

Sarfo-Mensah, Paul

Working Paper

Exportation of Timber in Ghana: The Menace of Illegal Logging Operations

Nota di Lavoro, No. 29.2005

Provided in Cooperation with:

Fondazione Eni Enrico Mattei (FEEM)

Suggested Citation: Sarfo-Mensah, Paul (2005) : Exportation of Timber in Ghana: The Menace of Illegal Logging Operations, Nota di Lavoro, No. 29.2005, Fondazione Eni Enrico Mattei (FEEM), Milano

This Version is available at:

<https://hdl.handle.net/10419/74062>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

**Exportation of Timber in Ghana:
The Menace of Illegal Logging
Operations**

Paul Sarfo-Mensah

NOTA DI LAVORO 29.2005

FEBRUARY 2005

NRM – Natural Resources Management

Paul Sarfo-Mensah, *Bureau of Integrated Rural Development,
Kwame Nkrumah University of Science and Technology*

This paper can be downloaded without charge at:

The Fondazione Eni Enrico Mattei Note di Lavoro Series Index:
<http://www.feem.it/Feem/Pub/Publications/WPapers/default.htm>

Social Science Research Network Electronic Paper Collection:
<http://ssrn.com/abstract=670621>

The opinions expressed in this paper do not necessarily reflect the position of
Fondazione Eni Enrico Mattei
Corso Magenta, 63, 20123 Milano (I), web site: www.feem.it, e-mail: working.papers@feem.it

Exportation of Timber in Ghana: The Menace of Illegal Logging Operations

Summary

This paper presents an empirical analysis of the linkage between external timber trade in Ghana and the increased incidence of illegal chainsaw operations which do not only threaten the country's forests and other natural resources but also the erosion of the basis for sustainable agriculture which is the main-stay of the country's economy. It uses ethnographic data from case studies of a recent research in selected forest reserves fringe communities in High Forest Zone of the country to explain the frustrations of local people with government policies that favour export to the neglect of local demand for timber and wood products. Although government pronouncements suggest that it is gaining an upper hand in the battle against illegal logging operations, evidence on the ground suggests that the greater part of the lumber on the local markets is supplied through illegal means predominated by itinerant chainsaw operators and their urban financiers .

The paper concludes that the country's forest and tree resources face massive degradation and overexploitation if the government does not take a bold decision on illegal logging, especially the activities of chainsaw operators. An option, though unpalatable and politically sensitive, may be the mainstreaming of chainsaw operations through the re-introduction of limited permits to registered local groups of timber traders and their chainsaw operators to supply the domestic market. This should be under a system which enjoins such groups to be collectively responsible for the activities of their members. And, the government should also strengthen the Forestry Services Division (FSD) to design and operationalize an enhanced monitoring and surveillance system of logging activities.

Keywords: Economic recovery program (ERP), Timber exportation, Illegal chainsaw operation, Timber traders, High forest zone, Forestry services division (FSD)

JEL Classification: O, O5

Address for correspondence:

Paul Sarfo-Mensah
University of Science and Technology
Private Mail Bag
UST, Kumasi
Ashanti Region
Ghana
Phone: 00 233 51 60406
Fax: 00 233 51 60137
E-mail: pksm01@yahoo.com

INTRODUCTION

The Economic Recovery Program (ERP) embarked upon by Ghana in 1983 induced strong recovery in the exploitation of natural resources especially those that have comparatively favourable export potential. Precious minerals and forest resources have particularly come under tremendous exploitation.

In the timber industry, export earnings increased from US\$44.1 million in 1986 to US\$118.0 million in 1990 representing a percentage increase of 167.6% within the period of 4 years from the base year (1986). Its contribution to the total export earnings also correspondingly increased from 5.9% in 1986 to 13.2% in 1990 recording a significant performance from a hitherto consistently declining growth and to dormancy in the period close up to the pre ERP era (ISSER, 1993). Recent figures suggest an upward increase in export earnings from the timber industry, ranking it amongst the top five foreign exchange earners for the country.

Increased earnings from the timber exports correspondingly accelerated deforestation. For example, the closed forest zone of Ghana occupies 8.2 million hectares of which 1.2 million hectares has been reserved. The remaining 6.5 million hectares is being deforested at a rate of 25,000 hectares per annum which represents 0.4% annually (ISSER, 1993) primarily for timber and wood fuel requirements.

This unsustainable exploitation of forest resources especially for timber has had tremendous adverse impact on the country's economy. An estimated environmental degradation cost of ₵10.8 billion or US\$33.4 million was imposed on the economy of Ghana as a result of the exploitation of the forest resources (ISSER, 1993).

Ironically, the massive exploitation of forest resources did not meet the local demand for timber products. In fact, over the years, the over-concentration on the external trade of timber has led to the emergence of itinerant chainsaw operations in the country which meet the local demand for timber and wood products. Several policy measures targeted at illegal logging activities, especially itinerant chainsaw operations, have not yielded the expected results. The menace of chainsaw and illegal logging activities has become a 'password' for policy makers to explain the degradation of the country's forest and other natural resources. It is also used to justify shifts in policies which may not have necessarily benefited the local people or government objective of achieving sustainable management of the country's forests and improving the performance of the timber industry.

Although government pronouncements suggest that it is gaining an upper hand in the battle against illegal logging operations, evidence on the ground suggest the contrary. In fact, in the majority of the local timber markets greater part of the lumber is supplied through illegal means predominated by itinerant chainsaw operators and their urban collaborators and financiers. They are blamed for the destruction of the forest, and since 1997 official government position has been a total ban of their activities. However, an in-

depth assessment of the situation on the ground indicates that there is more to it than just blaming the chainsaw operators and their urban collaborators. In a more comprehensive way, this paper explores the combination of factors that have led to the survival of the chainsaw operators and a thriving illegal timber trade and why successive governments have found it difficult to rid the timber industry of these ‘undesirables’.

The rest of the discussion is organised into five sections. The first section is the methodology employed in the study. The context of the external timber trade in Ghana is presented in section two. The local timber market and the activities of illegal chainsaw operations are analysed in section three. In this section an empirical analysis of the linkage between external timber trade in Ghana and the increased incidence of illegal chain saw operations which does not only threaten the country’s forests and other natural resources but also the erosion of the basis for sustainable agriculture which is the mainstay of the country’s economy has been done. Section four explains the frustrations of the local people with government policies that favour export to the neglect of local demand for timber and wood products. Conclusions and policy implications are presented in section five.

METHODOLOGY

This paper is based on analysis of data gathered by the author at three levels. The first is an ethnographic data gathered through participant observation between October 2003 and June 2004 from field studies in two communities which fringe Globally Significant Biodiversity Areas (GSBAs) in the Atewa Range and the Boin Tano Forest Reserves in the High Forest zone of Ghana (GEF and World Bank 2004). The GSBAs in Ghana include 29 forest reserves zoned on the merit of their high significance as biodiversity-rich areas. Five of these forest reserves are wholly protected (no logging, mining and industrial activity as well as the collection of NTFPs are permitted) while 24 including six (6) in Southern Dry Forests (SDFs) are partially covered (MES 2002). The fieldwork which was carried out in two of the partially covered reserves, examined the local effects and benefits on the creation of the GSBAs. It also studied factors that underlie the differences in the protection of the reserves i.e. their relative remoteness or closeness to major trunk roads and how this was directly related to the level of illegal activities in the reserves.

The second comprise qualitative and quantitative data gathered from policy makers and focal persons in the sector ministry (i.e. Ministry of Lands and Forestry), departments and agencies on the institutional and policy environment that relate to the development of the timber industry in Ghana. Key personnel in the formal and informal wood processing firms as well as traders of lumber and wood products were also interviewed on the changes in government policies that relate to the timber industry. This was done in Kumasi, the second largest city in Ghana, which is home to the largest concentration of sawmills and the biggest conglomeration of informal wood processors and lumber traders in the country. As encountered by similar studies (Owusu 2001), access to primary data from the formal and informal operatives in the timber industry was difficult and limited. In the formal processing sector, this emanated principally from fear amongst the

operatives of exposing themselves to government investigation by divulging company data, an approach which was used by a previous government in the late 1980s to crack down on the industry for 'irregular activities' such as smuggling, evasion of taxes and non payment of royalties and fraudulent invoicing (Abdulla 1993; quoted by Owusu 2001). With the informal wood and lumber traders and processors many were tight lipped and reluctant to talk about their sources of supply. As intimated by one respondent who wanted to remain anonymous, "our business has now become very risky and entails daily gambling with our capital and hence we keep our operations very confidential". However, in both situations the author adopted an approach which involved the combination of formal introduction by intermediaries who the respondents trusted as well as the avoidance of asking or demanding sensitive information. Also, the triangulation of information which was in the public domain such as government policies on banning of chainsaw operations and open tendering of concessions as well as general opportunities, problems and constraints in the timber industry, facilitated discussions and encouraged respondents to open up.

The third comprise secondary data obtained from relevant government institutions including the Timber Industry Development Division (TIDD) and the Resource Support Management Centre (RSMC), both of the Forestry Commission (FC) and the Statistical Services of Ghana. It involved the collection of statistical information as well as review of technical reports and published articles.

THE CONTEXT OF THE EXTERNAL TIMBER TRADE IN GHANA

The free fall that came to characterise the Ghana economy before the adoption of adjustment in 1983 is often seen as classic policy-decline (Hutchful 2002) and affected all sectors of the economy including the timber industry (Owusu 2001). The pre ERP era (especially the years from 1970 to 1982), was characterised by sharp decline in GDP. For example, between 1970 and 1980, per capita GDP declined by a total of 19.7%; from 1980 to 1983 it dropped by a further 21.2%. The period was characterised by sharp decline in both domestic and export production.

To arrest the situation, the then military government embarked upon the World Bank and IMF sponsored Economic Recovery Programme which was, among others, to halt the economic decline and stabilise the situation, promote economic growth and export recovery through a realignment of incentives towards productive activity and the rehabilitation of economic and social infrastructure (Hutchful 2002). The programme, as indicated earlier, rekindled the export sector and consequently natural resources, particularly minerals and timber came under intensive exploitation.

