ghosh from India to chair the meeting.

2.2. Adoption of the agenda

14. In introducing the item, Mr. Lehmann explained that the provisional agenda prepared by the Executive Secretary for the meeting (UNEP/CBD/WS-Incentives/3/1) was based on paragraph 6 of decision IX/6 of the Conference of the Parties. He also noted that the tasks before the workshop were consistent with the decision made by the Conference of the Parties, pursuant to the in-depth review of the programme of work on incentive measures at its ninth meeting, to put more emphasis on its implementation through, *inter alia*, enhanced sharing of information on good practices, lessons learned, difficulties encountered, and other practical experiences on its implementation.

2.3 Organization of work

15. Under this item, the Group considered the proposed organization of work for the meeting as contained in annex II of the annotations to the agenda (UNEP/CBD/WS-incentives/3/1/Add.1). The Group decided to conduct its deliberations on item 3 of the agenda in plenary, and break into three smaller groups under item 4 of the agenda. The break out groups would cover the following topics:

- (a) Good practice cases on the identification and removal or mitigation of perverse incentives;
- (b) Good practice cases on payments for ecosystem services schemes and related approaches;
- (c) Good practice cases for community-based natural resource management and conservation programmes, and related approaches, including examples and lessons learned with regard to the role of benefit sharing.

16. In addressing item three of the agenda, the meeting decided to first address the identification and removal or mitigation of perverse incentives, and subsequently move to the promotion of positive incentive measures.

ITEM 3: COLLECTION, EXCHANGE AND ANALYSIS OF INFORMATION, INCLUDING CASE-STUDIES ON, GOOD PRACTICES FOR, AND LESSONS LEARNED FROM, CONCRETE AND PRACTICAL EXPERIENCES IN IDENTIFYING AND REMOVING OR MITIGATING PERVERSE INCENTIVES, AND PROMOTING POSITIVE INCENTIVE MEASURES

17. Under this item, government-nominated practitioners provided information on their **national or regional experiences** in identifying and removing or mitigating **perverse incentives**, and promoting **positive incentive measures**. Representatives of international organizations and stakeholders also provided information on their pertinent work. All presentations made are available on the dedicated website of the workshop, available under <http://www.cbd.int/incentives/workshop.shtml>.

18. In introducing the item, the representative of the secretariat, Mr. Lehmann, provided an overview of document UNEP/CBD/WS-incentives/3/2, which reviews past work under the Convention and, as requested by the Conference of the Parties, provides an analysis of relevant information on the impacts of positive and perverse incentive measures, including analyses and studies from relevant international organisations, such as the Organisation for Economic Co-operation and Development.

A. Identification and removal or mitigation of perverse incentives

1. Summary of presentations

19. In introducing the sub-item, Mr. Lehmann explained that past work under the Convention conceptualized perverse incentives as **emanating from policies or practices that induce unsustainable behaviour that destroys biodiversity**, often as unanticipated side-effects of policies designed to attain other objectives. **Environmentally harmful subsidies** would be a prime example, and moreover, some **laws or regulations governing resources use** may also generate perverse incentives, such as “beneficial use” laws that require land holders to make productive use of resources such as water or forests. Some measures which seek to provide positive incentives may unintentionally also generate perverse incentives.

20. He recalled that, according to the OECD, an environmentally harmful subsidy could be defined as the result of a government action that conferred an advantage to consumers or producers, in order to supplement their income or lower their costs, but in doing so, discriminated against **sound environmental practices**. Subsidies may generate **environmentally harmful effects** through two general mechanisms: (i) **production subsidies** which reduce input costs or increase revenue, and (ii) **consumer subsidies** which imply the below-cost pricing for the use of natural resources. This would generate incentives for increased use of subsidized resources, with often negative effects for biodiversity. He noted that estimates of global subsidies in general (that is, not necessarily environmental harmful ones) pointed to an annual three-digit billion US-dollar figure, with subsidies provided in the agriculture, fisheries, energy, transport and water sectors being of particular relevance for their potential or actual harmful effects on ecosystems and biodiversity.

21. He noted that the OECD identified a **need for reform not only for environmentally harmful subsidies, but also for those subsidies which did not target their stated objectives, or were not cost-effective**. The work of the OECD in the last decade identified a number of critical obstacles to subsidy reform, namely: (a) the **entitlement culture** created by subsidies; (b) **concentrated benefits and widespread costs** of subsidies; (c) short-run difficulties in **adapting economic decisions and livelihoods** to subsidy reform; (d) **complex interactions** between subsidy impacts, other policy tools, and the potential benefits from reform, and absence of thorough assessments thereon. He also pointed to the conclusion of the OECD that the design of the reform process was a critical success factor, and often hinged on the following conditions: (i) the policy objectives must be defined **transparently and rigorously**; (ii) the distribution of benefits and costs must be transparently identified; (iii) government must **engage broadly with stakeholders**; (iv) government should set **ambitious endpoints**, but, depending on circumstances, timetables for reform may be cautious; and (v) **fiscal transfers** are often required to facilitate the transition process.

22. In concluding, he pointed to a number of **important interlinkages** between the identification and removal or mitigation of perverse incentives, and the promotion of positive incentive measures:

(a) Introducing such positive incentive measures without the simultaneous or prior reduction or removal of environmentally harmful subsidies would lead to **incoherent and inefficient policies**. Conversely, the simultaneous or prior reduction or removal of environmentally harmful subsidies would free up scarce public funds, which could be used, *inter alia*, for the provision of the positive incentive measures; and their reduction or removal, by alleviating the emanating perverse incentive, will already make a positive environmental contribution.

(b) Under certain circumstances, **positive incentive measures could be applied for mitigating some perverse incentives, namely, for some laws governing resource use**. For instance, the provision of compensatory payments, for instance for loss of harvest or livestock due to foraging wildlife, may help to mitigate perverse incentives emanating from laws that assign protection status to nuisance wildlife.

(c) Programmes that offer positive incentives need to be designed carefully so as to **avoid the generation of perverse incentives**.

23. The representative of the OECD, Mr. Anthony Cox, gave an update on the recent work of the OECD on environmentally harmful subsidies. The OECD is engaged in collecting data in the **agricultural, fishery, water, and energy sectors** since the mid-80s, with subsidy estimates varying in their completeness and agricultural and fishery data being the most complete. Conservative estimates point to an annual subsidy figure of at least \$US400 billion to different sectors in OECD countries, which is equal to around 1.9% of GDP.

24. Mr. Cox noted the importance of the subsidy definition and where to draw the boundaries, especially when subsidies played into different sectors, and to understand the linkages between subsidies and the environment. He presented a number of tools developed by the OECD to assess the environmental aspects of subsidy regimes:

(a) **Quick-scan:** The quick-scan is a roadmap that guides the analyst through linkages between support measures and their environmental effects. The idea is conceptually elegant but difficult to apply in practice.

(b) **Check-list:** the check-list is a simplified decision tree that requires less data than the quick scan. It is a more useful, manageable tool that can identify those subsidies whose removal would lead to environmental improvements, other things being equal, and can help identifying the so-called ‘policy filters’ – that is, policy measures put in place in order to mitigate environmental harmful effects.

(c) **Integrated assessment:** this is a set of guidelines to account for a wider range of subsidy impacts, thus enabling to take the ‘broader picture’ into account and address issues of ‘policy coherence’, including for instance equity considerations and cost-effectiveness.

25. **Sectoral case studies** were carried out by the OECD from 2003-2004, including on agriculture, fisheries, transport, energy, and water. The studies on agriculture point to market price support, output payments, and input subsidies as potentially being environmentally harmful, while the studies on fisheries noted the critical importance of the management regime and its interplay with subsidies. Referring to OECD’s model-based analysis of the effects of energy pricing, he noted that the reform of consumer energy subsidies would yield significant improvements in societal welfare, and would reduce greenhouse gas emissions.

26. **The lessons learned from the case studies** are:

(a) There is significant scope for reducing **environmentally harmful subsidies** (EHS) across all sectors;

(b) The **OECD checklist** is useful in a common organizing framework;

(c) The checklist provides **transparency**;

(d) Checklists also **identify data problems**;

(e) Checklists help set **priorities for action**;

(f) Finally checklists help identify **sectoral and country-diverse characteristics** (for example, resource endowments).

27. The **strengths of the checklist** approach include: (i) there are no data intensive or model requirements; it is a ‘first cut’; (ii) it identifies areas where further detailed empirical analysis is required; (iii) it is helpful for those new on the topic; (iv) it can easily be applied in relatively cost-effective manner. Limitations include: (i) the checklist runs the risk of being too flexible and all-encompassing; (ii) the quality of the underlying data might be a restricting factor; (iii) the need for more systematic information on policy interactions and related models.

28. In concluding, he noted that further work was needed in particular in order to address and disentangle the **complex interaction** between different policies and the **chains of causality** that resulted in environmentally harmful effects.

29. Ms. Vera Weick presented the work of UNEP on environmentally harmful subsidies in the **fisheries** and energy sector. Recalling FAO data that most fish stock were fully or over exploited, she noted that fish stock decline was highly detrimental to the world's marine ecosystems, as well as to local economies. The main contributors to over-fishing were **open access, overcapacity, and illegal, unreported and unregulated fishing**. These causes were enhanced by subsidies – in particular, with respect to **overcapacity** (Current over capacity was 250% globally). Fisheries subsidies amounted to US\$ 15-34 billion annually, corresponding on average to 25% of the revenue of the sector, and many of those subsidies had environmentally harmful effects.

30. UNEP works on promoting fisheries subsidies reform and on the promotion of certification of sustainable fisheries and supply chain management, by preparing analytical papers providing advisory services and organizing stakeholder consultations; and by conducting country projects to raise awareness and assess impacts.

31. The analytical work on fisheries subsidies provided the following lessons with respect to fisheries subsidy reform:

- (a) It is important to define and classify the different types of fisheries subsidies;
- (b) It is critical to consider the interaction between fisheries subsidies and the fisheries management regime to identify their impact;

Based on this analysis, priorities, in terms of types of subsidies, can be identified for reform efforts.

32. Based on this work, UNEP, jointly with WWF, has developed “**sustainability criteria**”, in order to help WTO negotiators to craft new international law on fisheries subsidies and provide advice to governments at national level. According to these criteria, subsidies should only be given if certain biological, industrial and regulatory criteria are met.

33. She also presented a recent study on ‘reforming energy subsidies’. She noted a number of typical justifications for energy subsidies (such as international competitiveness, job promotion, energy security, affordability of energy services by of certain social groups and rural communities). When looking, however, at the real impact of the subsidies, these goals were not always met. Energy subsidies placed a heavy burden on government finances, which provided an argument and starting point for subsidy reform. She recalled in this regard the recent commitment of the G-20 to phase out inefficient fossil fuel subsidies. As a general conclusion of the study she noted that a ‘good’ subsidy programme should be: well-targeted, efficient, soundly based, practical, transparent, and time bound. Participants added that subsidies need to be well targeted against environmental objectives to this list.

34. She also presented a number of lessons learned with regard to how to address barriers to subsidy reform:

- (a) A method of **gradual, programmed phasing out** should be adopted;
- (b) **Compensation** should be provided to certain groups (e.g. by supporting income in more direct ways);
- (c) **Clear communication** should be established regarding the costs and benefits of reform;
- (d) **Subsidy reforms** should be integrated into broader processes of economic and social reform, which would include addressing social issues through other channels.

35. The expert from Uganda, Mr. Ronald Kaggwa Kiragga, highlighted examples of perverse incentives emanating from laws governing resources use in his country. He explained that a number of reforestation and afforestation programmes in his country promoted the use of fast-growing species, many of them exotics. This has led to a perverse incentive to **replace biodiversity-rich natural (although degraded) forest) by plantations forests**, with subsequent loss of biodiversity. Moreover, the distribution of licenses raised issues of equity and access, as they were given to the rich who could afford to participate in these programmes.

36. Another example of a perverse incentive was the **undervaluation of fishery licences** provided to local fishers, which led to the overexploitation of the fish stocks, including because revenues generated were not sufficient for effective enforcement.

37. The expert from India and chair of the meeting, Mr. Asish Ghosh, pointed to a recent reform of a subsidy programme for fertilizer subsidy in his country as an example how better biophysical targeting could reduce environmental impacts while simultaneously keeping adverse social consequences of subsidy reform under control. He explained that large areas of farmland had become increasingly less productive due to excessive use of a single fertilizer, urea, which, due to high subsidies, was cheaper than other fertilizers. In April 2009, the Indian Government introduced a new policy which provided more leeway to fertilizer manufacturers to mix nutrients needed for different kinds of soil and to sell them as separate products, and under which **subsidies are based on the ingredients in each nutrient mix**. This will lead to reduced overall nutrient levels and more adapted composition, which will **augment biological resources in agricultural soils** (e.g. bacteria, earthworm, micro-arthropods etc.). With regard to social implications, he explained that the **increased efficiency of nutrient use is expected to compensate the reduced subsidy level**. In the transition of subsidy reform, all farmers will receive the new type of subsidy, while further consideration is given to reduce eligibility in the future to more targeted recipients, that is, small and marginal farmers.

38. The expert from the European Commission, Mr. Jerzy Pienkowski, gave a presentation on reforming environmentally harmful subsidies in the European Union, in particular with regard to the **Common Fishery Policy and the Common Agricultural Policy (CAP)**. He explained that the progressive removal of environmentally harmful subsidies was on the agenda of the **European Union and its Members States**, including also the energy and transport sectors, and in government taxation. He noted that work on some of those areas fell under the responsibility of Member States, and the available information from Member States on progress made was patchy.

39. He noted that the CAP gradually incorporated environmental reform in the form of **direct payments to farmers** which were decoupled of production, the conditioning of his payment to compliance with environmental, food safety, animal health and animal welfare standards ('cross-compliance'). The budget for rural development also increased, including through a reduction in direct payments for bigger farms ('modulation'). The **2008 CAP Health Check** shifted an additional part of the rural budget to climate change, renewable energy, water management, biodiversity, innovation, and dairy sector. However, he underlined that more can and needs to be done.

40. Turning to the Common Fisheries Policy, he referred to a recent **Green Paper on the Reform of the Common Fisheries Policy**, published in April 2009. According to the document, the objectives of the 2002 fisheries reform were not met, with 88% of Community stock being exploited beyond sustainable levels. Catches have fallen – in fact, the Member States of the European rely on imports for 2/3 of their fish consumption. Fleet overcapacity was important, with most operating at low profit or losses. In several Member States, the budgetary support exceeded the total value of the catches. The Green Paper proposed fundamental changes to fishery policy, and calls for important changes to the subsidy regime. A legislative proposal was planned for 2011.

41. Referring to two recent reports ¹ on environmentally harmful subsidies prepared for the European Commission's DG Environment, he explained that practical guidelines for subsidy reform were developed and tested on practical case-studies, including the phasing out of **subsidies for hard coal mining** in the United Kingdom, Poland and Germany, and the **reform of water pricing** in the Czech Republic. The second study developed an integrated tool for identification, assessment and quantification of harmful subsidies, based on OECD methods. Lessons learned include:

¹ IEEP "Reforming environmentally harmful subsidies" (2007), and "Environmentally harmful subsidies – identification and assessment" (2009), both prepared by The Institute for European Environmental Policy (IEEP), London.

(a) There is a need for transparency and **good information on subsidies, also addressed to the general public**;

(b) There is a need to **understand and deal with social and local impacts and costs** of both the subsidy and its removal;

(c) Subsidy reform does not happen in isolation. The need to mitigate adverse impacts exists as part of a **broader reform package**;

(d) There is a need for **strong leadership, a broad coalition and a well-managed process** to consider staging the reform and taking advantage of economically beneficial circumstances.

42. In closing, he underlined the importance of linking the subsidy reform agenda to the broader agenda of promoting **green growth**, and noted the opportunities for subsidy reform in the context of the budgetary consolidation needed further to the economic crisis and the stimulus packages adopted by many governments.

43. Mr. Patrick ten Brink from the **Institute for European Environmental Policy (IEEP)** gave a presentation on the initiative on **The Economics of Ecosystems and Biodiversity (TEEB)** and its work on perverse and positive incentives. He started with a general background and rationale for the TEEB, noting that TEEB was part of the **Potsdam Initiative on Biodiversity 2010** initiated by G-8 environment ministers at their meeting in March 2007. TEEB is supported by the European Commission and the Government of Germany, and is part of UNEP's Green Economy Initiative.

