

# Asia Regional Workshop on Compensation for Ecosystem Services

A Component of the Global Scoping Study on Compensation of Ecosystem Service

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KV Raju, S Puttaswamaiah, Madhushree Sekher and Rachel Rumley



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# Asia Regional Workshop on Compensation for Ecosystem Services

**A Component of the Global Scoping Study on Compensation of Ecosystem Services**

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KV Raju, S Puttaswamaiah, Madhushree Sekher and Rachel Rumley

Centre for Ecological Economics and Natural Resources  
Institute for Social and Economic Change  
Bangalore, India  
8-10 May 2006  
[www.isec.ac.in](http://www.isec.ac.in)

Workshop made possible with support from the World Agroforestry Centre (ICRAF) and the International Development Research Centre (IDRC) of Canada.

The World Agroforestry Centre (ICRAF) and a diverse team of partners were tasked by the International Development Research Centre (IDRC) to contribute to the conceptualization and development of their Rural Poverty and Environment (RPE) programme related to Compensation and Rewards for Environmental Services (CRES) by providing an overview of relevant developments in Africa, Asia and Latin America, a global synthesis of results and recommendations. Truly global in nature, the CRES Scoping Study was undertaken by the following partners and collaborators based in 7 countries across 4 continents.

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## **Abstract**

The World Agroforestry Centre, Nairobi, Kenya, together with Forest Trends, Washington DC, The World Conservation Union, Gland, Switzerland, Corporación Grupo Randi Randi, Quito, Ecuador, the African Centre for Technology Studies, Nairobi, Kenya, the Institute for Economic and Social Research, Bangalore, India, and the United Nations Environment Programme – Division for Environmental Law and Conventions, Nairobi, Kenya, is leading a scoping study for the International Development Research Centre (IDRC-Canada) on the model of payments for environmental services (PES) as applied in developing countries, to determine how the poor are affected by these schemes and whether the schemes are compatible with poverty reduction objectives.

As a key part of the study, a 3-day workshop is being held in each focal region. The Asia Regional Workshop was held in Bangalore, India from 8 -10 May 2006 at the Centre for Ecological Economics and Natural Resources (CEENR) of the Institute for Social and Economic Change (ISEC). The event brought together 39 participants from across the region, including India, Indonesia, Nepal and Sri Lanka, as well as the project coordination team from the Nairobi headquarters of The World Agroforestry Centre (ICRAF). Delegates represented international and national-level organizations, academic bodies, NGOs, consulting firms and donor agencies.

This report covers the proceedings of the workshop. It includes summaries of all presentations made (22) as well as summaries of the panel discussions and the open discussions held after the presentations.

## **Keywords**

Environmental services, conservation, compensation and reward mechanisms, ecosystem services, environmental degradation, payment for environmental services, sustainable development, India, Sri Lanka.

## Preface

From the beginning of 2006 until March 2007, the World Agroforestry Centre (ICRAF) led a consortium of organizations and individuals from around the world in a pan-tropical scoping study of Compensation and Rewards for Environmental Services (CRES). The scoping study was commissioned by the Rural Poverty and Environment Programme of the International Development Research Centre of Canada (IDRC) to identify critical issues affecting the development, operation, impacts and institutionalization of mechanisms linking beneficiaries of ecosystem services with stewards of those ecosystems. Particular attention is paid to the potential for CRES to alleviate or exacerbate the multiple dimensions of poverty: rights to productive assets, streams of income and consumption, and vulnerability to shocks.

The scoping study included a series of regional workshops held in Latin America (Quito, Ecuador), Asia (Bangalore, India) and Africa (Nairobi, Kenya). Participants presented and discussed practical CRES experiences from across the developing world, experiences which informed and challenged the development of several cross-cutting issue papers. A series of nine working papers have been prepared to summarize the results of the scoping study, including an introductory paper, three regional workshop reports, and five issue papers on key topics.

ICRAF Working paper 32 – Compensation and Rewards for Environmental Services in the Developing World: Framing Pan-Tropical Analysis and Comparison.

ICRAF Working paper 33 – Report on the Latin American Regional Workshop on Compensation for Environmental Services and Poverty Alleviation in Latin America.

ICRAF Working paper 34 – Asia Regional Workshop on Compensation for Ecosystems Services. A component of the global scoping study on compensation for ecosystem services.

ICRAF Working paper 35 – African Regional Workshop on Compensation for Ecosystem Services (CES).

ICRAF Working paper 36 – Exploring the inter-linkages among and between Compensation and Rewards for Ecosystem Services (CRES) and human well-being: CES Scoping Study Issue Paper no. 1.

ICRAF Working paper 37 – Criteria and indicators for environmental service compensation and reward mechanisms: realistic, voluntary, conditional and pro-poor: CES Scoping Study Issue Paper no. 2.

ICRAF Working paper 38 – The conditions for effective mechanisms of Compensation and Reward for Environmental Services (CRES): CES Scoping Study Issue Paper no. 3.

ICRAF Working paper 39 – Organization and governance for fostering pro-poor Compensation for Environmental Services: CES Scoping Study Issue Paper no. 4.

ICRAF Working paper 40 – How important will different types of Compensation and Reward Mechanisms be in shaping poverty & ecosystem services across Africa, Asia & Latin America over the next two decades? CES Scoping Study Issue Paper no. 5.

The working papers are designed for relatively limited circulation of preliminary material. We anticipate that all of the papers will be revised and published in a formal outlet within the next year.

Brent Swallow  
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International Development Research Centre  
Singapore



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# 1. Introduction

The Asia Regional Workshop was staged as a component of the Global Scoping Study on Compensation for Ecosystem Services (CES). Commissioned and funded by the International Development Research Centre (IDRC), the general objective of the study is to contribute to the conceptualization and development of the IDRC's Rural Poverty and Environment (RPE) programme related to CES by providing an overview of relevant developments in Africa, Asia and Latin America, a global synthesis of the results, and recommendations for a possible niche for RPE.

As a key part of the study, a 3-day workshop was being held in each focal region. During the Asia Regional Workshop hosted by the Centre for Ecological Economics and Natural Resources (CEENR) of the Institute for Social and Economic Change (ISEC), Bangalore, 22 papers were presented over three days, 8-10 May 2006. The event brought together 39 participants from across the region, including India, Indonesia, Nepal and Sri Lanka, as well as the project coordination team from the Nairobi headquarters of The World Agroforestry Centre (ICRAF) (see Appendix 2). Delegates represented international and national-level organizations, academic bodies, NGOs, consulting firms and donor agencies.

Lead by ICRAF, the study is being performed by a diverse network of partners: the Institute for Social and Economic Change (ISEC), the African Centre for Technology Studies (ACTS), Corporación Grupo Randi Randi (CGRR), Forest Trends, the World Conservation Union (IUCN-Sri Lanka), with inputs from the United Nations Environment Programme (UNEP) and the Partnership for the Tropical Forest Margins (ASB).

## 2. Summary of Workshop Report

The Asia Regional Workshop on Compensation for Ecosystems Services (CES), held 8-10 May 2006, was organized by the Centre for Ecological Economics and Natural Resources at the Institute for Social and Economic Change, Bangalore, India. The workshop was part of a major study led by the World Agroforestry Centre (ICRAF) in Nairobi, Kenya, and supported by the International Development Research Centre (IDRC) of Canada. Thirty-nine participants from India, Indonesia, Nepal, Sri Lanka and Kenya attended the workshop, representing international and national-level organizations, academic bodies, NGOs, and donor agencies. The workshop was inaugurated by His Excellency Shri T N Chaturvedi, Governor of Karnataka, and consisted of eight technical sessions (22 papers presented – see Appendix 3) and 1 panel discussion.

### Asian Context

Asia has the highest population density in the world (152 km<sup>2</sup>), and 60 percent of global poor suffer as a result of anthropogenic pressure on their natural resources. Examples of these stresses include: the reclassification of most of India's rivers from Class A to Class C, the rate of soil erosion in Bangladesh has increased several folds, worsening ambient air quality in most Asian cities, and deforestation in several countries. In recent years, several countries in Asia have become signatories to the Stockholm Declaration (1972) and enacted various legislative measures. Still, these countries are struggling to cope with increasing environmental pressures and the urgent need to improve quality of life. Some of the important challenges to CES in Asia are: (a) high resource degradation and increasing pollution levels – 35 percent of land is degraded in Asia; (b) low literacy levels, particularly female literacy, and lack of awareness about CES; (c) need for supportive policy and legal environment with commensurate institutional mechanisms to implement CES, as observed in some countries in the region who have developed alternate bio-fuels to alleviate reliance on fossil fuels; and, (d) ensuring that CES mechanisms can benefit from the many informal associations of resource users that already exist.