It is within the above background that the timber export in Ghana has been discussed. The timber industry which comprise of three categories of operation: primary (logging), secondary (sawmilling, ply milling and veneer milling) and tertiary (furniture, doors, flooring, profile/moulding and toys) (Inkoom 1999) constitute an important component of the economy. The forestry sector and its constituent formal wood processing industry

exports raw materials (such as lumber) to, and import non-wood inputs from the developed world. With a resource base of 109,000 km² as at 1980, the sector contributes some 6 percent of the country's total GDP and 11 per cent of the total commodity export annually (Owusu 2001). The industry has over the years ranked as the third most important component, after cocoa and minerals and is considered to have immense potential for expansion in terms of employment and output.

Figure 1 shows export from the industry between 1972 and 1997. The export figures show two distinct scenarios: a steady decline before 1983 and a consistent rise in exports thereafter. The period of decline coincides with the general fall in the Ghanaian economy to its lowest before 1983. Four factors have been assigned for the decline (Owusu 2001):

- ❖ generally poor state of the economy during the period
- ❖ obsolescence, break down of equipment and shortage of spare parts to maintain machinery and equipment
- ❖ an over-valued exchange rate, which was disincentive for exports and hence production
- ❖ poor infrastructure like roads, railways and ports

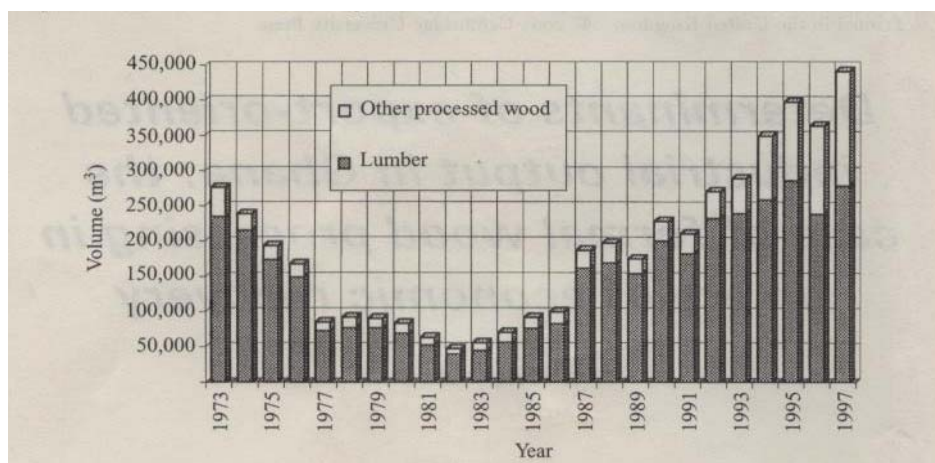


Figure 1: Export of Processed Wood, 1973-1997

Source: Forest Products Inspection Bureau FPIB 1990,1991; Owusu 2001

The decline affected the formal processing industry which had until then employed specialised skill labour and was compelled to lay off most of this labour. The government also lost export revenue as well as internally generated income from fees and taxes. But the sector's potential was not lost to the country's development partners. And, at the outset of the ERP, the World Bank encouraged the government that the timber industry offers the greatest immediate potential for growth and foreign exchange earning (World Bank 1984; quoted in Owusu 2001).

A major government programme that facilitated the rise in export of timber under the ERP was the Ghana investment Code of 1985 which provided general incentives, benefits and concessions to entrepreneurs and investors, and special packages for specific sectors such as manufacturing. These included granting firms and investors full exemption for custom duties on plant, machinery, equipment and accessories required for the enterprises. Wood processing firms could enjoy the retention of 20 per cent and 25 per cent export earnings for lumber and value added products, respectively in external accounts (Owusu 2001).

To further enhance exports during the period, the wood processing firms were given incentive packages under an investment code which stipulated that the more a firm exported the greater the benefits it enjoyed. Therefore, the provisions discouraged the sale of lumber on the domestic market in preference to exports. This phenomenon led to the rise in the operations of informal sector to meet the local demand for lumber and wood products. This has since become a major problem for sustainable forest management in the country and a subject which will underlie discussions in the next sections.

A point that ought to be emphasised here is that the timber exports were tied to meeting the needs (accommodation) of international capital because the country badly needed these foreign exchange to meet its numerous import obligations. This accommodation was clearly demonstrable by the fact that the bulk of the increase processed wood was exported to the then European Community (EC), now European Union (EU). For example, according to Owusu (2001), from 1983 to 1991, a minimum of 81 per cent of the volume of processed wood exported went to donor countries, mostly in the European Union. Within the period the industry earned US\$44.1 million in 1986 and US\$118.0 million in 1990 in foreign exchange for the country (ISSER 1993). In addition, thousands of jobs were created in the formal processing mills and the industry operated at an average of 70 per cent of installed capacity relative to figures below 46 per cent for all manufacturing sector as a whole over the period, which was a significant improvement over the pre ERP era. But of course this did not come at any cost. As indicated above, increased earnings from the timber exports correspondingly accelerated deforestation and imposed tremendous environmental cost on the economy of the country.

To make the industry sustainable, there have been some policy shifts since the introduction of the ERP. Ghana's wood has traditionally been exported in the form of unprocessed logs. In order to generate more income from the forestry sector, the government instituted measures to augment the export of higher-value processed wood, and phase out log exports by 1997. The policy has been given further impetus by the present government under its Sustainable Forest Management for poverty reduction in the Ghana Poverty Reduction Strategy (GPRS), the main government development policy document. Under the programme the government, among others, has made it a condition for timber processing firms to establish plantations in order to be awarded concessions. Also, firms which add value to wood which otherwise would have gone waste into exportable commodities such as finger joints and mouldings are given incentives including a tax relief of one percent upon application. The government aims at achieving

low volume but high value timber exports and thereby slow down the massive exploitation of the country's forest resources which occurred during the period of ERP. Timber exports appear to be responding to this policy initiative as exemplified by the figures of timber exports between 2001 and 2004 (Figure 2).

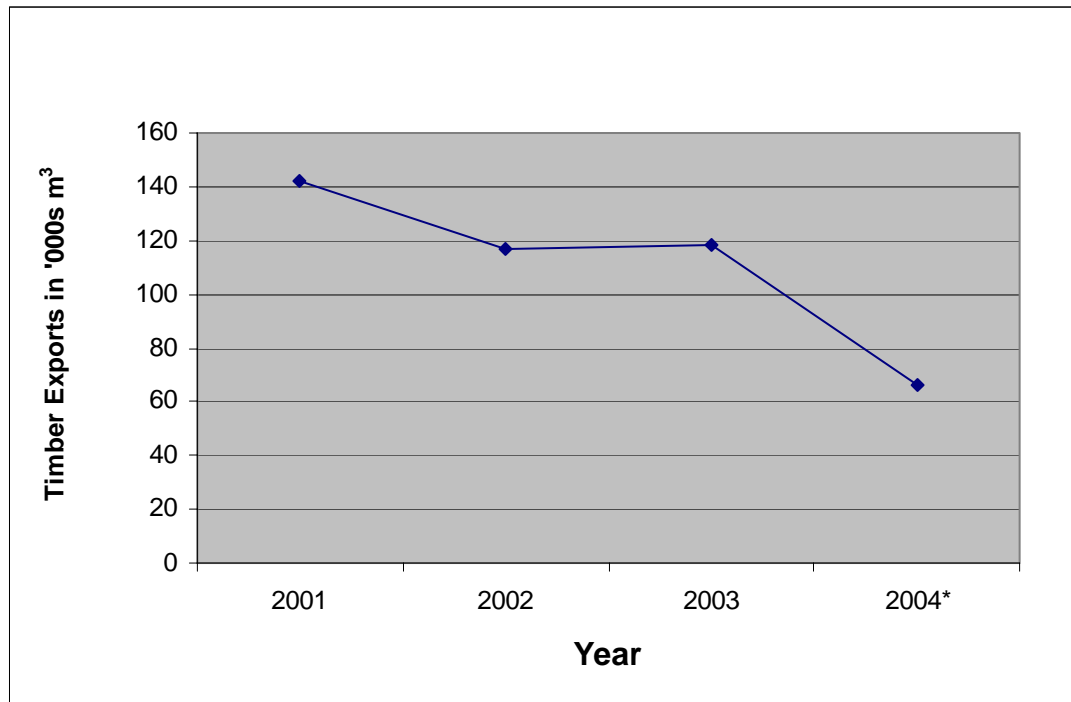


Figure 2. Export performance of Mills (National)

Source: Timber Industry Development Divisions (TIDD). * The 2004 figure is for the months Jan-July

The sector ministry in implementing this policy has sought to change the image of the industry which is characterised as:

- heavily subsidized (low stumpage rates and under-pricing of the resource) and protected.
- over capacity in the wood processing industry. Industry efficiency in converting harvested timber remains low deteriorating from 68% in 1990 to 37% in 1999.
- Low product recovery rates which led to unsustainable levels of timber exploitation. Total harvest for 1999 estimated at about 3.7million cubic metres which was almost four times the allowable cut.
- Log export suspension has depressed log prices resulting in a disparity between domestic and external market prices. Real values for forest resources are not being realised

The government has achieved some significant successes in the area of sustainable management of forest and tree resources of the country. Under the Ghana Poverty Reduction Strategy, sustainable forest management has received attention. Several policy initiatives, including the President's Special Initiative (PSI) on Afforestation and open bidding of timber concessions, have begun yielding good results both in terms of forest conservation and better management of the timber industry in terms of transparency in the award of concessions.

In spite of the seemingly improved policy environment in the timber industry, the present government has also not adequately addressed issues relating to local demand and supply of timber and wood products. The subsequent sections of the paper put this dilemma and its ramification for environmental degradation into perspective.

LOCAL MARKET AND ILLEGAL TIMBER OPERATIONS

Whilst export trade in timber and wood products has been encouraged over the years little or no attention has been paid to the supply of local market which is dominated by illegal operators (Gayfer *et al.* 2002). It could be argued that perhaps in the period immediately before and after the ERP, the construction sector (especially road and housing) which needed timber and wood products had sunk, like the other sectors of the economy, below the threshold of minimal capacity utilisation. Therefore, there was no urge for government to even consider policy on meeting demand for local market. Of course at that time government might have been pre-occupied with its huge balance of payment deficit and therefore concentrated on the potential of the forestry sector in generating international capital (Owusu 1998). Therefore, there was no coherent policy of meeting local demand which in the main were ad hoc.