44. He proceeded to present lessons learned on reforming subsidies, noting that myths about subsidy reform needed to be "debunked". He explained key steps in organizing subsidy reform, referring back to work undertaken by the OECD and others, and also pointed to a number of recommendations on how to design reform processes. Critical lessons learned for existing reform processes, identified by TEEB, include:

(a) While there is a lot of rhetorical and policy support for subsidy reform, **progress, with a few notable exceptions, is generally slow**;

(b) Subsidies, although launched for a reason, are sometimes **no longer valid**;

(c) Subsidies support economic activities and, as people become dependent on that activity, create **vested interests and "culture of entitlement"**;

(d) The level of subsidies, their impacts and the potential benefits from reform are not always easily clarified. **Some subsidies are hidden** and their impacts are not immediate or direct;

(e) **Transparency** needs to be improved;

(f) More **assessments and a clearer prioritization** of reform efforts are needed.

45. On positive incentives, he underlined that local biodiversity assets lead to benefits at local, national and international levels, and this would justify incentive payments at different geographical levels. He noted also underlined **critical links between the removal or mitigation of perverse incentives and the promotion of positive incentives**:

- (a) Reforming perverse incentives can **release funds for positive incentives**;
- (b) Reforming perverse incentives can **reduce the needs for the provision of positive incentive measures**;
- (c) Positive incentive measures can be **part of transition management**;
- (d) Some instruments aim **to be positive, but end up being perverse**;
- (e) Unless well targeted and designed, payments for environmental purposes can also be interpreted as a subsidy with **doubtful effect**; for instance, payments to industries in order to reduce pollution, in violation of the polluter-pays principle.

46. Mr. Helmut Röscheisen of the **German League for Nature and Environment** gave a presentation on environmentally harmful subsidies, which he said were the main driver of biodiversity loss. He quoted UNEP 2004 estimated that global subsidies amount to between US\$ 0.5 and 1.5 trillion per year, and referred to one study estimating that **half of all subsidies had detrimental effects**. Environmentally perverse subsidies were **prevalent in agriculture, fisheries, forestry, water, energy, and transport**. Other subsidies may also have adverse consequences on the biodiversity in other countries. He proposed a number of recommendation on how to address subsidy reform, and noted that a number of countries, including New Zealand, Argentina, Chile and Brazil, are already making efforts, or have succeeded, in implementing many of these recommendations:

- (a) To conduct **compulsory environmental impact assessment** for all subsidies;
- (b) To make all subsidies time-bound by implementing **sunset clauses**;
- (c) To cut subsidies for **budgetary consolidation**;
- (d) To realize that many **subsidies in the north lead to poverty in the south**;
- (e) To subject subsidies to **strict environmental and social conditions**;
- (f) To phase out subsidies prior to the **introduction of new instruments**;
- (g) To enhance **transparency**;
- (h) To make mandatory a **report on all direct and indirect subsidies** that are harmful to biodiversity by national governments, possibly towards international organizations or conventions;
- (i) To agree on **time-bound commitments** for phasing out environmentally perverse subsidies, and to impose sanctions for non-compliance.

2. Important observations made during the discussion

47. This sub-section provides a summary of the observations made by the workshop in analyzing the information provided.

48. While not being the only type of perverse incentive, subsidies with harmful effects on biodiversity are an important example of perverse incentives for the conservation and sustainable use of biodiversity. **Subsidies provided and their effects, including the possible perverse effects for biodiversity conservation and sustainable use, differ largely between countries**. It is important to recognize the **regionally uneven distribution of subsidies and their effects, particularly regarding developed countries and developing countries**. Reference was made in this regard to the overexploitation of fish stocks resulting from **agreements for foreign fleets**, and to the problem of **illegal fishing**, problems which would be exacerbated by changing fish migration pattern due to climate change. In terrestrial ecosystems, current **trends in contract farming** would also tend to exacerbate the impacts of subsidy regimes.

49. While it is important to not overstate or oversimplify the case of environmentally harmful subsidies, it is important to remember that there are many studies saying that **world market prices are depressed because of subsidies**, to the detriment of agricultural exporters from southern countries.

50. The **international dimension of subsidy reform** needs to be taken into account, bearing in mind that progress can only be achieved if it is helpful to all countries involved. The negotiations currently under way at the WTO, under the **Doha work programme**, are important in this regard, and in particular the negotiations on domestic support in the **agricultural negotiations**, and the negotiations on **fisheries subsidies**.

51. Regarding the environmental harmful effects of certain subsidies, similar conclusions could be drawn for both many OECD and non-OECD countries. While findings would vary from sector to sector and country to country, and while there would be other resource endowments and social outcomes, there is **a significant number of examples on environmentally harmful subsidies not just in OECD countries, but also in many non-OECD countries** – in particular subsidies to fertilizers and irrigation water. Identifying and removing or mitigating their perverse effects are **important areas for further work**, and the OECD checklist is a useful tool including for addressing biodiversity impacts.

52. The assessment of subsidies and their effects should not just address environmentally harmful effects, but rather take a **multi-criteria, holistic approach**, which should also address the **cost-effectiveness** and the **social effects of subsidies**. The whole chain of cause and effect matters, and could also be addressed through **sensitivity analysis**.

53. Sometimes subsidies are removed but environmental quality is not improved. Hence, reforming subsidies may not be sufficient and **further assessments** are needed in these cases in order to disentangle the **complex relationship** between subsidies and the surrounding institutional and policy framework.

54. Access to, and the provision of, relevant data is often insufficient, and **enhancing transparency** is an important step, and critical precondition, for identifying and reforming environmentally harmful subsidies. Initiatives taken by countries to enhance transparency were welcomed. In this context, there is a need to recognize that OECD subsidy estimates are **conservative** ones.

55. For instance, while the results of the Green Paper on the Reform of the Common Fisheries Policy are not yet validated and turned into political action, it is useful to **point to the evidence in order to generate a credible process towards subsidy reform**. For instance, with regard to fish exports to the European Union and sustainability in export zones, the Green Paper notes that European stock is so overfished that imports need to come from somewhere else.

56. **Ad hoc political interventions** are sometimes **an important barrier to the effective reform** of subsidies.

57. Subsidy removal is also an issue of scale, in particular with regard to **social implications**. As an example, reference was made to the need to support the **livelihoods of small and artisanal fisheries**.

58. **Subsidies can also be useful to protect the environment**, if properly designed and targeted towards environmental objectives.

3. *Conclusion and consolidated lessons learned*

59. While support provided and its effects differ largely between countries and sectors, and while there would be other resource endowments and social outcomes, there are generally **ample opportunities for identifying and removing or mitigating perverse incentives**, both in developed and in developing countries. Such reforms could make a **critical contribution to reducing the current rate of biodiversity loss**, and it is important to pursue this work. The analytical and guidance tools developed by the OECD and UNEP would be useful in this regard, including for addressing biodiversity impacts.

60. The meeting identified a number of succinct consolidated lessons learned on how to organize subsidy reform, including on how to address obstacles to reform:

(a) Subsidies can create **dependency in the subsidized sectors**. Attention should be paid to where vested interest is. The social implications of subsidy reform must also be taken into account, especially when the subsidy is linked to a resource used in particular by **indigenous and local communities and marginalized segments of society**;

(b) **Transparency** must be improved on what amount of subsidies is given to whom, in order to assess how **funding allocations affect biodiversity** loss, and in order to mobilize support for subsidy reform. Increasing transparency can also assist in ensuring the **subsidy's effectiveness against its stated objective, its cost efficiency, and in minimizing environmental impacts**;

(c) A strong leadership and broad coalition, based on broad **stakeholder engagement**, combined with a well-managed process, is necessary to stage reform and take advantage of beneficial circumstances;

(d) Better and more **complete data and analysis on subsidies** are needed, including more comprehensive assessments on the **complex interactions between different subsidy programme and other policies**. For example, reforming the perverse incentive can release funds for positive incentives, or simply alleviate the need for a positive incentive;

(e) There must be **better communication and coordination** among policy/decision-makers, as well as **between policy/decision makers and relevant stakeholders** to showcase the potential benefits of reforming subsidies, and/or to ensure coherent implementation of reforms at governmental levels.

B. Promotion of positive incentive measures

Summary of presentations

61. In introducing the sub-item, the representative of the Secretariat, Mr. Markus Lehmann explained that positive incentive measures **encourage the achievement of biodiversity-friendly outcomes or support activities that promote the conservation and sustainable use of biodiversity**. They are typically further differentiated into **direct and indirect approaches**: direct approaches involve paying relevant actors to achieve biodiversity-friendly outcomes or, conversely, to not achieve biodiversity-harmful outcomes, while indirect approaches seek to support activities or projects that are not designed exclusively to conserve or promote the sustainable use of biodiversity, but also have the effect of contributing to these objectives.

62. On direct approaches, he noted that **payment-based measures** are presumably still most common in developed countries but, with the recent advent in popularity of '**payments for ecosystem services**' (PES) schemes, an increasing number of developing countries are also applying such incentive measures. Such direct payments are frequently provided in conjunction with **use-restricting regulatory approaches**. The application of these schemes can be explained by, *inter alia*, high enforcement and monitoring costs of regulations and access restrictions. The literature points to a number of potential risks and limitations, including: (i) paying for activities that would have been conducted anyway (**lack of additionality**); (ii) shifting environmentally-damaging activities elsewhere (**leakage**); (iii) creating **perverse incentives** (e.g., inducing an expansion of environmentally destructive activities by future recipients of payments, in order to obtain higher payments later on); (iv) **misuse for protectionist purposes**, (v) **cultural limitations** to the use of financial compensation.

63. He pointed to the need for **better targeting** of such measures, frequently underlined in the discussion, and referred to the conclusion of the FAO that cost-effective PES programmes require careful design based on the characteristics of the service and the biophysical and socio-economic context. With regard to **equity considerations and poverty alleviation objectives**, he drew attention to the conclusion

of the FAO that, even while payments for environmental services are not primarily a poverty reduction tool, the **poor are likely to be affected** and implications for them must be considered, and that PES programmes if properly designed have been shown to **be potentially accessible and beneficial to the poor**.

64. On **indirect approaches**, he noted that a number of countries use measures which support activities or projects that were not designed exclusively to conserve or promote the sustainable use of biodiversity, but had the side-effect of contributing to these objectives. Measures included, for instance, the development of **sustainable tourism or eco-tourism** in specific biodiversity-rich regions, or the marketing of other biodiversity-related goods and services such as, for instance, **non-timber forest resources, as well as community-based natural resource management programmes**. He pointed to the **UNCTAD Biotrade Initiative** as a global programme which provided support to developing countries for the creation and promotion of markets for biodiversity-based products.

65. Community-based natural resource management programmes typically rely on the involvement of local communities in, for instance, **wildlife conservation or sustainable forestry management**. In concluding, he noted that the **generation or sharing of revenue** for these local communities was recognized as a key element in these programmes.

66. Ms. Natalie Olsen from IUCN gave a presentation on IUCN work on direct and indirect approaches to positive incentive measures, namely, their work on **payments for ecosystem services and biodiversity offsets**, as well as on the promotion of new biodiversity business opportunities and community-based natural resource management.

67. As an example of a private PES scheme, she presented the case of the Vittel company, producing mineral water in France. Payments were provided to 26 farmers operating in the relevant water basin in order to **maintain and improve water quality by supporting less intensive agriculture practices**. Lessons learned from this case on the design and implementation of PES schemes included:

- (a) A **long-term commitment** to providing positive measures is important;
- (b) Establishing PES schemes are complex undertakings not necessarily for financial reasons, **involving the building of institutions and trust**;
- (c) They have to **understand farmers and life choices**;
- (d) Payments must ensure **no loss of income**.

68. Regarding offsets, she noted that **legal frameworks that enabled such offsets** existed in a number of countries, including in the United States, Australia, Brazil, Canada, Mexico, South America, Switzerland, and the European Union. She also presented the Rio Tinto case in Madagascar.

69. Pointing to biodiversity banking as an extension of offsets, she explained that the rationale of biodiversity banking was the consolidation of conservation efforts, thereby realizing economies of scale. She noted that such systems would **enable to showcase the commercial value of biodiversity conservation to critical stakeholders**, for instance, the shareholders of private companies. Concerns and questions surrounding this approach include:

- (a) They may provide a **slippery slope towards approving doubtful projects**;
- (b) They may lead to **inequitable outcomes**;
- (c) Given the complexity of biodiversity, **expressing it in form of a ‘currency’ is difficult**;
- (d) **Additionality and leakage** are issues that need to take into consideration;
- (e) The **sustainability of the payment stream** needs to be assured;
- (f) The **timing of projects and business opportunities** is important to consider.

70. In his presentation on pertinent experiences in Cuba, Mr. Raul Garrido spoke of Cuba's experiences with positive incentives and the Government's approach to the environment through targets for forests, land management, hydrographical basins, coastal zones, and mountains. He explained that global threats to biodiversity included: **consumption patterns; excessive market forces; the underestimation of the multi-sectoral role of biodiversity; and the absence of economic information and political decision-making**, including the absence of environmental considerations in national accounting. He emphasized that an adequate understanding of the economic value of biodiversity was important, and that **absence of this understanding leads to deficient economic and political decision-making**. He underlined the important role which economic instruments could play to change economic behaviour and decisions, and noted the importance of coordination between ministries in this regard.

71. Cuba uses positive measures as mechanisms to direct public financial flows to reach environmental objectives. These measures are part of the toolbox for implementing the environmental strategy of the country. He explained that a **national environmental fund** has been established as a new decentralized economic mechanism. The fund provides funding for projects at the local level with specific positive impacts for individual communities. 305 projects were approved between 2002 and 2008, including projects for **reforestation, soil recovery, sustainable agriculture, species conservation, activities against contamination and public awareness**.

72. He also explained how the Cuban Government used **taxes or fees that generated disincentives** towards environmentally harmful activities, while mobilizing funds that could be used for providing positive incentives. A **forestry tax** partly feeds a forestry fund, which was used for **reforestation and sustainable forestry management activities**. Another example was the funding of the **cleanup of Havana Bay** by a levy on ships using the bay as harbour. He also mentioned special tariff allowances for environmental products as a positive incentive.

73. He recalled the current lack of recognition of the economic value of biodiversity as an important threat to biodiversity, and underlined the importance of **strengthening curricula on environmental economics in higher education**, in order to enhance capacities in this regard.

74. The expert from the Philippines, Mr. Antonio C. Manila, presented on the **Philippines' Initiatives on the Implementation of Article 11**. The Philippines have a programme of incentive measures for a more sustainable interaction with the environment. An **Environmental User Fee System**, relying on the **Polluter Pay Principle**, was implemented for the Laguna de Bay area. The goal of the system is to encourage businesses to **share the cost of environmental preservation**, and to make the link between peoples' daily lives and the lake's water quality more apparent. Moreover, a trust fund to promote sustainable financing of the **National Integrated Protected Areas System (NIPAS)** was also implemented.

75. The Philippines have also implemented a system of **regulation for wildlife breeding**, including representation with the international and local communities involved in wildlife breeding, and an export fee per commodity. Another initiative includes the development of guidelines for **industry self-regulation** in order to promote a sustainable floriculture industry. **Certificates of Accreditation** are

issued for the sustainable use of wildlife which, as a symbol of good standing, qualify for receiving CITES permits to trade wildlife.

76. He further explained that the Philippines had also established a community-based forest management agreement, which **granted local communities the authority to manage and utilize forest resources on a sustainable basis**.

77. The expert from Moldova, Ms. Alu Rotaru, described recent efforts of the Republic of Moldova to apply incentive measures for environmental conservation. She explained that a series of **Local Action Plans** were developed under the umbrella of the **National Biodiversity Strategy and Action Plan**, which foresaw to encourage farmers to apply sustainable production practices and to establish private forests; however, due to a lack of financial resources, these activities had yet to be implemented. She pointed to two specific cases: the **Moldova Soil Conservation project**, and the **Project “Sustainable Integrated Land Use of the Eurasian Steppe.”**

78. The Moldova Soil Conservation project, initiated in 2002, foresees large-scale reforestation of degraded and eroded state-owned and communal agricultural lands spread across the country. One mechanism **was market promotion and the enhanced supply of forest products**, produced in a sustainable manner, by local communities.

79. The Project “Sustainable Integrated Land Use of the Eurasian Steppe” is operating since 2007. The goal is to **test in practice and implement measures of steppe area management** that would facilitate the simultaneous development of rural areas and the conservation of natural ecosystems.

80. The expert from Cameroon, Mr. Steven Ngwa Njinyam, presented on the **country’s regional programmes to conserve biodiversity and to reduce the rate of deforestation**. He explained that the northern part of the country would become dryer at an alarming rate, with severe consequences for Cameroon’s biodiversity conservation and food security efforts, due to the serious climatic change factors affecting the region, which would lead to an increased competition for increasingly scarce resources. He explained that, while the country was member to many international agreements and conventions, **capacities to implement them effectively were not sufficient**. With regard to incentive measures, he explained that those were applied, and needed to be applied, in a cooperative manner, in **close cooperation with the targeted local communities**, and with a clear development perspective. That would also determine the kind of incentives provided; for example, existing programmes had been implemented to improve health, schools and roads.

