The Potential For UK Portfolio Investors To Finance Sustainable Tropical Forestry

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* For reasons of space the appendices are not included in this report, but are available on request from the Environmental Economics Programme at IIED or from the IIED web site at http:/ /www.iied.org/enveco/.

Summary

Reason for study: Sustainable forestry, which aims to produce sustained yields of timber while simultaneously maintaining the environmental and social benefits of forests, is being promoted as an alternative to destructive land uses such as unregulated logging and unplanned conversion to agriculture of tropical forests. In part because of the newness of the concept of sustainable forestry, there has been little implementation to date. The availability of public sector funds from, developed countries that could be used to help implement sustainable forestry in developing countries is declining. However, private capital flows (portfolio investment and foreign direct investment) have been increasing rapidly. The objective of this study is to determine whether portfolio investment, a major component of private capital flows, is likely to fund sustainable forestry in tropical countries.

Approach: The approach of the study was to survey UK fund managers of emerging markets[1] and green/ethical[2] funds to establish investment preferences and requirements. This information was then compared to what is currently known about the structure and performance of sustainable forestry investments in the tropics and subtropics. Two sources provided information on financial returns. First, a review of the scientific and development literature was conducted to form a database on the profitability of both plantations and natural forest management. The literature review was then supplemented by a survey of existing certified forest products companies. However, because there are so few certified producers, and responding companies were unwilling to part with much commercially sensitive financial information, this study relies mainly on the results of the literature survey.

Findings: The commercial nature of the information sought, and the relative youth of sustainable forestry, meant that sample sizes were quite small for some aspects of this study. This is a general problem of studies in this field. Nevertheless, the findings are robust enough to come to the following conclusions:

- From the limited studies available, the financial returns from both industrial plantations and vertically integrated natural forest management companies appear to meet or exceed fund manager requirements. This conclusion is tentative as it is not clear that all case studies would meet all the criteria for sustainable forestry as defined by organisations such as the Forest Stewardship Council (FSC).

[1] The term "emerging market" can imply that a process of change is underway, with markets growing in size and sophistication, in contrast to markets that are small and stagnant. The term can also refer to any market in a developing economy, with the implication that all have the potential for development. The International Finance Corporation (IFC) follows the latter definition. Just as most low- and middle-income economies are considered to be developing, regardless of their particular stage of development, all stock markets in developing countries are considered to be emerging. IFC follows the World Bank criteria in classifying economies as low-income, middle-income, or high-income: low-income economies had a GNP per capita of $725 or less in 1994; middle-income economies had a GNP per capita of $726-$8,955 in 1994; high-income economies had a GNP per capita of$8,956 in 1994 (IFC 1996).

[2] Green/ethical investment objectives are to achieve long-term growth of capital, while avoiding investments in companies which generate significant turnover from: alcohol or tobacco; export of goods or services for military uses; supplying ozone depleting chemicals; testing of cosmetics or toiletries on animals; using intensive fanning methods; extracting or importing tropical hardwood; trade in prohibited pesticides; activities which significantly pollute waterways; of who have registered companies in a significant number of countries where certain human rights are violated.

- The major risk associated with investing in forest products companies, as perceived by fund managers, is the cyclical nature of commodity prices. Although fund managers perceive some reduction in investment risk due to the fact that a company has met the criteria for sustainable forestry, this is not sufficient for them to accept a lower return on their investment compared to investing in a conventional, non-certified forest products company. The most likely way that certification could address the concerns of investors is if it could be shown that certified forest products are less susceptible to price cycles than uncertified products.

- UK fund managers overwhelmingly prefer to invest in relatively large, publicly listed companies. The minimum market capitalisation to attract investment is $18Om for emerging markets funds, and $33m for green/ethical funds. Certified forestry companies, particularly those in developing countries, are generally small and under private ownership, and thus are not attractive to UK portfolio investors.

- The geographic location of an investment can be an important factor for UK fund managers. Green/ethical funds rarely invest outside of North America and Europe. Thus, they are unlikely to invest in tropical sustainable forestry companies under any conditions. Emerging market fund managers will invest in tropical and subtropical countries, but there are large differences in preference. Africa is the least favoured, and (at the time the survey was undertaken), South East Asia the most, with Latin America intermediate. Thus, the location of a sustainable forestry company would appear to have a significant bearing on its ability to attract investment from UK investors.

***Conclusions**:* The findings suggest that the greatest obstacles for sustainable tropical forestry companies to obtain investment from UK portfolio investors are their small size and the fact that they are not listed on a stock exchange. Perhaps the best way to overcome this problem is through the creation of a forestry fund, which would take on the ownership and management of many smaller companies, but would be large enough itself to be publicly listed. Until this or some other appropriate action is taken, it seems unlikely that significant investments in sustainable tropical forestry will be made by UK fund managers.

I. Introduction

In recent years there has been increasing concern over the loss of forest cover in the world, particularly in tropical areas. The extent and causes of such deforestation can vary from region to region and there are differences in opinion as to the relative importance of factors such as agricultural expansion, subsidies to commercial agriculture, population growth and commercial logging. Nevertheless, a number of observers have identified unregulated or poorly regulated logging as a significant cause of tropical forest loss and degradation (Rudel and Roper 1996). Harvest rates typically exceed those associated with sustained yield of timber, and little effort is made to reduce damage to the residual stand during logging. Over-harvesting can deplete the value of the forest for timber production, and conversion to other land uses may result.

In response to concerns over the impacts of unregulated logging and the role that it plays in deforestation, national and international guidelines have been developed to promote the sustainable management of tropical and temperate forests (Nussbaum *et al* 1996). These guidelines call for restricting harvests to levels that will permit indefinite harvests of timber (i.e., sustained yields) and, to varying degrees, they call for additional measures ensuring that environmental and social benefits provided by forests are maintained. These measures may reduce the short term profitability of sustainable forestry compared to conventional logging, though the extent to which this is true is not well understood. A variety of national standards has been developed, but the only international standards are those of the Forest Stewardship Council (FSC). Forest products companies in tropical countries can apply to third party certifying organisations that have been accredited by the FSC to assess their compliance with FSC guidelines. To date, a relatively small area of forests worldwide has been certified as practising sustainable forestry (approximately 10 million hectares, as of August 1998), and a high proportion is in temperate countries (FSC 1998).

Both environmentalists and governments would like to see the private sector become more involved in financing sustainable tropical forestry. This is because private capital flows to developing countries have been rapidly outpacing public sector financing such as overseas development assistance. Official flows have been declining in real terms such that by 1996 they accounted for less than 15% of aggregate net resource flows to developing countries compared with almost 70% ten years earlier. Over the same period private capital flows grew from some US$25 billion to nearly US$244 billion (World Bank 1997). Flows of portfolio investment (bond and equity) from North to South have grown particularly rapidly, and in some years have exceeded foreign direct investment in emerging markets. Institutional investors such as pension funds, mutual funds and insurance companies represent an increasingly important proportion of these flows. The hope is that if private capital flows can be used to fund sustainable forestry, the high rates of tropical forest loss and degradation will be countered.

The purpose of this study is to determine whether UK portfolio investors are likely to fund tropical sustainable forestry .This study focuses on two groups of investors: green and ethical fund managers; and emerging market fund managers. Green/ethical fund managers are included because it was considered that they would be most interested in making investments with potential environmental and social benefits. Emerging market fund managers are included because, of all types of investors, they have the greatest proportion of their investments in subtropical and tropical countries.