However, there was a recognisably well defined local demand at the time and which has expanded tremendously over the years that should have encouraged the formulation of consistent policies to address this need. The construction sector constitutes the major domestic timber market and it is predominantly found in the Accra-Tema Cosmopolitan areas, which encompass the capital city, Accra, and Tema, the main sea port and industrial city. The regional capitals, especially Kumasi, also form a big market. The expanding local market is attested by the springing up of new industries, construction of major highways, the rehabilitation of hospitals and educational institutions. Other domestic demand is derived from furniture making, truck body building, boat building, pallets and crates, rail way sleepers and carvers. It has been emphasised that the domestic consumption of timber for industrial application is on the increase (Inkoom 1999). For instance, the processing sectors, primarily the furniture and joinery units, also provide ample market.

It has been estimated that national per capita consumption of wood products of 0.029 cubic metres (excluding plywood) is expected to rise (TEDB 1995). And, there are signs that the construction industry particularly private estate development will make enormous demand from the timber industry, especially for sawn timber due to growing interest of individuals owning their own houses.

Meeting local demand for sawn timber

In the late 1980s and throughout the 1990s, government's attempt to supply the local market was mainly through the imposition of levies on sawn timber for export aimed at reducing its export and hence making it more available for the domestic market (Inkoom 1999). In practice, this approach did not work because the exporters could still make more at the international market and also because of their need for foreign exchange to meet their requirement of capital equipment.

There was also the allocation of permits by the Forestry Department to registered chainsaw operators and traders of wood products to fell and saw timber off reserves for sale to the local market. The operations of these groups, which are subject for detail discussions later, were considered to be cheaper and could meet the needs of the local market. However, abuse by the groups through indiscriminate felling of timber in and off reserves with the connivance of some forestry officials and local people, prompted the government to terminate this arrangement. A total ban was slammed on the activities of chainsaw operations by the government in 1997. A recent interview conducted by the author indicated that the decision by Forestry Services Division to stop the permit system to informal sector to fell and process timber for the local market is doing more harm than good as most of these operators have gone underground and are wreaking havoc to the forest and timber resources of the country (see below).

In recent times, the sector ministry, through its main agent, the Forestry Commission, has designated some formal timber processing firms to supply the local market. In the Kumasi Area which is the centre of the sawmilling industry in Ghana, 25 of such firms exist (TIDD 2004). In addition, there is a general policy which enjoins all timber processing firms (designated as non selected firms) to supply 20 percent of their total output to the local market. In the Kumasi Area alone there are about 88 of such firms. Interviews conducted at the Kumasi area showed that supply from these sources are either too expensive and out of reach of ordinary individuals who are building their homes or are just not available as it takes too long a time to get orders supplied by such mills. For example, provisional figures for the period between January and July, 2004 showed that a total of 4738.8m³ and 4374m³ were supplied by the non selected and selected firms respectively to the Kumasi area (TIDD 2004). These figures (the total) are estimated to represent about 10 per cent of the lumber and other wood products sold on the local market in the Kumasi area. The rest were met from illegal suppliers. This confirms the findings by Gayfer *et al.* (2002) that over two-thirds of the wood harvested (in 1999) in the country was done illegally and this is focused in off-reserve areas and is dominated by the activities of illegal small scale chainsaw operators.

Explaining the gaps in the policy of over concentration on timber exports, a management staff of a big timber firm in the Kumasi area indicated that supplies by the formal firms to the local market may not necessarily be the products that are needed. The 20 per cent supplied by the non selected firms, for instance, are mainly Tongue and Groove (T&G), plywood and block wood which are very expensive. Lumber which is the product in great demand is not cut by these firms for the local market but for export.

Responses from some formal operators in the Kumasi area also indicated that the government policy of quota system under which concessionaires are given a limited number of trees to fell within a reserve compartment i.e. allowable yield, is also affecting the supply of raw materials to the formal processing mills to meet demand of the local and international markets. They explained further that the situation is compounded by 'concession contractors' who constitute individuals who do not have sawmills but have managed to have access to concessions which they sell to mill owners at exorbitant prices. A triangulation with a forestry official indicated that the open bidding of timber concessions introduced recently by the Forestry Commission has removed shady deals in the awarding of concessions and therefore there are no such contractors. Rather, it is concessionaires who had long term leases but lack capacity for utilisation who resell logs to mill owners who have excess installed capacity.

The role of the informal timber and wood products sector

Given the apparent lack of the formal sector to meet the local demand of lumber, the informal sector has become dominant in meeting the needs of the local market. The informal timber and wood products traders and allied operators i.e. saw millers, carpenters and illegal chainsaw operators became pronounced in the parallel economy that emerged in Ghana in the early seventies due to the crisis which hit the economy. The timber and wood products have a big informal sector which is still growing and may be found throughout the country with defined physical markets in the regional capitals, especially Accra and Kumasi, the capital and the second largest city respectively. The latter is in the centre of the forests.

The informal sector in the Ghanaian economy has been described variously (Inkoom 1999; Owusu 2001; Hutchful 2002). The following description by Hutchful (2002) fits the operators in the timber and wood industry, especially the lumber traders and the illegal chainsaw operators who are the subject of interest in this paper because of the emphasis past and the present governments have placed on their role in deforestation and its implications for sustainable agriculture:

“By informalization it is meant diversion of economic transaction beyond the reach of the state and the formal economic sector. This sector spans an extremely diverse range of products and activities and involves unrecorded though open transaction, which are unregulated and non legal rather than legal. Structurally, the main characteristics of the sector are: it's predominantly artisanal in nature; its ease of entry and often (though not necessary) marginal operators; the prevalence of non contractual (and often highly exploitative) relationships; and the coexistence of waged and partially waged, and family forms of labour”. (Hutchful 2002). It has been observed that the crisis in the Ghana economy generated a process of informalization which had profound implications for the state, civil society and politics (Hutchful 2002).

The above description of Hutchful (2002) of the informal sector is an exact representation of the informal timber industry. But the following key words are worth noting because they emphasize the structure and dynamics of the informal timber and wood products

market and the *modus operandi* of the operators in the market: diversion of economic transaction beyond the reach of the state and the formal economic sector; artisanal in nature; illegal rather legal and have profound implications for the state, civil society and politics. In the next few paragraphs an analysis of the informal timber and wood products market is presented to underscore these key words.

A typical local timber market comprise mainly of traders (or merchants) of sawn lumber and other wood products, master craftsmen or artisans (mainly carpenters and other wood fabricators) and their apprentices as well as small and medium scale sawn millers. Service providers in the market include porters, delivery vans and truck operators, cooked food sellers and traders in hardware (nails, industrial glue, etc) required by the artisans for their work.



Figure 3: A section of the Anloga Timber market in Kumasi

The market is male dominated but in recent times women have shown interest and have a reasonably representation. Most businesses of the main operators in the market i.e. the wood traders, millers and carpenters, are not registered and the operators do not keep proper records which could be used for income assessment and taxation. Therefore, majority of the key operators and their assistants/employees are outside the tax net.

As indicated earlier, lumber, which is the main ‘raw material’ and tradable commodity at the market, is supplied by itinerant chainsaw operators in the countryside. It must, however, be emphasised that the supply chain emanates from the lumber and wood products merchants in the markets in the cities. This is summarised by a merchant in the Kumasi Anloga Market:

“We have our boys (chainsaw operators) who supply us on order but we have to pre-finance them. The risky nature of the business due to frequent impounding and subsequent confiscation of our wares by the forestry people

and the police makes any pre-financing more of a gamble than a proper investment. But we do not have any option.”

The bulk of the lumber and wood products consumed locally are obtained from these markets. This testifies the importance of these traders and their suppliers. In the supply chain, the chainsaw operators are very crucial. Perhaps, this may explain why it has been very difficult for the authorities to curb their operations.

Much as the timber merchants recognise that their activities and that of their associates are not favoured by the authorities, the traders argue that they are performing useful services to society, and government must therefore give them recognition. For instance, they argue that they supply lumber at affordable prices. Majority of them consider that the country will be better off if their activities were mainstreamed.

The traders and their operatives could obtain permits in the recent past from the Forestry Services Division to fell trees which they purchased at pre-determined prices. These trees were sawn for sale on the local markets. Their trees were sawn in situ thus reducing their operational cost which made their lumber cheaper than the formal sawmills. They were also given waybills to transport their lumber to the markets. However, as mentioned earlier, this arrangement was terminated about 10 years ago by the Forestry Commission on the basis that they had abused the system and were doing indiscriminate felling both in and off reserves. It is important to note the traders and their associates argue that the government's decision was influenced by sawn millers in the formal sector who could not compete with them because processed wood from the formal firms were very expensive. This argument may be flawed on the grounds that most of the formal timber firms are interested in the export market.

It is important to stress here that an assessment that the author did with some Forest Range Officers on the performance of these ‘trader concessionaires’ indicated that they were less destructive of the environment (especially water bodies, farms and fallow lands) and wasteful of tree resources in comparison with formal concessionaires. The ‘trader concessionaires’ do not use heavy equipment such as tractors and timber trucks which destroy the local environment during logging. Local farmers are noted to have a preference for the ‘trader concessionaires’ due to the environmentally benign nature of their harvesting processes. They normally, as indicated above, would fell tree and saw it in situ and use porters to head load the lumber to trucks which do not go in the bush or the forest.

Some traders suggested that the authorities should consider re-integrating their activities into the mainstream because most of them are willing to form groups which could be registered to negotiate for concessions in off reserves; this would give them relief and happiness to work. They claimed that benefits that could be derived from mainstreaming their activities will include increased government taxes, the weeding of undesirable elements in the informal sector, especially those who cause wanton destruction to the forest. For example, it was mentioned that traders who would obtain concessions will organise the youth in the villages who predominate the illegal logging into identifiable working groups and this will reduce the high incidence of itinerant chainsaw operators.

There are also wood associations in the markets which have majority of the traders as members. The associations are said to operate mainly as welfare groups which offer financial assistance to bereaved members. Members are also helped when they have to fight legal cases in the courts which involve their trade. The associations have become very powerful mouth piece for the traders and it was suggested that the associations could be used as the entry point for discussion with the traders. It was suggested that these associations can be given concessions for the benefit of its individual members.