### Emerging Issues

The discussions, spread over eight sessions, during in the three-day workshop raised several issues, which are categorized below:

#### *1. CES, Sustainable Development and Poverty Reduction:*

- How to use CES to protect local ecosystem services, such as forestry and reforestation for carbon sinks.
- Need for effective approaches to work in a proactive manner to prevent degradation.
- Compensation for Ecosystem Services mechanisms need to enhance livelihoods, particularly of the poor.
- The interlinkages between environmental degradation and poverty are complex and need to be addressed in a case-specific manner.
- Criteria and indicators to evaluate the effectiveness of pro-poor CES mechanisms need to be identified.

#### *2. Design and Enforcement of Appropriate Clean Development Mechanism (CDM):*

- Designing appropriate models for reserving revenues from CDM for CES.
- There is a need for a comprehensive information base and building awareness on CDM in order to promote community-based CDMs.

- Inadequate capacities for operation and maintenance of CDM technologies.
- Access to CDM, preferably to communities rather than to individuals.

### 3. Institutional Concerns:

- The multi-layered nature of environmental governance involving government, private sector and community. This raises issues of accountability and the role of local/user organizations in environmental management.
- Constraints in establishing property rights owing to the provision of 'public goods' by ecosystem services.
- Refining CES related multi-lateral agreements to ensure positive impact in Asian context.

### 4. Market-based Instruments:

- Specific sources of ecosystem services need to be identified for proper valuation.
- Need to develop payment mechanisms, and identify buyers and sellers of ecosystem services.
- Necessary to identify the potential of CES to enhance livelihoods, particularly for socially and economically disadvantaged groups.
- Environmental externalities need to be incorporated into pricing policies.

## Research and Policy Issues

In the last session, a participatory exercise was employed to identify and discuss the critical areas for future action relating to CES. Below is the summary of research questions and policy issues that participants identified as priorities for the further development of CES.

Issues	Research Questions	Policy Issues
Direct and indirect link between poverty and CES	<ul style="list-style-type: none"> <li>▪ Criteria and indicators to evaluate pro-poor mechanism of CES and the role of community.</li> <li>▪ Extent of user organizations impact on poverty alleviation in the presence of community incentives as compared to induced ones.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Need to contextually define poverty and address the dimensions outlined in the Millennium Assessment.</li> <li>▪ Include CES in poverty alleviation policies.</li> <li>▪ Relate Willingness-to-Pay (WTP) to the ability to pay.</li> </ul>
Structure and use of compensation	<ul style="list-style-type: none"> <li>▪ Focus compensation on vulnerable areas, such as health, nutrition, etc.</li> <li>▪ Methods to compare benefits and costs of CES.</li> <li>▪ Determining threshold limits of the ecosystem at the regional level and in markets.</li> <li>▪ Defining appropriate technologies and establishing links to CES mechanisms.</li> <li>▪ How can different types of ecosystem services influence the global trends on CES?</li> <li>▪ Types of compensation and their effects on reducing poverty.</li> <li>▪ Possibility of insurance mechanisms in CES.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Consider separately how much to compensate and how to compensate.</li> <li>▪ Need a review of different types of CES mechanisms in different countries.</li> </ul>

Issues	Research Questions	Policy Issues
Institutional issues	<ul style="list-style-type: none"> <li>▪ Monitoring and learning mechanisms of CES schemes.</li> <li>▪ Methods and extent of involving external beneficiaries in the management of ecosystem services.</li> <li>▪ Designing criteria to provide ecosystem services across different locations.</li> <li>▪ Interlinkages between institutions, markets and poverty.</li> <li>▪ Methods to involve impoverished communities with insecure tenure rights.</li> <li>▪ Performance assessment of user organizations in achieving compensation when there are formal contracts. Also, assess the relevance to traditional communities.</li> <li>▪ Conflict resolution mechanisms at various levels.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Need to define the role of government agencies in conserving ecosystem services.</li> <li>▪ Build mechanisms to finance and regulate other public costs.</li> <li>▪ Need for monitoring the environmental impact of CES schemes and optimum use of resources.</li> <li>▪ Need to address the equity concerns in CES mechanisms.</li> <li>▪ Need to build an effective database and ensure easy access to database by all stakeholders.</li> </ul>

### 3. Inaugural Session

Dr Gopal K Kadekodi, Director of the Institute for Social and Economic Change (ISEC), welcomed His Excellency Sri T N Chaturvedi, Governor of Karnataka and President of ISEC; Sri S L Rao, Chair of the ISEC Board of Governors; Dr Brent Swallow, the Global Scoping Study on Compensation for Ecosystem Services (CES) Coordinator; and all other distinguished delegates. Dr Kadekodi stressed the relevance of CES, as a cross-cutting approach that draws on both natural and social sciences, to address the current development challenges. He expressed his appreciation to Dr K V Raju, Professor and Head of ISEC, who played a key role in organizing the workshop.

Sri S L Rao, Chairman of the ISEC Board of Governors, addressed the delegates. Although his personal experience with CES is limited, he pointed out that many of the issues CES attempts to address are the same as he encountered during his involvement in policy implementation in relation to environment issues. Rao emphasized the importance of the interplay between economics and power, and the necessity of good governance in implementing approaches like CES. He outlined the example of wind-generated power. In India, an investment in windmills is 100 percent tax deductible. As a result, such power schemes become tax-shelters for the earnings of upper classes. He emphasized that incentives should be for production rather than for investment. He welcomed CES mechanisms as an innovative way to resolve the intricacies of complex development challenges.

His Excellency Sri T N Chaturvedi, Governor of Karnataka and President of ISEC, began by expressing appreciation to ISEC, in cooperation with ICRAF, for hosting the workshop, and expressed his hope that the gathering would be a useful opportunity to address issues of poverty and environmental degradation. The Governor recognized the need for knowledgeable experts to focus attention on the slow degradation of the environment, and the associated problems, especially since there is a lack of understanding of these within government administrations in India. Drawing on his own extensive professional experience, he provided several examples exploring the role of governance and academicians in environmental management, including water sharing between Tamil Nadu and Karnataka, and the Kerala experience where four villages patented an herb and, as a result, enjoyed an influx of income.

His Excellency posed a number of challenging questions to the expert delegates for consideration, and stressed the urgent need to resolve problems at interface of society and the environment. In closing, he wished delegates fruitful sessions during the workshop and a pleasant stay in Karnataka.

### **Open Discussion**

The issue of where ecosystem service ‘conservers’ fit within the framework was raised. Swallow responded that the framework broadly captures this group within the ‘modifiers’ group, which includes investments made to mitigate pressure and threats. A particular activity for conservation would be classified as an investment that needed to be compensated.

**Dr Mohan Munasinghe, Founder and Director of Munasinghe Institute for Development, Sri Lanka**, described the major environmental problems facing developing countries, outlining their need for mitigation strategies, which to date have focused on fast growth and improving adaptive capacity. One challenge to getting government support is that at the country level, decision makers are concerned with development, then sustainable development, then the environment, and lastly with a particular concern such as climate change. By using CES to embed climate change into sustainable development, it will move climate change up the list of national priorities. CES acts as an integrated tool that transcends the boundaries between economic, social and environmental factors.

Munasinghe addressed how to use CES to protect local services, such forestry and reforestation for carbon sinks. In Sri Lanka, expansionary policies for growth resulted in massive deforestation. The current costs of harvesting timber are too low. There is a need to enforce a property right scheme and raise the cost of logging, so that internal pricing policies incorporate economic costs as well as the cost of environmental externalities. CES is a strategy to bring costs up again, and get logging down to a manageable level.

CES is extremely important but has to be incorporated into other sustainable development contexts:

1. Ecosystem services are vital for sustainable development.
2. We need to integrate ecosystem services into a development framework that is comprehensive and accessible to decision makers.
3. This should be done at the national level; not purely at the global level. The MEA is an important attempt, but this assessment is at the global level. There is now need for local initiatives. Likewise, consider CES for local ecosystem services.

### **Open Discussion**

Scholars observed the need to have full cost pricing in ecosystems service markets. Under current circumstances, a partial cost of the service provided is essentially savings to the buyer. With climate change and increases in extreme weather events, there is the opportunity that insurance can bring in the private sector and attempt to distribute or spread risk. This approach to risk management is very useful for repeated events.