The approach taken by the study is to evaluate the investment preferences of these two groups of fund managers, and then to determine whether sustainable tropical timber producers are likely to meet their investment criteria. Although many factors may influence investor preference, this study concentrates on basic project attributes such as rates of return, levels of risk, and market capitalisation.

Specifically, the questions addressed by this study are:

(1) Do the financial returns from tropical sustainable forestry meet fund manager requirements ?

Establishing whether the financial rates of return available from tropical forestry meet the requirements of UK portfolio investors is a logical starting point for this study. If rates of return requirements cannot be met, then the probability of any significant amounts of capital flowing into sustainable forestry is low. We attempted to answer this question by conducting a questionnaire survey to identify fund manager requirements for minimum rates of return, and compared these to estimates of the rates of return available from plantation forestry and natural forest management in the tropics. Ideally, the financial performance of sustainable forestry would be available from historic price information of publicly listed companies. As there are few listed certified forestry companies, in this study we rely primarily on a review of the scientific and development studies to summarise what has been documented about the profitability of these enterprises. A questionnaire survey of the few certified companies was also undertaken to supplement the database.

(2) Are the risks associated with sustainable forestry investments acceptable to fund managers?

Investment decisions are based not only on the projected financial return, but also on the perceived level of risk associated with the investment. Investors expect to be compensated with higher returns from higher risk ventures, and conversely, are generally willing to accept lower returns from lower risk investments. While the reduced harvests and increased management costs of sustainable forestry operations might reduce profitability, this might be compensated for by a reduction in the level of certain risks (e.g., disease, fire, eliminating the need to find and acquire new productive forest areas) and by price premiums and better and more stable market access for products derived from certified forests. Theoretically, the risks of different companies/sectors could be compared quantitatively by using beta coefficients[3] and the capital assets pricing model. But the infancy of the sustainable forestry sector means that these formal methods of assessing risk are unavailable at present, as the data do not exist to apply them. We did, however, collect qualitative information on the perception of the relative risks of certified versus uncertified forest products companies by asking institutional investors whether they perceived a lower (or higher) level of risk to be associated with sustainable forestry versus conventional forestry, and whether they would accept a correspondingly lower (or higher) rate of return.

[3] The beta coefficient measures the price movement of shares, bonds and other securities in relation to that of the overall stock market.

(3) ***What type of in vestment vehicles/structures are preferred by fund managers?***

Companies can have various types of ownership, and this may affect their ability to attract investment. Companies may be privately owned, publicly listed, or subsidiaries of larger companies. Financing will generally consist of different combinations of debt and equity .We consider how sustainable forestry companies could be structured to maximise their attractiveness to emerging markets and green/ethical fund managers through a questionnaire survey of this investment community. We also compare investor preferences with the current ownership structure of the certified forestry companies to see how conducive the current ownership structure is to portfolio investment.

(4) Are there additional investment requirements?

In the case that UK fund managers prefer to invest in listed companies over private companies, it is important to determine which additional screening criteria are applied to investment decisions, particularly with regard to market capitalisation. We asked fund managers for the minimum market capitalisation of a company that would be required for investment purposes, with the intention of comparing this figure with the market capitalisation of existing certified forestry companies or some other indicator of their size.

(5) Are there certain geographical regions where investors are most likely to invest?
Because tropical countries differ in their forest asset values and productivity, and also in important economic attributes, the attractiveness of a sustainable forest products company to investors is likely to be influenced by the country in which it is located. Therefore, the final question that we attempt to answer is whether UK fund managers have preferences with regard to the countries and regions where they invest, irrespective of the financial returns available. Fund managers were asked which of the 13 tropical countries, selected on the basis of their current importance as timber producers and their representation in the literature survey, they would consider investing in. We also compare geographic investment preferences of the fund managers to the locations of existing certified companies.

The data sources and the techniques used to examine these questions are described in detail in the Methodology section below. Major study findings are presented in the Results section, with supporting information included as Appendices[4]. The paper concludes with the answers to the five focal questions.

II Methodology

The three main data sources and techniques used to collect information for this study are:

Questionnaire survey of certified timber producers

A questionnaire survey of sustainable timber producers was conducted to collect information on ownership structure, company size, and financial returns. The survey was limited to those companies that had been certified by an FSC-accredited organisation, because FSC has the

[4] For reasons of space the appendices are not included in this report but are available from the IIED web site at http:/www.iied.org/enveco, or on request from the Environmental Economics Programme at IIED.

greatest market acceptance of the various certification initiatives, and is the only international forestry certification initiative. The FSC~ Working Group provided a list of 54 forestry operations that had been certified globally as of March 1997. A summary of the geographic distribution and size of certified timber producers is shown in Table I. Twenty-three of these companies are located in temperate regions (North America and Europe), with the remaining 31 in sub-tropical and tropical countries. Although the focus of this study is the tropics and subtropics, we included the temperate producers in the questionnaire survey as well because certified producers are so few.

Table 1: Geographic distribution and characteristics of all forestry operations certified by FSC-accredited organisations, as of March 1997. The number and location of respondents of this study are also shown.

Region	No. of Operations	No. participating in survey	Total Certified Area (ha)	% of total	Median Forest area (ha)	Minimum Forest Area (ha)	Maximum Forest Area (ha)
UK and Europe	1	4	1,928, 142	66.2	254	0.2	635, 000
Asia	4	1	12, 977	0.5	3, 625	251.0	5, 476
Pacific Island	14	1	16, 796	0.6	200	30.0	12, 500
CS America	7	1	252, 040	8.7	25, 000	1,734.0	86, 215
USA and Canada	12	3	620, 906	21.3	4, 179	3.6	364, 000
Africa	6	2	83, 632	2.9	2, 979	300.0	51,922

Questionnaires were sent to all but nine of the certified forest products companies (see Appendix 1). The nine companies were excluded from the survey because they were so small that they could not be of interest to fund managers. For those companies that received questionnaires, if no response had been received after three weeks, they were reminded to complete the questionnaire and return it, or given the opportunity to complete it by telephone.

The survey requested information on the following topics:

Suitability for listing: Information on the type, ownership structure, size, and financing arrangements was requested, to assist in determining whether the companies would be of a size and structure that would qualify them for listing on a stock exchange.

Risk-return profiles: Respondents were asked to provide financial information (e.g., Internal Rates of Return, Net Present Value, cash flows) from which financial returns could be measured. Information on beta coefficients was requested so that a risk-return profile for listed certified forest products operations could be constructed.

Impacts of certification on company profitability: Respondents were asked to provide information on the costs of certification (direct costs of being certified, and indirect costs of compliance) as a percentage of normal operating costs, and whether they received price premiums for their certified products (and if so, of what magnitude). Respondents were asked to provide basic information on the contribution of earnings from certified forestry operations to overall company earnings.

It is worth emphasising that response rates to the questionnaire were low, and even in those cases where companies did respond, they generally failed to provide most of the requested information. Many smaller companies simply did not collect the type of information sought, while the larger companies may have had it, but did not wish to disclose it because of its commercial sensitivity.