Illegal chainsaw operations

Studies carried out by the author in several forest fringe communities showed that illegal chainsaw operators are mainly outsiders. However, they are often assisted by local young men who act as operator's assistants and porters. The people involved in the illegal chainsaw operation have been classified by local people as the following:

- Operators – fell and saw timber
- Operator boys – assist operators; carry chainsaw to the site and help in felling and sawing of timber
- Owners – chainsaw machine owners; they rent the machines to operators for fees or employ operators to work for them.
- “Shakers” or Porters – carry sawn timber from the bush to loading points
- Loading boys – those who load the timber onto trucks bound for the timber markets in the urban centres
- Buyers – mainly located in the cities and other urban centres

Some local young men are also engaged by traders outside to fell timber for them. They are provided with chainsaws and paid for their services. Syndicates of some local elders and young men who collaborate with outsiders to harvest timber or give assistance to chainsaw operators and their financiers were in the past a common occurrence. There have also been cases where forest guards have been arrested as accomplices of illegal chainsaw operators. It has been mentioned also that some security men who impound lumber from chainsaw operators divert these for sale at the local markets. The collaboration of some local people with chainsaw operators has made the monitoring of these activities a difficult conservation task. This is a major problem throughout the country (Gayfer *et al.* 2002; FAO and FC 2003).

This collaboration has been fostered in several local communities due to the lack of alternative livelihoods. Farming which is the major means of livelihood in these communities is viewed by young men as not lucrative. In addition, illegal chainsaw operations are considered to be much quicker way of getting rich. Until recently, illegal chainsaw operations sustained the economies of several forest fringe communities. For example, in a recent study at Sagyimase, a community which fringes a Globally Biodiversity Significant Area known as the Atewa Range (see section on Methodology above), it was mentioned by some local people that chainsaw operations in the area was what sustained the local economy. Some young men and women in the community emphasised that the improved protection of the range in recent times due to the formation of Community Biodiversity Advisory Groups (CBAGs) in the fringe communities of the

range has adversely affected business and other socio-economic activities in the community.

Chainsaw operators, who ply their business mostly in the night, admit that the job has become very risky due to increased patrol by the Forest Guards and local people and the occasional swoops undertaken by military and police task forces. The porters (i.e. those who carry lumber from the bush to waiting trucks) are the ones prone to arrest by the forest guards or security agencies. Reported casualties of deaths are usually the porters; they are killed when they fall with the heavy sawn timber (known as 'beams' or 'bush cut') they carry. They also suffer from severe neck and waist pains, cuts and bruises, coughs and headaches. Within the last 6 years, there have been 12 reported deaths of "Shakers" in the Sagyimase community. The study revealed that most local young people would like to stop the business but are unable to do so due to the lack of alternative livelihoods. What they do is that when they realise that a particular operational area has become intensively patrolled they relocate to more remote areas. Therefore, majority of them are itinerant. This makes tracking them down very difficult.

Chainsaw operators have also become sophisticated in response to increased collaboration between the Forestry Services and local people to protect the forest resources of the country. Due to extensive environmental awareness creation by the FC and NGOs in forest fringe communities, local people have responded favourably to calls to give voluntary services to the Commission to protect the country's forest resources and fight the menace of the illegal chainsaw operators and other encroachers. The chainsaw operators have, therefore, resorted to the use of fire arms during their operations, and there have been several media reports of forest guards and local people being violently attacked by armed chainsaw operators. In some instances these have resulted in fatalities. The quote below is from the caption, "Timber firms worried over chainsaw operations" which appeared in a local newspaper demonstrates the menace of the chainsaw operators:

Four timber firms operating in the Twifo Hemang-Lower Denkyira District in the Central Region have appealed to the police and forestry officials to help stem the activities of illegal chainsaw operations. The chainsaw operators, who are believed to have come from the Eastern Region to operate in the area, are alleged to be armed with guns and cutlasses, have illegally occupied concessions of the firms and are vandalising their tractors and trucks. They urged the police to intervene to avert a clash between their workers and the operators who carry out their operations in the night (*Daily Graphic, Tuesday August 31, 2004*).

The menace the illegal chainsaw operators pose to the country's forest resources and lives of those who protect these resources is also manifested in recent suggestion by the Forestry Commission (FC) that the staff should be given paramilitary training to enable them to combat the threat posed by the illegal operators. And, the Commission has called on all Ghanaians, especially those living in the fringe communities to see the fight against chainsaw operators as a national affair and not only for the Forestry Commission (*Daily Graphic Thursday, August 6, 2004*). The formation of the Community Forest Committee (CFCs) and CBAGs in forest fringe communities by the FC is a major step in this

direction. These are being formed and trained to primarily serve as link between their communities and the Forestry Services Division, to educate the communities on forestry issues, assist in social responsibility agreement negotiations and forest boundary cleaning and monitoring of permits (FAO and FC 2003; GEF and World Bank 2004).

It is important to mention here that the sector ministry has recently emphasised that the chainsaw operators have failed to take advantage of the government's policy to get them organised and find alternative sources of employment through the national plantation development programme. Under the programme announced by the Ministry of Lands and Forestry two years ago, the chainsaw operators were tasked to organise themselves into recognisable groups in the various communities where they operate so that they could avail themselves of the various job opportunities under the plantation programme and the competitive bidding programme. However, a ministry official in the Ashanti Region claimed that not a single chainsaw operator in the Ashanti region for example, had availed himself of the opportunity. He emphasised that the chainsaw operators rather preferred to continue with cheaper means of making money through their illegal activities. It was mentioned that the Forestry Commission had had to solicit the assistance of the military in stemming the plundering of the forest resources of the region. Hostile attacks have been reported on the staff of the Commission by chainsaw operators and it was emphasised that the operators were now becoming sophisticated. Reports indicated that some chainsaw operators use guns and cutlasses in their operations and there are reports that some have shot some villagers and amputated the hands of others. The courts have been called upon to assist in stemming the illegal activities in line with the laws of the country.

To reinforce the position of the sector ministry on the illegal activities of the chainsaw operators, the sector Minister is quoted to have said the following at recent forum at the launch of a Community Forestry Management Project:

‘The Minister strongly condemned the unpatriotic and selfish individual Ghanaians whose activities undermine the government's determination to replenish the stock of timber, wood fuel and protect the water bodies. The Ministry is particularly concerned with chainsaw operators who are supported by some big time financiers and in some cases collude with some forestry official to plunder the forests with impunity. The Ministry is seriously working out plans to wean the young chainsaw operators from the clutches of the financiers who mostly cheat them. These financiers will soon be chased out of business once the competitive bidding process firmly gained root and successful bidders of the forest resources started mounting security surveillance over their leases or concessions’ (*Daily Graphic, Monday August 23, 2004*).

From the ongoing it clear that the activities of the illegal chainsaw operators have been very difficult for the sector ministry and other stakeholders in the timber industry to curb. Although the government is doing its best to stem the activities of chainsaw operators, the demand-driven nature of illegal logging operations makes it more complex than the sector ministry considers.

Environmental implications and sustainable agriculture

The indiscriminate logging activities of the chainsaw operators certainly have environmental implications. Ethnographic data gathered by the author from two Globally Significant Biodiversity Areas in the High Forest Zone in Southern and Eastern Ghana showed that local people detested the activities of indiscriminate felling of trees in the forest landscape, especially along water bodies and on their farms. It is believed that activities of chainsaw operators undermine local environmental values. Areas such as watershed protection, erosion control, bio-diversity or genetic reserves and of course forests for carbon sequestration which have global implications (Hyde *et al.* 1996) were emphasised.

Local people attribute improved rainfall patterns and other microclimate improvements (reduced intensity of sunshine, rainstorms, etc) to forest cover. The maintenance of the forest and reduced illegal logging in off reserve forests lands were cited as major contributory factors that could lead to the improvement in the local weather conditions. The forest cover is also believed to 'trap' diseases from entering the community and they perceive that forest serves as a filter of certain diseases.

In the studied communities due to the activities of chainsaw operators in the catchments of rivers, streams and ponds several water bodies have either dried up or have become semi-perennial (i.e. flow only in the rainy season). In some instances, the washing and cleaning of their equipment have also polluted drinking water sources. These water bodies serve as the main sources of drinking water for humans, watering of livestock and other economic activities. Although there are some boreholes, these are not adequate and reliable due to their frequent break down. Therefore, the health and other social implications for the local people, especially women and children, who are compelled to use these water sources for both domestic and economic activities, have been tremendous.

It was also mentioned that chainsaw operators sometimes undertake other parallel activities during their operations which are equally inimical to the local environment. Hunting for game by setting fire to fallow lands and thickets is a common practice of these illegal loggers. Wild land and bush fires which have resulted from these hunting activities devastate the local vegetation, crops and wildlife. And, because these operators are usually armed, local people can do very little to stop them, especially in small and remote communities where they are common.

The setting up of fires to fallow lands and thickets has serious implications for sustainable agriculture. In these communities the common approach to improving soil fertility and agricultural productivity is by leaving land which has been cropped for a maximum of three years to fallow for a period not less than five years. The setting up of fires to such lands does not only inhibit the process of regeneration but expose the lands to severe erosion. However, the implementation of Ghana Natural Resources Management Project (NRMP), part of which covers the GSBAs, has led to significant

improvement in the curtailment of the activities of illegal logging operations due mainly to formation of the CBAGs mentioned earlier on (GEF and World Bank 2004).

FRUSTRATIONS OF LOCAL PEOPLE WITH THE TIMBER INDUSTRY

The increasing scarcity and the higher prices of lumber for building private homes and to undertake community projects are major sources of worry to most rural communities, especially those that live close to forest reserves. Wood products for construction are not only expensive but difficult to get in these communities. They are usually purchased from the district or regional capitals and transported at great cost. In a study undertaken for the World Bank and GEF on the GSBAs (see methodology), the author was confronted with this intriguing question by an elderly man:

“Why do we need permits to enter the forest reserves to fell trees for the construction of homes? And why does the government not do the same to our brothers who live by the sea? We do not understand this” (*Opanin Dwomo, Sagyimase, personal comm.*).

The above statement underlies the frustration of the local people with the sector ministry and the timber industry in particular. They contend that concessionaires and millers in the timber industry are allowed to fell trees from local forests and process them mainly for export to the neglect of the local market. One of the major expectations of the local people from the NRMP is for them to have easy access to lumber at the local level. It is important to note that the Forestry Commission (FC) is piloting mobile sawmills in the district to meet the local demand for timber and wood products. The millers have been given concessions in the forests outside the forest reserves (i.e. off reserve forests). The objective is to encourage local people not to resort to illegal chain saw operators to meet their requirements for timber and thereby reduce the pressure on the forest reserves.