**Dr Pushpam Kumar, the Institute for Economic Growth, India**, presented a summary of the Millennium Ecosystem Assessment. There are basically 12 major ecosystems. There is a need to manage ecosystems because a large number of services are emanating from these ecosystems. One major recommendation of the MA came from this assessment group: ecosystem services enhance human well-being, and well-being is better than well-off. Well-being would mean security, including the freedom to make decisions.

## 4. Session 1.1

*The session opened by outlining the Global Scoping Study on CES, of which the workshop is an important component. A summary of the Millennium Ecosystem Assessment (MA) was presented to provide context. Presentations discussed approaches to embedding CES mechanisms into the broader framework of environment, sustainable development and development, in order to increase its political priority. Discussion also evaluated the current level of support for previous CES-related activities and potential approaches to increasing government subscription to these concepts.*

**Dr Brent Swallow, Environmental Services Theme Leader, ICRAF-Nairobi** and the Project Coordinator for the Global Scoping Study on CES, outlined the objectives, conceptual framework and anticipated outputs of the study. The objectives and anticipated outputs are briefly included in the Introduction to this workshop report.

In addition to the regional workshops, the study will produce a series of publications with multiple authorship including the conceptual framework and five issue papers. A final writeshop will be held in Nairobi to finalize the text for the issue papers, and prepare a final report for submission to the IDRC during the Rural Poverty and Environment Programme Annual Meeting on 16 June 2006, in Bali, Indonesia.

Swallow outlined the main objective of the Conceptual Framework as resolving ‘fuzzy boundaries,’ that is to introduce structure to the study; to identify areas of overlap between issue papers (partially completed); characterize and typify CES mechanisms; typify CES scenarios; discuss the links between CES, rural poverty and environment; and, outline key topics for the issue paper series.

He went on to discuss ecosystem structure and services, natural capital that generates the services, and the different stakeholders (beneficiaries, modifiers, and intermediaries – organizations which mediate between the two).

Four Prototypes of CES were outlined:

CES 1 – compensation for threat reduction

CES 2 – compensation for investment and management

CES 3 – compensation for damage (polluter pays principle)

CES 4 – compensation for diverted use (among beneficiaries).

Swallow also drew participants’ attention to the 12 ecosystem service prototypes developed by the Rewarding Upland Poor for Environmental Services (RUPES).

The four aspects of the IDRC RPE agenda coincide with the current scoping study, are: RPE 1 – Building effective environmental governance; RPE 2 – Enhancing equitable access and use rights; RPE 3 – Strengthening community capacity to respond to and benefit from integration with wider social and economic systems; and, RPE 4 – Adaptive learning (looking at and analyzing alternatives).

Swallow listed the countries in which IDRC’s RPE has a research interest, but indicated that the Scoping Study would consider relevant evidence from other geographic regions as well.



**Dr Ashish Kothari, Coordinator of Kalpa Vriskha, India**, explored how to use the values we estimate for ecosystem services to achieve more effective conservation and livelihood security, especially for the poor, and how to operationalize this approach within government. He criticized purely economic notions of Compensation for Ecosystem Services, emphasizing the need to reflect the notion of rights and responsibilities (entitlements) with multiple ties (social, economic, political). CES mechanisms should aim to return rights of access and management, facilitate appropriate technologies, provide social recognition and rewards, etc., all aimed at re-establishing a sustained link with ecosystems. If not, integration of ecosystem benefit values into government policy becomes a ‘dollar game,’ whereby qualitative values do not receive equal importance.

Kothari stressed the importance of equity — Who decides on the natural resources for sale? Who gets the benefits? Who is taking the decisions — those on the ground or those in this room? He also suggested that ecosystems providing services should not be restricted to natural ecosystems, but should include agricultural ecosystems, for example farms, pastures and fisheries.

He reviewed the National Biodiversity Strategy and Action Plan (NBSAP). The result of a four year study that began in 2000 and consulted more than 50000 stakeholders from academia through to the general public, the NBSAP provides the current profile of biodiversity, and outlines the root causes of biodiversity loss, ongoing efforts and further strategies. The NBSAP recommendations include seventy action plans across the country covering local, state, eco-regional (interstate) and thematic levels.

Over 300 specific actions were outlined in the NBSAP National Draft. The key strategies called for are: securing the ecological and political context, strengthening decentralized natural resource management with governance structures that empower village assemblies as the basic decision-making unit, securing tenure over natural resources of traditional maritime communities and freshwater users, strengthening protected areas (PAs) with new participatory paradigm, and recognizing Community Conservation Areas (CCAs).

### **Open Discussion**

The issue of making findings more palatable for decision makers was addressed. Kothari noted that the NBSAP receives considerable opposition, partly due to political maneuvering, but also because the recommendations are diametrically opposite to current thinking within the government. Current planning follows a traditional model of economic growth which doesn’t account for the environment. He also pointed out the need to translate the document into a more easily digestible form for its bureaucratic audience, i.e. 2-3 pages not 800 pages.

Kothari warned that valuing can lead to degradation. For example, if the government offers 15 lakhs per acre of forest, then afforestation may occur in unsuitable areas, e.g. drylands. What does it mean to green the country, we need a brown country that makes space for various shades of green.

## 5. Session 1.2

Highlighting the efforts to recognize Compensation for Ecosystems Services, this session addressed various case studies ranging from non-conventional energy sources to watershed management.

**Sri Balaji, Consultant**, presented an in-depth analysis of the UNFCCC and the Kyoto Protocol, focusing on the treaty's possible economic impacts in India, and its potential to help developing nations to achieve the Millennium Development Goals (MDGs) through technology transfer. Cautioning against the process of the Clean Development Mechanism (CDM) and its possible implications, he cited case studies related to two different sectors, reduction in the GHGs emission and energy shift. Balaji pointed out that though the original objective was altogether different, he pointed out that the benefits accruing from the CDM are flowing into individual hands, though they made some commitment to contribute towards the sustainable development, albeit indirectly. Giving another example of a community-based CDM project, he cited biomass energy generation along with reduced methane production from livestock by improving the feed stock with diet supplements. Under this scenario, benefits flow to the community as a whole. Highlighting that it is the community as a whole that should benefit, he gave the example of State Owned Enterprises in China, where 40% of the returns from the CDM projects are earmarked for community development. However, Balaji cautioned that such earmarking may be difficult in India since industrial units tend to be owned by private agencies. He cautioned that the CDM may not deliver on its original objectives unless checks and balances are put in place.

**Sri Srinivas from the Ministry of Forest and Environment, Government of India**, presented a case study of energy generation using rice husk biomass. The programme started with the objective of promoting non-conventional energy sources in rice mills.

The original plan was to promote a 'bio-gasifier' plant with a production capacity of 450KW, out of which 100KW would be given to 4 rice mills and the remainder would be supplied to the local community. According to the established norms, a rice mill with the capacity to process 2 tons of rice would generate approximately eight tons of paddy husk — four tons could be used in the 'bio-gasifier' and the balance could be sold for other purposes. The caloric value of paddy husk is 2040 kcal/kg and 1.2-1.4 kg of husks would generate about 1KWH. It was proposed to have both gas fired and dual fuel engines for the mill. The gas fired engine can be repaid in just 3 years, but the capital investment was higher than for dual fuel engines.

Practical problems encountered while implementing this scheme include: the difficulty in convincing the mill owners who, on account of initial capital investment involved, were not willing to participate. In the end, only two mills chose to implement the new technology. Though the process has started, the promised subsidy of 18 lakhs that was to be provided by the Ministry of Non-Conventional Energy Sources was delayed and subsequently reduced to 8 lakhs, forcing the mill owners to seek loans from the banks. Even after installing the system problems remained. Technicians need to be brought in from West Bengal, resulting in an escalation of costs. However, the units are now working at 80 percent efficiency.

**Dr Paul Appaswamy** presented his research into the ‘Loss of Ecosystem Services Due to Pollution in the Noyyal River Basin, Tamil Nadu’. Noyyal River, a tributary of Cauvery River, flows over 172 km with a basin area of 3510 km<sup>2</sup>, comprising 50 percent cultivated area, 5 percent forest and the remainder is pasture and fallow. Rainfall in the basin ranges from 600 to 3000 mm. Ground water potential is very good. Rice paddies and sugar cane are commonly grown in the wetter areas of the basin, while cotton is favoured in the dry areas. The Noyyal provides several ecosystem services including: irrigation, drinking water supply, promotion of biodiversity and waste assimilation, amongst others.