81. He underlined the importance of taking **gender issues** fully taken into account when designing and implementing positive incentive measures. For instance, community forestry programmes redistribute forest resources, and this has an **impact on rural and forest-dwelling women**.

82. The expert from Uganda, Mr. Ronald Kaggwa Kiragga, presented on the country’s efforts to conserve biodiversity in forests, savannahs and grasslands, wetlands and aquatic ecosystems. A famous example of Uganda’s biodiversity conservation was the **conservation of mountain gorillas**. He identified important challenges to biodiversity conservation and sustainable use of natural resources: **(i) widespread poverty, (ii) high population growth, (iii) a proliferation of alien invasives, (iv) incoherent government policies, (v) climate change**.

83. The measures/tools that Uganda has used are: (i) **the establishment of protected areas**, where collaborative management schemes are being implemented, for example 20% of the access fees to National Parks and Game reserves goes back to the neighbouring communities while 25% of the money generated from **fish movement permits** at landing sites goes to Beach Management Units (BMUs); (ii) financial instruments where **environmental funds** such as the National Environment Fund, the Bwindi Impenetrable Forest Conservation Trust Fund and Friend a Gorilla have been established; (iii) **subsidies to promote better environmental practice**. Uganda has also explored **market creation and carbon sequestration offsets**. However, attempts to value biodiversity as well as efforts to carry out an inventory of biodiversity resources face capacity challenges. Moreover, there is private sector

participation, in terms of national biotrade programme which promotes trade and investment in products and services derived from Uganda's biodiversity.

84. Referring back to the case where reforestation programmes generate perverse incentives (see paragraph 29), he noted a number of lessons learned:

- (a) Positive incentive measures have led and can lead to **massive participation**;
- (b) However, careful and regular **assessment of their ecological effectiveness** is important to prevent incentives from turning perverse;
- (c) Incentive measures therefore need to be **embedded into a mix of measures**, also including regulation;
- (d) In particular, giving **forest reserves to the private sector as investment incentives** can lead to encroachment for short-term political gains;
- (e) **Unsustainable harvesting and exports of resources** can be exacerbated by liberalization policies.

85. He concluded that economic instruments were currently used as revenue generating tools, and not for promotion of sustainable ecosystem management. Environmental taxes and market-based instruments were largely not based on the **maximum sustainable yield of the resource**. The design of incentive tools needed to be improved, and they had regularly been reviewed for continued relevance, efficiency and cost-effectiveness. Measures had to be calibrated in a way to ensure that prices reflect the **resource's true economic value and the real cost of their degradation**.

86. The expert from India and chair of the meeting, Dr. Asish Ghosh, gave a presentation on India's experience with the reform of perverse and promotion of positive incentive measures. He explained that the Indian government switched from policies that excluded people in conservation measures to those that **include people as active agents for ecological conservation**. These policies emphasized the sharing of benefits with communities, for instance, through support of ecotourism activities.

87. The Forest (Conservation) Act of 1980 provided a first opportunity for setting up a mechanism of funding for compensatory afforestation, in case the forest land was allowed to be converted for non-forestry purposes. The Forest Policy, 1988 further ensured a process of **Joint Forest Management (JFM)** by forming Forest Protection Committees (FPC) with participation of the local community. As a result, between 7-9 million ha. were being jointly managed by communities and the forest department in 2000, with 35,000 community committees existing. Although details differ from state to state, **committees in almost all states held full rights over most non-timber forest products**, and were entitled to receive a share of receipts for those exempt from full entitlement. Moreover, 25-50% of the receipts from non-timber sales by the forest department went to the committees. Positive changes to local livelihoods had been observed accordingly; for example, **benefit-sharing had increased the income from sale of forest products to its members and the revenue re-invested into forest management**. A recent study of villages near the Sundarbans Tiger Reserve found that, relative to other households, households involved in eco-tourism spent 19% more on food and 35% more on non-food items.

88. **The Biodiversity Act of 2002 and 2004** had also devised a legal framework for access and benefit sharing (ABS). The Act stipulates norms for access to biological resources and traditional knowledge. Under the Act, a three tier management system had been proposed, both at Central and State Government levels as well as the local level. At the local level, **Biodiversity Management Committees (BMC)** were established as independent bodies with seven representatives from the local community. They can determine the **amount of levy to be charged for any biological resource to be utilized commercially**; money thus collected would be deposited to the Local Biodiversity Fund, which could be **utilized for providing incentives to individuals or communities undertaking biodiversity conservation** at the local level. The BMC would work with a People's Biodiversity Register (PBR) which would be prepared by the Local Community in local language.

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89. He also explained that the Supreme Court in New Delhi had made it mandatory to determine the **Net Present Value** of forest land whenever permission was granted to convert it to non-forestry purposes, and pay compensation accordingly. The Net Present Value was required to include the value of “biodiversity”.

90. He also pointed to a 1995 partnership between the Kani tribe in the Western Ghats and Arya Vaidya Pharmacy (AVP) manufactures on Jeevani, a drug made from the tribally used plant, Arogyapacha. The **tribe received 50 per cent of the license fee that the pharmaceutical company payed to the Tropical Botanic Garden and Research Institutes**, and also received 50 per cent of the royalties for the sale of the drug. Despite some problems encountered in implementation, this has been celebrated as a model benefit-sharing arrangement.

91. A West Bengal-based NGO, ENDEV-Society for Environment and Development, established a seed bank through which farmers **received free stocks of seeds of varieties naturally suited to the land and water of the area**. The farmers were able to borrow these seeds on the condition that they return twice as much as they took. The initiative also seek to draw in women who would otherwise collect prawn seeds from the estuary, a trade that was extremely damaging to the region’s ecosystem.

92. The expert from Japan, Professor Kiichiro Hayashi, gave a presentation on Japan’s ecological conservation measures, including subsidies for environmental purposes. He noted that many measures were **not price-based instruments**. He explained that Japan had a long history of **forest conservation for conservation of water**. Forest conservation taxes applied to water use, and the revenues were channelled back to forest conservation activities. However, he noted that the tax rate was generally too low, implying that there was insufficient revenue to meet conservation objectives.

2. Important observations made during the discussion

93. This sub-section provides a summary of the observations made by the workshop in analyzing the information provided.

94. **Economic instruments (taxes or user fees) play a potentially important role as a source of revenue** for funding the provision of positive incentive measures. However, economic instruments, even when applied in the first place, are frequently being set too low to effectively change behaviour (that is, act as disincentives) or to meet resource requirements for the provision of positive incentive measures. The **calibration of economic instruments needs to be improved**, both in developing and developed countries.

95. **Assessing the economic value of biodiversity** and ecosystem services, and **complementing existing national accounts** to reflect depreciation natural capital, can play an important role in better calibrating economic instruments and positive incentive measures for the conservation and sustainable use of biodiversity. The initiative on The Economics of Ecosystems and Biodiversity (TEEB) to promote common understanding and broader application of these tools is welcome. There is an **information gap in this regard between developing and developed countries**.²

96. It is important to **enhance capacity in, and provide training** for, the design and implementation of positive incentive measures. Recent efforts to **expand university curricula on environmental economics**, undertaken for instance by India, and to **build regional programmes and networks**,³ are welcome. Such efforts need to be broadened.

97. **Gender issues** need to be taken fully into account when designing and implementing positive incentive measures, for instance, the impact of community forestry programmes on rural and forest-dwelling women through the redistribution of forest resources.

² See paragraph 96.

³ E.g., the Latin American and Caribbean Environmental Economics Programme, or the Economy and Environment Programme for Southeast Asia.

98. Programmes implementing payments for ecosystem services (PES schemes) are most effective when seeking to **cover, to the extent feasible, all ecosystem services provided** by a particular ecosystem. In this context, reference was made to the requirement, implemented in India, to compensate for the entire **net present value of the forest ecosystem** in case of forest loss or degradation.

99. In developing countries, **negotiations for voluntary PES schemes are typically with the authorities (both formal and traditional)**, and it is very rare that all voices are heard. This may lead to **equity issues** as well as limited value of PES schemes for poverty alleviation objectives. It is important to recognize that PES schemes are **not a poverty alleviation tool**.

100. **Land ownership** plays an important role in designing PES schemes. The allocation of formal land titles may generate important equity effects when introducing such schemes.

101. While **offsets are generally a valuable tool for biodiversity conservation**, there are important **limitations** which need to be taken into account. For instance, **some areas should be completely off-limits** for offset activities, for instance **sacred areas and groves** as well as areas with a **high degree of endemism**.

102. Another important potential **limitation** of offsets is the **definition of equivalence**, given for instance the important time lags before ecosystems are restored completely – wetland mitigation being a concrete example.

103. Difficult decisions arise frequently in designing and implementing community-based natural resource management in the context of establishing protected areas, in particular with regard to the role of human settlements in protected areas and potential relocation decisions. There is a need to **carefully balance objectives of biodiversity conservation and sustainable use, taking into account poverty alleviation and livelihood development objectives**. Reference was made to the **UNESCO Man and Biosphere programme** as an approach to reconcile protected areas and human settlements and activities in buffer zones.

104. **Business-driven initiatives** (e.g. large retail chains requiring food coming from sustainable sources, indicated by appropriate certification) can play a positive role in providing incentives for conservation and sustainable use. In general, the examples of the **pharmaceutical and cosmetic industries**, which rely increasingly on biodiversity-based products, show that opportunities exist to understand biodiversity and ecosystem services as an emerging economic sector. However, there is a need to be aware of potential limitations – for instance, **leakage** may occur, resulting in more harmful effects from products that are not covered by certified products.

3. Conclusions and consolidated lessons learned

105. The group noted a number of important general lessons learned from its analysis of existing cases and related information.

106. With regard to the promotion of **direct positive incentives**, including payments for ecosystem services, the group noted that:

(a) A long-term commitment to providing positive incentives is important. Securing the **long-term financial sustainability** of providing positive incentives is critical, since positive effects on biodiversity will require time to take effect and since maintaining these positive effects will typically require the ongoing provision of positive incentives;

(b) They are complex undertakings, and not necessarily only for financial reasons, involving the **building of institutions and trust**. The dynamics among and between government representatives and stakeholders must be taken into account.

(c) The **important relationship between the provision of positive incentives and the removal of perverse incentives** must be taken into account. The prior removal of perverse incentives will make positive incentives more effective, and can even reduce the need for providing positive incentives;

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(d) They have to understand **farmers and life choices**. If the design of positive incentives do not reflect a deep understanding of local communities and farmers; and of the relationship between the users of natural resources and the resources themselves, they run the risk of not achieving their goals and harming already sensitive bonds of trust between local communities and formal institutions;

(e) Payments must ensure **no loss of income**. This could impact the trust built between actors within the scenario. The case of France's Vittel company provides a good practice case in which payments for services ensured no loss of income to the farmers involved;

(f) More generally, **equity and gender considerations need to be careful taken into account**, since high poverty and widespread inequality is often part of the barrier to biodiversity conservation in the first place;

(g) They can generate **additionality issues and leakage**, which must be taken into account during the design stage to ensure that positive incentives are cost-efficient and effective;

(h) They can generate **perverse effects when not properly designed and implemented**. Understanding the relationship between perverse and positive incentives is also important in this context;

For this reason, there needs to be a **regular review of positive incentive measures**. Just as sunset clauses must be considered in the case of subsidies, positive incentive measures should be reviewed regularly to ensure that they have generated the intended impacts in a cost-effective manner and within a reasonable amount of time.

107. With regard to **community-based natural resource management**, the group noted that:

(a) **Community participation** needs to start early on and as a long-term commitment. This ensures that positive incentives can be monitored for effectiveness, and that the programme gains credibility;

(b) **Inputs have to be sustained** to gain the trust and confidence of local people, and build credibility;

(c) **Benefits must be tangible, tailored and appropriately scaled**, so that shareholder enthusiasm does not wane, and that communities remain committed to the projects;

(d) The responsibility of **local people as traditional resource managers** must be acknowledged and used, as these communities often have a deeper understanding of how to maintain biodiversity and use it in a sustainable manner.

ITEM 4. IDENTIFICATION OF A LIMITED NUMBER OF GOOD PRACTICE CASES FROM DIFFERENT REGIONS

108. In introducing the item, the representative of the Secretariat, Mr. Lehmann, noted that document UNEP/CBD/ws-incentives/3/2 contained a number of **suggested criteria for identifying good practice cases**, which were identified based on a review of other existing collections of good practice cases. He invited the group to take these into consideration as a possible basis for their work in the break-out groups:

(a) The case should present a policy or policy reform with a **substantial contribution to the conservation and sustainable use of biological diversity**;

(b) The case should present examples of **positive practice and innovation**, creative **ways of overcoming barriers and resistance to change**, and/or ways of **making better use of resources**;

(c) The case should present a **good possibility of replication** at least within the region, possibly with some adaptation or modification; at the minimum, it should provide a useful reference when searching ideas for own initiatives.

109. He also pointed to the annex of the document, providing a tentative list of case-studies on the removal or mitigation of perverse incentives, and the promotion of positive incentive measures, as a possible starting point for the work of the break out groups.

110. The experts then formed break-out groups on the topics described in paragraph 15 above. The result of the work of the groups is summarized in annex I of the present report.

ITEM 5. OTHER MATTERS

111. The workshop expressed its appreciation to the Government of Spain for the financial support provided to the meeting, as well as to the Division on Technology, Industry and Economics of the United Nations Environment Programme (UNEP-DTIE) for hosting the meeting at its premises. Appreciation was also expressed by the support provided by IUCN – The World Conservation Union, with financial support by the United Nations Environment Programme, in preparing the summaries of the cases-studies provided in annex I.

ITEM 6. ADOPTION OF THE REPORT AND CLOSURE OF THE MEETING

112. The present report was adopted by the Group on 8 October 2009.

113. After the usual exchange of courtesies, the meeting closed at 5:30 p.m. on Thursday, 8 October 2009.

*Annex I***IDENTIFICATION OF A LIMITED NUMBER OF GOOD PRACTICE CASES FROM DIFFERENT REGIONS ON THE REMOVAL OR MITIGATION OF PERVERSE INCENTIVES AND THE PROMOTION OF POSITIVE INCENTIVE MEASURES**

In light of the request of the Conference of the Parties to identify a limited number of good practice cases, the following list is by necessity not comprehensive. The workshop wishes to underline that the absence of a particular case from the compilation below does not imply that such a case could not also be considered good practice.

*Identification and removal of perverse incentives***Austria: removal of subsidies for wetland drainage**

The establishment of the National Park Neusiedler See in Austria was accompanied by a package of incentive measures aimed at supporting the effective management of the protected area and the reedbelt which has been a UNESCO biosphere reserve since 1977. Subsidies for the drainage of wetlands for agricultural cultivation were removed. Additional incentives to promote conservation included: the compensation of owners ceding land, restricting access to hunters (including compensation to hunters with licenses), cessation of stocking the lake with non-native species, and banning the burning of reeds, but promoting the sustainable harvest of reeds.

The policy reform was innovative in that it combined a range of instruments to address competing uses and interests in the area. Establishment of the national park affected over 1500 land owners and negotiations had to address the competing interests/uses associated with agriculture, hunting, fishing, the reed industry, the local population and tourism.

Impact on biodiversity:

The area is currently effectively protected. While there is limited quantitative information available on actual measured biodiversity gains, the protection of the threatened ecosystem has resulted in net gains for biodiversity and the ecosystems that benefit people.

Replicability:

Rather than impose regulation which would have been resisted, the government's approach was to provide a range of positive incentives, together with subsidy removal, to change the use of natural resources in the National Park. In parallel to the removal of subsidies for the drainage of wetlands, incentives for ecologically sound farming were implemented with the provision of financial resources (lease, compensation, subsidies) for practices conforming to National Park standards. There seems to be promising scope for replicability whenever the reform of pre-existing environmental harmful subsidies can leverage sufficient funds for effectively addressing competing uses and interests in and around the protected area.

Lessons learned:

The use of a combination of economic incentives, information dissemination and paying individuals compensation for restricting land use were critical to success.

In a context of falling agricultural prices and increasing intensification of agriculture, the National Park was regarded as a positive economic alternative to agriculture.

Compensation seemed to be necessary, in particular where pressures on biodiversity came from outside Park boundaries.

Sources: Hubacek, K. and W. Bauer (1999).

Denmark: removal of perverse incentives in the forest sector

Denmark is a forest-poor country with a long-standing national commitment to increase forest cover. A national Strategy for Natural Forests and Other Types of Forests with High Conservation Value in Denmark was launched in 1992. A prerequisite for its successful implementation was to include both public and privately owned areas. Privately owned forest areas in Denmark contain a high level of biodiversity as these areas are often among the most untouched forests in Denmark. Private forest owners had conserved natural forests in the past, but in many cases were no longer able or willing to continue covering the costs of managing forests for biodiversity rather than for timber production on their own.