Literature survey on tropical forestry operations

A review of the scientific and development literature on the financial returns from natural forest management and plantation forestry forms the basis for the majority of our conclusions about the potential financial returns from sustainable forestry .Most of the studies available are not specifically of sustainable forest management systems as defined by the various initiatives such as the FSC, but the systems analysed are designed, at a minimum, to attain sustained yields of timber.

As well as noting the financial performance of the forestry enterprise, we also recorded the general characteristics, and information on attributes that relate to sustainability:

(i) Location and characteristics of production forest: including geographic location, and type and size of forest standing crop and productivity .This information was recorded in order to characterise the studies with regard to forest type and geographic location.

(ii) Characteristics of management system: including re-entry period, harvest intensity, and additional silvicultural practices such as thinning and enrichment planting. These attributes define the intensity of management, and determine the degree to which a managed forest will retain structural and compositional characteristics of unlogged forest.

(iii) Environmental and social impacts of the management system: including, for natural forest management, measures such as reduction in primary forest biomass and area of forest allocated to protected reserves, and, for plantation operations, the number and type of commercial species. These are areas where the FSC guidelines for sustainable forestry differ most strongly from traditional management.

(iv) Financial Performance; Because the goal of these studies was usually to rank the economic performance of alternative land use projects, the financial metrics given were typically standard costs benefit analysis measures, such as Net Present Value (NpV)[5] and Internal Rate of Return (IRR)[6]. Plantation studies typically reported both measures, while natural forest management projects usually gave NPV only. NPV figures have been standardised to per hectare values and 1996 US dollars.

Questionnaire survey of the investment community

UK fund managers -mainly in the City of London -were surveyed for criteria used in their investment decision-making processes, for past experiences and current interest in investing in the forest products sector, and for information on their attitudes towards the environmental and social aspects of their investments. The survey questionnaire is included as Appendix 2.

[5] The value of the net benefits ~f a project over its estimated life discounted at an appropriate interest rate

[6]The discount rate which when applied to the cash flow of a project gives a Net Present Value of zero.

The managers of two types of funds were included in the study. Emerging markets fund managers were included as they are the most likely to invest in tropical regions of interest to this study. Green/ethical fund managers were also included as it was expected that they would be the most sympathetic to the non-financial objectives of sustainable forestry operations (e.g., biodiversity conservation, or maximisation of social benefits).

The purpose of the survey was to collect information on:

The main characteristics of the funds and investment criteria: Fund managers were asked for information on investment objectives, investment vehicles, investment restrictions, methods of investment analysis, methods for risk measurement or assessment, and fund performance over the past five years.

Risks and returns: Fund managers were asked for information on minimum required rates of returns, and whether this differed among countries. Fund managers were also asked whether any quantitative measures of risks were used (e.g., Capital Assets Pricing Model) when making their investment decisions. In addition, they were asked to provide any qualitative assessment of risks pertaining to tropical forest products companies.

Attitudes towards forest sector investments: Fund managers were questioned on their motivations for buying and selling forestry investments, and on the financial returns realised from these investments. They were also asked whether and why they would be interested in making any future investments in the forest products sector.

Environmental and social impacts of forest management practices: Fund managers were asked whether they thought that reductions in the environmental and social impacts of forestry companies would affect investment risk, and whether there would be any corresponding change in the minimum return they would require. They were also asked whether (i) their clients had expressed concern over the social or environmental impacts of a fund's investments, (ii) whether they expected the level of client interest to change in the future, and (iii) if so, what factors were driving this change.

III Results

This section presents the main findings from the literature review and the two questionnaire surveys. The integration of this information to assess the suitability of sustainable forestry investments for UK institutional investors is carried out in the discussion.

Certified Forestry Company Survey Results

Sample size: Twenty-two of the 45 certified companies contacted either did not wish to participate in the study, or were unable to provide relevant information. Reasons given for not participating included company policy not to disclose financial information, and lack of time to complete the questionnaire. Of the 23 companies that agreed to participate, only 15 ultimately returned questionnaires, and not all respondents answered all questions. The sample size is given below for those questions where not all 15 respondents provided answers.

General characteristics: The majority of the responding certified forestry companies are private companies. Only one of the 15 responding certified forestry companies is publicly listed (Table 2).

Table 2: Ownership type of the 15 certified forestry companies participating in the study.

Type of Ownership	Number
Publicly Listed plc	1
OTC plc	1
Private	5
Subsidiary	4
Charitable Trust	3
Community Owned	1

Financial information: On average, the certified companies that responded derive approximately half of their revenue from certified forests (range 0-100 %, n=11), with the remainder coming from uncertified forests, other commodities such as tea or rubber, or alternative investments. Companies provided little further financial information, either concerning rates of return, or beta coefficients as measures of the volatility of returns.

Impact of certification on company profitability: Ten of 13 certified forestry companies responding stated that the cost of implementing sustainable forestry was higher than conventional forestry , while the remaining three companies said that the certification process had not resulted in any increase in operating costs. Seven of the ten companies claiming higher operating costs provided estimates. The median increase was 12.5% (min=3%, max=74%). These estimates are likely to be an underestimate of the costs to the industry as a whole to shift to sustainable forestry, because companies that were already carrying out best practice forestry were probably the first to apply for certification.

Half of the companies (five of ten respondents) indicated that they received price premiums for their products, with a median value of 5% (min=5%, max=15%). Five companies said that they did not receive price premiums, though their products had better market access as a result of certification. Again, the results of the survey may not be representative of the industry as a whole, as some of the certified companies are tied very closely to individual buyers, who in some cases have even helped pay for the certification.

Literature Review Results

Information was found on financial returns from 35 natural forest management and 37 plantation management systems (note that the actual number of studies was less, as some studies provided returns from several alternative management systems applied to the same production forest). For both natural forest management and plantations, the greatest number of studies was available for South America. The remainder of the studies were fairly evenly distributed among Central America, Africa, and South East Asia. For both natural forest management and plantation systems, the majority of studies were simulations or projections, rather than documentation of actual returns from operational forestry companies. The most

relevant findings from the database are presented below, and the database description is given in Appendix 3.

Natural Forest Management

Description: Average values for forest and management characteristics of natural forest management studies are shown in Table 3. These operations on average are 50,000 hectares in size (n=18), cut 18 timber species (n=22), have a re-entry period of31 years (n=27), with each harvest removing about 29 cubic metres of timber per hectare (n=28).

Table 3: Management characteristics of NFM studies in database.

	n	Average	Minimum	Maximum
Size of concession (ha)	18	50,000	800	150,000
Standing volume of forest (m^3/ha)	22	82	28	250
Number of species harvested		18	1	60
Harvest rate (m /ha)	28	29	3	240
Re-entry period (years)	27	31	5	100
Growth rate (m /ha/yr.)	19	2.4	0.4	7.0

Sixteen studies provide financial information of direct relevance to this study, and these are shown in Table 4. Of the 16 studies, two describe community forest projects, two describe forestry carried out on large privately owned forests by landowners, and the remaining 12 studies describe commercial operations on public land. The majority of these studies describe management plans designed to attain sustained timber yields. Three studies clearly go further than sustained yield and meet sustainable forestry guidelines (Barreto *et a11998,* Kishor and Constantino 1993, Richards 1991), while four studies describe unregulated (unsustainable) logging in various Amazonian countries (Pinedo-Vasquez *et al* 1992, Rice and Howard unpublished, Uhl *et a11991,* Verissimo *et aI1995).* The remainder consider sustained yield management. How far these sustained yield management plans are from meeting all the criteria for sustainable forestry is not entirely clear.