However, a boom in textile industry — particularly the dyeing sector — resulted the release of heavy doses of salts (emanating from approximately 500 industrial units) into the river. It is estimated that over a period of 20 years nearly 3 million tons of TDS was released, polluting the river to the extent that downstream farmers demanded that sluices should not be opened because the polluted water would spoil their soils. The matter went as far as the courts. The pollution has also severely impacted several ecosystem services, particularly in the downstream region: (i) decrease in agricultural productivity (irrigated areas - Rs.7,400 per year, unirrigated area - Rs.3000 per year, for a total annual loss - Rs.35 crore<sup>1</sup> in 3 taluks<sup>2</sup>); (ii) drinking water sources (Tiruppur Residents - Rs.12 crore annually to purchase, rural water supply - alternative schemes at a cost of Rs. 2 crore); (iii) industrial water (Tiruppur Industries - Rs.90 crore annually to purchase water); (iv) loss of fish catch (Rs.15 lakh per year); and (v) changes in biodiversity (changes in species composition and chronic insidious effects).

Owing to the escalating problems, farmers’ organizations in the downstream of Noyyal filed suit against the industrial polluters, bringing the environmental calamity to the attention of the judiciary.

The court ordered the construction of effluent treatment plants. The Ecology Authority awarded a compensation of Rs.104 crore. Also, an expert committee was set up to manage the remediation of Noyyal River. Siruthili, an NGO, has been restoring the tanks in the river basin.

Strategies put forward for restoration of Noyyal River Basin include:

- compensating farmers for loss of ecosystem services;
- technology options to prevent damage (effluent treatment, reverse osmosis, clean technology);
- restoration of upstream tanks; and,
- purification of polluted reservoir.

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<sup>1</sup> Crore is a currency term in India. One crore is equal to ten million Indian Rupees. One US\$ is equal to 43 Rupees (April 2007).

<sup>2</sup> Taluk is an administrative unit in India; it is a small province.

## 6. Panel Discussion

*See Appendix 5 for information on the panelists.*

### **Round One:**

*Each panelist received 2 minutes to list 2 critical issues pertaining to CES. Below are summaries of their priority issues.*

#### **Gopal K Kadekodi**

*Ecosystem complementarity and valuing ecosystems, rather than ecosystem services:*

In all the academic and practical deliberations, we have not distinguished between ecosystems and ecosystem services. We never talk about ecosystems to be compensated as a whole. All ecosystem services are complimentary to each other, whether watershed, flora or fauna. Ecosystem functions are so interwoven that it is impossible to separate out the services. Ecosystem services cannot be treated as substitutes or replacements.

*Ecosystem services do not easily fit with public economics:*

Economists or social scientists in general, have not been able to develop effective mechanisms for compensation. They are limited by instruments of public economics, which relies on the production of a commodity, but ecosystem services are themselves an entity, and not produced. Ecosystem services could produce externalities, for example pollution, which is not an intended production and therefore not easily taxed. It is very difficult to design a fully operational polluter pays principle.

#### **Sharad Lele**

*Need for improved property rights:*

There are many steps to go in order to operationalize CES. Better information is needed about physical linkages and changes in economic value induced by changes in ecosystems, and the institutional framework supporting CES needs to be strengthened. But the real gapping hole is property rights. Lots of talk about money flow. In India, property rights on public lands are not defined. In this context, who is compensated? No need to do CES at all if property rights are not properly assigned.

*Determining rights to ecosystems:*

To what extent does CES produce positive externalities? What right does an individual/community have the right to pollute or harvest? Should they be compensated for cutting every tree or is there a limit?

#### **Meine van Noordwijk**

*Minimum Acceptable Behaviour:*

At the interface of compensation and rights, we need to be clear on what are the rights to harm ecosystem services. Then we can define what CES can do. In essence, a baseline of minimum acceptable behaviour or harm should be developed.

*Poverty dimension:*

CES instruments can be pro-poor. Even if they could be developed to be institutionally neutral, that would be a victory. Property rights will be critical in keeping CES pro-poor and equitable.

**Ashish Kothari***Mechanism for buying nature?*

CES has sometimes degenerated into a mechanism for 'buying nature'. It becomes a situation where 'I have the money I can buy out nature or whatever aspect I'd like to buy'. He cited the recent building of a pipeline through a national park; the company in question paid a significant sum to secure the right to do so.

*If regulations fail, regulator pays:*

We expect polluters to pay, so why not demand or penalize regulators who fail to adequately perform their duties? Those with the responsibility, power and mandate to prevent pollution should pay when they fail to act.

**Paul Appasamy***Damage to stock, effects the flow:*

The ecosystem is a stock and the ecosystem service is a flow. If you damage the stock, then the flow will be affected; this linkage should be analyzed in detail in order to develop efficient CES schemes.

*Public goods, careful of private gains:*

We need to think of ecosystem services as a public good. Noting, however, that where it becomes very difficult to establish property rights, there is a danger of converting the public good into a private good.

**A N Yellappa Reddy***Preferential investment in select aspects of ecosystems:*

Yellappa pointed out that as a forester he sees two different important issues. First, preferential investment in certain aspects of ecosystems while neglecting others. For example, irrigation projects place importance on the catchment area while neglecting the command area, which resulted in misuse of land and water resources. He noted that a great deal of money goes to dams and very little is spent to protect watershed area. There is very little understanding of watershed impacts, specifically sedimentation.

*Accurate valuing of resources:*

Western Ghats recently erected a massive energy plant that converts solar power. The project is affecting the entire Western Ghats region.

**A Ravindra***Do not forget urban ecology:*

Urban ecology has not been acknowledged. Urbanization is growing so fast, urban agriculture can be damaging.

*Governance and regulation:*

He raised the issue of personal governance. What are the government's responsibilities as a regulator of markets to ensure the effective development of CES approaches? Unregulated vs. regulated market?

## **Round Two:**

*Each panelist received 3 minutes to argue the importance of the critical issue they selected in Round One.*

**Kadekodi** pointed to the high degree of complexity involved in ecosystems. It is very difficult to isolate a single service and value it. Complimentarity is central to ecologists, but a problem for economists because they do not know how to value it. The degree of compensation becomes underestimated because of this complimentarity. Furthermore, he argued that long-term losses cannot be compensated and it is difficult to find value for declining resources. Under pressure from international bodies and economic pundits in India, they are striving to design compensation for specific services. But this is only possible for those measurable on the goods and services curve, e.g. carbon that can be valued because of its relationship to timber.

**Lele** took us back to the origins of CES in the USA and Costa Rica, where these early schemes paid off private landowners in the upstream areas of the water catchments. But with clear property rights, owners can do whatever they want on that land. CES schemes have to pay them off to get them to plant forest. The situation is very different in South Asia. Governments are already making huge investments in such schemes. Small changes of state to co-management do not work because benefits do not percolate down to the people.

**Van Noordwijk** told the story of a farmer and a donkey, and the farmer has to get to the market. What is the best way to encourage the donkey to move in the direction of market — the carrot (incentive) or the stick (regulations)? Neither. You cannot solve with the carrot what you cannot solve with the stick. He acknowledged that the current baselines of acceptable behaviour are not sufficient. Once better baselines are established, there is a certain area where voluntary actions could help. Not an issue for economists, but for governments, communities and other institutions working together.

**Kothari** added, “make regulators also pay!” He admitted his statement was partly to provoke reactions, but also one of the biggest problems for CES is poor governance. He argued that environmental governance has failed; institutions set up for managing environment are not functioning effectively. He suggested that an institution along the lines of the Election Commission of India, which is beyond the control of government, is needed for effective environmental management.

**Appasamy** picked up on the concept of a public good. He raised concerns about the misuse of tools like CDM by industries for profit sake. He stressed that for the effective management of the environment, benefits should be available to the community rather than individuals.

**Yellapa Reddy** argued that governments invested huge amounts, particularly by borrowing and thus incurring significant interest costs, in poorly designed projects that result in ecosystem services becoming totally impaired and unproductive. For example, in several irrigation projects, farmers have not adhered to cropping patterns resulting in pollution and decreased production capacity. Productive ability has not been looked into – bioregion ability to maintain its productivity? He added that the governments are trying to push development projects, but impacts could be larger.