One regulation, contained in the Forest Act of 1989, had been a major source of forest degradation for many years. This provision made it illegal to leave areas of potentially productive forest 'unproductive', and consequently created a strong disincentive for 'unproductive' conservation activities – in fact, it created a perverse incentive to deforest in order to maintain land rights. The reform of this requirement was a key element in the efforts to increase the area of natural forests in Denmark. By allowing exemptions from the Forest Act, it became possible for private forest owners to protect natural forests and other forests with high biodiversity content as non-inventory (untouched) forest.

Complementary to the removal of this perverse incentive, positive measures were introduced in order to promote expansion of forests on private land. These included a special grant-scheme to compensate for the direct financial losses associated with the set aside of untouched forests on private land and to finance the costs of any special management required. The government also combined grants for reforestation and compensation for the voluntary conversion of private forests into strictly protected reserves.

Impact on biodiversity:

The system of grant-aid for untouched forest was introduced in 1994 and has been assessed to have been very effective in creating incentives for the transformation of cultivated forest areas into untouched forest areas (6,500 hectares in 2000). While no targeted assessment of biodiversity per se has been undertaken, biodiversity has most likely benefitted significantly by increasing the area of natural protected forest.

Replicability:

This case should be replicable in countries where there is significant private ownership of forest resources, a national commitment to maintain or increase forest cover, and sufficient financial resources available for compensation.

Lessons learned:

The policy measures addressed forest holdings on both public and private land. The success of policy reform is increased when a package of policy measures is adopted with different tools targeted at different stakeholders.

Broad political support for this reform was contingent on the fact that the scheme was voluntary, reflecting the limitations as regards the level and degree of regulation that landholders are ready to accept on their private property.

Sources: OECD (1999); Strange et al. (2004).

European Union: enhanced transparency on subsidy measures in the European Union and its Member States

Enhancing the transparency of subsidy programmes has been recognized as an important prerequisite for effectively removing or reforming environmentally harmful subsidies and, promoted by important regional instruments such as the UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice (Aarhus Convention), and European Regulation 1049/2001 regarding public access to European Parliament, Council and Commission documents, a number of governments had already taken steps to publicly disclose information on their subsidy programmes. The

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European Commission, in its 2006 Green Paper on the European Transparency Initiative, proposed the mandatory disclosure of beneficiaries of EU funds by the Member States, such as structural funds and agriculture and fisheries subsidies, arguing that beneficiaries of EU funds receive money to fulfil public policy objectives, and that EU citizens are therefore entitled to information on who receives how much. A recent EU regulation, agreed in December 2006, requires ‘adequate ex-post disclosure’ of the recipients of all EU funds, with agricultural spending transparency to begin in the 2008 budget.

Compliance of Member States with the regulation is still uneven; and concerns have been raised in particular with regard to inconsistent data formats, including sometimes insufficient levels of disaggregation, and a general lack of user-friendliness, due to the fact that the information provided is scattered across websites operated by the Member States and provided under different standards and different formats, some of which are not searchable by electronic means. However, the regulation, together with the instruments referenced above, has spurred important watchdog initiatives such as farmsubsidy.org, caphealthcheck.eu or fishsubsidy.org, which seek to closely monitor compliance by EU Member States and assess the quality of the released data. These initiatives also develop and provide search engines to better use the raw data supplied by the Commission and the EU Member States.

Impact on biodiversity:

It is expected that transparency in allocation of funds to the agriculture and fisheries sectors will increase awareness of both decision-makers and the general public on the effects of these subsidies and their effectiveness in reaching stated targets and, consequently, increase pressures for reform of environmentally harmful subsidies.

Replicability:

Improved transparency in policy making has already been sought by many governments and financing agencies to promote the efficiency and equity of the allocation of national, regional and global financial resources, in particular with regard to the beneficiaries of subsidy programmes. Assessing the precise scope for replicability would require a careful analysis of these efforts but they should be replicable in particular when the existing legal, institutional and administrative framework already promotes transparency in national policy and decision making (e.g. through general access to information requirements, and/or the existence of watchdog organizations).

Lessons learned:

Minimum requirements on data types, standards and formats of disclosed information can be helpful for achieving user-friendly access to information.

Source: TEEB (2009).

Ghana: removal of fuel subsidies

In 2004, faced with persistently high oil prices, Ghana experienced serious fiscal constraints and was forced to discontinue subsidizing petroleum products. The government launched a poverty and social impact assessment (PSIA) for fuel, including all stakeholders. The PSIA found that price subsidies predominantly benefitted the better-off in society. When the government eliminated fuel subsidies in 2005 and set price ceilings in line with world prices, leading to a 50 percent price increase in fuel, the government simultaneously launched a campaign explaining the need for price rises and announcing mitigation measures. These measures included the elimination of government run primary and junior secondary school fees and a programme to improve public transport. As a result of adequate compensation measures, the transparency of the process of removing subsidies and the public information campaign, the public generally accepted the measures despite opposition from trade unions.

Further developments illustrate that policy reform is an ongoing process rather than an event. When the population was faced with high food and energy prices from 2006 to 2008, the government was forced to intervene to keep prices at acceptable levels. Facing high and increasing fuel and food prices, Ghana froze

price ceilings between May and November 2008, and also introduced mitigation measures focusing on energy conservation. Ghana continued to reduce fuel taxes even after the oil price collapsed in late 2008, lowering fuel taxes in March 2009 as part of a pledge to alleviate the financial burden on its citizens (Kojima 2009, *Ghana News* 2009 quoted in Kojima 2009). However the financial burden of keeping fuel prices low has been so great that Ghana was forced to close its refinery from February to October 2009 due to high levels of debt (Reuters, 29.10.2009).

Impact on biodiversity:

The impact of removing fuel subsidies on biodiversity is indirect working through the links between fuel subsidies increasing fuel consumption increasing GHG emissions and pollution with negative effects on biodiversity via the negative impacts of climate change and contamination of ecosystems from pollution. Moreover, investment in transport-related infrastructure in economies which have fuel subsidies will be greater than is socially optimal and results in too much conversion of natural areas and in habitat fragmentation.

Replicability:

Experience has shown that removing fuel subsidies is difficult due to vested interests which resist reform. The early positive experience of Ghana suggests that making the public aware of precisely who benefits from fuel subsidies can be critical for minimizing resistance from vested interests. Successful elements of this strategy can also be found in the Indonesia case.

Lessons learned:

Policies aiming at reducing or removing subsidies can be more effective if the public understands who is receiving the subsidy and how much.

Compensatory spending should be transparent, immediate, effective and pro-poor.

Source: ESMAP (Energy Sector Management Assistance Programme) (2006) cited in Bacon and Kojima (2006); Bacon and Kojima (2006); Kojima (2009).

India: reform of subsidy for chemical fertilizer

In India, large areas of farmland have become barren due to excessive use of a single fertilizer, urea. A recent reform of the fertilizer pricing policy seeks to remedy this problem. The existing subsidy regime was skewed in favour of urea and consequently led to urea overuse by farmers to the detriment of other essential nutrients. Moreover, it was very expensive as the subsidy was offered at a uniform rate irrespective of varying costs of production.

In February 2009, the Indian Cabinet decided to relax controls on the prices of fertilizers, with the exception of urea, whose price was increased by 10 percent. By partially liberalising the prices of potassic (K) and phosphate (P) fertilizers, while still maintaining control through a more flexible subsidy regime, the government seeks to keep the relative prices of these nutrients low compared to urea, and to induce farmers to use more P, K and micro-nutrient based fertilizers.

Under the new Nutrient Based Subsidy Scheme (NBS), subsidies for the period 2010-11 will now be fixed on the basis of the concentration of each nutrient, N (nitrogen), P (phosphate), K (potash) and S (sulphur). The amount of the subsidy is to be worked out with regard to international prices and the need to avoid domestic price shocks to the agriculture sector and to food consumers. In addition, the new policy allows fertilizer manufacturers to mix nutrients needed for different kinds of soil and to sell them as separate products.

The government expects the new scheme to encourage fertilizer firms to offer more competitive prices based on the costs of production. In fiscal terms, the government hopes to dramatically reduce expenditure on fertilizer subsidies.

The financial impact on farmers will be minimised as the fertiliser industry will be incited to design more efficient products choosing the right combination of nutrients. It is expected that the increased efficiency of fertiliser at farm level should compensate for the reduced subsidy and the higher cost of fertiliser to farmers – that is, farmers should be able to use less fertiliser because by being more targeted to local conditions, fertiliser use will be more effective. In addition, the Department of Finance is considering giving the Nutrient Based Subsidy only to targeted segments of the population, that is, small and marginal farmers. However, in the current transition phase of subsidy reform, all farmers will receive the new type of subsidy.

Impact on biodiversity:

The new policy is intended to protect biodiversity and agricultural biodiversity in particular, by encouraging more appropriate and balanced fertilizer use and thereby maintaining soil biodiversity (bacteria, earthworm, micro-arthropods). In light of the continuing need to maintain and increase agricultural productivity, the aim is not to reduce fertiliser consumption as such – as the government has argued that fertilizer consumption in India, despite historically high subsidy levels, remains comparatively low (at 113 kg per hectare compared to 289 kg per hectare in China).

Sources: Ghosh, A. (2009).

Indonesia: removal of pesticide subsidies

As a low income country with a large and fast-growing population, Indonesia has traditionally put high priority on achieving growth in agricultural output and rice self-sufficiency. To this end, agricultural policy promoted the use of high-yielding varieties and pesticides via direct subsidies on pesticide sales, government spraying and favourable credit packages.

The heavy use of pesticides caused considerable harm to the environment, to human health and ultimately to rice production itself. By the mid-eighties, a drop in rice production had been observed resulting from the overuse of pesticides which had wiped out the natural enemies of many pests, including the brown rice planthopper. US\$1.5 billion worth of damage to the rice sector resulted directly from pest infestations.

Further triggered by the oil shock in 1986 and the subsequent strain on the public budget, Indonesia has significantly reduced support to agriculture including:

- the removal of pesticide subsidies in 1986, combined with a ban on the import of broad spectrum pesticides in 1986; and
- the removal of fertilizer subsidies in 1998.

Following pesticide subsidy removal in 1986, pesticide applications halved while rice production grew by three million tons over four years. A well-funded and widely disseminated national programme of Integrated Pest Management (IPM) was a critical factor in the maintenance of rice production and farm incomes. An additional benefit was the US\$100 million fiscal saving resulting from subsidy elimination.

Impact on biodiversity:

The reduced use of pesticides is thought to have reduced the flow of toxins to the environment and their negative impact on biodiversity and human health.

Replicability:

This experience suggests that subsidy removal is feasible even when there is strong opposition from some stakeholders. Subsidy removal was undertaken at the same time as a national programme of integrated pest management (IPM) was implemented. In parallel, agricultural research and extension was decentralized from national to province level. The financial stress associated with declining oil prices after 1984 provided further justification for cuts to government budgets.

Lessons learned:

Fiscal crises often present opportunities and strong arguments for subsidy removal that facilitate reform at a political level.

Subsidy removal may generate fiscal as well as environmental benefits. In this case, the treasury saved over US\$100 million per year from subsidy removal while the IPM programme cost roughly US\$5 million per year.

Subsidy reform coupled with supporting institutional changes is more likely to succeed. Pesticide subsidy removal occurred at the same time as adoption of IPM as a national policy and the decentralization of many government functions, including agricultural extension.

The adoption of integrated pest management as a national policy provided farmers with information and tools to maintain (and increase) rice production thereby minimizing the potential costs of subsidy removal to certain stakeholders while maintaining national food security.

Sources: Moor and Calamai (1997); Pasandaran et al. (2003); World Bank (1997, 2005).

New Zealand: removal of agricultural and fisheries subsidies

The economy of New Zealand has historically been highly dependent on agriculture and food exports. Prior to 1984, agriculture was heavily protected via subsidies and price and income support. Protection led to market distortions, over- production and degradation of marginal lands. Subsidies encouraged large areas of marginal land to be brought into production and by 1984 over two million hectares of marginal land were being farmed only because subsidies made it profitable. Production no longer matched demand as subsidy-based production soared; the government paid for the slaughter of sheep that could not be sold and in 1983, 6,000 tons of surplus sheep meat was turned into fertilizer. By 1984, agricultural output was worth less than the costs of producing and processing it.

In 1984, the government faced a severe fiscal crisis and implemented an ambitious deregulation programme, which also included devaluation and subsequent floating of the New Zealand dollar and the liberalization of capital markets.

As part of this economy-wide reform, the government removed all agricultural subsidies (price support for wool, beef, sheep meat and dairy products, income support, fertilizer, irrigation, transport and land development subsidies). Tax concessions and free government services for farmers were eliminated. Producer Boards lost access to concessionary Reserve Bank funding. Land development loans, fertilizer and irrigation subsidies, and subsidized credit were reduced and eventually phased out after 1987, as was assistance for flood control, soil conservation, and drainage schemes.

In 1986, New Zealand removed all subsidies to the fishing industry. The financial and social distress that would have been caused by the virtually overnight subsidy removal was dampened by a major change in fishery management regime. Rights based management was introduced along with a system of individual transferable quotas (ITQs) and a buy-out of existing rights. The improved management of the fishery sector provided those who wished to remain in the newly unsubsidised, efficiency-focused fishery sector with the opportunity to do so while those who wished to leave were compensated through buy-out payments.

Sectoral adjustment in the agriculture sector took seven years, but the government supported the farming sector through the transition with loan restructuring and social welfare payments. Farm land prices fell by 60 percent and fertiliser used declined by 50 percent. Approximately 1 percent of farmers left farming. The number of sheep fell sharply from 70 million in 1983 to 40 million in 2004; by 2007 there were 31 percent fewer sheep and beef farms.

By 1995, farm land prices had recovered to 86 percent of their pre-reform levels. Today, the agriculture sector is larger than when it was heavily supported; it is more profitable, efficient and innovative. The

meat industry has developed from the least efficient to the second most efficient in the world. Employment in the sector has actually increased. The rural economy has diversified to include tourism and other services which have made rural communities less vulnerable to cyclical downturns in agriculture. The support of farmers' organizations and consumer groups contributed greatly to reform success.

Impact on biodiversity:

Reform had a positive impact on biodiversity by reducing the use of fertilizers and pesticides, decreasing pollution levels in rivers and reducing the farming of marginal land. There was a halt to land clearance and overstocking, which had been major causes of high levels of soil erosion. Livestock production has now been intensified on better land rather than hills prone to erosion, and hills have been reforested leading to a 50 percent increase in area under plantations.

It should be noted however, that agriculture in New Zealand has in recent years intensified significantly, especially in the dairy sector, which has caused renewed concerns about pollution and loss of biodiversity.

In the fisheries sector, as a result of both subsidy removal and the introduction of the new management regime, fish stocks were managed more effectively and in some cases recovered from overexploitation.

Replicability:

The success of New Zealand's reform provides encouraging evidence that it is possible to reform policies in economic sectors of critical importance in terms of contribution to GDP, employment and foreign exchange. However, New Zealand is a small, isolated, relatively homogeneous, well-educated, and affluent society, which may have helped win political support with arguments based on the fiscal crisis and the need for sustainability.

Lessons learned:

The existence of a fiscal crisis required cuts in government expenditure and provided justification for reductions in financial support to the agriculture and fisheries sectors.

Involvement of stakeholders, farmers and fishers, at early stage of the reform process and in decision-making greatly improves the likelihood of acceptance and success.

Removal of subsidies must be implemented within an agreed and transparent timetable. Certainty of reform, its scope and pace is essential for success. Farmers and fishers were given sufficient information about the pace, breadth and depth of reform.

Farmers and fishers can adapt to lower support and increase profitability, particularly if they and others believe that government will not make a U-turn on policy reform.

Adjustment takes time. Although farmers and fishers acted quickly to improve profitability in New Zealand, it took considerably longer for economic growth to return and for unemployment to subside.

During the adjustment period, there is an important role for government assistance measures, decoupled from production decisions, to support household consumption.

Agricultural reforms can have a positive environmental impact. In New Zealand, subsidies encouraged the use of marginal land, higher stocking rates and the overuse of fertilizers. With the removal of support, production has become more extensive, chemical use has declined, and marginal land has been taken out of production.

Sources: Myers and Kent (1998); OECD (2006) and (2007); Ray and Blandford (2004); TEEB (2009); Vitalis (2007).

Norway: significant reduction of fisheries subsidies

Between 1981 and 1994, Norway reduced subsidies to fisheries by 85 percent from US\$ 150 million to US\$ 30 million. More effective management measures were adopted simultaneously and have helped the sector to become self-supporting. The reduction in subsidies occurred at a time when Norway was under financial pressure from falling oil prices. Moreover, significant external political pressure to reduce direct price support to fisheries was also associated with the development of multilateral agreements, namely, the Oporto Agreement on the European Economic Area, which was signed in 1992 between the Member States of the European Union and of the European Free Trade Association (EFTA).

