1. Introduction

1.1 What this report is about and why it is important

In 1988, Applied Energy Services, Inc., a U.S. electrical power producer, invested US$2 million in a number of agroforestry projects in Guatemala to absorb the carbon dioxide emitted from a new 183 megawatt coal-fired power plant in Connecticut. In May 2000, Earth Sanctuaries Ltd. listed on the Australian stock market in an effort to transform the company’s growing biodiversity investments into working capital – 6,800 individuals paid A$12 million for shares. Surrounded by civil strife and violence, farming communities in the Guabas River watershed in Colombia have not been deterred from their efforts to negotiate deals with upstream landowners to adopt improved land management practices, including reforestation, to maintain dry-season flows. In the Langtang National Park of Nepal, frightened that rapid deforestation and degradation will undermine tourist interest, lodge operators in Syabrubensi village have agreed to pass on payments to local communities to protect over 170,000 hectares, including some of the best preserved silver fir and rhododendron forests in the country.

Hardly a week goes by without new stories, like those above, of innovative deals involving payments by beneficiaries for a range of forest environmental services. Each new tale adds to the growing evidence of a rapidly evolving environmental service sector. Yet, the ad hoc, sensationalist and often superficial nature of these stories leaves us with a hazy understanding of these markets. How common are payments for environmental services? What form do payment systems tend to take? How exactly do they evolve? What impacts do they have for human welfare? And do they benefit or harm poorer people?

Notwithstanding these uncertainties, such stories have been surprisingly successful in capturing the imagination of cash-strapped governments, non-governmental organisations (NGOs) and entrepreneurs keen to exploit new market opportunities. Yet, as market creation gains momentum, the lack of critical analysis is becoming more acute. Policy-makers are launching market development initiatives with little understanding of the risks they are taking. There is an urgent need for practical guidance.
In this report we take a tentative step forward through an analysis of 287 cases of emerging markets for four forest environmental services, including carbon sequestration, biodiversity conservation, watershed protection and landscape beauty. The paper seeks to achieve three objectives:

- to develop a **framework for analysis** which sets out the key questions which need to be addressed to develop our understanding of how markets evolve, how they differ, their benefits as well as their potential pitfalls;
- to apply this analytical framework to the review of environmental service markets to **provide an overview of the evidence** – a reference point for others considering how their experiences fit into the bigger picture; and
- to **draw out preliminary lessons** on market form, drivers, the process of market development, welfare impacts and constraints to inform policy-makers and to stimulate discussion. Particular attention is given to impacts for poorer households and tentative thoughts are put forward on how policy makers might promote more equitable markets.

### 1.2 Moving beyond the “government versus market” debate

Free market economists, generally suspicious of government solutions to environmental problems, eagerly trumpet the attractions of markets for forest environmental services. Government intervention, they argue, is too often characterised by overstaffed and inefficient bureaucracies, hampered by heavy information and coordination costs and vulnerable to rent seeking. Even where governments have the will and capacity to deliver efficient forest management, they often lack the means. In a world where public authorities are constrained by low budgets, imperfect information and low levels of motivation, free-market proponents argue that market solutions should be pursued wherever possible.

At the opposite end of the spectrum are those who have an inherent distrust of markets and fear a world where cooperative action and accountable systems of governance are marginalised to make way for the “invisible hand”. For these groups, the benefits provided by forests go far beyond those goods and services traded for financial gain. Not only do forests provide an array of non-marketed benefits, they are also critical in the livelihoods of poorer groups and provide an invaluable social safety net. Leaving decisions over production, investment and resource allocation to independent market actors is thought to jeopardise current and future welfare. These arguments resonate with economists who point to pervasive “market failures” in the forestry sector and the need for government intervention. Allowing the private sector free reign would, the argument goes, end in rapid forest depletion and welfare loss.

While debates between market proponents and detractors are interesting, their presentation of government and market systems for resource allocation as mutually exclusive is not very helpful. In reality, not only are markets and governments interdependent, they should also be seen in a broader context
which takes account of cooperative systems of governance and resource utilisation. Markets, for instance, depend critically on legal and judicial systems set up and monitored by governments, while the effectiveness of government intervention may often be improved through the creation of “internal markets”. Trust, social customs and informal enforcement mechanisms are also key ingredients underpinning the efficient functioning of trading systems. Equally, markets have been known to reinforce incentives for cooperative action. The key question is, thus, not whether we should promote markets instead of government intervention, but what is the optimal combination of market, hierarchical and cooperative systems for governing forest sector utilisation and management?

1.3 This study – key questions and methodology

Keeping the need for a more integrated understanding of government regulation and market mechanisms in mind, this paper seeks to explore how markets for forest environmental services are emerging, how they fit into their broader contexts and what they mean for welfare. The aim is to respond to demands for practical guidance in market creation.

Drawing on insights from New Institutional Economics the paper identifies six central questions to guide research:

- What form do markets take?
- Why do markets evolve?
- How do markets evolve?
- What does market development mean for human welfare?
- What do markets mean for poor people?
- What are the key constraints to market development?

The paper is based on a global review of empirical data on market development for carbon sequestration, biodiversity protection, landscape beauty and watershed protection undertaken between February 2000 and July 2001. Information was gathered from published and unpublished documents, internet searches, email and telephone interviews. In total, 287 cases have been covered from developed and developing countries all over the world. Figures 1 and 2 below provide a breakdown of these cases by service type and region.

As with any desk study, this review has been restricted in what it can achieve by the availability and quality of written material. Because material is limited in both detail and scope, the review does not seek to provide definitive answers to all the questions raised above. Rather, it attempts to develop a framework for analysis and preliminary insights.

For some this report may appear overly concerned with theoretical and conceptual issues and place excessive emphasis on the systematic application of the framework for analysis. We would argue, however, that the approach taken is necessary for such a new field of research. Not only do we hope to learn lessons in this review, but we also hope that the paper provides a baseline for future investigations.
Finally, it should be stressed that two economists have written this report. Despite our best efforts to avoid using language and preconceptions that non-economists might find hard to follow or accept, there are likely to be parts of the paper with which readers disagree. We do not seek to avoid debate, and very much hope that by provoking a reaction this paper will stimulate wider discussion.
1.4 Structure of this report

The report is structured as follows. In Section 2, following a brief review of the theory behind market failure, market creation and forests and poverty, we turn to practical issue of developing a framework for analysis. This framework guides the review of markets for biodiversity conservation, carbon sequestration, watershed protection and landscape beauty undertaken in Sections 3-6 respectively. In Section 7 attention is turned to the emergence of markets for bundled services, i.e. more than one service marketed together. Section 8 is split into two parts. The first part draws out lessons relating to market form, drivers and the process of market development. The second part focuses on how markets impact on poor communities and draws out tentative lessons for policy-makers interested in promoting pro-poor markets. To help those unfamiliar with market “jargon” and to guide readers with respect to unusual terminology used in this report, a Glossary is provided in Annex 1. Annex 2 lists the cases reviewed, broken down by environmental service.