**Ravindra** posed several questions arising from the growing trend of urbanization, and the associated crisis of urban pollution. How do we conceive CES mechanisms for urban settings? How do we account for vulnerability, particularly of human health? Can monetary terms really compensate for damaged health? How do we really value ecosystem services in an urban setting? He also raised the issue of governance and accountability in preventing degradation and being responsible for compensation. He felt the real problem is to fix accountability itself – sometimes it exists in government, sometimes not.

**Moderator:**

K V Raju asked about the role of the media in developing CES schemes and making them pro-poor. He also stressed the need to address the problem of urban expansion and its associated problems.

**Open Discussion**

*Following the first two rounds of panelists' commentary, the floor was opened to a rich and varied discussion. Insights into several critical issues emerged over the course of the discussion and are summarized below.*

**Valuation challenges – where does the price tag go?**

General consensus reflected that purposeful valuation is both possible and necessary in order to operate payment schemes. Some controversy ensued over what should be valued — ecosystems or ecosystem services. The idea that ecosystems should be valued, rather than ecosystem services (too complimentary to accurately assign value) met opposition from the floor on the basis that this scenario neglected the role of flows in favour of stocks. It was noted that the potential efficiencies in achieving the environment objectives of a society using market-based systems does not require anything be valued. The example of wetlands offset credits in the US was cited.

Other issues tabled in relation to valuation included the concept of use value, and the determination of baselines (subject to spatial variation). Attention was drawn to the temporal limits of compensation, e.g. can a one-time compensation for ecosystem damage be adequate in situations of inter-generational impact? Also, it was pointed out that slowly people will develop a system suitable for cultural and environmental services, but who is doing the valuation of cultural services?

**Information sharing and ecosystem data needed:**

The need was identified for greater understanding of (site-specific, scalable) ecosystem complexities in order to perform proper evaluations. Lack of information sharing was mentioned as another barrier to obtaining necessary data. Free access to information was recognized as an important means of breaking barriers to transparency and government accountability. Various relevant legal acts were described as confusing, and simplified ways of presenting these acts are needed.

**Intermediaries for an equitable approach:**

The floor was questioned as to whether the goal was to create a compensation system that is fair? If this is so, then negotiations — and negotiation support — will be critical for the success of CES.

**Broadening stakeholder definitions:**

Various types of stakeholders were debated, however, the most inclusive suggestion pointed to the fact that the environment is an issue that affects all people. More precise recommendations drew attention to the absence of industry representation, and suggested we spread our messages beyond the academic community. It was also tabled that a differentiation should be made between urban and rural stakeholders, particularly since the instance of degradation, urban groups can often economically access environmental resources and services through alternatives means. Site-specific citizen representation was recommended.

**Rationale for property rights:**

Property rights extend beyond private ownership, and need to be defined more clearly. There is a need to differentiate between management and ownership, for example a recognized group's ownership over different aspects of an ecosystem. 'Closing the circle' — you cannot compensate until you know who has the right/responsibility to manage an ecosystem service.

A landscape-level planning approach to property rights should be adopted. Political failure in current planning means that there is little attention paid to ecosystem boundaries in relation to political borders or community demarcations. Governments were also castigated for their propensity for short-term planning horizons, and potential to 'sell out'. In this light, it was suggested that the government role should be as a facilitator, not as 'guns and guards'. The idea being summed as 'I alone have rights; government has control mechanism'.

Another necessity is to assign rights and responsibilities in tandem, particularly with respect to global commons. The discussions did not hinge on inalienable rights. Property rights are more akin to management, not the right to destruct. This linked back to the idea of 'minimal acceptable behaviour'.

A caveat to property rights is that they mean more boundaries, more externalities. The paradox is that CES, while requiring secure property rights, is supposed to incorporate externalities. Instead, property rights will magnify externalities.

**Making it work or not — governance issues:**

The idea of 'governance' as a panacea approach to effective CES is problematic. It was suggested that this imposes a homogenous structure to a heterogeneous problem; each ecosystem service needs separate governance mechanism. The need to engage several levels of government – within county, transboundary, in state, transnational – was emphasized.

Governments were again criticized for myopic planning horizons. The CDM produces a better plant or a better road (for example), but it does not replace forests — it is not a CES mechanism. Forest replacement takes 25 years, and no government is willing to invest in such a lengthy timeline.

The state was identified as a necessity, and thought to be currently lacking in many countries. In response to the suggestion that regulators charged with protection of environment pay compensation when degradation occurs was challenged on this basis. Many governments are heavily understaffed, critically under-funded and massively overworked, and hence who would we sue?



## **Relevance and enforcement of CES schemes**

Several points and questions were made in this domain including: market-based instruments would work provided institutional structure (e.g. where markets are already working), what kind of market instruments should be developed for services like Non-Timber Forest Products (NTFPs), precautionary principle works better in the case of CES, and an environmental fund can be created along with compensation scheme.

## **7. Session 2.1**

*The session focused on issues of valuation, recognizing the deep need for understanding ecosystem services in order to develop representative values. The non-linearity of ecosystem functions poses a challenge to economists, and careful attention will be needed to reconcile this complexity with the production function. Along with the estimation of stock and flows of monetized ecosystem services, the social dimensions need to be considered. The psychological aspects which determine the turning points and behaviour of people should also be emphasized while analyzing the value of ecosystem services.*

**Dr Pushpam Kumar, the Institute for Economic Growth, India,** highlighted the importance of understanding ecosystem services which are being evaluated in order to accurately assign value to such services. Certain preconditions must be met in order to assess ecosystem services such as availability of buyers and sellers, social trust, defining property rights and the enabling institutional set up.

The economic analysis of any ecosystem service must be strongly supported by an understanding of the exact ecological processes which supports those services. This necessitates the specification of an ecological production system which is non-linear, unlike the conventional (linear) economic analysis.

Ecosystem services can be classified into four groups: provisioning, regulating, supporting and cultural. The conventional economic valuation systems can take care of the provisionary services, whilst the supporting and regulating services can be better dealt with using static and dynamic optimization techniques. Many of these services have cultural and spiritual aspects which are much more difficult to evaluate — a challenge for economists.

Current CES schemes carried out all over the world have yielded useful lessons for designing effective economic responses to the problems of ecosystem management. They include the need for proper identification of risks and opportunities for using different types of market instruments, site-specific designs of market rules, clear documentation of biophysical linkages between land uses and ecosystem benefits, and the design of appropriate regulatory framework.

### **Open Discussion**

A few examples of CES in Asian countries were brought out, including experiences in Indonesia and Nepal. The discussion revealed that the political process for the implementation of CES is strongly dependent on the local perceptions of ecosystem services. Identifying the source of ecosystem services is a very important step in ensuring that the production function specification for valuing ecosystem services can be properly applied. Another important question raised during the discussion was, “Why is it difficult to internalize the ecological factors into a production function?” The main reason offered was

the dynamic nature of ecological services. The price components for ecosystem services are dynamic in nature and it is a challenge for economists to internalize these changing values into the production function. Moreover, the valuation of ecosystem services mainly takes into account the flow of services from the ecosystem. But, this ignores the intrinsic value of these ecosystems, which also requires consideration. Valuing the flows will only provide a second best choice for Compensation for Ecosystem Services.

**R Parthasarathy** presented two case studies — the Taungya cultivation and the Forest Division of Ramgarh Tal of Gorakhpur — which illustrate the status of compensation policies for ecosystem services over time and the interactions between different institutions and government policies with regards to managing such services.

The Taungya cultivation was initially a successful step towards forest regeneration. Over time, however, the government failed to re-allot land to the Taungya cultivators and political interference encouraged the Taungya to abandon cultivation, resulting in a loss of control over their land and the end of Taungya cultivation in this area. The Taungya cultivators stopped serving the forest area and illegally occupied the land, bringing them into conflict with forest officials. An effort on the part of the government to rehabilitate these cultivators met with little success. The potential allocation of a rehabilitation site for the Taungya cultivators is still unresolved.

The Forest Division of Ramgarh Tal helps to identify gaps between government departments that work on common resources and may be having different (and possibly conflicting) impacts on the resource base. This case study highlighted the need for better coordination between the forest department with the town and country-planning department to distribute the land use.

### **Open Discussion**

Various criticisms were aired against the Taungya cultivation system, particularly in relation to its socially exploitative nature. Parthasarathy agreed that the system was somewhat exploitative, but added that compared to the initial years in which it was a success, presently the living conditions of the Taungya cultivators are much worse. The need for comparatively efficient use of the ecosystems was identified. As well, it was suggested that the baseline value of the system should not be floating. Parthasarathy further substantiated this point by mentioning other work in which he tries to estimate the potential value of the forest by using the available records on forest cover when it was not degraded. He also pointed out the difficulty of assigning financial value for the land in Ramgarh Tal. These values tend to fluctuate as a result of government policies supporting alternative use of forests. The sensitivity of land values to zoning was highlighted. Issues regarding the institutional mechanism interacting with the resources were also raised in the discussion.