The successful reduction in subsidies has been attributed to a number of factors. First, the timing of the reform was important – subsidy reduction occurred in the context of falling oil prices which reduced government revenues and encouraged political support for reform by convincing stakeholders of the need for fiscal restraint. Second, various measures to reduce capacity and to increase the productivity of the industry had been developed and implemented in the last decades. Compensation in the form of publicly-financed programmes for decommissioning fishing vessels in both the ocean-going and coastal fishing fleet were used up to the 1980s and allowed the fishing fleet to downsize without significant negative impacts on local livelihoods. From the 1980s and onwards various consolidation schemes based on consolidation of license capacity were implemented. These schemes have in effect been privately financed efficiency programmes.

The current structural quota system is designed to take economic considerations into account, and to provide for a profitable fishing fleet. Harvest capacity is primarily an economic issue if output is strictly controlled. Regional considerations are also an important part of Norwegian fisheries policies. Some restrictions are therefore implemented including maximum quotas, geographically limited markets, transactions only within the vessel groups, and scrapping requirements.

Impact on biodiversity:

Existing evidence suggests that subsidies in the 1970s and 1980s promoted higher levels of exploitation and a decline in fish stocks. While this effect has been estimated to not be very strong, this is largely due to its dissipation in a common-pool resource: it is generally difficult to detect the impact of one country's fishing effort on fish stocks when fish stocks are affected by the exploitation of other countries and by exogenous environmental factors as well.

Replicability:

Subsidies to the fishery sector were completely removed in New Zealand. The more gradual approach to fisheries subsidies reform taken by Norway (compared with the brisker pace taken by New Zealand) suggests that there is scope for the replication of reform policies even when the political opportunities for swift reform do not arise.

Sources: OECD (2006); The Norwegian Ministry of Fisheries and Coastal Affairs (2010).

Uganda: correcting the undervaluation of property rights in fisheries

With a fish population density of between 47,000 and 55,000 fish/hectare, and a fish biomass of $2,334 \pm 5.6/\text{km}^2$, Lake George was considered, in the late 1960s, being the most productive lake in Africa and perhaps in the world. Located in the Queen Elizabeth Protected Area, it is known for its flagship bird species such as the *Shoebill Balaeniceps rex*, and it became the first Ramsar site in Uganda because of its rich biological diversity.

The lake has supported livelihoods and licenced commercial fisheries since the 1950s. By the end-1990s, Lake George was severely overfished resulting in declining volumes of catch and average fish catch size. Overfishing was attributed to the undervaluation of prices charged for the 145 fishing licenses for Lake George issued each year, as well as to illegal fishing. Limited monitoring and enforcement capacity was a direct result of the insufficient revenue collected via the license fee. The lack of resources for

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effective monitoring was aggravated by the lack of institutional mechanisms for the local communities to support in enforcement initiatives. As a result, illegal fishing – both by licensed and non- licensed fishermen – was widespread, with the number of canoes fishing in the lake being three times the permitted number.

To remedy the situation, a reform in 1998 introduced the co-management of local fishing communities by establishing Beach Management Units (BMUs) which are financed by retaining 25 percent of revenues from the issuance of fish movement permits at the landing sites. A lake-wide organization called Lake George Integrated Management Organisation (LAGBIMO) was established with a view to harmonise fishing practices across the BMUs and to provide a framework for coordination and coherence in policy planning and implementation. It is composed of representatives of the BMUs and of local governments. Moreover, the number of licenses was significantly increased – from 142 to 326 in 2001.

The higher revenue from the licenses and the landing fees allowed more effective monitoring and enforcement. Together with the co-management implemented, this temporarily reduced the number of illegal fishermen operating on the lake and created incentives for legally licensed fishermen to stop illegal fishing (out of season, at night).

In the past years, illegal fishing and the utilization of illegal gear has increased again and constitutes an ever more serious challenge to the resource, including severe negative impacts on landing volumes in recent years. The increasing pressure on the resource has to be understood against the backdrop of a dramatically growing fisheries sector in the last decade in Uganda, with export revenues raising from US-\$ 400,000 in 1998 to over US-\$ 145m in 2008. According to the government, due to overfishing and a decline in fish production from natural stocks, the Uganda fishery sector is currently facing a crisis. In order to address this crisis, measures currently under consideration or already being implemented include: (i) the temporary closure of fisheries in order to allow the resource to recover; (ii) enhanced monitoring and enforcement (e.g., through the issuance of license plates for fishing vessels); (iii) further productivity increases by promoting aquaculture (currently non-developed).

Lessons learnt

Incentive-based instruments must be regularly reviewed for continued relevance, efficiency and cost-effectiveness. Special effort needs to ensure that fiscal instruments are calibrated to ensure that prices continue to reflect the resource's true economic value and the real cost of resource and ecosystem degradation.

The establishment of co-management institutions and of mechanisms to sustain monitoring and enforcement expenditures is generally recognized as good practice. However, in the context of a high-growth environment, resulting in an ever-increasing pressure on the resource, sustaining the effectiveness of these institutions and mechanisms for managing a finite (although renewable) resource remains a considerable challenge.

Sources: Bahiigwa et al. (2003); Government of Uganda (2009); Kaggwa, R. (2009); Kazoora, C. (2010); New Vision (2010).

Positive Incentives Measures

Australia: Bush Tender Programme

In Australia voluntary, market-based incentive programmes have become an increasingly important tool to achieve environmental objectives. Several state governments and the Commonwealth government now use a mix of incentive approaches to secure targeted management actions that retain and improve biodiversity conservation on private lands. A national web-based information resource has been created to support these initiatives (<http://www.marketbasedinstruments.gov.au/>).

Starting in 2001, the State government of Victoria commenced a series of Bush Tender trials through which the government paid landowners to enter into three to six year contracts to adopt a range of vegetation management practices. Reverse auctions are used in specific regions to minimise the cost of conservation actions. As a consequence of the trial programme, under which about 125 contract bids were signed covering about 4800 hectares, the use of reverse auctions is receiving increasing attention as a promising method to obtain biodiversity conservation at least cost, and was subsequently expanded and scaled up to other programmes. In 2008 the EcoTender programme was released, an auction-based approach that expands BushTender to include multiple environmental outcomes and that includes a more detailed way to evaluate tenders (www.dse.vic.gov.au/EcoTender).

Discriminative-price reverse auctions, together with other mechanisms, are also used for disbursing funds of the Forest Conservation Fund, which was created in 2005 by the Commonwealth government to protect up to 45,600 hectares of old-growth and other high conservation value forests on private land in Tasmania. A total of four reverse auction rounds secured 88 contracts to protect 13,779 hectares of forest. Fixed price offers provided a further 26 contracts to protect 2,996 hectares and direct negotiations a further eight contracts and 5,657 hectares. The cost of designing and administering the market components of the Fund was 10.5 percent of the total programme budget. Using the metric, an additional 18.6 percent in conservation outcomes are achieved. The additional conservation gains are valued at approximately \$3.3 million, while the cost of achieving those benefits is only \$0.5 million. The ratio of benefits to costs from investing in the metric is 6.9.

In 2008, the Australian Government commenced a market-based Environmental Stewardship Programme as part of the national Caring for our Country environmental initiative of more than \$2 billion over five years (<http://www.nrm.gov.au/stewardship/index.html>). The Program's investment focus is Matters of National Environmental Significance identified under the *Environmental Protection & Biodiversity Conservation Act (1999)*, specifically nationally endangered ecological communities. The Programme continues the use of discriminative-price reverse auctions to protect high conservation value assets on private land, and it provides for 15 year funding contracts with private land managers to ensure long term protection and restoration of targeted endangered communities. The Programme initially targeted endangered box gum woodlands in south eastern Australia and by the end of 2009 has completed four auctions for a total of 161 contracts and over 17,000 hectares of woodland protected. The Programme used an ecological state-and-transition model to develop an investment management framework for achieving specific improvements in the condition and extent of endangered ecological communities.

In 2007, the New South Wales government commenced a Biodiversity Banking and Offsets Scheme (Biobanking) to help address the loss of threatened species and other biodiversity. The scheme only addresses biodiversity values, including threatened species listed under the New South Wales *Threatened Species Conservation Act 1995*. The aim of biobanking is to generate conservation gains while streamlining the biodiversity assessment process for developments. Under the scheme landowners manage their biobank site to either maintain or improve the site's overall biodiversity values. Developers can offset the impacts of their development site – after they have minimised and mitigated the impacts on the site – by purchasing matching biodiversity credits from the biobank site owner (www.environment.nsw.gov.au/biobanking).

Impact on biodiversity:

The programmes use quantitative indicators (quality-adjusted hectares of biodiversity restored or protected) in order to measure biodiversity impacts effectively. BushTender uses a habitat-hectares methodology to assess vegetation condition and EcoTender has introduced more details including potential improvements in salinity, biodiversity, carbon sequestration and water quality. The Forest Conservation Fund used a conservation value metric based on an assessment of the ecological significance of the forest proposed; the conservation management provided by the proposal; and the security of conservation outcomes as measured by covenant length to determine value-for-money. Overall, the careful assessment of area and quality of conservation implies that there are significantly positive impacts on biodiversity.

Replicability:

Biodiversity stewardship payments seem to be suitable in situations where managing threats to biodiversity requires monitoring and management effort from private landholders and outcomes are difficult and/or costly to monitor. These include the restoration and management of habitat for threatened species and ecological communities, and specific issues, for example fire management.

The expanded use of reverse auctions suggests that the tool is replicable in a range of circumstances where there is a sufficient private market for competitive tenders to operate.

A mix of market based programmes is effective, as in the Forest Conservation Fund. A mix of innovative financing mechanisms is now becoming more common in Australia.

Lessons learnt:

Market-based competitive auctions are popular with landholders: biodiversity conservation is translated from a complex and abstract idea to practical actions from which local results can be seen. All conservation market programmes have been oversubscribed. As voluntary payments maintain the autonomy of the landholder, they are perceived as being fair, which reduces enforcement costs.

There was strong community and landholder interest in better understanding how reverse auctions and other mechanisms operate, which has required effective communications, information management and capacity building efforts by governments to support emerging markets.

In general, the best strategy is to reveal all information to landholders. Experience has shown that there is a lot of economic surplus (or rent) and it is reasonable to share this between government and landholders. Payments need to be demonstrably above legal environmental obligations on private land managers.

Collusion has not been a problem – experience suggests it is almost impossible to collude because bids are formed on an action basis, but assessed competitively on value for money.

Results suggest that using auctions to reveal individual landholder opportunity costs improves the cost effectiveness of conservation expenditure up to seven fold over what a non-competitive grants based scheme would have cost.

While auctions have focussed on improving the cost efficiency of publicly funded conservation, most schemes have two weaknesses. First, most payment schemes are for short periods of time so long term gains to biodiversity remain uncertain (see Environmental Stewardship for a different approach). Second, most schemes do not sufficiently consider the spatial configuration of bids, so ecosystem and landscape scale benefits, including through improved habitat connectivity, are missed.

Contract design is an important and relatively undeveloped area for managing sovereign risks for environmental investments. Contracts may be designed differently according to the environmental and economic context thus providing a more efficient incentive instrument.

Reliable scientific knowledge and tools for ecological valuation are critical for running effective biodiversity markets, as are robust monitoring and reporting systems. Use of fit-for-purpose conservation metrics has allowed government investors to assess and prioritise competing proposals using a simple

cost-efficiency formula (\$/metric score). As biodiversity markets progress into more complex markets for 'bundles of ecosystem services' to deliver multiple policy objectives, there will be a need to develop appropriate metrics and mechanisms that provide for differentiated co-investments.

Sources: Binney and Zammit C (2010); Department of Sustainability and Environment (2008); Parkes D et al. (2003); Stoneham G et al. (2002); Zamitt (2010); Zammit C et al. (*in press*).

Bolivia: selling ecosystem services

Local water users often fail to manage water resources in an optimal manner because they lack the information, institutional mechanisms and incentives to do so. A scheme of payments for ecosystem services (PES) in the Los Negros valley in Bolivia is trying to address these issues by introducing an incentive-based transparent system of watershed management. The scheme includes 46 farmers bordering the Amborò National Park who are given incentives to protect 2,774 ha of watershed containing the threatened cloud-forest habitat of 11 species of migratory birds.

The scheme is unusual in that it is financed by two ecosystem service buyers: the US Fish and Wildlife Service, which is interested in biodiversity conservation, and the municipality representing downstream irrigators who benefit from stabilised dry season water flows. The Municipality of Pampagrande paid for upstream watershed management: US\$2000 in 2004 and US\$2,500 in 2007 to purchase bee boxes on behalf of downstream irrigators. In addition, a small group of irrigators paid per diem and food for independent monitors, but other than this, water users and water user associations are not yet contributing directly to the scheme.

Payments are made in kind (bee hives, apiculture training and barbed wire). The use of non-cash compensation was requested by local environment committees during the negotiation stage. Apparently participants feared cash payments might end up being spent unproductively. Moreover, it seems that payment via beehives rather than cash minimised local concerns about land expropriation.

All upper watershed landowners have been invited to participate in the scheme. Participants are not allowed to cut trees, hunt or clear forest on enrolled land. Monitoring takes place on an annual basis and payments are denied in cases of non-compliance. Landowners are able to select which plots to enrol and the duration of the contract, ranging from 1-10 years. Payments are made annually. Total payments are roughly US\$5,000 per year.

An unexpected consequence has been reduced colonisation by landless people; the formal contracts with maps and demarcation required for the scheme have helped institutionalise de facto land-tenure security and raised local ability to resist invasions. Of the fifteen new participants to the scheme in 2005, 14 chose payment in the form of barbed wire rather than bee hives due to the value of wire in strengthening land tenure claims.

Impact on biodiversity:

Compliance in the scheme has been good –only a single landholder has been denied payments for allowing the construction of a road on enrolled land. The precise impact on biodiversity is difficult to measure as the scheme has not addressed additionality or leakage issues. Overall, the threat level after the implementation of the PES programme was much reduced with positive conservation effects in some cases and negligible conservation effects in others.

Replicability:

The local NGO which has supported the development of this PES scheme is replicating the Los Negros scheme in the nearby Comarapa and Quirusillas watersheds which have been identified as highly suitable areas for the development of PES systems. Both areas are made up of cloud forests at high risk of deforestation from the local expansion of cattle ranching. Downstream, large areas of irrigated agriculture farmed by relatively well-off farmers rely heavily on dry season water flows.

Lessons learned:

Marketing a number of ecosystem services from the same area is a successful strategy to attract additional financial resources by making conservation a more competitive land use relative to alternative uses for threatened ecosystems. In this case, the international biodiversity buyer provided large up-front payments to cover start-up and transactions costs. Local water user services were less willing to fund set-up and transactions costs, but may be more likely to produce a sustainable stream of revenue in the future. Given that forests provide a number of ecosystem services which can be “used” individually without compromising the supply of other services, exploring mechanisms to sell individual services to different buyers may, in some cases, provide additional financial resources.

It can be very difficult to build trust between service buyers and providers which takes times and investment, but it is critical to do so for a successful user financed PES scheme. Demonstration activities can also overcome such constraints, i.e. a three year pilot scheme to be assessed on the basis of upstream forest maintained in its natural state and delivery of promised environmental services

Successful implementation of watershed PES scheme is promoted by the existence of a credible downstream institution to ensure service buyers will contribute to the scheme.

In some cases, payments in kind are more acceptable than cash payments as the perception of a sale of a good or service is avoided. A continued presence in the community, working with farmers, and communicating the positive experiences of participating farmers, is useful to gain acceptance of the scheme.

PES are not a poverty alleviation tool and synergy with overarching social objectives will not result automatically. Clear and secure land tenure is important for successful implementation of PES. Poverty alleviation needs to be tackled as a separate issue and will in many cases generate additional benefits for biodiversity conservation and sustainable use, for instance by encouraging more productive investment in the productive capacity of not enrolled land in order to reduce pressure on enrolled land.

While a number of PES observers advocate intensive data collection prior to PES implementation, the Los Negros scheme attempted to win local goodwill by introducing biodiversity payments before baseline data were available. The idea was to learn by doing and use adaptive management to be able to get started and to change the structure of the scheme as and when required. This strategy has been relatively successful in that the significant changes as the initiative has developed have not overly disruptive. Even reducing per hectare payments in a switch to a more differentiated system was not resisted by landowners. This learning by doing approach allows PES schemes to get off the ground quickly; lessons can be integrated while payments are being made and schemes can avoid delay in trying to design all important features in advance. The national PES scheme in Mexico has also initiated payments before all necessary data had been collected.

Sources: Asquith et al. (2008).