Another important area that local people associate with the timber industry is the destruction of cocoa farms. In this context, as indicated earlier, the formal timber firms have been noted to be much more notorious than the illegal chainsaw operators. In a recent article in a national daily, farmers at Sefwi in the Western Region, one of the major cocoa producing areas in the country, have petitioned the government to assist them to protect their cocoa farms which are being destroyed by timber companies. The farmers complained that even though some of the cocoa trees had a lot of fruit for harvesting, the timber firms entered their farms without their consent and destroyed cocoa farms. The farmers also explained that the timber trees on the cocoa farms were nurtured by the farmers to serve as shades for the cocoa farms against the dry season. Besides the feeling of the trees, the timber firms were not only destroying the affected cocoa trees which were crushed by the logs, but their farms were at risk, especially during the harmattan season when the cocoa trees would not have sufficient shade to protect them from the hot weather.

It is important to note that in the areas where cocoa farmers predominate, it is rather the formal timber firms which have been mentioned as constituting a threat to farms, the

local environment as well as infrastructure (artery roads, bridges and culverts). In a triangulation with a Ranger of a forest reserve in the region, it was confirmed that in terms of real destruction of the environment, it is the formal timber firms which are causing the havoc because of their use of heavy equipment. He however emphasised that unlike the chainsaw operators, the operations of these firms are comparatively easier to monitor, and corrective measures can easily be taken.



Figure 4: A loaded timber truck

Some local people are also frustrated with the non compliance of some of the timber firms operating in their localities in fulfilling their social responsibility obligations which include the maintenance of local roads, assistance to local communities to meet basic socio-economic infrastructural needs (schools, health post and potable water) and offering local people job opportunities.

The perception of the most local communities which fringe forest reserves is that these forest resources belong to them and are being held in trust for them by the government. Thus they should derive maximum benefit from these resources. And they should be adequately compensated for the sacrifices they are making in the interest of the country and the global community. In this context, some people even argue that the royalties that are paid to the land owning stools are inadequate and cannot be used to bring any meaningful development to local people (Gayfer et al. 2002).

CONCLUSIONS AND POLICY IMPLICATIONS

The analysis in this paper has shown that illegal chainsaw operations threaten the environment and agricultural production of Ghana. This has been occasioned indirectly by policy which gives preference to exportation of timber to the neglect of meeting the ever growing demand for lumber and other wood products at the local market. The linkage between the export trade and escalation of illegal chainsaw operations is therefore not far fetched.

The inability of past and present governments to curb the activities of chainsaw operations in the country's forest reserves and outside reserve areas also indicates the complexity of the situation. Whilst chainsaw operators have become sophisticated and use arms in their operations, the capacity of the Forestry Services Division (FSD) to deal with the situation has dwindled due to inadequate personnel and equipment.

The decision by the FSD to stop the permit system which enabled local traders to fell trees in off reserve areas to process appears to have worsened the supply situation on the local market. This suggests that not much appraisal was done about the timber export business and its ramification on the local market.

The menace of illegal chainsaw operations to the environment and sustainable agriculture is real and can no longer be taken for granted. And until the government takes a bold and pragmatic decision on illegal chain saw operations, the country's forest and tree resources face massive degradation and overexploitation.

An option, though unpalatable and politically sensitive, may be the mainstreaming of chainsaw operations through the re-introduction of limited permits to registered local groups of timber traders and their chainsaw operators to supply the domestic market. This should be under a system which enjoins such groups to be collectively responsible for the activities of their members. This will make monitoring of their activities, unlike previously, much easier for the FSD to do. Recent overtures to the illegal chainsaw operators suggest that government intends to register them and bring them into the mainstream. A carefully thought out procedure which will build the confidence of the chainsaw operators and their urban financiers in the government would enhance the success of such an exercise. It will also be important for the government to strengthen the FSD to design and operationalize an enhanced monitoring and surveillance system of logging activities, which will take care of any integration arrangement for the illegal chainsaw operators.

Government must also re-examine the timber export and its related policies. Of particular importance is the policy which compels formal mills to supply 20 percent of their products to the local market. The policy is ambiguous on what products the firms must supply and the regulatory mechanism on the supply has also been found to be weak. Under the circumstance, the firms have supplied to the local market products which are of less export value and what the local market does not actually need. These gaps in the policy must be addressed to enhance supply of lumber, the most needed product at the local market.

Finally, the paper has demonstrated a classic case of north-south trade and its implications for the economy and the environment of the country in the south. It has brought to the fore the dilemma of governments in the south, especially in Africa, where the exportation of some primary commodities have had tremendous adverse social, economic and environmental consequences for the people. Governments in the south should be encouraged and supported to develop and implement policies which will genuinely lead to sustainable development with express urgency of alleviating local poverty whilst emphasising the global concerns for environmental integrity.

REFERENCES

- Abudalla, N. 1993. 'Save our forest from rape', *Ghana Today* 1, 2: 28-29.
- FAO/FC 2003. 'Strengthening Participatory Approaches in Forest Management in Uganda, Ghana and Guyana' (GCP/INT/808/UK). The Development of Monitoring and Evaluation System for Collaborative Forest Management in Ghana. A Technical Report prepared for FAO and Ghana's Forestry Commission.
- FC 1994. Forest and Wildlife Policy. Forestry Commission (FC), Ministry of Lands and Forestry, Government of Ghana, Accra.
- Gayfer, J., Sarfo-Mensah, P. and Arthur, E. 2002. Gwira Bansa – Joint Forest Management Project: Mid Term Review. Technical Report Prepared for CARE Ghana.
- GEF and World Bank. 2004. 'The Nature and Role of Local Benefits in Global Environmental (GEF) Management Program Areas. Pilot Case Studies on Natural Resources Management Project (NRMP) in Ghana'. Technical Report Prepared for Global Environmental Facility (GEF) and the World Bank.
- Hutchful, E. 2002. *Ghana's Adjustment Experience: The Paradox of Reform*. United Nations Research Institute for Social Development (UNRISD). Oxford: James Currey Limited; Portsmouth: Heinemann; Accra: Woeli Publishing Services.
- Hyde, W.F., Amacher, G.S. and Magrath, W. 1996. 'Deforestation and Forest Land use: Theory, Evidence, and Policy', *The World Bank Research Observer*, vol11, no. 2 (August 1996), pp. 223-48.
- Inkoom, D. K. B. 1999. *Management of Non-Reserve Forests in Ghana: A Case Study of Mpohor Wassa East District*. SPRING RESEARCH SERIES, No. 24. Dortmund.
- ISSER 1993. The State of the Ghanaian Economy in 1992. The Institute of Statistical, Social and Economic Research (ISSER), University of Ghana, Legon, Ghana.
- MES. 2002. National Biodiversity Strategy for Ghana. Ministry of Environment and Science, Accra, Ghana.
- Owusu, J.H. 1998. 'Current convenience; desperate deforestation: Ghana's adjustment programme and the forestry sector', *The Professional Geographer*, 35, 2.
- Owusu, J.H. 2001. 'Determinants of export-oriented industrial output in Ghana: the case of formal wood processing in an era of economic recovery', *The Journal of Modern African Studies*, 39, 1(2001), pp. 51-80.
- TEDB 1995. The Timber Industry in Ghana, Takoradi. Timber Exports Development Board.

TIDD 1994. 'Summary of production and sales on local market by selected and non selected saw mills'. Timber Industry and Development Division of the Forestry Commission (FC) of Ghana, Kumasi.

NOTE DI LAVORO DELLA FONDAZIONE ENI ENRICO MATTEI

Fondazione Eni Enrico Mattei Working Paper Series

Our Note di Lavoro are available on the Internet at the following addresses:

<http://www.feem.it/Feem/Pub/Publications/WPapers/default.html>

<http://www.ssrn.com/link/feem.html>

NOTE DI LAVORO PUBLISHED IN 2004

IEM	1.2004	Anil MARKANDYA, Suzette PEDROSO and Alexander GOLUB: <u>Empirical Analysis of National Income and So2 Emissions in Selected European Countries</u>
ETA	2.2004	Masahisa FUJITA and Shlomo WEBER: <u>Strategic Immigration Policies and Welfare in Heterogeneous Countries</u>
PRA	3.2004	Adolfo DI CARLUCCIO, Giovanni FERRI, Cecilia FRALE and Ottavio RICCHI: <u>Do Privatizations Boost Household Shareholding? Evidence from Italy</u>
ETA	4.2004	Victor GINSBURGH and Shlomo WEBER: <u>Languages Disenfranchisement in the European Union</u>
ETA	5.2004	Romano PIRAS: <u>Growth, Congestion of Public Goods, and Second-Best Optimal Policy</u>
CCMP	6.2004	Herman R.J. VOLLEBERGH: <u>Lessons from the Polder: Is Dutch CO2-Taxation Optimal</u>
PRA	7.2004	Sandro BRUSCO, Giuseppe LOPOMO and S. VISWANATHAN (lxv): <u>Merger Mechanisms</u>
PRA	8.2004	Wolfgang AUSENNEGG, Pegaret PICHLER and Alex STOMPER (lxv): <u>IPO Pricing with Bookbuilding, and a When-Issued Market</u>
PRA	9.2004	Pegaret PICHLER and Alex STOMPER (lxv): <u>Primary Market Design: Direct Mechanisms and Markets</u>
PRA	10.2004	Florian ENGLMAIER, Pablo GUILLEN, Loreto LLORENTE, Sander ONDERSTAL and Rupert SAUSGRUBER (lxv): <u>The Chopstick Auction: A Study of the Exposure Problem in Multi-Unit Auctions</u>
PRA	11.2004	Bjarne BRENDSTRUP and Harry J. PAARSCH (lxv): <u>Nonparametric Identification and Estimation of Multi-Unit, Sequential, Oral, Ascending-Price Auctions With Asymmetric Bidders</u>
PRA	12.2004	Ohad KADAN (lxv): <u>Equilibrium in the Two Player, k-Double Auction with Affiliated Private Values</u>
PRA	13.2004	Maarten C.W. JANSSEN (lxv): <u>Auctions as Coordination Devices</u>
PRA	14.2004	Gadi FIBICH, Arie GAVIOUS and Aner SELA (lxv): <u>All-Pay Auctions with Weakly Risk-Averse Buyers</u>
PRA	15.2004	Orly SADE, Charles SCHNITZLEIN and Jaime F. ZENDER (lxv): <u>Competition and Cooperation in Divisible Good Auctions: An Experimental Examination</u>
PRA	16.2004	Marta STRYSZOWSKA (lxv): <u>Late and Multiple Bidding in Competing Second Price Internet Auctions</u>
CCMP	17.2004	Slim Ben YOUSSEF: <u>R&D in Cleaner Technology and International Trade</u>
NRM	18.2004	Angelo ANTOCI, Simone BORGHESI and Paolo RUSSU (lxvi): <u>Biodiversity and Economic Growth: Stabilization Versus Preservation of the Ecological Dynamics</u>
SIEV	19.2004	Anna ALBERINI, Paolo ROSATO, Alberto LONGO and Valentina ZANATTA: <u>Information and Willingness to Pay in a Contingent Valuation Study: The Value of S. Erasmo in the Lagoon of Venice</u>
NRM	20.2004	Guido CANDELA and Roberto CELLINI (lxvii): <u>Investment in Tourism Market: A Dynamic Model of Differentiated Oligopoly</u>
NRM	21.2004	Jacqueline M. HAMILTON (lxvii): <u>Climate and the Destination Choice of German Tourists</u>
NRM	22.2004	Javier Rey-MAQUIEIRA PALMER, Javier LOZANO IBÁÑEZ and Carlos Mario GÓMEZ GÓMEZ (lxvii): <u>Land, Environmental Externalities and Tourism Development</u>
NRM	23.2004	Pius ODUNGA and Henk FOLMER (lxvii): <u>Profiling Tourists for Balanced Utilization of Tourism-Based Resources in Kenya</u>
NRM	24.2004	Jean-Jacques NOWAK, Mondher SAHLI and Pasquale M. SGRO (lxvii): <u>Tourism, Trade and Domestic Welfare</u>
NRM	25.2004	Riaz SHAREEF (lxvii): <u>Country Risk Ratings of Small Island Tourism Economies</u>
NRM	26.2004	Juan Luis EUGENIO-MARTÍN, Noelia MARTÍN MORALES and Riccardo SCARPA (lxvii): <u>Tourism and Economic Growth in Latin American Countries: A Panel Data Approach</u>
NRM	27.2004	Raúl Hernández MARTÍN (lxvii): <u>Impact of Tourism Consumption on GDP. The Role of Imports</u>
CSRM	28.2004	Nicoletta FERRO: <u>Cross-Country Ethical Dilemmas in Business: A Descriptive Framework</u>
NRM	29.2004	Marian WEBER (lxvi): <u>Assessing the Effectiveness of Tradable Landuse Rights for Biodiversity Conservation: an Application to Canada's Boreal Mixedwood Forest</u>
NRM	30.2004	Trond BJORN DAL, Phoebe KOUNDOURI and Sean PASCOE (lxvi): <u>Output Substitution in Multi-Species Trawl Fisheries: Implications for Quota Setting</u>
CCMP	31.2004	Marzio GALEOTTI, Alessandra GORIA, Paolo MOMBRINI and Evi SPANTIDAKI: <u>Weather Impacts on Natural, Social and Economic Systems (WISE) Part I: Sectoral Analysis of Climate Impacts in Italy</u>
CCMP	32.2004	Marzio GALEOTTI, Alessandra GORIA, Paolo MOMBRINI and Evi SPANTIDAKI: <u>Weather Impacts on Natural, Social and Economic Systems (WISE) Part II: Individual Perception of Climate Extremes in Italy</u>
CTN	33.2004	Wilson PEREZ: <u>Divide and Conquer: Noisy Communication in Networks, Power, and Wealth Distribution</u>
KTHC	34.2004	Gianmarco I.P. OTTAVIANO and Giovanni PERI (lxviii): <u>The Economic Value of Cultural Diversity: Evidence from US Cities</u>
KTHC	35.2004	Linda CHAIB (lxviii): <u>Immigration and Local Urban Participatory Democracy: A Boston-Paris Comparison</u>

KTHC	36.2004	<i>Franca ECKERT COEN and Claudio ROSSI</i> (lxviii): <u>Foreigners, Immigrants, Host Cities: The Policies of Multi-Ethnicity in Rome. Reading Governance in a Local Context</u>
KTHC	37.2004	<i>Kristine CRANE</i> (lxviii): <u>Governing Migration: Immigrant Groups' Strategies in Three Italian Cities – Rome, Naples and Bari</u>
KTHC	38.2004	<i>Kiflemariam HAMDE</i> (lxviii): <u>Mind in Africa, Body in Europe: The Struggle for Maintaining and Transforming Cultural Identity - A Note from the Experience of Eritrean Immigrants in Stockholm</u>
ETA	39.2004	<i>Alberto CAVALIERE</i> : <u>Price Competition with Information Disparities in a Vertically Differentiated Duopoly</u>
PRA	40.2004	<i>Andrea BIGANO and Stef PROOST</i> : <u>The Opening of the European Electricity Market and Environmental Policy: Does the Degree of Competition Matter?</u>
CCMP	41.2004	<i>Micheal FINUS</i> (lxix): <u>International Cooperation to Resolve International Pollution Problems</u>
KTHC	42.2004	<i>Francesco CRESPI</i> : <u>Notes on the Determinants of Innovation: A Multi-Perspective Analysis</u>
CTN	43.2004	<i>Sergio CURRARINI and Marco MARINI</i> : <u>Coalition Formation in Games without Synergies</u>
CTN	44.2004	<i>Marc ESCRIHUELA-VILLAR</i> : <u>Cartel Sustainability and Cartel Stability</u>
NRM	45.2004	<i>Sebastian BERVOETS and Nicolas GRAVEL</i> (lxvi): <u>Appraising Diversity with an Ordinal Notion of Similarity: An Axiomatic Approach</u>
NRM	46.2004	<i>Signe ANTHON and Bo JELLES MARK THORSEN</i> (lxvi): <u>Optimal Afforestation Contracts with Asymmetric Information on Private Environmental Benefits</u>
NRM	47.2004	<i>John MBURU</i> (lxvi): <u>Wildlife Conservation and Management in Kenya: Towards a Co-management Approach</u>
NRM	48.2004	<i>Ekin BIROL, Ágnes GYÓVAI and Melinda SMALE</i> (lxvi): <u>Using a Choice Experiment to Value Agricultural Biodiversity on Hungarian Small Farms: Agri-Environmental Policies in a Transition al Economy</u>
CCMP	49.2004	<i>Gernot KLEPPER and Sonja PETERSON</i> : <u>The EU Emissions Trading Scheme. Allowance Prices, Trade Flows, Competitiveness Effects</u>
GG	50.2004	<i>Scott BARRETT and Michael HOEL</i> : <u>Optimal Disease Eradication</u>
CTN	51.2004	<i>Dinko DIMITROV, Peter BORM, Ruud HENDRICKX and Shao CHIN SUNG</i> : <u>Simple Priorities and Core Stability in Hedonic Games</u>
SIEV	52.2004	<i>Francesco RICCI</i> : <u>Channels of Transmission of Environmental Policy to Economic Growth: A Survey of the Theory</u>
SIEV	53.2004	<i>Anna ALBERINI, Maureen CROPPER, Alan KRUPNICK and Nathalie B. SIMON</i> : <u>Willingness to Pay for Mortality Risk Reductions: Does Latency Matter?</u>
NRM	54.2004	<i>Ingo BRÄUER and Rainer MARGGRAF</i> (lxvi): <u>Valuation of Ecosystem Services Provided by Biodiversity Conservation: An Integrated Hydrological and Economic Model to Value the Enhanced Nitrogen Retention in Renaturated Streams</u>
NRM	55.2004	<i>Timo GOESCHL and Tun LIN</i> (lxvi): <u>Biodiversity Conservation on Private Lands: Information Problems and Regulatory Choices</u>
NRM	56.2004	<i>Tom DEDEURWAERDERE</i> (lxvi): <u>Bioprospection: From the Economics of Contracts to Reflexive Governance</u>
CCMP	57.2004	<i>Katrin REHDANZ and David MADDISON</i> : <u>The Amenity Value of Climate to German Households</u>
CCMP	58.2004	<i>Koen SMEKENS and Bob VAN DER ZWAAN</i> : <u>Environmental Externalities of Geological Carbon Sequestration Effects on Energy Scenarios</u>
NRM	59.2004	<i>Valentina BOSETTI, Mariaester CASSINELLI and Alessandro LANZA</i> (lxvii): <u>Using Data Envelopment Analysis to Evaluate Environmentally Conscious Tourism Management</u>
NRM	60.2004	<i>Timo GOESCHL and Danilo CAMARGO IGLIORI</i> (lxvi): <u>Property Rights Conservation and Development: An Analysis of Extractive Reserves in the Brazilian Amazon</u>
CCMP	61.2004	<i>Barbara BUCHNER and Carlo CARRARO</i> : <u>Economic and Environmental Effectiveness of a Technology-based Climate Protocol</u>
NRM	62.2004	<i>Elissaios PAPYRAKIS and Reyer GERLAGH</i> : <u>Resource-Abundance and Economic Growth in the U.S.</u>
NRM	63.2004	<i>Györgyi BELA, György PATAKI, Melinda SMALE and Mariann HAJDÚ</i> (lxvi): <u>Conserving Crop Genetic Resources on Smallholder Farms in Hungary: Institutional Analysis</u>
NRM	64.2004	<i>E.C.M. RUIJGROK and E.E.M. NILLESEN</i> (lxvi): <u>The Socio-Economic Value of Natural Riverbanks in the Netherlands</u>
NRM	65.2004	<i>E.C.M. RUIJGROK</i> (lxvi): <u>Reducing Acidification: The Benefits of Increased Nature Quality. Investigating the Possibilities of the Contingent Valuation Method</u>
ETA	66.2004	<i>Giannis VARDAS and Anastasios XEPAPADEAS</i> : <u>Uncertainty Aversion, Robust Control and Asset Holdings</u>
GG	67.2004	<i>Anastasios XEPAPADEAS and Constadina PASSA</i> : <u>Participation in and Compliance with Public Voluntary Environmental Programs: An Evolutionary Approach</u>
GG	68.2004	<i>Michael FINUS</i> : <u>Modesty Pays: Sometimes!</u>
NRM	69.2004	<i>Trond BJØRNDAL and Ana BRASÃO</i> : <u>The Northern Atlantic Bluefin Tuna Fisheries: Management and Policy Implications</u>
CTN	70.2004	<i>Alejandro CAPARRÓS, Abdelhakim HAMMOUDI and Tarik TAZDAÏT</i> : <u>On Coalition Formation with Heterogeneous Agents</u>
IEM	71.2004	<i>Massimo GIOVANNINI, Margherita GRASSO, Alessandro LANZA and Matteo MANERA</i> : <u>Conditional Correlations in the Returns on Oil Companies Stock Prices and Their Determinants</u>
IEM	72.2004	<i>Alessandro LANZA, Matteo MANERA and Michael MCALEER</i> : <u>Modelling Dynamic Conditional Correlations in WTI Oil Forward and Futures Returns</u>
SIEV	73.2004	<i>Margarita GENIUS and Elisabetta STRAZZERA</i> : <u>The Copula Approach to Sample Selection Modelling: An Application to the Recreational Value of Forests</u>