Financial returns: The most common measure of profitability used in the studies was NPV, calculated for a range of discount rates, typically spanning from 5% to 20% or more. A number of studies use an annual profit margin indicator (net revenues as a percentage of costs, the latter treated with varying degrees of comprehensiveness). One study (Richards 1991) uses return on capital, defined as net revenue as a percentage of land value plus the value of the capital equipment inventory .The IRR, which is more useful for comparing with fund manager requirements of minimum rates of return, was almost never reported in these studies. However, the discount rate at which NPV is positive and closest to zero can be used to provide a lower bound for IRR. In general, NPV s were still positive and large for the highest discount rates used in the studies, so in this respect the figures given represent conservative estimates of IRRs. However, comparisons of these rates with fund manager requirements need to be made with caution as it is not clear that all taxes, subsidies and payments for concessions that affect the financial return from forestry operations have been included. For example, none of the studies make any reference to deduction of taxes on company profits. In this respect the rates of return indicated by the studies could be an overestimate of the potential returns to private investors.

Of the studies that meet sustained yield objectives, four describe the returns from extraction only (Howard and Valerio 1996, Kumari 1996, Laarman *et at* 1995, Peters *et at.* 1989). These range from 5*% -12*% (Note: * denotes lower bound on IRR provided by highest discount rate with positive NPV). Note the actual IRRs may be considerably higher than these figures because NPV s were generally quite large at these discount rates. Another four studies show the returns of vertically integrated firms (extraction plus processing), and these provide returns from 10*% to 25*%. The three cases of sustainable forestry provide returns comparable to those of sustained yields with IRRs of 20*%, 35*%, and ROCs of 14-15%. The studies examining unregulated logging show that it is the most profitable, with annual returns or profit margins ranging from 14% to 254%.

Table 4: Financial performance of natural forest management case studies. Information includes: reference of study (full details at end of manuscript); scale of operation (community forestry/large private holding/commercial); time horizon of financial calculations; whether it is explicit that taxes or royalties on timber harvest have been paid; terms of concession or cutting rights; whether the study was of an extraction and/or processing operation; whether the study was of unregulated, sustained yield, or sustainable forestry; and financial returns (IRR/NPV/ARI). Note that where IRRs were not given the NPV for the largest discount rate is given instead. In these cases the discount rate used provides a lower bound for the IRR.

Source	Country	Scale	Time Horizon (years)	Taxes/Royalties Paid?	Concession Purchase	Type of Logging	Level of Integration	Profitability
Barreto *et al.* 1998	Brazil	Commercial	20-30	NA	Market value from private owners	Sustainable	Extraction	Discount Rate=20% NPV=$430/ha
Barros & Uhl	Brazil	Commercial	20	NA	Cubic meters charge from loggers	NA	Processing	IRR 14-62% depends on transport costs
Howard & Valerio 1996	Costa Rica	Large Private	80	?	?	Sustained Yield	Extraction	Discount Rate=10% NPV=977-1395 $/ha
Howard *et al.* 1996	Bolivia	Commercial	50	Paid	No	Sustained Yield	Extraction and Processing	Discount Rate=25% NPV=92-304 $/ha[1]
Kishor & Constantino. 1993	Costa Rica	Large Private	100	Paid	Private Forest	Sustainable	Extraction and Processing	Discount Rate=35% NPV=1364 $/ha
Kollert, Uebelhor & Kleine. 1995.	Malaysia	Commercial	10	Paid	Paid	Sustained Yield	Extraction and Processing	>25% annual return on investment
Kumari. 1996.	Malaysia	Commercial	100	Paid	Paid	Sustained Yield	Extraction	Discount Rate=8% NPV=510-944 $/ha[2]
Laarman *et al.*1995.	Philippines	Community	25	?	Community Forests	Sustained Yield	Extraction	Discount Rate=12% NPV=638 $/ha
Mendoza & Ayemou. 1992	Ivory Coast	Commerical	50	Paid	?	Sustained Yield	Extraction and Processing	Discount Rate=10% NPV=160 $/ha[3]
Peters *et al.* 1989	Peru	Commercial	Perpetuity	?	?	Sustained Yield	Extraction	Discount Rate=5% NPV=933 $/ha
Pinedo-Vasques *et al.* 1992.	Peru	Commercial	NA	Paid	Community Forest	Clear felling Conversion	Extraction	254% annual return on investment
Rice & Howard, A. unpublished.	Bolivia	Commercial	NA	Paid	?	Unregulated	Extraction and Processing	45-100% annual return on investment[4]
Richards. 1991.	Mexico	Community	25	?	Community Forest	Sustainable Forestry[5]	Extraction and Processing	14-15% annual return on capital[6]
Uhl *et al.* 1991.	Brazil	Commercial	NA	?	Per tree from private owners	Single selective logging preceding conversion[7]	Extraction	95.7% annual return on investment
Verissimo *et al.* 1995	Brazil	Commercial	NA	Paid	Cubic metre charge from land owners	Unregulated single selective logging	Extraction and Processing	Annual profit of 27-28%
Verissimo *et al.* 1992	Brazil	Commercial	20	?	Management costs	Sustained Yield	Extraction and Processing	25% annual return on investment

Notes:[1] Depends on intensity of silvicultural treatments
[2] Depends on steps taken to reduce damage to residual sand
[3] These figures are based on combined profitability of six concessions for the constant harvest scenario
[4] Profitability depends on volume at mill, which in turn depends on weather. Factored in 35% as "normal" profits, plus additional 10-65% windfall profits
[5] Includes harvest of non-timber forest products
[6] Land valued at market rates
[7] Note that sufficient volume remained for additional harvests

Plantation Forestry

Description: In the case of plantations, there is far less distinction between good and bad management compared to natural forest management. None of the plantation case studies is of sustainable forestry, but all management plans are capable of meeting sustained yield objectives. Characteristics of the plantations included in the database are shown in Table 5. These operations are on average about 10,000 hectares in size, are planted with a single exotic species, and harvest approximately 320 cubic metres per hectare every 25 years. The difference in productivity between natural forests and plantations is clear; the plantations included in this study show growth and yields 10 to 15 times higher than natural forests. This increase in productivity is achieved by reducing the structural and compositional diversity of the forests, thus reducing their ability to provide environmental and social benefits.

Table 5: Management characteristics of plantation studies in database.

	n	Average	Minimum	Maximum
Size of plantation (ha)	9	10,500	10	37,300
Volume of plantation at harvest (m /ha)	27	319	64	703
Harvest rate (m /ha)	23	308	22	703
Re-entry period (years)	35	25	5	80
Growth rate (m /ha/yr)	24	15	4	27
Additional silvicultural treatments (proportion of studies)	37%	49%	-	-

In the majority of cases, primary forests were not cleared for the establishment of plantations. This is one of the most controversial aspects of plantations and most of the existing sustainable forest management guidelines discourage or exclude plantations based on conversion of natural forest. In this respect the available studies can be considered representative of well-managed or sustainable forest management. However, natural regeneration of indigenous species was permitted only in a minority of cases; and, as was noted previously, few plantations used indigenous species, or planted more than a single species. The implications of this are not clear as there is little consensus about the environmental impacts of using single species or exotic species and such impacts tend to be rather site-dependent. They may also be offset by other factors such as good management and harvesting practices and active promotion of biodiversity, through maintenance of areas of indigenous vegetation.