Botswana: community-based wildlife management

In 1989, the Botswana government launched a new natural resource management programme based on the realization and acknowledgement that conservation of wildlife resources in Botswana was neither practical nor possible without active involvement of rural communities that reside within or adjacent to the conservation designated areas such as Wildlife Management Areas (WMAs) and Controlled Hunting Areas (CHAs). The Community Based Natural Resource Management (CBNRM) policy was designed and approved by Parliament in 2007. The policy empowers communities to derive benefits from CBNRM with support from the Government. Community Boards, Technical Advisory Committees and the Kgotla (a place where everyone in the village has a voice) are used to implement the CBNRM policy. The Ministry of Environment, Wildlife and Tourism (MEW&T) spearheads the activities of the CBNRM with the Department of Wildlife and National Parks as the secretariat for all CBNRM activities.

The government programme rests on the recognition that local communities must be actively involved in the management and utilization of natural resources (namely, wildlife and veld products) and derive a livelihood from them in order to value them in a sustainable manner. Consequently, the programme involves community mobilization and organization, institutional development, comprehensive training, enterprise development, and monitoring of the natural resource base.

The village of Sankuyo stands out as a good practice case for CBNRM as the community derives a significant amount of benefits from their biodiversity-based enterprises. Local communities operate a lodge (Santawani) and a camp site (Kaziikini) and they derive additional revenue from safari drives, basket weaving and game walks.

Impact on biodiversity

Communities covered by the programme developed a different view of elephants and predators which used to destroy their crops and prey on their livestock. Today, the communities relying on wildlife for local livelihoods view wildlife as a resource rather than an enemy.

Lessons learnt

CBNRM projects demonstrated the utility value of traditional ecological knowledge in sustainable natural resource management. Traditional ecological knowledge systems and institutions can serve as entry points into sustainable natural resource utilisation and management.

Devolution of power can pose practical challenges, due to the different expectations and interpretations of stakeholders, power imbalances including at the local level, etc. Local participatory decision-making institutions can be fragile and external safeguards to maintain good governance and adequate capacity will then be required, as well as possibly continuing external support.

Source: Monamati (2009); Phuthogo, T. C. and R. Chanda (2006); Twyman, C. (2000).

Cameroon

Cane Rat Domestication Programme

The bush meat trade in Central and West Africa is seriously threatening regional wildlife and biodiversity as harvest levels grow to unsustainable levels and threatened/endangered species (mountain gorillas, monkeys) are killed for food. With longer life expectancy and population growth, raising demand for traditional bush meat led to increased trade volumes in Central and West Africa. This trend is causing rapid biodiversity loss, as illegal hunting is reaching unsustainable levels and many endangered species are threatened, despite laws enacted and trained Forest Guards (Ecoguards) deployed by the government to protect wildlife in Cameroon.

To address the threats posed by the bush meat trade, the Government of Cameroon has initiated the domestication and commercial production of the rodent “cane rat” (*Thryonomys Sp*). The Ministry of Forestry and Wildlife has created at the local council level official markets in order to stop the illegal hunting of endangered species. Farmers are trained in cane rat raising, animal health and marketing. A small number of farmer “leaders” are chosen and trained to serve as model cane rat farmers. After training, they are given two or three pairs of cane rats, and monitoring through follow-up visits is to ensure good husbandry and success. Just as in any livestock practice, competition prizes and other incentives are awarded to high quality producers.

The overall objective of the scheme is that commercial production of cane rats should provide a substitute for bush meat. The objective is to protect wildlife by providing a substitute source of protein in a region where bush meat is an important source of food and income. In parallel, the scheme aims to alleviate rural poverty and promote self-employment by providing alternative sources of livelihoods.

Impact on biodiversity

The programme is still limited to certain areas but expanding. Positive impacts of this programme on the illegal harvest of wildlife and the regional bush meat trade can thus be expected but, in light of its early stage, there is little data available on its precise quantitative impact.

Replicability

Based on lessons from the cane rat domestication in the savanna regions of Cameroon, the “Bush- Tailed Rat” Porcupine (*Atherurus Sp*) and other species of cane rats are now being domesticated by local communities in tropical humid forest zones. Due to limited financial resources, the cane rat domestication programme could not yet be promoted on a wider scale.

The Green Sahel Reforestation Programme

The Lake Chad basin lies in the Saduno-Sahelian climatic zone of Africa with average annual rainfall ranging from 400 mm in the north and 1100 mm in the south. Severe climatic conditions and changes associated with global warming have contributed to desertification, rendering the ecosystems of this zone increasingly fragile and posing a serious threat to biodiversity and human survival in the area. As Lake Chad has increasingly dried up, the Lake Chad basin area has decreased from 26,000 km² in 1963 to barely 1,500 km² in 2001.

The government of Cameroon has initiated broad support for forest landscape restoration in the Lake Chad region in order to raise water levels, encourage sustainable agro-pastoral activities and conserve dwindling biodiversity. The main activities focus on encouraging local production of tree seedlings, buying seedlings from farmers and employing local communities and organizing labour for afforestation/reforestation programmes by youths and NGOs. By financing ecosystem restoration, the Government is seen to be re-investing in natural capital and “paying” for ecosystem services and the restoration of biodiversity (e.g. fish, fauna, flora) in order to re-create local conditions which are suitable for sustainable agro-pastoral production, to re-establish the area as suitable for human habitation (to prevent further out-migration) and to promote food security.

The Ministry of Environment and Nature Protection and the Specialized Institute (IRAD) of the Ministry of Scientific Research have identified suitable natural drought resistant tree species, tested for their viability and other environmental compartment factors. Field experts from other ministries were co-opted and the programme of activities was established. Participation of local communities has been essential for success and includes the production of seedlings by the local population and NGOs, and providing labour for planting and maintenance of restored areas.

The Ministry of Youth Affairs in collaboration with institutions of secondary and higher education have developed a programme for “national youth voluntary service” which organizes for young people to plant trees seedlings in North Cameroon during the summer holidays. Over 2.5 million youths are to participate every year.

The Biodiversity Development and Conservation Programme of Cameroon (*BDCP-C*), a local NGO, has initiated several biodiversity conservation projects, focusing on restoration of natural sacred forests (shrines) which have been degraded by desertification. Related projects have worked with local women to encourage the adoption of shrub-like vegetable plants husbandry which can help to raise the level of the water table and to promote the progressive restoration of agro-pastoral production.

Replicability

Ecosystem and forest landscape restoration are being introduced in degraded areas globally. Although it is generally more cost-effective to conserve intact ecosystems than to restore degraded ones, in many situation, such as in Lake Chad, there is no alternative to restoration which can have significant and positive impacts on local livelihoods.

Source: Njinyam, S.N. (2009, 2010).

Colombia: forestry project for the basin of Chinchina river (PROCUENCA)

This PES scheme in the basin of the Chinchina river in Colombia involves payments for reforestation in a critical watershed in order to secure the water supply and to promote biodiversity conservation and carbon sequestration. The sellers of ecosystem services include 232 rural land owners covering 3,427 ha. The ecosystem service buyer is the Manizales Municipality Water Supply Company, a mixed public/private water utility company. The water company has a 30 year concession and 10 percent of net revenue is allocated to payments for ecosystem services in the water basin. Payments are made to promote both the conservation and sustainable use of 15,000 hectares of natural forest in the basin and the establishment of a further 15,000 hectares of commercial forest plantations. Overall, the objective is to improve water quality and hydrological regulation in the water basin, to develop the forest production sector, and to generate 1,500 new and permanent jobs in the sector.

The payments are used to support reforestation on private lands. Participation is voluntary, but certain criteria are to be met. The project investigates the suitability of applicants based on type of property title, the technical conditions of the farm, potential ecosystem services provided, road infrastructure, etc. If the plot is considered suitable, a sustainable forest management scheme for the farm (OFSF) is developed which identifies the type of forest to establish, including species and management.

Because this scheme has focused on reforestation rather than forest conservation, there has been the opportunity to expand into a CDM Carbon Sequestration project. As a result, the project will be able to issue Certified Emissions Reductions (CERs) and benefit from the revenue from the sale of CERs (which is intended to be shared, but details are not available).

Similar schemes are replicated in other watersheds, for instance:

- In the Chaina micro-basin, community associations made direct payments to upstream landholders to maintain forest cover to ensure the provision of water from rural water distribution systems (2001-07).
- The environmental impact of cattle ranching in Colombia has triggered the search for tools to identify and promote land uses that are profitable for landholders and that promote the continued provision of important ecosystem services. In the La Vieja watershed, GEF has financed payments for reforestation with native species, in order to increase biodiversity and carbon sequestration. The scheme includes 80 livestock ranchers and offers direct payments up to \$6,500 per year depending on the type of reforestation package adopted.

Impact on biodiversity

The environmental outcome is positive with an increase in area under native forest, reduced pressure on natural forests, and reduced erosion.

The payments to cattle farmers resulted in a decrease in the area of degraded pasture on each property and increased the area of improved pastures with low to high tree density.

Lessons learned

Previous experience has shown that when there is a single user or a small number users of watershed services, it is more likely that ecosystem service beneficiaries will be willing to pay for these services. The PROCUENCA scheme confirms this finding.

Sources: Aristizabal Buitrago, S.L. (2009); Ocampo (2008); Zapata et al. (2007).

Costa Rica: Payments for environmental services

The PSA (Pago por Servicios Ambientales) programme in Costa Rica is a national payment programme for carbon storage, hydrological services, and the protection of biodiversity and landscapes. This scheme has been credited with reducing the rate of deforestation in Costa Rica from one of the world's highest to

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net negative deforestation by the start of the 2000s. Between 1997 and 2004, approx. US\$ 200 million was invested in PES to protect over 460,000 hectares of forests, to establish forestry plantations and to provide additional income to more than 8,000 forest owners (TEEB 2009). PSA is managed by FONAFIFO, a semi-autonomous agency.

PES have been predominantly financed by receiving 3.5 percent of revenues from a sales tax on fossil fuels, but the objective is that all beneficiaries of environmental services eventually pay for the services they receive. While there has been some success charging water users for upstream watershed management services, there has been more limited success charging for biodiversity and carbon. The proportion of the programme's costs financed with direct payments will increase as a new water tariff is implemented.

Water service payments. PSA intended that payments from hydroelectric power producers and other water users would at least partly finance PES. However, as there is no legal requirement, FONAFIFO negotiates with water users and has reached a number of agreements. While the start was slow, the process has been streamlined based on environmental services certificates (standardised instruments that pay for conservation of a hectare of forest in a particular area). Both the number of agreements and the amounts paid has risen sharply. In the past, water users paid only one quarter of conservation costs (based on the idea that watershed management is one of four ecosystem services provided by forests), but recent agreements pay the full cost of conservation in addition to FONAFIFO's administrative costs.

Biodiversity payments. Biodiversity payments have been predominantly financed by the Global Environment Facility (GEF). In contrast to agreements with water users, financing for biodiversity is not renewable. Efforts to make it sustainable by generating financing from local tourism industry have not been successful. This situation is acceptable in areas where financing based on carbon or water management is possible, but there is a large area (roughly 900,000 hectares) which has been identified as priority area for biodiversity conservation, but which lies outside protected areas and does not have the potential for either water or carbon financing. An endowment fund is being created as a partial solution.

Carbon payments. While use of the fuel tax revenue can be considered to be a payment from carbon users to carbon suppliers, because the tax is mandatory and because the revenue is used for payments to a range of environmental services, the link is weak. Since its inception, PSA has sought to sell carbon emission reduction credits. PSA contracts clearly state that FONAFIFO owns the right to emissions reductions. FONAFIFO developed the Certifiable Tradable Offset (CTO) equal to an externally certified one ton net reduction in carbon emissions. The programme successfully sold 200,000 CTOs for US\$ 2 million to the Norwegian government and a consortium of Norwegian power producers. However, no additional sales of CTOs have been made as emissions reductions are predominantly based on avoided deforestation and only reforestation and afforestation are considered eligible under the Kyoto Protocol's Clean Development Mechanism (CDM). Costa Rica has since sold 0.61 million tons of CO₂e to the World Bank BioCarbon Fund, based on a mix of planting trees in agroforestry systems, natural regeneration and commercial plantations. In order to better deliver Kyoto-eligible carbon emission reductions, PSA is introducing a new type of contract based on assisted natural regeneration.

Landscape payments. The Forest Law which provides the legal basis for the PSA scheme mentions scenic beauty as an environmental service provided by forests. While there have been negotiations with hotels and a rafting company for payments for scenic beauty, no agreements have been reached. Users of landscape services are numerous and fragmented, and problems of collective action make implementing PES for landscape beauty difficult.

Impact on biodiversity

In terms of the efficiency of PES in providing ecosystem services,

Despite the difficulty in charging for biodiversity services, because biodiversity is "bundled" with other ecosystem services, there are significant biodiversity benefits associated with forest conservation for watershed management. The PES scheme has helped slow deforestation, added monetary value to forests

and biodiversity, and increased understanding of the economic and social contribution of natural ecosystems.

Identifying the specific results of PES schemes can be tricky when a number of policy changes are introduced simultaneously and it has proven difficult to determine precisely the extent to which the PSA programme has generated ecosystem services. While studies have found that PSA recipients had a higher proportion of forest on their land than non-recipients, other research had questioned additionality, that is, it suggested that participants would have protected their forest even in the absence of the PSA programme.

Replicability

The number of PES schemes in Latin America is growing, suggesting good scope for replicability when there are clearly identifiable suppliers and intermediary institutions to facilitate payment. Costa Rica's PSA scheme has been much studied and imitated. Many countries already have similar schemes in place, and these have often been used following policy reform including a shift from subsidies to PES.

Lessons learned

PES schemes are easier to introduce if they build upon existing systems of payments. In fact, Costa Rica's PSA was based on a reform of an existing forest subsidy programme. In the 1970s Costa Rica had begun to provide incentives for timber plantations through tax rebates, due to concerns over shrinking timber supplies. The Forest Credit Certificate expanded the programme which continued to evolve to support forest conservation as well as timber production. When introduced, the PSA programme built on the base of this payment scheme, with two major changes:

- payments were to be based on the provision of environmental services instead of timber, and
- financing would change from the government budget to an earmarked tax and payments from beneficiaries.

While PES schemes are proliferating in Central and Latin America, it is proving more difficult to implement user-financed PES schemes than government financed schemes. This limits the sustainability of these schemes.

It is easier to implement PES schemes for watershed management than for biodiversity (difficult to measure) and for carbon (difficult to identify beneficiaries).

Effective targeting and differentiated payments are important to allow for differences in the level of and the opportunity cost of service provision.

PES schemes need to monitor and document how activities are generating environmental services. This is particularly important for carbon sequestration projects intending to sell carbon offsets in the emerging global carbon market.

Due to the new and innovative nature of PES, schemes need to be flexible and need to adapt to lessons learned and constantly changing circumstances. Costa Rica's experience was broadly positive, yet PSA was (and is) evolving and improving in response to experience and feedback.

Sources: Pagiola (2008); TEEB (2009).

Cuba: Havana Bay User Tax

The Cuban government uses environmental taxes and fees to generate disincentives towards environmentally harmful activities. These taxes provide revenue which is channelled into funds that can be used for providing positive incentives. Since 2002, the government has applied a tax on harbour users in order to promote conservation in Havana Bay. The tax is applied to anyone (local and foreign) who uses the Bay for tourism, recreation, and commercial activities which have an impact on the harbour. The tax rate is calculated based on the use of the entrance channel, the use of the shore including use of

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harbour infrastructure. Revenue (roughly 1.6 to 2.6 million CUPs per year) is earmarked for an environmental fund which finances cleanup activities in the Bay.

A similar scheme is applied in forest policy: A tax partly finances a forestry fund, which is used for reforestation and sustainable forestry management activities.

Impact on biodiversity

Following implementation of the tax, hydrocarbon concentrations in the bay were reduced as industry effluent emissions were cut by 50 percent. Signs of the recovery of the ecosystem include the reappearance of fish and phytoplankton species thought to be lost. Sports fishermen are now more common.

Replicability

The experience of environmental taxation has been very positive. It was recently decided to replicate the use of this instrument in other Cuban bays, and also to increase the rate of the tax and to target a greater number of users. The extension of this economic instrument to cover all the hydrological basins associated with bays and the introduction of an additional payment associated with waste water disposal in the basin will increase the number of contributors to this tax under the “polluter pays” principle. The additional payment will be calculated on a volumetric basis of cubic metres disposed and on the basis of the level of hazard of the waste water.

This additional measure will increase the collected revenue to four million CUP, revenue that will be earmarked for cleaning up other damaged bays.

The country is preparing a set of new economic instruments to support not only biodiversity, but the environment more broadly.

Lessons learned

A high level of coordination between economic and environmental policy makers enabled the introduction of the tax. The tax was designed and promoted by an interministerial group created for the specific purpose of cleaning up the Bay. The “Grupo Estatal para el Trabajo (GET) de Saneamiento de la Bahía de la Habana” linked the efforts of the ministries of Transport and CITMA and the Havana city government. The Environmental Authority, to which the Havana Bay tax revenues accrue, finances the activities of this group.