CCMP	74.2004	<i>Rob DELLINK and Ekko van IERLAND</i> : <u>Pollution Abatement in the Netherlands: A Dynamic Applied General Equilibrium Assessment</u>
ETA	75.2004	<i>Rosella LEVAGGI and Michele MORETTO</i> : <u>Investment in Hospital Care Technology under Different Purchasing Rules: A Real Option Approach</u>
CTN	76.2004	<i>Salvador BARBERÀ and Matthew O. JACKSON (lxx)</i> : <u>On the Weights of Nations: Assigning Voting Weights in a Heterogeneous Union</u>
CTN	77.2004	<i>Àlex ARENAS, Antonio CABRALES, Albert DÍAZ-GUILERA, Roger GUIMERÀ and Fernando VEGA-REDONDO (lxx)</i> : <u>Optimal Information Transmission in Organizations: Search and Congestion</u>
CTN	78.2004	<i>Francis BLOCH and Armando GOMES (lxx)</i> : <u>Contracting with Externalities and Outside Options</u>
CTN	79.2004	<i>Rabah AMIR, Effrosyni DIAMANTOUDI and Licun XUE (lxx)</i> : <u>Merger Performance under Uncertain Efficiency Gains</u>
CTN	80.2004	<i>Francis BLOCH and Matthew O. JACKSON (lxx)</i> : <u>The Formation of Networks with Transfers among Players</u>
CTN	81.2004	<i>Daniel DIERMEIER, Hülya ERASLAN and Antonio MERLO (lxx)</i> : <u>Bicameralism and Government Formation</u>
CTN	82.2004	<i>Rod GARRATT, James E. PARCO, Cheng-ZHONG QIN and Amnon RAPOPORT (lxx)</i> : <u>Potential Maximization and Coalition Government Formation</u>
CTN	83.2004	<i>Kfir ELIAZ, Debraj RAY and Ronny RAZIN (lxx)</i> : <u>Group Decision-Making in the Shadow of Disagreement</u>
CTN	84.2004	<i>Sanjeev GOYAL, Marco van der LEIJ and José Luis MORAGA-GONZÁLEZ (lxx)</i> : <u>Economics: An Emerging Small World?</u>
CTN	85.2004	<i>Edward CARTWRIGHT (lxx)</i> : <u>Learning to Play Approximate Nash Equilibria in Games with Many Players</u>
IEM	86.2004	<i>Finn R. FØRSUND and Michael HOEL</i> : <u>Properties of a Non-Competitive Electricity Market Dominated by Hydroelectric Power</u>
KTHC	87.2004	<i>Elissaios PAPYRAKIS and Reyer GERLAGH</i> : <u>Natural Resources, Investment and Long-Term Income</u>
CCMP	88.2004	<i>Marzio GALEOTTI and Claudia KEMFERT</i> : <u>Interactions between Climate and Trade Policies: A Survey</u>
IEM	89.2004	<i>A. MARKANDYA, S. PEDROSO and D. STREIMIKIENE</i> : <u>Energy Efficiency in Transition Economies: Is There Convergence Towards the EU Average?</u>
GG	90.2004	<i>Rolf GOLOMBEK and Michael HOEL</i> : <u>Climate Agreements and Technology Policy</u>
PRA	91.2004	<i>Sergei IZMALKOV (lxv)</i> : <u>Multi-Unit Open Ascending Price Efficient Auction</u>
KTHC	92.2004	<i>Gianmarco I.P. OTTAVIANO and Giovanni PERI</i> : <u>Cities and Cultures</u>
KTHC	93.2004	<i>Massimo DEL GATTO</i> : <u>Agglomeration, Integration, and Territorial Authority Scale in a System of Trading Cities. Centralisation versus devolution</u>
CCMP	94.2004	<i>Pierre-André JOUVET, Philippe MICHEL and Gilles ROTILLON</i> : <u>Equilibrium with a Market of Permits</u>
CCMP	95.2004	<i>Bob van der ZWAAN and Reyer GERLAGH</i> : <u>Climate Uncertainty and the Necessity to Transform Global Energy Supply</u>
CCMP	96.2004	<i>Francesco BOSELLO, Marco LAZZARIN, Roberto ROSON and Richard S.J. TOL</i> : <u>Economy-Wide Estimates of the Implications of Climate Change: Sea Level Rise</u>
CTN	97.2004	<i>Gustavo BERGANTIÑOS and Juan J. VIDAL-PUGA</i> : <u>Defining Rules in Cost Spanning Tree Problems Through the Canonical Form</u>
CTN	98.2004	<i>Siddhartha BANDYOPADHYAY and Mandar OAK</i> : <u>Party Formation and Coalitional Bargaining in a Model of Proportional Representation</u>
GG	99.2004	<i>Hans-Peter WEIKARD, Michael FINUS and Juan-Carlos ALTAMIRANO-CABRERA</i> : <u>The Impact of Surplus Sharing on the Stability of International Climate Agreements</u>
SIEV	100.2004	<i>Chiara M. TRAVISI and Peter NIJKAMP</i> : <u>Willingness to Pay for Agricultural Environmental Safety: Evidence from a Survey of Milan, Italy, Residents</u>
SIEV	101.2004	<i>Chiara M. TRAVISI, Raymond J. G. M. FLORAX and Peter NIJKAMP</i> : <u>A Meta-Analysis of the Willingness to Pay for Reductions in Pesticide Risk Exposure</u>
NRM	102.2004	<i>Valentina BOSETTI and David TOMBERLIN</i> : <u>Real Options Analysis of Fishing Fleet Dynamics: A Test</u>
CCMP	103.2004	<i>Alessandra GORIA e Gretel GAMBARELLI</i> : <u>Economic Evaluation of Climate Change Impacts and Adaptability in Italy</u>
PRA	104.2004	<i>Massimo FLORIO and Mara GRASSEN</i> : <u>The Missing Shock: The Macroeconomic Impact of British Privatisation</u>
PRA	105.2004	<i>John BENNETT, Saul ESTRIN, James MAW and Giovanni URG</i> : <u>Privatisation Methods and Economic Growth in Transition Economies</u>
PRA	106.2004	<i>Kira BÖRNER</i> : <u>The Political Economy of Privatization: Why Do Governments Want Reforms?</u>
PRA	107.2004	<i>Pehr-Johan NORBÄCK and Lars PERSSON</i> : <u>Privatization and Restructuring in Concentrated Markets</u>
SIEV	108.2004	<i>Angela GRANZOTTO, Fabio PRANOVI, Simone LIBRALATO, Patrizia TORRICELLI and Danilo MAINARDI</i> : <u>Comparison between Artisanal Fishery and Manila Clam Harvesting in the Venice Lagoon by Using Ecosystem Indicators: An Ecological Economics Perspective</u>
CTN	109.2004	<i>Somdeb LAHIRI</i> : <u>The Cooperative Theory of Two Sided Matching Problems: A Re-examination of Some Results</u>
NRM	110.2004	<i>Giuseppe DI VITA</i> : <u>Natural Resources Dynamics: Another Look</u>
SIEV	111.2004	<i>Anna ALBERINI, Alistair HUNT and Anil MARKANDYA</i> : <u>Willingness to Pay to Reduce Mortality Risks: Evidence from a Three-Country Contingent Valuation Study</u>
KTHC	112.2004	<i>Valeria PAPPONETTI and Dino PINELLI</i> : <u>Scientific Advice to Public Policy-Making</u>
SIEV	113.2004	<i>Paulo A.L.D. NUNES and Laura ONOFRI</i> : <u>The Economics of Warm Glow: A Note on Consumer's Behavior and Public Policy Implications</u>
IEM	114.2004	<i>Patrick CAYRADE</i> : <u>Investments in Gas Pipelines and Liquefied Natural Gas Infrastructure What is the Impact on the Security of Supply?</u>
IEM	115.2004	<i>Valeria COSTANTINI and Francesco GRACCEVA</i> : <u>Oil Security. Short- and Long-Term Policies</u>