Social criteria, for example the impact on local communities, are an important element of sustainable forest management and are particularly relevant to plantations. However, the studies do not address these types of characteristic.

Table 6: Financial returns of plantation case studies. Information includes: reference of study (full details at end of manuscript); scale of operation (smallholder, community, or industrial); time horizon of financial analysis; whether any taxes or royalties are explicitly paid; ownership and/or payment for plantation land; whether management plan meets sustainable forestry or sustained yield objectives; whether the analysis includes production and/or processing revenue; and measures of profitability (IRR and NPV).

Source	Country	Scale	Time Horizon (years)	Taxes/ Royalties Paid?	Concession Purchase	Type of Logging	Level of Integration	Profitability
Scherr, 1995.	Costa Rica	Small-holder	20	?	Private	Sustained Yield	Production	IRR=19.7
Current *et al1995.*	Costa Rica	Small-holder	13	?	Private	Sustained Yield	Production	IRR=27.1
Vieto Morales 1995.	Nicaragua	Small-holder	5	?	Private	Sustained Yield	Production	IRR=69.8
FAO. 1979. Case Study 1	Philippines	Small-holder	20	?	Private	Sustained Yield	Production	IRR=39.4%
FAO. 1979. Case Study 6	Zambia	Industrial	5	Yes	Govt. Project on Natl forests	Sustained Yield	Production and processing	IRR=10.5% on production, IRR=15.6% on processing
FAO. 1985.	Bangladesh	Industrial	5	Yes	Forest Dept on own land	Sustained Yield	Production	IRR=17.1% (11% with land at market value)
Gomez Otalora. 1973	Colombia	Industrial	15	?	Private	Sustained Yield	Production	IRR=26.5%
Gomez Otalora. 1973	Colombia	Industrial	10	?	Private	Sustained Yield	Production	IRR=39%
Gomez Otalora. 1973	Colombia	Industrial	22	?	Private	Sustained Yield	Production	IRR=18.9%
ITTO. 1994								
Kishor, N. M and Constantino, L. F.. 1993.	Costa Rica	Industrial	30	Yes	Private	Sustained Yield	Production	Discount Rate=35%, NPV=$754/ha
Kollert, W., Zuhaidi, A., Weinland, G. 1994	Malaysia	Industrial	50	?	Degraded Land – No Value	Sustained Yield	Production	IRR=6.3%[7]
Laarman 1983.	Panama	Industrial	20	?	Degraded - No Value	Sustained Yield	Production	Discount Rate=10% NPV=517 $/ha Discount Rate=15% NPV=-143 $/ha
Lowe, P.1986.	Zimbabwe	Small-holder	20	NA (own use)	Private	Sustained Yield	Production	IRR=22.7%
Osemeobo, G.J. 1991	Nigeria	Small-holder	8	Yes	Private	Sustained Yield	Production	IRR=8%
Russell, J. S. *et al. 1993*	Australia	Industrial	Infinity	?	Private	Sustained Yield	Production	Median IRR=7% for top 10 species reviewed
Sedjo, R. 1983.	Brazil	Industrial	Infinity	?	No	Sustained Yield	Production	IRR=17.5-23.5% (depends on species, location)
Sedjo, R. 1983.	Chile	Industrial	Infinity	?	No	Sustained Yield	Production	IRR=17.5%
Sedjo, R. 1983.	Gambia-Senegal	Industrial	Infinity	?	No	Sustained Yield	Production	IRR=14.7-17.5% (depends on species)
Sedjo, R. 1983.	Borneo	Industrial	Infinity	?	No	Sustained Yield	Production	IRR=14.7%
Tewari, D. D. 1996.	India	Community	50	NA	Government Forest	Sustainable Forestry	Production	IRR=38.6%

[7] Unusually low return because of long rotation time.

Financial returns: Twenty-one plantation systems are described in sufficient detail to provide relevant financial information (Table 6). One of these studies is of community forestry, five describe plantations in the context of smallholders, and the remaining 13 studies describe industrial plantations. In contrast to the natural forest management studies, most plantation studies provided the internal rate of return of the project. The single community forestry project had an IRR of 38.6%. The returns from smallholder plantation forestry ranged from 8% to 69.8%, and exceeded 18% in all but one case. The returns from industrial plantations ranged from 6% to 39%, with IRR exceeding 15% in nine of the 13 cases. Note that with a single exception, all studies covered the returns from production only. A vertically integrated firm that included processing would presumably have a higher rate of return.

The returns given in these studies can be considered indicative of well-managed plantations because they do not involve conversion of natural forests and because they imply sustained yield of timber. It is possible, though, that returns in practice would be slightly lower if active measures were taken to meet requirements of sustainable forest management guidelines. For example, one typical requirement is that plantation lands are shared with community or indigenous groups that have traditional rights, and this might be expected to reduce profitability if it means that a significant area of land is taken out of production. As with the natural forest management studies, there is considerable diversity in the plantation studies in the treatment of taxes, subsidies and certain types of cost, such as land and interest charges. Where land value is included it results in a significant reduction in the return from the plantation. Thus, the returns estimated in the studies are indicative of the potential returns to investors, but precise comparisons are not possible.

UK Fund Manager Survey Results

Background information

Sample size: 108 questionnaires were sent out: 89 to emerging market fund managers, of whom 37 responded; and 19 to green/ethical fund managers, of whom 13 responded. In most cases a single fund within an investment institution was targeted, except where institutions operated both emerging markets and green/ethical funds. Not all respondents answered all questions, and in those cases we include sample size below. In some cases background information from the questionnaires was supplemented from the marketing departments of the funds. Appendix 4 contains the remaining data obtained from the questionnaire, but not presented in this paper.

General characteristics of emerging markets funds: Twenty- five of the responding emerging markets fund managers managed money for unit trusts, 22 managed money for pension funds, and ten managed money for life (insurance) funds (n=36). The value of emerging markets funds ranged from $8.2m to $343m, with a median size of $64m.

General characteristics of green/ethical funds: Unit trusts were generally more important for this group of respondents. Eleven of the green/ethical representatives managed money for unit trusts, three managed money for pension funds, and two managed money for life funds (n =13). The value of green/ethical funds surveyed was generally considerably smaller than that of emerging market funds with several ranging from $7m to $30m but with one fund exceeding $1bn. The median size was $39m.

Investment vehicles: Listed equities comprise the main investment vehicle for both emerging markets funds (n=31), and green/ethical funds (n= 11) (Table 7).

Table 7: Percentage of green/ethical and emerging market fund managers that would invest in various types of investment vehicles.

Investment Vehicle	Emerging Market % (n=34)	Green/Ethical % (n=12)
Listed equities	100.0	90.9
OTC equities	10.8	27.3
Venture capital	2.7	9.1
Convertibles	35.1	36.4
Equity-linked	10.8	9.1
Straight bond issues	8.1	9.1
Warrants	8.1	18.2
Cash	0.0	9.1
Unlisted securities	16.2	27.3
Derivatives	2.7	0
Private equity (funds)	2.7	9.1

Approaches to investment management: Most emerging markets funds (n=35) are actively managed; only two are passively managed[8]. All responding green/ethical funds (n=13) are actively managed.