Sources: Garrido (2009).

Ecuador: Decentralised Environmental Payments

Historically, programmes for environmental payments in Ecuador were implemented in a decentralised manner, that is, at the local level and without central government coordination. The Pimampiro Municipal Watershed Protection Scheme and the Forests Absorbing Carbon Dioxide Emissions Forestation Program, PROFAFOR have become models for successful local level PES programs in the region. More recently, Ecuador has developed national PES programmes, e.g. the Socio Bosque programme.

Pimampiro

In 2000, as part of a forest management plan, the municipality of Pimampiro set up a system of payments covering the Palaurco River upper watershed that delivered drinking water to Pimampiro residents. A drought in 1999 and the subsequent construction of a canal to increase water flow provided an opportunity to introduce PES – the dramatic improvement in local water supplies greatly increased the Willingness to Pay (WTP) of commercial and domestic water users. The recipients of PES were 27 households owning 638 hectares of land upstream. The PES programme was designed to halt and reverse the conversion of forests and native Andean alpine grasslands to annual crops and pasture which adversely affected the supply and quality of water downstream.

Currently, 19 Nueva América households (70% of targeted household) participate in PES, with 550 ha enrolled (87% of targeted area). PES contracts initially lasted for five years, but were renewed indefinitely in 2005. Households receive US\$6/year/ha for intervened forest, US\$8/year/ha for mature secondary forest, and US\$12/year/ha for primary forest. Payments are financed by users through a 20 percent water consumption surcharge on 1350 families in Pimampiro with water meters, in addition to the interest (US\$500 per annum) generated by a water fund of US\$15,000.

PROFAFOR

PROFAFOR is an Ecuadorean company created by the Forests Absorbing Carbon-dioxide Emissions (FACE) consortium financed by Dutch electricity companies to offset their carbon emissions. Since 1993, over 22,000 hectares of land under 152 contracts have been afforested or reforested, mostly in the highlands of coastal areas, resulting in approx. 2.23 million tons carbon sequestered.

Following contract signature between landowners and PROFAFOR, landowners plant trees to (re)establish and maintain tree cover. Contracts were initially valid for 15-20 years, but are now normally valid for 99 years.

Initial payments of US\$100–150/ha for seedling production and plantation cover roughly 80 percent of estimated plantation and management costs. The remaining 20 percent is paid after three years contingent upon a minimum survival rate of 75 percent. Participants receive in-kind benefits from forest by-products (thinning, pruning). The most important incentive is the receipt of 70 percent of revenues from the sale of harvested trees at the end of the cycle (15–20 years). If they reforest the area, as stipulated in the 99-year contracts, they receive the full revenue. However, if landowners fail to replant, they must pay 30 percent of sales revenues to PROFAFOR.

Replicability

The NGO that assisted in establishing the PES scheme in Pimampiro is replicating its experience in other municipalities (El Chaco and Celica). In other cases, spontaneous replication is occurring, e.g. emerging PES-like programmes in El Angel and in the municipalities of Loja and Zamora. Overall, in Ecuador, an additional handful watershed protection PES programmes are being implemented while another is currently being designed.

Impact on biodiversity

Both Pimampiro and PROFAFOR have been effective in reaching their environmental objectives and have shown high levels of additionality and low leakage effects. Both schemes have improved the welfare of participants, mostly through higher incomes. In the Pimampiro programme, not only has deforestation been halted, but native vegetation cover has increased significantly.

While reforestation under PROFAFOR was not able to keep up with FACE's original rather ambitious schedule, the 22,287 ha planted in the 13 years since its inception constitute almost half of all reforestation in Ecuador. The biodiversity impact of PROFAFOR is less significant than that of Pimampiro because only rapid growth exotic tree species (pine and eucalyptus) were planted initially. However, more recently native tree species are being experimented with.

Lessons learned

Success has been attributed to a focus on targeted ecosystem services and strict conditionality.

PES programmes should complement rather than replace more command and control measures for environmental conservation.

While there was no specific pro-poor mechanism built into the programmes, in general, the poor did benefit through net income gains. Moreover, as both schemes focused on economically marginal lands where the poor generally operate, it is likely that most relevant disadvantaged groups had access to the PES schemes.

Users of ecosystem services and landowners continue to have different interests – these differences are bridged by PES through compensations but they do not vanish. Service users will need to continue to pay for ecosystem services for the services to be sustained.

Sources: Wunder and Alban (2008); Wunder (2010).

Egypt: development of community-based eco-tourism

The government of Egypt is promoting Bedouin-managed tourism enterprises in pristine wilderness areas in protected areas. Conservation and sustainable tourism in St. Katherine Protectorate is intended to provide a model for how to conserve natural and cultural resources and provide benefits to local communities while also enhancing tourism quality. The programme includes the reconstruction of a Bedouin habitation into an eco-lodge, establishing nature trails, revitalizing traditional craft skills, constructing a visitor centre, publishing tourist maps and nature guidebooks.

The lodge was designed in the vernacular style and built by local Bedouin artisans using local materials. It operates on the principle of minimal environmental impact and offers very basic facilities - it has waterless composting toilets and the showers are water efficient and solar heated. A dam has been built upstream to recharge groundwater supplies. Grey waste water is filtered through a 'fat' trap and then used to irrigate Bedouin gardens. Guests bring their own bedding, so no laundry is done on site, and firewood comes from a sustainable source.

Interconnected trekking routes and various itineraries have been created. It is encouraged that local management and implementation be based on *orfi* tradition (customary law). The income generation programme, based on local stakeholder participation, redistributes entry fees for the Protectorate by promoting eco-tourism businesses via training and technical support, thus providing local incentives to conserve the wildlife base of these revenues, and by paying community guards who represent local communities, liaise between management units and communities and support monitoring, research and eco-tourism in their region.

The traditions and indigenous knowledge and customary skills of local people have become central to the development and management of the St. Katherine Protectorate. The craft programme was initiated in the belief that the maintenance of cultural diversity and the conservation of biological diversity are interconnected, and that biodiversity can be conserved through a broader effort to promote and sustain human welfare and culture. The Bedouin Craft programme was started in 1997 to assist in particular women to preserve, develop and market traditional skills in order to generate income. In 2002, a Bedouin owned company (Fansina) was established to produce and commercialize Bedouin crafts involving over 400 Bedouin women.

The Medicinal Plants Conservation Project (MPCP) component was initiated in 2007 to strengthen the in situ conservation management of medicinal and aromatic plants (MAP).

Impact on biodiversity

Local communities have realised that the protected area is of great interest to visitors. They are now interested and empowered to maintain and protect the area by reporting violations and using peer pressure to prevent degrading activities. The major opinion leader in the community is also a Protectorate Community Guard who helps enforce regulations and is a conduit between the Protectorate management and the community.

Replicability

The government of Egypt has provided an enabling environment and technical support to provide positive incentives to set up biodiversity and cultural based businesses and to protect the ecosystems on which these businesses are based.

Lessons learned

The effective integration between tourism, local economic development and protected area management, which is the basis for nature-based tourism, can direct economic benefits to remote rural areas and increase incentives for conservation in state protected lands.

Conservation projects can help to catalyze associated rural development activities by other agencies.

It is essential to involve and benefit local people at an early stage in the process. Community participation and support for conservation activities requires time.

The traditional responsibility of local people as the resource managers in the area should be acknowledged and built upon.

Inputs and benefits have to be tangible and be sustained to gain the trust and confidence of local people. This should also extend to the long-term involvement and accountability of individual rangers and managers.

Sources: Egypt (2009); Gehiny, A. T. (2010).

France: Payments for improved watershed management practices

The French legislation for “natural mineral” water is very strict. Each brand name is associated with maximum allowed levels of nitrates and, importantly, water treatment is not allowed: if water quality is not achieved naturally, the brand name and the business associated with it are lost. Protecting the ecosystems providing water filtration and purification services in the catchment where the springs are located is therefore critical for reducing business risks and maintaining the profitability of the operation.

In the early 1980s, Vittel, a subsidiary of Nestlé Waters and a world leader in natural mineral water, was faced with the increasing rate of nitrates and pesticides level in an important artesian spring in the Vittel catchment. Promoted the European Common Agricultural Policy, the traditional hay-based cattle ranching system had been increasingly replaced by a maize-based system, with limited free-range grazing and increased stocking rates. The increased nitrate and pesticides rates were caused by leaching of fertilizer and pesticides from the maize fields, overstocking, and poor management of animal waste.

Vittel considered a range of options. Doing nothing was too costly and implied closing the business. Relocating implied losing the brand name and the associated premium. Purchasing all land in the 3,500 ha catchment was socially, legally and economically not feasible. Use of legal action to force the 40 farmers to change their practices was not practicable since it was not technically possible to demonstrate the responsibility of individual farmers. The only alternative was to establish an incentive scheme for farmers to voluntarily change their practices, which would essentially involve going back to extensive dairy cattle ranching.

Farmers were asked to give up maize cultivation for animal feed, and to adopt extensive cattle ranching pasture management by reducing carrying capacity, composting animal waste, giving up agro chemicals, balancing animal rations to reach optimal milk productivity and farm profitability, and by modernising farm buildings accordingly. In return, farmers were provided with a long-term incentive package that included: (i) 18 to 30 year contracts; (ii) the abolition of debt linked with land acquisition; (iii) the acquisition of 1,450 ha of land which was left in usufruct to farmers for up to 30 years; (iv) an annual subsidy of about 200 Euros per ha over seven years to ensure guaranteed income during transition period (which corresponded to about 75% of disposable income); (v) the reimbursement of farmers’ debt up to 150,000 euro per farm to invest in new equipment and buildings; (vi) free labour to apply compost in farmers’ field and free technical assistance.

The total cost of the programme for the first seven years was about 24 million Euros (= 980 Euro/ha/yr).

Vittel was originally confronted with resistance from farmers. It took ten years to convince farmers to change practices. Partnerships with the Rhin Meuse River Basin Agency and the French National Institute of Agronomic Research, which co-financed four years of research to identify optimal agricultural

practices, were critical to the success of the scheme. The municipality (which benefited from tax revenue and employment) was also supportive. An intermediary institution (Agrivair), located in the heart of the watershed, was created in 1992 to work with farmers. By 2004, the 26 remaining farms (several had chosen early retirement) had adopted the new practices and 92 percent of the basin was protected.

New challenges have caused the programme to evolve over time. For example, urbanisation in the area has increased and, in order to maintain groundwater quality in the catchment, Agrivair had to expand its programme to non-farm municipal lands. Agrivair now manages 300 ha of city parks, 200 ha of golf courses, a horse racing track, and the Vittel thermal park.

Impact on biodiversity

Although protection of biodiversity was not the objective of the initial programme, in particular the new challenges as described above led the programme to incorporate practices that benefit biodiversity. For instance, herbicides have been replaced by thermal weeding in school yards, railroad tracks, airport grounds, paths and parking lots. Some farms have turned to organic dairy production, and Vittel established 140 hectares of organic apple orchards. Ladybirds, a natural predator of crops pests, are bred in Agrivair laboratories and released at strategic times during the year. Biodiversity is also encouraged through the planting of flower rows and the establishment of bird houses and bird refuges. Agrivair personnel work with farmers to plant and maintain 40 kms of hedgerows to keep a balanced population of foxes and birds of prey (the natural predators of field mice that ravage crops).

The performance of the programme is evaluated through a strict monitoring programme. Water quality from surface and groundwater is monitored daily. On-farm practices are also monitored and Agrivair has access to all farm accounts (a clause in the contract between farmers and Vittel) to ensure compliance with farming practices. An observation network monitors all activities in the catchment area to quickly identify pollution risks and preventive measures are taken when required. Biodiversity, especially insects, bird populations and diversity of wild flowers is also regularly monitored. Plans for the future include the expansion of organic agriculture, which will improve biodiversity in the area even further.

Replicability

Nestlé Waters expanded the approach to a total of 10,000 hectares by including the contiguous Contrex/Hepar catchment. Forest is a major land use in this catchment and Agrivair introduced a forest management programme which aims to maintain a balance of trees to maximize nitrate uptake.

The scheme was replicated in the Perrier spring in Vergèze in southern France where organic wheat and wine were successfully introduced. In this drought-prone area, fire prevention measures are a key component of water protection as destruction of the vegetal cover affects surface water run-off and infiltration patterns, and chemicals used by fire fighters affect groundwater quality. In collaboration with l'Institut Méditerranéen du Patrimoine Cynégétique et Faunistique (Mediterranean Institute for Hunting and Wildlife Heritage), Nestlé established a research programme to protect water resources, prevent fires and safeguard wildlife habitat in an area (40 ha). As the Perrier company has recently experienced financial difficulties, the long-term continuation of the agricultural component of its water protection programme is not clear.

Nestlé Waters further replicated the approach in Argentina, in partnership with a municipality where a source spring was located. Evian, a subsidiary of Danone, has adopted a similar approach (and entered into partnership with the Ramsar Convention to protect wetlands in their catchments of operation).

Lessons learned

Establishing PES programmes is a complex undertaking. There are no blueprints or quick fixes. Programmes must be adaptive and innovate constantly as new threats to water quality appear.

The ability to maintain farmers' income at all times and finance all technological innovation was important, but it was not sufficient. The primary reasons for the success of the programme were not financial. The attention given to the complex interactions between technical, economic, social, legal,

geographic, sociological and political issues (land market, debt cycle, labour constraints, future of farm family, role of farmers unions) was key to understanding farmers' livelihood strategies.

The mediation and communication provided by the multidisciplinary research team allowed the company to establish a dialogue with farmers based on trust. It enabled the identification of a set of incentives and practices that were mutually acceptable.

An important reason for success was that, in contrast to annual European subsidies, annual contracts offered were long-term (valid for 30 years) and provided more income security while engaging in innovation.

It was necessary for all farmers to participate in order to eliminate the threat of contamination of the groundwater. In some situations, the approach may not be feasible if the number of farmers is very large and there is disagreement within the group. In such a case, the cost of payments and the risk of not being able to target a critical mass of farmers in sensitive areas may be too high.

There is a business case for private sector participation in financing the protection of ecosystem services. The Vittel scheme has demonstrated that food production and biodiversity can be reconciled and the multiple uses of agricultural landscapes can be enhanced or restored. To succeed, a broad range of partnerships was indispensable, involving individual farmers, the National Agronomic Research Institute, the Water Catchment Agency and the municipalities.

The case also demonstrated that local economic development and conservation can go hand in hand. In Vittel, protecting water quality and biodiversity meant protecting economic activities that provided the bulk of employment in an area which had suffered from with high unemployment rates.

Sources: Benoit (2008); Nestec Ltd. Environmental Affairs Department (2003); Nestlé (2002); Pierre (2009); Perrot-Maître, D. (2006); Perrot-Maître, D. (2010).

India: Joint Forest Management and Biodiversity Conservation by Eco-Development Projects

Roughly 100 million people, including 50 million tribal people, depend on forests for their livelihoods. The Indian Forest Policy (1988) made a shift in forest management from near exclusion of people from use of forest resources to the protection of forests through the people. It now recognizes the customary rights and privileges of forest dwelling communities. The Ministry of Environment and Forests has issued policy guidelines for the involvement of village communities and voluntary agencies in the regeneration of degraded forest lands for strengthening Joint Forest Management (JFM). These guidelines emphasize the involvement of local communities in the protection, afforestation, and development of degraded areas and benefit sharing with communities.

In 2007, there were over a million Joint Forest Management Committees (JFMCs) involving 22 million people managing 22 million hectares of forest area. The nature of JFMCs varies between States with respect to their membership, the participation of women and other weak sections of society, and benefit sharing. In almost all the States, JFMCs have full rights over all non-timber forest products (NTFPs) except the nationalized Minor Forest Produce i.e. tendu leaves, sal seeds, cashew etc. In Andhra Pradesh, 50 per cent of the net proceeds from sale of tendu leaves are shared with JFMCs. In Madhya Pradesh and Chhatisgargh, 100 percent of net profit goes to the collectors of NTFPs. In most States, JFMCs retain about half of the net benefits from the final felling of trees.

In many cases, joint forest management is complemented by programmes addressing important local peculiarities. For instance, a World Bank-funded participatory biodiversity conservation programme is geared towards supporting the Periyar Wildlife Sanctuary in Kerala. A primary objective is to reduce the negative impact of local people on the sanctuary and to involve encroachers in conservation instead of exploitation. This was done by addressing the economic needs of those living in and around the protected area by funding viable innovative livelihood alternatives. Local communities living off the forest were organized into eco-development committees. The people who had been involved in the illegal debarking

of cinnamon trees, sandalwood smuggling and poaching formed an eco-development committee. They pledged to protect the forests in return for withdrawal of all cases against them, and by providing income-generating eco-tourism services like day treks through the forest, nature camps, and horse riding.