**M G Chandrakanth** analyzed the historical, institutional, social and economic factors influencing the preservation of Devara Kadu (sacred groves) in the Kodagu district of Karnataka. He presented a detailed history of the cultural association between the village people and the Devara Kadu, which includes festivals, social fencing, and ancestor worship. Emphasis was placed on the recent problem of deforestation as a result of encroachment and conversion to plantations. The existence value of Devara Kadu was generated by estimating the villagers 'willingness-to-pay' (WTP) for the preservation of the sacred groves. The results show that the mean WTP for preservation is Rs.702 per family, for groves in their own

village. It was found that education and contribution to the family festivals were the key factors influencing WTP for the preservation of the sacred groves.

### **Open Discussion**

Discussion centered on the challenges involved in estimating the WTP. What will happen if WTP is not as high as the benefit provided by the ecosystem? Averaging the WTP for village may distort the figure, as those with more may pay more and those with less may not pay at all. Standardizing for income and incorporating zero bids were suggested. The production function approach was seen as preferable. It was also noted that WTP studies are designed for future changes in policy, and will be more appropriate in such contexts. Concern was voiced that it was not the ecosystem being valued by the villagers but rather an idea.

## **8. Session 2.2**

**Madhu Verma** presented a detailed study of the Bhoj wetland in Bhopal, Madhya Pradesh, India. The study aimed at constructing methods to understand the ecosystem services provided by the wetland. The broad objectives of the study are to fully value wetland benefits/resources, examine causes of wetland degradation, and to estimate the nature or extent of injury to the wetland. Questions raised include: How does degradation affect the instrumental value of the wetlands for citizens of Bhopal? What cost is borne by the users because of this degradation, in terms of productivity loss and health impacts? What is the WTP to conserve this water body? What role do various stakeholders play in the sustainable management of the wetland?

Verma highlighted different uses of ecosystem services, both consumptive and non-consumptive. Some of the consumptive services are drinking water, fish, chestnut production, microclimatic stabilization and nutrient cycling. Select non-consumptive uses are recreation, biodiversity, aesthetic value and education services (research). The WTP method was used to assess local WTP for wetland conservation. The study selected seven sites in Bhoj wetland — five are in the upper lake and two in lower lake areas. Economic values were determined using various valuation techniques, e.g. CVM, hedonic pricing and the production function approach.

Lake degradation was found to be the result of multiple causes. As such, the lake's restoration will require multiple interventions. The value of the drinking water supply was found to have increased. Income to fishermen, boatmen and washermen has also increased. The total cost of water purification for households has been increasing.

**Cheatn Agarawal** presented a paper on developing incentive-based mechanisms for watershed services, emphasizing that all the regulatory, institutional and fiscal mechanisms should provide incentives for appropriate behaviour. Focusing on international projects, he discussed various mechanisms, including the CPR embedded barter system, public payment schemes, compensation schemes, and environmental friendly schemes. Agarawal pointed out that the 2/3 of the population engaged in primary activities resides in rural areas.

Shyam Upadhyaya used the Kulekhani watershed in Nepal to examine how CES mechanisms can address market failure. While presenting his paper, Upadhyaya emphasized the potential

ecosystem services provided by watersheds, e.g. carbon sequestration, hydrological functions, biodiversity and landscape beauty.

Upadhyaya outlined the conservation activities undertaken during the project — reforestation of the terraces along slopes and tree planting in agricultural land. In his analysis, he showed that land use had decreased between 1978 and 2001. During this period, the area under forest has increased. The increase in forest cover was accompanied by a decrease in sedimentation.

While addressing the issue of the valuation of ecosystem services, Upadhyaya pointed out that increasing the volume of available water, leads to increased electricity generation with a knockdown economic effect. More revenue from electricity generation will result in higher royalties to be paid to central and district governments.

Emerging trends were touched upon, including the proliferation of CDM projects for biogas production and electric transportation, the prominence of the user pay principle, and the growing assertion of rights by local communities over natural resources. Upadhyaya also observed the inadequacy of existing scientific evidence, and the challenges posed by inadequate property rights, public sector ownership of hydropower plants, and the current political landscape.

### **Open Discussion**

The discussion centred on the importance of socio-economic and institutional conditions in developing CES schemes.

## **9. Session 2.3**

*This session examined the RUPES experience in Southeast Asia, and the CES activities of the Centre for Environmental Education, India.*

**Beria Leimona** introduced the Rewarding Upland Poor for Environmental Services (RUPES) programme that aims to enhance rural livelihoods and reduce poverty for the upland poor while simultaneously protecting the environment. The programme has test sites in Nepal, Indonesia and the Philippines, with further interest in other parts of Asia, including India. RUPES investigates the various ecosystem services in their test sites, while assessing the benefits that accrue to the local community as a result of these services. The goal is to stop pollution and decrease deforestation, while establishing a baseline of acceptable behaviour and rewarding those efforts which exceed this minimum. The solution is to identify land management practices that maintain natural capital and benefit the community on the whole, in terms of landscape beauty, biodiversity, etc. The land uses promoted in each site differ, but include some aspect of community based forest management, shade grown coffee and rubber cropping. Each of these land uses can enhance certain environmental services, such as carbon sequestration and water provision. RUPES works as a negotiating body and also monitors agreements between various stakeholders (providers and the beneficiaries). RUPES tries to combine dominant ‘modeler’s ecological knowledge’ with the less popular but equally important ‘local ecological knowledge’. RUPES tries to categorize ‘value,’ ‘threat,’ ‘opportunity’ and ‘trust’ that arise from various land uses and interactions between providers and beneficiaries. Value is linked to natural capital, and threat is linked to human capital, in terms of agreements over what is allowed and what is not. Opportunity is linked to social

capital (bonding). Similarly, trust among stakeholders is linked with social capital and serves the important function of bridging any gaps that may exist.

**Ishwar Pujar** focused on the need for compensation to reach communities. He pointed out that ecosystems are unique and many local communities depend on ecosystem services. The project was initiated in districts of Andhra Pradesh, which were chosen because of their low levels of rainfall, high poverty rates, and the distress sale of livestock. The lack of fodder for the livestock was recognized as an important biodiversity and community welfare issue. The aim was to preserve various types of biodiversity which could be otherwise used as fodder. For this purpose, 40 acres of land were acquired from the local government for planting fodder species. A rapport was built up with the local community, to help establish their background in and perception of the issues, and to support community-based institutions to store and utilize the fodder during the dry season. The programme was successful in reducing the negative effects of drought on livestock. Another measure of success for the programme was the creation of 2840 days of work for the local communities. The various CES opportunities identified in the presentation were leasing of the ecosystem for fodder production and biodiversity conservation, under the guidance of local communities. The communities can evolve self-regulating mechanisms to establish tradable rights and regulations.

### **Open Discussion**

The general discussion raised some fundamental issues. Firstly, compensation should be given to those whose property rights are taken away like in the cases of pollution etc. However, to help communities to maintain ecosystem, there should be proper institutions in place. If communities are able to do the job, then they should be allowed to continue and compensation should not be ‘imposed’ on them. The gist of the argument was that if communities have to substitute their current practices with an alternative use, then there is a need for compensation. However, if communities are required to maintain ecosystem then institutions rather than compensation have a role to play.

## **10. Workshop Closing**

Brent Swallow addressed delegates to express his appreciation for three days of productive sessions. He indicated that the project will incorporate the discussions and lessons into the upcoming Africa Regional Workshop, scheduled for 22-24 May 2006. Two weeks later, a Final Writeshop will bring together donor representatives from the IDRC with the seven institutional partners on the Global Scoping Study on CES to review the content and text for the project’s five issue papers. Following the writeshop, Drs Raju and Swallow will present the results of the scoping study to IDRC. With their comments, the nine project papers will be finalized – the conceptual framework (ICRAF Working Paper 32), 5 issue papers (ICRAF Working Papers 36, 37, 38, 39, 40) and 3 workshop reports (ICRAF Working Papers 33, 34, 35). By the end of the year, the issue papers will be ready for publication for an international audience. Due to the quality of the papers received, there is a strong inclination towards publishing a special issue in a journal, perhaps Ecological Economics.