Investment restrictions

Geographical profile of investments: 70% of emerging markets fund managers invest in global emerging markets, while 16% of the funds specialise in the Far East/South East Asia, 8% specialise in Latin America, and 3% invest in Europe. Just over half of the 13 green/ethical fund managers who responded invest in the UK only, only four extend their coverage in principle to regions outside of Europe and North America, and of these only two are primarily focused on emerging markets.[9]

At the time of the questionnaire survey (July 1997) almost all emerging markets fund managers were willing to invest in companies operating in South East Asia[10], while on average a little less than half (42.6%) would invest in a Latin American country. Least desirable regions for investing were Africa and the Pacific Islands, with 11.1% and 5.6% of fund managers willing to invest respectively. There was variation as to where fund managers were willing to invest within geographic regions: in Latin America, for example, 77.8% of fund managers would invest in Brazil, but only 3.7% would consider making an investment in Surinam (Table 8). As expected from their geographical specialisation, only two of the responding ethical/green funds would consider investing outside of Europe and North America and would only consider investments in South East Asia (n=13).

[8] Passive funds track fund index composition and, presumably, performance. Active funds try to outperform the index.

[9] One focuses on global emerging markets, the other on the Far East/South East Asia.

[10] Note that current willingness to invest would presumably be much lower given recent currency and market devaluations.

Table 8: Restrictions on investment size and minimum market capitalisation for green and emerging market fund investments.

	Emerging Markets					Green/Ethical				
	n	med	mean	min	max	n	med	mean	min	max
Minimum holding (% of funds capital)	14	0.8	1.6	0.1	5.0	1	0.5			
Minimum holding ($million)	9	0.2	1.3	0.01	10.0	5	0.4	0.4	0.2	0.7
Maximum holding (% of funds capital)	28	5.0	7.1	1.5	10.0	10	7.5	6.9	2.0	10.0
Maximum holding ($million)	3	5.5	19.2	2.0	50.0	1	4.0			
Minimum market capitalisation of single company ($million)	15	100.0	180.0	10.0	500.0	6	33.0	33.1	16.5	50.0

Characteristics of investment holdings: On average, the maximum investment in a company as a percentage of a fund' s total capital was similar for both types of fund, at 7.1 % for emerging markets funds (n=28), and 6.9% for green/ethical funds (n=10). Some fund managers also provided the maximum size of an individual investment: for emerging markets fund managers this was, on average, $16.9m (n=3); for one green/ethical fund manager this was $4m (Table 9). On average, the minimum investment size as a percentage of a fund's capital in an individual company by emerging markets fund managers (n=14) was 1.6%, and for green/ethical funds (n=1) 0.5%. In dollar terms, on average, the minimum size of an investment for emerging markets funds (n=9) was $1.3m, and for green/ethical funds (n=5) somewhat lower at $0.4m.

Table 9: Investor willingness to invest in selected emerging market countries (emerging markets: n=27 fund managers; green/ethical: n=13 fund managers).

Region	Country	Emerging Markets		Green/ Ethical	
		Would invest (%)	Consider investing (%)	Would invest (%)	Consider investing (%)
South East Asia	***Malaysia***	100.0		15.4	
	Indonesia	88.9	3.7		
Pacific Islands	***Solomon Islands***	3.7			
	PNG	7.4			
Latin America	***Brazil***	77.8			
	Bolivia	29.6	3.7		
	Surinam	3.7	3.7		
	Colombia	55.6	3.7		
	Costa Rica	18.5			
	Peru	70.4	3.7		
Africa	***Nigeria***	7.4	3.7		
	Côte d'Ivoire	18.5	3.7		
	Gabon	7.4	3.7		
North America	***USA***	59.3	30.8	30.8	
Europe	***UK***	59.3		69.2	
	Sweden	70.6		38.5	

As well as maximum and minimum restrictions on the amount of an individual investment, most funds had lower limits on the market capitalisation of the companies that they would invest in. The average minimum market capitalisation for emerging markets fund managers (n=15) was $180m (range of $10m to $500m); for green/ethical fund managers (n=6) average minimum market capitalisation was considerably lower at $33m (range of$16.5m to $50m). This suggests that the minimum size requirements, whether in terms of market capitalisation or the amount invested, are lower for green/ethical funds.

Minimum required rates of return: many fund managers stated that they did not have a required rate of return but instead looked at other factors such as price earnings ratio and earnings growth. Some stressed that the required rate of return depended on the sector and market. For this reason the response rate for this question was rather low for both types of fund and particularly so for green/ethical funds. The minimum annual rates of return required by emerging markets fund managers (n=17) ranged from 10% to 50%, with a mean value of 17.5%. Two green/ethical fund managers responded to this question indicating minimum rates of return in the order of 10%.

With regard to geographic variation in required rates of return, most fund managers were reluctant to respond. The few who responded either felt that there would be no difference in required rates of return by region or that emerging markets would require some premium ranging from 4% to 6%. It should be borne in mind that these are not absolute requirements, and that the minimum required rate of return for individual investments will fluctuate with overall market performance.

Investment experience in the forestry sector

Past investments in the forestry sector: The majority (70.6%; n=34) of emerging markets fund managers had previously invested in forest products companies (mostly pulp and paper) (Table 10), with nine funds (27.3%) having invested in three or more companies. Most of these investments had been in Brazil and Indonesia (34.8% of respondents in each case), and Chile and Canada (21.7% of respondents in each case). Only one green/ethical fund manager (n=13) had invested in forestry and this had been in Europe.

Table 10: The number of past forestry investments made by green and emerging markets fund managers.

No. of past forestry investments	Emerging Markets	Green/Ethical
0	10	12
1	9	1
2	4	0
3	7	0
4 or more	2	0

Factors influencing investment in the forestry sector: Emerging markets and green/ethical fund managers displayed somewhat different attitudes towards investment in the forestry sector. For emerging markets fund managers, expectations about the price of forest products played an important role in the decision to invest. Those fund managers who had never invested in forestry cited as the main reasons the cyclicality of the commodity prices of forest products and, correspondingly, variable returns (Table 11). Some respondents cited a poor

understanding of the sector as a reason for never having invested, and a few said that they were not against the sector but they had not encountered attractive opportunities. Price movements were also cited as reasons for investing in the sector and also for divesting. Emerging markets fund managers' (n=17) main reasons for past forest sector investments were that the companies had looked undervalued, and/or that there had been expectations of an increase in forest products prices which would have a positive impact on earnings (Table 12). Similarly, the main reason given by such fund managers (three of eight respondents) for selling was an actual or expected decrease in commodity prices, which in turn would reduce annual rates of return from forestry investments.

Table 11: Reasons given by fund managers for avoiding forestry investments in the past.

Reason	Number of times cited	
	Green/Ethical (n=11)	Emerging Markets (n=6)
Lack of sector understanding/insufficient information/valuation problems	2	2
Low returns	4	1
High risk sector	2	1
Cyclicality & unsustainability of returns	2	4
Shortage of opportunities (companies small, illiquid, not quoted or marketable)	8	1
Do not invest in emerging markets	3	
Lack of sustainable forest products companies	4	
No opinion	2	2

For green/ethical fund managers, the primary reason for never having invested in the forest products sector was a lack of suitable opportunities (i.e., quoted or sufficiently liquid or not too small, or independently certified forestry companies) (Table 11). Approximately one-third of green/ethical fund managers also specified low returns as a reason for not investing in this sector. Three indicated poor knowledge of the sector as a factor discouraging investment in forestry.