Similarly, at Kumbhakarnan Falls in Tamil Nadu, over 100 tribal people and members of Village Forest Councils have been trained as eco-tourism guides. These guides regulate tourists, maintain the surroundings and implement eco-conservation measures. Fees are collected from visitors to finance amenities and to cover part of the expenses of the tribal peoples as eco-guards.

Sources: India (2004); India (2009); Thampi (2009).

Japan: Payments for forest and agriculture land management

Japan suffers frequent natural disasters, such as earthquakes, typhoons, floods, etc. In Japanese culture, people live within nature and have great respect for it. Against this background, payments for ecosystem service have taken place for over a hundred years, particularly for ecosystem services associated with forests. For example, the local government of Tokyo has held and managed forest in the upstream basin since 1901 to ensure that the watershed continues to provide water filtration and avoided soil erosion services.

Japan has mountainous landscapes and almost two-thirds of land is covered by forest. However, half of forest area is planted forest. In the past, the forestry sector expanded rapidly to support Japanese industrialization and urbanization after World War II and during the period of high economic growth from 1950s to 1960s. The current situation is very different. Japan imports cheap foreign timber, has an aging population and a declining domestic forestry sector. This has resulted in an expansion in the area of unmanaged plantation forests. Currently most of Japan's forests are unmanaged and the ecosystem services provided by forests are degrading. The challenge for Japan is not decreasing forest area, but the degradation of plantation forest ecosystems through insufficient management, particularly on privately-owned land.

Payment schemes for ecosystem services have been implemented by both local governments and companies. Ecosystem service payment agreements are of three types. There has been direct negotiation between ecosystem service suppliers and beneficiaries, e.g. the local government of Tokyo has paid several companies for the conservation of watershed forest. Second, the government has applied earmarked taxes and/or charges, for water consumption for example, and payments are subsequently made to landholders in watersheds who adopt forest management practices that ensure the provision hydrological regulation. Third, there is small amount of trade in ecosystem services, for instance, a pilot carbon trading scheme organized by Ministry of the Environment.

A good example of a payment scheme based on direct negotiations between buyers (a company) and sellers (farmers) is implemented in Kyushu area. A company has introduced the concept of "returning groundwater that is consumed in a manufacture factory". The company uses groundwater extracted from the aquifer under the factory. The company makes a contract with several farmers which allows the company to flood nearby agriculture fields between crop cultivation periods in summer. The flooded water filters down through the ground and recharges the groundwater aquifer. Payments are made from the company to farmers via local intermediaries. The payment is 11,000 JYen /10ha for 30 days of flooding and 16500JYen/10ha for 60 days. The payment is based on the farmers' costs associated with the preparation of land and flood management. There are several other direct negotiation examples in which companies provide monetary and/or non-monetary contribution to conserve forest ecosystems in upstream watersheds, on a voluntary basis.

Since 2003, 29 prefectures have introduced earmarked environmental fees on beneficiaries of forest ecosystem services. Part of the revenue is earmarked for direct payments to forest owners for forest management practices that protect critical watershed areas. Such a PES scheme is implemented in Toyota city in Aichi prefecture (adjacent to the COP-10 host city of Nagoya). 78 percent of tap water in Toyota city comes from Yasaku River. A surcharge on tap water (1 JYen/m³) was introduced in 1994 and its

revenue is earmarked for the Toyota city tap water conservation fund, constituting, depending on the volume of water usage, 0.3 to 1.2 percent of the total water usage fee. Since 2000, the fund has financed water resource conservation projects in privately-owned plantation forests, such as tree thinning which is required in unmanaged plantations to reduce water uptake of young trees. Forest owners have to agree to halt clear-cutting of forest in order to receive payments from the fund. Similar tap water fees for conservation purpose have been introduced by other local governments, e.g. in Fukuoka.

In many prefectures, forest management is partly funded by earmarked local taxes. Kochi prefecture, in the south-west of Japan, was the first prefecture to introduce a local tax for protecting forest ecosystem service. The tax ranges from 500 to 1000 JYen per person, depending on the prefecture. Revenue generated from the tax is used for tree thinning and for transforming unmanaged plantation forests into natural mixed forests (broadleaf and coniferous trees) through enrichment planting. In Kanagawa prefecture, near Tokyo, a forest management tax was introduced in 2007. The tax rate was based on a study of willingness to pay (WTP) and estimates of the expenditure required for the conservation project. There was extensive participation and public consultation with citizens on issues relating to the costs to households of the tax and on the use of tax revenue. Revenue is also used for household wastewater management, water conservation measures, and forest conservation and restoration.

However, there are several issues to be tackled. Most taxes earmarked for forest management are set at levels which are very low compared to WTP. Because tax rates are low, little revenue for improving ecosystem management is generated. Moreover, these taxes are generally levied on all citizens in a prefecture and are not targeted to beneficiaries of ecosystem services. Finally, in some cases revenue earmarked for ecosystem management is used for non-forest management purposes.

In addition, Japan has introduced a number of PES-like systems at the local level, some of which also relate to payments for agriculture ecosystem services. For example, payments from local governments to farmers to encourage biodiversity friendly rice production are made to compensate for the additional costs even though biodiversity friendly rice sells at a premium.

Replicability

The proliferation of PES schemes in Japan suggests that this experience is replicable.

Lessons learned

It is important to set the taxes that finance PES schemes at a level that approaches the marginal value of the ecosystem service used and which provides a level of revenue which can contribute to effective sustainable resource management.

In Japan each PES system is implemented independently, with no coordination amongst schemes. This negatively affects the effectiveness of schemes.

There seems to be greater scope for bundling ecosystem service payments.

Source: Hayashi (2010).

Mexico: payments for hydrological environmental services (PSAH) programme

Mexico's predominant environmental issues are water scarcity and deforestation. Challenges associated with limited water supplies have been aggravated by (i) subsidies to electricity for pumping water and (ii) the failure to price water according to its scarcity. In order to combat problems of high deforestation and water scarcity, the government of Mexico developed a Programme of Payment for Hydrological Environmental Services of Forest (PSAH). This scheme was developed to make payments to forest owners to conserve forest in order to ensure watershed protection and aquifer recharge in areas where forestry was not commercially viable. The scheme is financed by increasing the already existing federal water fee paid by water consumers and earmarking a percentage to pay for environmental services. This

mechanism to link those who benefit from environmental services to those who provide them was rather innovative at the time.

Two eligibility criteria were applied in order to ensure that payments covered the forests that are most important for water supply and at risk: participants had to be (i) located in over-exploited watershed areas (ii) at risk of deforestation. Research was undertaken to quantify opportunity costs near forested areas in order to estimate the amount per hectare that should be paid to compensate landholders. The objective was to maximise the area protected for a given budget. While the use of auctions was considered, they were not used because they were considered to be too innovative, difficult for potential participants to understand and, therefore, could potentially have very high transactions costs. A fixed price two-tiered payment approach was adopted with a base rate (US\$18/ha) paid for most forest and a higher rate (US\$27/ha) paid for cloud forest due to its important role in capturing water from fog in the dry season. Payments were made annually and contracts were signed for five years. Payment was conditional on performance, i.e. no payment was made if any deforestation took place in contracted areas.

First experience suggested that many payments had initially been made in areas of low deforestation risk and that improved targeting was needed to produce a greater environmental impact and to improve the cost-effectiveness of payments. The scheme has since introduced a series of weights for water scarcity, deforestation risk and poverty in the application grading system in order to improve targeting and efficiency.

Impact on biodiversity

Deforestation rates on land included in the scheme are very low (in fact the programme reported no deforestation in participating areas, but as this is unlikely it is thought that monitoring is not as rigorous as would be desired). The scheme is popular and is generally oversubscribed. In 2003, 127,000 ha were accepted for five years and in 2004 another 180,000 ha were enrolled. In 2005 a further 169,000 ha were included.

Lessons learned

Early evidence suggested that little additionality had been achieved. As a result, the scheme's targeting and use of criteria in the selection of applications has been improved with a focus on developing an indicator for deforestation risk.

Rather than a providing a uniform payment to landholders who face different costs, a high degree of targeting should be combined, when possible, with a payment mechanism that reveals the true costs of conservation to different landholders. By paying landholders the minimum amount of compensation they need, PES schemes are able to maximise the area included in the scheme and thereby maximise their environmental effectiveness.

Sources: Muñoz-Piña et al. (2009).

Nepal: Himalayan Biotrade

The Asia Network for Sustainable Agriculture and Bioresources (ANSAB) in Nepal created Himalayan Bio Trade Private Limited (HBTL) to market non timber forest products (NTFPs) to national and international markets. HBTL is a consortium of community-based enterprises that specialise in natural and sustainably sourced NTFPs (essential oils, handmade paper, and medicinal and aromatic plants) that hold organic and/or Forest Stewardship Council (FSC) certification. The scheme targets supply chains of multinational companies committed to sustainability and willing to pay price premiums for sustainably sourced material (Aveda, S&D Aroma, Altromercato).

At the local level, ANSAB favours incentive-based resource management strategies such as enterprise oriented community forestry. This approach links enterprise creation to forest management in an effort to ensure the sustainable use of forest resources. Local communities are therefore responsible for protecting and monitoring the resources which they are then able to harvest/sell. The scheme also ensures that

communities are empowered to run the enterprises and manage the forest through capacity building to community members. ANSAB then facilitates the implementation of both a forest management plan and an enterprise development plan. Additional incentives are provided further up the supply chain by linking community enterprises so they are better able to compete and obtain higher returns internationally. Another form of ensuring a premium for the community products as well as an incentive to conserve the resources is to achieve Forest Stewardship Council or Organic Certification.

This integrated model of enterprise development and forest conservation has been successful and suggests that market creation may improve the financial sustainability of conservation/sustainable use efforts by harnessing a broad range of resources that do not rely on government financed direct payments. Such programmes also operate as an important means to changing local attitudes to conservation and hence increase buy-in for protecting local biodiversity. Besides the economic incentives that are created, improved social conditions for local communities also work in favour of protecting the local environment.

At the policy level, this initiative has succeeded in improving the policy environment for the sustainable management and use of forest resources as well as raising awareness of how policy-making is reflected on the ground. ANSAB has become a very well-reputed organisation at the national level being able to influence the government and other stakeholders on the non-timber forest product agenda. Through this programme, ANSAB has also introduced forest certification as a tool to promote sustainable forest management and sustainable business practices.

Impact on biodiversity

In developing enterprise-oriented community forestry and the Himalayan Bio Trade, ANSAB aimed to create economic and social incentives for biodiversity conservation in the rural areas of Nepal. Biodiversity in these areas was under threat due to the need for local people to secure their livelihoods and the lack of viable alternatives for doing so.

As a result of this programme, 80,000 hectares of forest land are currently under improved management, out of which 14,000 hectares are certified by the FSC. The programme has also led to the adoption of improved collection and trading practices by individuals and community groups. There have also been significant benefits associated with improved livelihoods for 15,000 households. In addition, the Aveda partnership has generated 30,000 jobs in rural areas.

Replicability

ANSAB began testing the model of integrating enterprise development with forest management in a few rural villages and has continued to replicate this model in many of Nepal's regions. Continued replication has then allowed the organisation to scale up the project through the creation of Himalayan Bio Trade. This has in turn added value to local products and therefore created additional incentives for conservation at the local level.

From a global perspective, the number of biodiversity-based businesses focusing on the sustainable harvesting of natural products and NTFPs is steadily increasing (see http://www.iucn.org/about/work/programmes/business/bbp_our_work/biobusiness/). Examples of such businesses are becoming widespread: In Lebanon's largest nature reserve, the Al Shouf Cedar Society works with local communities to produce and market the products that showcase the area's traditions and the reserves resources. In the greater Mekong region, WWF and IKEA are working together to develop a model for sustainable rattan production and commercialisation that improves community welfare. In South Africa, the Flower Valley Conservation Trust works to ensure that flowers from the mega-biodiverse Cape Floral Kingdom are sustainably managed and harvested for sale to the retail flower industry.

Lessons learned

Devote time to developing appropriate business and forest management plans, including mechanisms for economic incentives that reward creativity and hard work

Stakeholder buy-in, involvement and collaboration are necessary for the long-haul.

It is essential to look at the bigger picture, think about the end-product and envisage the place where the business will end up. The market is complex and an effort should be made in understanding and responding to it.

Partnerships are crucial and can make the enterprise more competitive.

It is important to manage expectations, particularly from local communities.

It is necessary to think about scaling up early on and to ensure that the business has the capacity to do this without compromising the resources upon which it depends.

Sources: IUCN (2009); Subedi (2009).

Philippines: environmental tax

The Laguna de Bay Region covers an area of about 3,800 square kilometers and includes the Philippines' capital Manila as well as many smaller cities and around 360 square kilometers of urban and industrial area that spread outward from Manila. Twenty-one major rivers flow into the 90,000-hectare lake, which is the second largest inland water body in Southeast Asia. Laguna de Bay is the receiving water body for the entire watershed and of great importance for inland fish production (aquaculture in form of fish pens occupy a major part of the lake's generally shallow surface area), irrigation uses, power generation and industrial cooling. Rapid urban and industrial growth has led to considerable environmental degradation, and continues to be an important threat to the lake's ecosystem.

At the end-nineties, an industrial wastewater effluent fee programme was developed in order to create economic incentives for industry to reduce discharges and to raise revenues for financing the management of the programme and for environmental activities by local governments. The Environment User Fees System (EUFS) was designed to complement the dominant command-and-control approach to environmental policy. Reflecting the quantity of discharges, the costs of environmental externalities created by industrial discharges, and the budget requirements to administer the program, the fee comprises a fixed fee – designed to cover the administrative cost of running the programme – and a two-tiered variable fee based on the unit load of pollution of BOD (biological oxygen demand – an indicator for biological pollution). Covering around 900 companies at the end of the pilot phase in 2002, the programme is implemented by the Laguna Lake Development Authority (LLDA), the government agency responsible for protecting and managing the watershed. As in other cases, the introduction of disincentives through taxes or fees was combined with the provision of positive incentives on the expenditure side. In the EUFS case, twenty percent of the fee revenue are earmarked for local environmental projects such as the establishment of sewage plants, while eighty percent are used for monitoring and enforcement of the programme by the LLDA.

Impact on biodiversity

The pilot test of the EUFS programme resulted in a 88 percent reduction of BOD from direct discharges between 1997 and 1999 of affected companies. The regulatory monitoring and enforcement components of the programme led to closure of around 50 companies by LLDA between 1998 and 1999 for significant violations. Despite these successes, the ongoing and dynamic immigration to the Manila agglomeration continues, with a considerable degree of uncontrolled human settlement along river banks and the lakeshore areas, and the rapid development of economic activities. Consequently, the degradation of the lake's ecosystem through pollution and siltation – including solid and liquid wastes from households, nutrient loading from agricultural and aquaculture activities, and industrial pollution – remains a major and ongoing challenge.

Replicability

The EUFS is planned to eventually cover all water pollution sources from industrial, commercial, domestic and even agricultural sources. In light of the competing interest of a multitude of stakeholders,

as a matter of strategy, LLDA seeks to implement the EUFS cautiously and by stages – for instance, a fee on fish pens was subsequently introduced and covers a significant part of the LLDA's budget.

Lessons learnt

Adaptive management is critical when introducing measures that are highly innovative against the predominant regulatory style. In the EUFS case, some perverse incentives for dilution were detected because the variable fee rate was designed to also rely on concentration levels. Applying total pollution load management principles or the pricing of input water were suggested as possible responses.

Managing a lake basin in a highly dynamic socio-economic environment is an ongoing challenge. Keeping pace with rapid demographic growth and economic development requires continued work with the different stakeholders.

Sources: Manila, A. (2009); Nepomuceno D. (2004); Santos-Borja, A. and D. Nepomuceno (2004); UNESCAP and KOICA (w.d.).

Uganda: Collaborative management schemes

Uganda promotes innovative ways of empowering local communities, who are the stewards of many ecosystems, to access international markets and seeks to develop the strategic role of private sector-community partnerships in the sustainable use natural resources. In particular, Uganda promotes the use of collaborative management schemes for the conservation and sustainable use of biodiversity:

- In national parks and game reserves, 20 per cent of entry fee collection goes directly to communities neighbouring protected areas. Since 2000, a total of US\$ 1.7 million has been collected, of which \$896,000 has been disbursed to a total of 600,000 people. In forest reserves, Community Forest Management is widespread.
- Markets, marketing and value added processing are promoted for ecosystem-based products from wetlands (mats, baskets) that are produced in a sustainable manner. Revenues generated go to the local ecosystem stewards, providing incentives for conservation and sustainable use of ecosystems.

Source: Kaggwa (2009).

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