On behalf of ICRAF, Dr Swallow thanked Drs KV Raju, S Puttaswamaiah and M Sekher, and the many others involved at ISEC for their excellent and tireless work in organizing and steering the workshop to a successful end. Before arriving he had no idea that the ISEC team

would embrace the project team so heartily, and he was overwhelmingly impressed with how they had. Swallow drew attention to the global interest in CES, and expressed his wish for future collaboration with ISEC on these issues.

Dr KV Raju, also on behalf of Drs S Puttaswamaiah, M Seker, L Babu and the rest of the ISEC team, responded by expressing his sincere thanks to ICRAF, Dr Brent Swallow and Rachel Rumley, and to the participants who joined the programme on such short notice.

# Appendix I

## Asia Regional Workshop on Compensation for Ecosystems Services 8-10 May 2006

### Programme Schedule

Day 1: 8 May 2006		
<b>Registration: 8.30am</b>		
<b>Inaugural Session: 9.30 - 10.30am</b>		
<i>Chairman: S L Rao</i>		
<i>Rapporteur: S Manasi</i>		
Welcome	Gopal K Kadekodi	
Opening Remarks	S L Rao	
Inaugural Address	His Excellency Shri T N Chaturvedi Governor of Karnataka	
Vote of Thanks	K V Raju	
<b>Tea Break: 10.30 - 10.45am</b>		
<b>Session 1.1: 10.45am - 1.00pm</b>		
<i>Chairman: A Damodaran</i>		
<i>Rapporteur: Madhushree Sekher</i>		
Brent Swallow	Pan-Tropical Scoping Study of Compensation for Ecosystem Services: Conceptual Foundations	10.45am
Pushpam Kumar	Millennium Assessment of Ecosystems Services	11.15am
Mohan Munasinghe	Integrating CES Considerations into Sustainable Development and Poverty Reduction Strategy – Analytical Framework and Case Study of Climate Change Response Policy in Sri Lanka	11.40am
Ashish Kothari	Summary of the National Biodiversity Strategy and Action Plan-India	12.05pm
Sri Balaji	CDM in India and its Contribution to Compensation for Ecosystem Services	12.30pm
Discussion		12.45pm
<b>Lunch Break: 1.00 - 1.45pm</b>		
<b>Session 1.2: 1.45 - 3.30pm</b>		
<i>Chairman: G S Sastry</i>		
<i>Rapporteur: K Lenin Babu</i>		
Srinivas Ravindra	Community based Energy Generation using Rice Husk Bio Mass – A Case Study	1.45pm
Paul P Appasamy	Compensation for the Loss of Ecological Services in the Noyyal Basin	2.10pm
Discussion		
<b>Photo Session: 3.30 - 3.45pm</b>		
<b>Tea Break: 3.45 - 4.00pm</b>		
<b>Session 1.3: Panel Discussion, 4.00 - 6.00pm</b>		
<i>Moderator: K V Raju</i>		
<i>Rapporteur: S Puttaswamaiah</i>		
<b>Panelists:</b>		
Gopal K Kadekodi	Paul P Appasamy	

Sharachchandra Lele	Yellappa Reddy A N	
Meine von Noordwijk	Ravindra A	
Ashish Kothari		
<b>Day 2: 9 May 2006</b>		
<b>Session 2.1: 8.30 - 10.30am</b>		
<i>Chairman: Mohan Munasinghe</i>		
<i>Rapporteur: Poulomi Bhattacharya</i>		
Pushpam Kumar	Payment for Ecosystem Services: Experiences and Lessons Learned	8.30am
R Parthasarathy and Vaishali Bhutani	Planning and Development of Forest Resources: An Assessment of Different Compensating Mechanisms of Forest	8.55am
MG Chandrakanta, MS Accavva, PG Chengappa and Mahadev G Bhat	Willingness-to-Pay for Preservation of Kodagu Devara Kadu	9.20am
Discussion		9.45am
<b>Tea Break: 10.30 - 10.45am</b>		
<b>Session 2.2: 10.45 - 1.00pm</b>		
<i>Chairman: R S Deshpande</i>		
<i>Rapporteur: K H Anantha</i>		
Madhu Verma, CVRS Vijay Kumar, Alind Shrivastava	Importance of Incentive-based Mechanisms for Watershed Protection Services for Improving Livelihoods – The Case of Palampur Catchment and Bhoj Wetlands	10.45am
Chetan Agarwal, Mamta Borgoyary, et.al.	Developing Incentive-based Mechanisms for Watershed Services and Improved Livelihoods: Lessons from the Field	11.15am
Shyam Upadhyaya	Compensating Upland Communities of Kulekhani Watershed for Ecosystem Services	11.45am
Discussion		12.15pm
<b>Lunch Break: 1.00 - 1.45pm</b>		
<b>Session 2.3: 1.45 - 3.30pm</b>		
<i>Chairman: Brent Swallow</i>		
<i>Rapporteur: Durba Biswas</i>		
Leimona and Meine Von Noordwijk	Rewarding Upland Poor for Environmental Services	1.45pm
Ishwar Pujar	Potential opportunities for “Compensating Ecosystem Services” in Southern India – A Case Study	2.15pm
Discussion		2.45pm
<b>Tea Break: 3.30 - 3.45pm</b>		
<b>Session 2.4: 3.45 - 5.30pm</b>		
<i>Chairman: M J Bhende</i>		
<i>Rapporteur: Geetanjoy Sahu</i>		
Sharachchandra Lele	Payments for Ecosystems Services: Conceptual and Empirical Issues in the Indian Context	3.45pm
R Gopichandran and Praveen Prakash	Resolving Conflicts and Facilitating Cooperation in Preventive Management of Large Scale Mobile Common Resource: Lessons from Montreal Protocol	4.10pm
Discussion		4.35pm



<b>Day 3: 10 May 2006</b>		
<b>Session 3.1: 8.30 - 10.30am</b> <i>Chairman: K N Ninan</i> <i>Rapporteur: K H Anantha</i>		
Usman Ifthikar	IP1: The Direct and Indirect Links Between CES and Poverty	8.30am
Meine van Noordwijk	IP2: Criteria and Indicators to Evaluate Potential of Pro-poor Mechanisms of CES	8.50am
Brent Swallow, Rachel Rumley, Roberto Porro & S. Puttaswamaiah	IP3: Under what conditions -poverty, environment, institution, and market – different CES Schemes will be effective?	9.10am
Madhushree Sekher	IP4: User Organisations and Compensation for Environment Services	9.30am
Brent Swallow	IP5: How Important will the Different Types of CES Mechanisms be in Shaping Environment Services and Poverty?	9.50am
Discussion		10.10am
<b>Tea Break: 10.45 - 11.00am</b>		
<b>Session 3.2: Research and Policy Issues Discussions, 11.00 - 1.00pm</b> <i>Rapporteur: Latha Nagesh</i>		
KV Raju	Vote of Thanks	

## Appendix II

### Asia Regional Workshop on Compensation for Ecosystems Services 8-10 May 2006

#### *List of Participants*

Sl. No.	Name and Address	Phone, Fax, E-mail
1.	His Excellency Shri T N Chaturvedi Governor of Karnataka Rajabhavana, Bangalore, India	
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## Appendix III