Table 12: Reasons cited by emerging market fund managers for investing in forest products companies (17 fund managers responding, giving 24 reasons).

Reason for investing	Number of times cited
Cycle turning up/cycle timing	6
Looked cheap	6
Good company fundamentals	2
Expected good returns/good earnings potential	2
Owns land	1
Good share price performance	1
Expected to outperform benchmark	1
Liked (fundamentals of) sector	2
Stable returns	1
Expected high returns in short term only	1
Stable returns relative to stock market	1

Interest in investing in the forestry sector: 85% of emerging markets fund managers (n=33) said that they would be interested in investing in the forest products sector in the future. A similar percentage of green/ethical fund managers (n=13) indicated that they would be interested in investing in forestry , but for most of these, the companies would have to be certified, more liquid, and preferably based in the UK, Europe, or North America. Only one green/ethical fund manager categorically ruled out future forestry investments.

Forestry sector risk characteristics

Risks associated with investments in the forestry sector: Cyclicality of commodity prices was ranked by both emerging markets arid green/ethical fund managers as the most significant risk associated with investing in forest products companies (Table 13).

Table 13: Risks pertaining to investments in the forest products sector (emerging markets, 30 fund managers responding; green/ethical, II fund managers responding).

Risk Factor	Green/Ethical	Emerging Markets
	No. of times cited	No. of times cited
Cyclicality of commodity prices	20	7
Over capacity -supply/demand	7	3
Insufficient downstream integration	1	0
Currency/exchange rates (currency depreciation)	4	2
Political	2	2
Macroeconomic	6	3
Quality of management	11	3
Too much capital expenditure	2	0
Environmental laws	5	1
Limits to land ownership	1	1
No reforestation	1	1
Weather/climate/disease/quality of location	5	1
Growing time for trees	1	1
Land ownership	2	
Business risk	1	
Lack of forest products companies so difficult to compare	1	
Over leverage	2	
Cost of production	1	
Labour	1	
None specific to forest products companies	1	

Both types of fund manager also expressed concern over management quality , as well as over-capacity. Less commonly cited concerns included vulnerability to environmental regulations, macroeconomic factors such as currency risk, and environmental factors such as natural disasters and disease.

Impacts of certification on risks and returns: The consensus for both emerging markets and green/ethical fund managers was that a good rating on aspects of forest management as assessed by certification organisations would somewhat reduce investment risk (Table 14). However, 60 % of emerging markets fund managers (n=30) and 90.9% of green/ethical fund managers (n= 11) said that the reduction in risk alone would not be sufficient reason for them to accept a lower rate of return (Table 15).

Table 14: Perception of how the various aspects of certification would affect the risk of investing in a **forest products company (maximum of 26 emerging market fund managers, and** 8 **green/ethical fund managers, responding to question).**

	Perception of change in risk	Emerging Markets	Green/ Ethical
Environmental Impacts	**Increase**	1	1
	decrease	20	5
	don't know	0	1
	no change	5	1
Sustainability of Harvest	**increase**	3	0
	decrease	10	2
	don't know	0	3
	no change	11	3
Non-timber Forest Products	**increase**	1	0
	decrease	17	3
	don't know	1	1
	no change	6	4
Good Labour Relations	**increase**	2	0
	decrease	16	2
	don't know	1	2
	no change	7	4
Local Community/ Indigenous Relations	**increase**	1	0
	decrease	17	3
	don't know	0	0
	no change	8	3
Written Management Plan	**increase**	0	0
	Decrease	18	4
	don't know	1	0
	no change	7	3

Table 15: Change in minimum rate of return required if a **company is certified by an independent third party**

	Emerging Markets n=30	Green/Ethical n=11
Require Higher Return	0	0
Accept Lower Return	10	1
No change	18	10
Don't know	2	0

Demand for additional information on environmental and social aspects of investments: Approximately half of the emerging markets and green/ethical fund managers considered that an independent environmental audit, social audit, and environmental rating system would be of some importance in making a decision about whether to invest in a forest products company (Table 16). However, these were all given lower importance ratings than almost , every other source of information currently used to make investment decisions (see answers i to question 2D in Appendix 4).

Table 16: Average importance (ranging from O (not important) to 3 (very important) given by emerging market and green/ethical fund managers to additional types of environmental and social information (21 emerging market fund managers responding; 9-13 green/ethical fund managers responding).

	Emerging Market	Green/Ethical
Environmental audit	0.9	1.5
Social audit	0.6	1.0
Environmental Rating System	1.0	1.2

Client interest in environmental and social impacts of investments: As expected, emerging markets fund managers considered that a very low proportion of their clients had expressed an interest in the social and environmental impacts of their investments and green/ethical fund managers generally reported a high degree of interest, although one or two thought that 50% or fewer of their clients had such interests. Despite the current low level of interest in environmental and social issues by investors in emerging markets funds, over half of the responding emerging markets fund managers (n=28), and all but one of the green/ethical fund managers (n=13) considered that investor interest in the social and environmental impacts of investments would grow in the future. Both types of fund manager believed that this would be driven mainly by media pressure, and by better education and availability of information.

IV Discussion

The investor survey revealed that the majority of emerging markets fund managers had made forestry investments in the past (though not in certified companies), while almost without exception, green/ethical fund managers had not invested in this sector. Despite the different experiences, both groups had fairly similar perceptions of the sector, and both expressed interest in making future forestry investments. We now apply the findings of the literature review and questionnaire surveys to the five focal study questions to examine the extent to which sustainable forestry can meet the requirements of these two types of institutional portfolio investor .

(1) Do the financial returns from tropical sustainable forestry meet fund manager requirements ?

The survey found that emerging markets fund managers required a minimum rate of return on average of 17.5% as a precondition for investing. This was slightly higher than the requirement of green/ethical fund managers[11]. Because of the unwillingness of certified

[11] It is important to acknowledge that while fund managers gave estimates of minimum required rates of returns, they emphasised that they looked for stocks which they believed would out-perform the market, and that much of the time they did not attempt to calculate an expected return.

timber producers to impart financial information, we cannot compare the requirement directly with the performance of operational sustainable forestry companies. However, the financial returns documented in the literature review show that in general, returns from plantations or natural forest management met or exceeded these levels of return. Four out of the five smallholder plantation studies, and nine out of 13 industrial plantation studies documented annual returns in excess of 15%. Three out of four studies of vertically integrated natural forest management operations suggested returns in excess of 15%.

Although returns from sustained yield and sustainable forestry do seem reasonably high in relation to investor expectations, in some cases the conclusion of the study concerned (for example Kishor and Constantino 1993) is that other types of land use such as forest clearing and conversion to agriculture will be more profitable for landholders. Thus, achievement of rates of return compatible with investor requirements is a necessary but not sufficient condition for the wider introduction of sustainable forestry .Other incentives will be necessary to induce landholders to opt for a type of land use which is less profitable to them than others.