### Asia Regional Workshop on Compensation for Ecosystems Services 8-10 May 2006

#### *List of Papers Presented*

Sl. No.	Author	Title of the Paper
1	Brent Swallow	Pan-Tropical Scoping Study of Compensation for Ecosystem Services: Conceptual Foundations
2	Pushpam Kumar	Millennium Assessment of Ecosystems Services
3	Mohan Munasinghe	Integrating CES Considerations into Sustainable Development and Poverty Reduction Strategy – Analytical Framework and Case Study of Climate Change Response Policy in Sri Lanka
4	Ashish Kothari	Summary of the National Biodiversity Strategy and Action Plan-India
5	Balaji	CDM in India and its Contribution to Compensation for Ecosystem Services
6	Srinivas Ravindra	Community based Energy Generation using Rice Husk Bio Mass – A Case Study
7	Paul P Appasamy	Compensation for the Loss of Ecological Services in the Noyyal Basin
8	Pushpam Kumar	Payment for Ecosystem Services: Experiences and Lessons Learned
9	Parthasarathy R and Vaishali Bhutani	Planning and Development of Forest Resources: An Assessment of Different Compensating Mechanisms of Forest
10	Chandrakanta M.G., M.S. Accavva, P.G. Chengappa and Mahadev G. Bhat	Willingness to Pay for Preservation of Kodagu Devara Kadu
11	Madhu Verma, CVRS Vijay Kumar, Alind Shrivastava	Importance of Incentive-based Mechanisms for Watershed Protection Services for Improving Livelihoods – A Case of Palampur Catchment and Bhoj Wetlands
12	Chetan Agarwal, Mamta Borgoyary, et.al.	Developing Incentive-based Mechanisms for Watershed Services and Improved Livelihoods: Learnings from the Field
13	Shyam Upadhyaya	Compensating Upland Communities of Kulekhani Watershed for Ecosystem Services
14	Leimona and Meine Von Noordwijk	Rewarding Upland Poor for Environmental Services
15	Ishwar Pujar	Potential opportunities for “Compensating Ecosystem Services” in Southern India – A Case Study
16	Sharachchandra Lele	Payments for Ecosystems Services: Conceptual and Empirical Issues in the Indian Context
17	Gopichandran R and Praveen Prakash	Resolving Conflicts and Facilitating Cooperation in Preventive Management of Large Scale Mobile Common Resource: Lessons from Montreal Protocol
18	Usman Ifthikar	IP1: The direct and Indirect links between CES and Poverty
19	Meine Von Noordwijk	IP2: Criteria and Indicators to Evaluate Potential of Pro-poor Mechanisms of CES
20	Brent Swallow, Rachel Rumley, Roberto Porro & S. Puttaswamaiah	IP3: Under what conditions -poverty, environment, institution, and market – different CES Schemes will be effective?
21	Madhushree Sekher	IP4: User Organisations and Compensation for Environment Services
22	Brent Swallow	IP5: How Important will the Different Types of CES Mechanisms be in Shaping Environment Services and Poverty?

## **Appendix IV**

### **Asia Regional Workshop on Compensation for Ecosystems Services**

*8-10 May 2006*

#### **List of Rapporteurs**

1. S. Manasi
2. Madhushree Sekher
3. K. Lenin Babu
4. S. Puttaswamaiah
5. Poulomi Bhattacharya
6. K.H. Anantha
7. Durba Biswas
8. Geetanjoy Sahu
9. K.H. Anantha
10. Latha Nagesh

## Appendix V

### Asia Regional Workshop on Compensation for Ecosystems Services

*May 8, 9 and 10, 2006*

#### Information of Panelists

Name of Panelists	Designation and Address
Gopal K. Kadekodi	Director, Institute for Social and Economic Change, Bangalore
Sharachchandra Lele	Coordinator, Centre for Interdisciplinary Studies in Environment and Development, Bangalore
Meine von Noordwijk	ICRAF Southeast Asia Regional Office Jl. CIFOR, Situ Gede Sindang Barang, Bogor 16680 P.O. Box 161, Bogor 16001, Indonesia
Ashish Kothari	Member, Kalpavriksh Co-Chair, IUCN Theme on Indigenous/Local Communities, Equity, and Protected Areas Apt. 5 Shree Dutta Krupa 908 Deccan Gymkhana Pune 411004, India
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K.V. Raju: Moderator	Professor and Head, Centre for Ecological Economics and Natural Resources, Institute for Social and Economic Change, Nagarabhavi Bangalore – 560 072, India



# ICRAF Working Papers

## 2005-2006

1. Agroforestry in the drylands of eastern Africa: a call to action
2. Biodiversity conservation through agroforestry: managing tree species diversity within a network of community-based, nongovernmental, governmental and research organizations in western Kenya.
3. Invasion of *prosopis juliflora* and local livelihoods: Case study from the Lake Baringo area of Kenya
4. Leadership for change in Farmers Organizations: Training report: Ridar Hotel, Kampala, 29th March to 2nd April 2005
5. Domestication des espèces agroforestières au Sahel : situation actuelle et perspectives
6. Relevé des données de biodiversité ligneuse: Manuel du projet biodiversité des parcs agroforestiers au Sahel
7. Improved Land Management in the Lake Victoria Basin: TransVic Project's Draft Report
8. Livelihood capital, strategies and outcomes in the Taita hills of Kenya
9. Les espèces ligneuses et leurs usages: Les préférences des paysans dans le Cercle de Ségou, au Mali
10. La biodiversité des espèces ligneuses: Diversité arborée et unités de gestion du terroir dans le Cercle de Ségou, au Mali
11. Bird diversity and land use on the slopes of Mt. Kilimanjaro and the adjacent plains, Tanzania
12. Water, women and local social organization in the Western Kenya Highlands
13. Highlights of ongoing research of the World Agroforestry Centre in Indonesia
14. Prospects of adoption of tree-based systems in a rural landscape and its likely impacts on carbon stocks and farmers' welfare: the FALLOW Model Application in Muara Sungkai, Lampung, Sumatra, in a 'Clean Development Mechanism' context
15. Equipping Integrated Natural Resource Managers for Healthy Agroforestry Landscapes.
16. Are they competing or compensating on farm? Status of indigenous and exotic tree species in a wide range of agro-ecological zones of Eastern and Central Kenya, surrounding Mt. Kenya.
17. Agro-biodiversity and CGIAR tree and forest science: approaches and examples from Sumatra
18. Improving land management in eastern and southern Africa: A review of policies.
19. Farm and Household Economic Study of Kecamatan Nanggung, Kabupaten Bogor, Indonesia: A Socio-economic base line study of Agroforestry Innovations and Livelihood Enhancement
20. Lessons from eastern Africa's unsustainable charcoal business.
21. Evolution of RELMA's approaches to land management: Lessons from two decades of research and development in eastern and southern Africa
22. Participatory watershed management: Lessons from RELMA's work with farmers in eastern Africa.
23. Strengthening farmers' organizations: The experience of RELMA and ULAMP.
24. Promoting rainwater harvesting in eastern and southern Africa.
25. The role of livestock in integrated land management.
26. Status of carbon sequestration projects in Africa: Potential benefits and challenges to scaling up.
27. Social and Environmental Trade-Offs in Tree Species Selection: A Methodology for Identifying Niche Incompatibilities in Agroforestry [Appears as AHI Working Paper no. 9]
28. Managing Trade-Offs in Agroforestry: From Conflict to Collaboration in Natural Resource Management. [Appears as AHI Working Paper no. 10]

29. Essai d'analyse de la prise en compte des systemes agroforestiers pa les legislations forestieres au Sahel: Cas du Burkina Faso, du Mali, du Niger et du Senegal.

## **2007**

30. Etat de la Recherche Agroforestière au Rwanda Etude bibliographique, période 1987-2003.
31. Science and Technological Innovations for Improving Soil fertility and Management in Africa.
32. Compensation and Rewards for Environmental Services in the Developing World: Framing Pan-Tropical Analysis and Comparison.
33. Report on the Latin American Regional Workshop on Compensation for Environmental Services and Poverty Alleviation in Latin America.
34. Asia Regional Workshop on Compensation for Ecosystems Services. A Component of the Global Scoping Study on Compensation for Ecosystem Services.
35. African Regional Workshop on Compensation for Ecosystem Services (CES)
36. Exploring the Inter-Linkages among and between Compensation and Rewards for Ecosystem Services (CRES) and Human Well-Being: CES Scoping Study Issue Paper no. 1.
37. Criteria And Indicators for Environmental Service Compensation and Reward Mechanisms: Realistic, Voluntary, Conditional and Pro-Poor: CES Scoping Study Issue Paper no. 2.
38. The Conditions for Effective Mechanisms of Compensation and Rewards for Environmental Services (CRES): CES Scoping Study Issue Paper no. 3.
39. Organization and Governance for Fostering Pro-poor Compensation for Environmental Services: CES Scoping Study Issue Paper no. 4
40. How important will different types of Compensation and Reward Mechanisms be in shaping poverty & ecosystem services across Africa, Asia & Latin America over the next two decades? CES Scoping Study Issue Paper no. 5.

## Who we are

The World Agroforestry Centre is the international leader in the science and practice of integrating 'working trees' on small farms and in rural landscapes. We have invigorated the ancient practice of growing trees on farms, using innovative science for development to transform lives and landscapes.

## Our vision

Our Vision is an 'Agroforestry Transformation' in the developing world resulting in a massive increase in the use of working trees on working landscapes by smallholder rural households that helps ensure security in food, nutrition, income, health, shelter and energy and a regenerated environment.

## Our mission

Our mission is to advance the science and practice of agroforestry to help realize an 'Agroforestry Transformation' throughout the developing world.