It should be noted that there may be some problems using the studies in the database as the basis to estimate returns for sustainable forestry .First, most of the studies are financial projections and simulation studies, not the documentation of returns from operational forestry companies. Second, the management systems used in these studies were designed to meet sustained timber yield objectives, but not necessarily to meet all of the other environmental and social criteria that are currently implied by the term "sustainable". As a result, the financial returns estimated in these studies may be somewhat different from those of an operational certified company. Information from the survey of certified timber producers suggests that compliance with FSC certification may increase costs for some companies by 5 -15%[12], but there may be potential to offset at least some of these costs through better market access, and in a very few cases, price premiums for certified products.

The tentative conclusion here is that although more work is needed in this area to better understand the financial performance of certified forestry companies, plantations and integrated natural forest management companies do seem capable of meeting the minimum rate of return requirements of emerging markets and green/ethical fund managers.

(2) Are the risks associated with sustainable forestry investments acceptable to fund managers?

Although many of the management practices called for under sustainable forestry guidelines are specifically designed to reduce certain types of management risks (such as disease, fire or pests), they do not address the most important perceived risk of fund managers in making forestry investments -namely, the risk of large fluctuations of commodity prices (and hence profitability). As a result, even though fund managers of both green/ethical and emerging markets funds considered that certification by an independent third party would somewhat reduce the investment risk of a forest products company, they were unwilling to accept a lower rate of return on their investments compared to investments in an uncertified company.

The results of the certified forest products producers survey however, do suggest that some certified companies receive preferential market access and price premiums. These companies

[12] This may be an underestimate because some companies may have received assistance with certification costs from buyers.

appear to have access to a niche market that might make them less susceptible to swings in commodity prices that characterise the forest products sector in general, thus addressing the major perceived investment risk (see Table 13). This possibility merits further investigation.

(3) What kind of investment vehicle/structures are preferred by fund managers ?

Almost all emerging markets and green/ethical fund managers invest in listed equities. Almost a third of both types of fund manager invests in listed convertibles. Even fewer fund managers would consider investing in unlisted securities (16.2% emerging markets funds, and 27.3% of green/ethical funds). These results show that sustainable forestry companies will be eligible for considerably more investment from institutional portfolio investors if they are publicly listed.

Table 17 shows which of the tropical countries considered in this study have stock exchanges. It is clear that many countries where sustainable tropical forest products companies might wish to locate do not have stock exchanges, and that, in some cases, countries that do have stock exchanges have listing criteria which might make listing for start-ups difficult. For example, in Malaysia companies need to have been established and in operation for five years before they can be listed, and in the case of Indonesia and Brazil for three years. The implications for this are that new companies setting up in sustainable forestry will not be eligible for listing for some time, and in Malaysia and Indonesia will also have to demonstrate net profits.

(4) Are there further investment requirements?

The next issue is whether there are additional requirements with respect to market capitalisation in excess of those that enable a company to become publicly listed. For example, for full listing in the United Kingdom, a company must be capitalised at a minimum of £700,000. However, this still may not be large enough to attract substantial investments if fund managers restrict their investments to larger companies. The survey showed that fund managers do, in fact, prefer to invest in companies that considerably exceed the minimum requirements for listing. On average, emerging markets fund managers require a minimum market capitalisation of $180m to invest in a company, while green/ethical funds have a lower but still large average requirement of $33.1m. While the survey of existing certified timber producers revealed little about their market capitalisation, it can be concluded from the size of the forest areas that they manage that these capitalisation requirements would be many times larger than their existing size. It seems unlikely that many certified forest companies on their own are large enough to meet these capitalisation requirements. There are signs that some larger companies are applying to be certified under the FSC initiative, so insufficient market capitalisation could become less of an obstacle to investment.

Table 17: Stock market availability and listing requirements in selected emerging markets.

	Market capitalisation of paid-up capital	Minimum total value of assets	Number of years Company established & in operation	Number of years company has made operational and net profits	Aggregate after-tax profit over 3 years
Malaysia (Main Board)	RM[1]50mn		5	3	RM25mn
Malaysia (Second Board)	Min: RM 10mn Max: RM 50mn		5	3	RM25mn
Indonesia	Rp[2]4bn	Rp 20bn	3	2	
Brazil*	None	None	3	None	None
Bolivia	NO MARKET				
Surinam	NO MARKET				
Gabon	NO MARKET				
Solomon Isl.	NO MARKET				
PNG	NO MARKET				
Colombia	No information available				
Costa Rica	No information available				
Peru	No information available				
Nigeria	No information available				
Côte d'Ivoire	No information available				
Gabon	NO MARKET				
USA (US corporations)	$40,000,000	$40,000,000		3	Pre-tax: $6,500,000
USA (non-US corporations)	$100,000,000	$100,000,000		3	$100,000,000
UK	£700,000		3		
Sweden	300m kroner		3		

[1] = Malaysian ringitt
[2] = Indonesian rupiah
* Carlos Rebello, Brazilian Stock Exchange Commission, 18/9/97. Personal communication.

(5) *Are there certain geographical regions where investors are more likely to invest in a forest products company* ?

The final issue considered was whether there are certain geographical regions where fund managers prefer to invest, or others that they will avoid entirely. Clearly, if investors avoid a region, irrespective of how high the financial returns are, sustainable forestry companies located in these areas will have little hope of attracting the necessary capital.

The fund manager survey revealed great variations in terms of where fund managers were willing to invest. The most popular region for emerging markets fund managers was South East Asia (this may have changed since the recent financial upheavals in the region), and the

least popular were the Pacific Islands and Africa. Latin America was intermediate in attractiveness. Clearly, the location of sustainable forest products companies can have a significant bearing on their ability to attract portfolio investors. Irrespective of how good the management is and how high the returns are, a certified forestry company would have little chance of raising investment capital from UK portfolio investors if it were located in Africa. The majority of certified tropical forests are located in Central and South America, and in this respect are likely to appeal to a significant proportion of fund managers.

An important finding is that in the UK, green/ethical funds -those funds that are most likely to be receptive to the social and environmental objectives of tropical sustainable forestry - have to date shown little willingness to invest in emerging markets. This means that certified forest products companies will need to attract investment capital from the emerging markets fund managers, and their attractiveness will be based primarily on their financial performance, rather than on any ethical or environmental criteria that they might meet.

V Concluding remarks

It would appear that the financial returns and levels of risk that typify sustainable forestry businesses in the tropics are likely to be compatible with fund manager requirements, though it would be desirable to have more operational examples of this type to reinforce these conclusions, particularly in the case of natural forest management. The most serious impediment to attracting larger investment flows from institutional portfolio investors is likely to be the typically small size of sustainable forest companies. Fund managers have a strong preference for investments with a high degree of liquidity and thus would prefer to buy a small percentage of a large, publicly quoted company than a large percentage of a small company. Most existing certified timber companies are not large enough, and are not listed on stock exchanges, and are, therefore, not available for portfolio investment. One solution to these problems would be to group many such small companies into a larger forestry fund that would be able to meet investor preferences with regard to minimum market capitalisation and listed status. Listing such a fund on a developed country stock market would also circumvent the problem of investors being unwilling, or unable (i.e., the country does not have a stock exchange) to invest in countries in which the individual timber companies are located. In the absence of such a fund (or suitable alternative mechanisms), it does not appear that tropical sustainable forestry companies will be able to take advantage of the massive portfolio capital flows into tropical regions.

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