ITEM	116.2004	<i>Valeria COSTANTINI and Francesco GRACCEVA: <u>Social Costs of Energy Disruptions</u></i>
ITEM	117.2004	<i>Christian EGENHOFER, Kyriakos GIALOGLOU, Giacomo LUCIANI, Maroeska BOOTS, Martin SCHEEPERS, Valeria COSTANTINI, Francesco GRACCEVA, Anil MARKANDYA and Giorgio VICINI: <u>Market-Based Options for Security of Energy Supply</u></i>
ITEM	118.2004	<i>David FISK: <u>Transport Energy Security. The Unseen Risk?</u></i>
ITEM	119.2004	<i>Giacomo LUCIANI: <u>Security of Supply for Natural Gas Markets. What is it and What is it not?</u></i>
ITEM	120.2004	<i>L.J. de VRIES and R.A. HAKVOORT: <u>The Question of Generation Adequacy in Liberalised Electricity Markets on the Islands of the Venice Lagoon: A Spatially-Distributed Hedonic-Hierarchical Approach</u></i>
KTHC	121.2004	<i>Alberto PETRUCCI: <u>Asset Accumulation, Fertility Choice and Nondegenerate Dynamics in a Small Open Economy</u></i>
NRM	122.2004	<i>Carlo GIUPPONI, Jaroslav MYSLAK and Anita FASSIO: <u>An Integrated Assessment Framework for Water Resources Management: A DSS Tool and a Pilot Study Application</u></i>
NRM	123.2004	<i>Margaretha BREIL, Anita FASSIO, Carlo GIUPPONI and Paolo ROSATO: <u>Evaluation of Urban Improvement on the Islands of the Venice Lagoon: A Spatially-Distributed Hedonic-Hierarchical Approach</u></i>
ETA	124.2004	<i>Paul MENSINK: <u>Instant Efficient Pollution Abatement Under Non-Linear Taxation and Asymmetric Information: The Differential Tax Revisited</u></i>
NRM	125.2004	<i>Mauro FABIANO, Gabriella CAMARSA, Rosanna DURSI, Roberta IVALDI, Valentina MARIN and Francesca PALMISANI: <u>Integrated Environmental Study for Beach Management: A Methodological Approach</u></i>
PRA	126.2004	<i>Irena GROSFELD and Iraj HASHI: <u>The Emergence of Large Shareholders in Mass Privatized Firms: Evidence from Poland and the Czech Republic</u></i>
CCMP	127.2004	<i>Maria BERRITTELLA, Andrea BIGANO, Roberto ROSON and Richard S.J. TOL: <u>A General Equilibrium Analysis of Climate Change Impacts on Tourism</u></i>
CCMP	128.2004	<i>Reyer GERLAGH: <u>A Climate-Change Policy Induced Shift from Innovations in Energy Production to Energy Savings</u></i>
NRM	129.2004	<i>Elissaios PAPYRAKIS and Reyner GERLAGH: <u>Natural Resources, Innovation, and Growth</u></i>
PRA	130.2004	<i>Bernardo BORTOLOTTI and Mara FACCIO: <u>Reluctant Privatization</u></i>
SIEV	131.2004	<i>Riccardo SCARPA and Mara THIENE: <u>Destination Choice Models for Rock Climbing in the Northeast Alps: A Latent-Class Approach Based on Intensity of Participation</u></i>
SIEV	132.2004	<i>Riccardo SCARPA Kenneth G. WILLIS and Melinda ACUTT: <u>Comparing Individual-Specific Benefit Estimates for Public Goods: Finite Versus Continuous Mixing in Logit Models</u></i>
ITEM	133.2004	<i>Santiago J. RUBIO: <u>On Capturing Oil Rents with a National Excise Tax Revisited</u></i>
ETA	134.2004	<i>Ascensión ANDINA DÍAZ: <u>Political Competition when Media Create Candidates' Charisma</u></i>
SIEV	135.2004	<i>Anna ALBERINI: <u>Robustness of VSL Values from Contingent Valuation Surveys</u></i>
CCMP	136.2004	<i>Gernot KLEPPER and Sonja PETERSON: <u>Marginal Abatement Cost Curves in General Equilibrium: The Influence of World Energy Prices</u></i>
ETA	137.2004	<i>Herbert DAWID, Christophe DEISSENBERG and Pavel ŠEVČIK: <u>Cheap Talk, Gullibility, and Welfare in an Environmental Taxation Game</u></i>
CCMP	138.2004	<i>ZhongXiang ZHANG: <u>The World Bank's Prototype Carbon Fund and China</u></i>
CCMP	139.2004	<i>Reyer GERLAGH and Marjan W. HOFKES: <u>Time Profile of Climate Change Stabilization Policy</u></i>
NRM	140.2004	<i>Chiara D'ALPAOS and Michele MORETTO: <u>The Value of Flexibility in the Italian Water Service Sector: A Real Option Analysis</u></i>
PRA	141.2004	<i>Patrick BAJARI, Stephanie HOUGHTON and Steven TADELIS (lxxi): <u>Bidding for Incomplete Contracts</u></i>
PRA	142.2004	<i>Susan ATHEY, Jonathan LEVIN and Enrique SEIRA (lxxi): <u>Comparing Open and Sealed Bid Auctions: Theory and Evidence from Timber Auctions</u></i>
PRA	143.2004	<i>David GOLDREICH (lxxi): <u>Behavioral Biases of Dealers in U.S. Treasury Auctions</u></i>
PRA	144.2004	<i>Roberto BURGUET (lxxi): <u>Optimal Procurement Auction for a Buyer with Downward Sloping Demand: More Simple Economics</u></i>
PRA	145.2004	<i>Ali HORTACSU and Samita SAREEN (lxxi): <u>Order Flow and the Formation of Dealer Bids: An Analysis of Information and Strategic Behavior in the Government of Canada Securities Auctions</u></i>
PRA	146.2004	<i>Victor GINSBURGH, Patrick LEGROS and Nicolas SAHUGUET (lxxi): <u>How to Win Twice at an Auction. On the Incidence of Commissions in Auction Markets</u></i>
PRA	147.2004	<i>Claudio MEZZETTI, Aleksandar PEKEČ and Ilia TSETLIN (lxxi): <u>Sequential vs. Single-Round Uniform-Price Auctions</u></i>
PRA	148.2004	<i>John ASKER and Estelle CANTILLON (lxxi): <u>Equilibrium of Scoring Auctions</u></i>
PRA	149.2004	<i>Philip A. HAILE, Han HONG and Matthew SHUM (lxxi): <u>Nonparametric Tests for Common Values in First-Price Sealed-Bid Auctions</u></i>
PRA	150.2004	<i>François DEGEORGE, François DERRIEN and Kent L. WOMACK (lxxi): <u>Quid Pro Quo in IPOs: Why Bookbuilding is Dominating Auctions</u></i>
CCMP	151.2004	<i>Barbara BUCHNER and Silvia DALL'OLIO: <u>Russia: The Long Road to Ratification. Internal Institution and Pressure Groups in the Kyoto Protocol's Adoption Process</u></i>
CCMP	152.2004	<i>Carlo CARRARO and Marzio GALEOTTI: <u>Does Endogenous Technical Change Make a Difference in Climate Policy Analysis? A Robustness Exercise with the FEEM-RICE Model</u></i>
PRA	153.2004	<i>Alejandro M. MANELLI and Daniel R. VINCENT (lxxi): <u>Multidimensional Mechanism Design: Revenue Maximization and the Multiple-Good Monopoly</u></i>
ETA	154.2004	<i>Nicola ACOCELLA, Giovanni Di BARTOLOMEO and Wilfried PAUWELS: <u>Is there any Scope for Corporatism in Stabilization Policies?</u></i>
CTN	155.2004	<i>Johan EYCKMANS and Michael FINUS: <u>An Almost Ideal Sharing Scheme for Coalition Games with Externalities</u></i>
CCMP	156.2004	<i>Cesare DOSI and Michele MORETTO: <u>Environmental Innovation, War of Attrition and Investment Grants</u></i>

CCMP	157.2004	<i>Valentina BOSETTI, Marzio GALEOTTI and Alessandro LANZA: <u>How Consistent are Alternative Short-Term Climate Policies with Long-Term Goals?</u></i>
ETA	158.2004	<i>Y. Hossein FARZIN and Ken-Ichi AKAO: <u>Non-pecuniary Value of Employment and Individual Labor Supply</u></i>
ETA	159.2004	<i>William BROCK and Anastasios XEPAPADEAS: <u>Spatial Analysis: Development of Descriptive and Normative Methods with Applications to Economic-Ecological Modelling</u></i>
KTHC	160.2004	<i>Alberto PETRUCCI: <u>On the Incidence of a Tax on PureRent with Infinite Horizons</u></i>
IEM	161.2004	<i>Xavier LABANDEIRA, José M. LABEAGA and Miguel RODRÍGUEZ: <u>Microsimulating the Effects of Household Energy Price Changes in Spain</u></i>

NOTE DI LAVORO PUBLISHED IN 2005

CCMP	1.2005	<i>Stéphane HALLEGATTE: <u>Accounting for Extreme Events in the Economic Assessment of Climate Change</u></i>
CCMP	2.2005	<i>Qiang WU and Paulo Augusto NUNES: <u>Application of Technological Control Measures on Vehicle Pollution: A Cost-Benefit Analysis in China</u></i>
CCMP	3.2005	<i>Andrea BIGANO, Jacqueline M. HAMILTON, Maren LAU, Richard S.J. TOL and Yuan ZHOU: <u>A Global Database of Domestic and International Tourist Numbers at National and Subnational Level</u></i>
CCMP	4.2005	<i>Andrea BIGANO, Jacqueline M. HAMILTON and Richard S.J. TOL: <u>The Impact of Climate on Holiday Destination Choice</u></i>
ETA	5.2005	<i>Hubert KEMPF: <u>Is Inequality Harmful for the Environment in a Growing Economy?</u></i>
CCMP	6.2005	<i>Valentina BOSETTI, Carlo CARRARO and Marzio GALEOTTI: <u>The Dynamics of Carbon and Energy Intensity in a Model of Endogenous Technical Change</u></i>
IEM	7.2005	<i>David CALEF and Robert GOBLE: <u>The Allure of Technology: How France and California Promoted Electric Vehicles to Reduce Urban Air Pollution</u></i>
ETA	8.2005	<i>Lorenzo PELLEGRINI and Reyer GERLAGH: <u>An Empirical Contribution to the Debate on Corruption Democracy and Environmental Policy</u></i>
CCMP	9.2005	<i>Angelo ANTOCI: <u>Environmental Resources Depletion and Interplay Between Negative and Positive Externalities in a Growth Model</u></i>
CTN	10.2005	<i>Frédéric DEROIAN: <u>Cost-Reducing Alliances and Local Spillovers</u></i>
NRM	11.2005	<i>Francesco SINDICO: <u>The GMO Dispute before the WTO: Legal Implications for the Trade and Environment Debate</u></i>
KTHC	12.2005	<i>Carla MASSIDDA: <u>Estimating the New Keynesian Phillips Curve for Italian Manufacturing Sectors</u></i>
KTHC	13.2005	<i>Michele MORETTO and Gianpaolo ROSSINI: <u>Start-up Entry Strategies: Employer vs. Nonemployer firms</u></i>
PRCG	14.2005	<i>Clara GRAZIANO and Annalisa LUPORINI: <u>Ownership Concentration, Monitoring and Optimal Board Structure</u></i>
CSRM	15.2005	<i>Parashar KULKARNI: <u>Use of Ecolabels in Promoting Exports from Developing Countries to Developed Countries: Lessons from the Indian LeatherFootwear Industry</u></i>
KTHC	16.2005	<i>Adriana DI LIBERTO, Roberto MURA and Francesco PIGLIARU: <u>How to Measure the Unobservable: A Panel Technique for the Analysis of TFP Convergence</u></i>
KTHC	17.2005	<i>Alireza NAGHAVI: <u>Asymmetric Labor Markets, Southern Wages, and the Location of Firms</u></i>
KTHC	18.2005	<i>Alireza NAGHAVI: <u>Strategic Intellectual Property Rights Policy and North-South Technology Transfer</u></i>
KTHC	19.2005	<i>Mombert HOPPE: <u>Technology Transfer Through Trade</u></i>
PRCG	20.2005	<i>Roberto ROSON: <u>Platform Competition with Endogenous Multihoming</u></i>
CCMP	21.2005	<i>Barbara BUCHNER and Carlo CARRARO: <u>Regional and Sub-Global Climate Blocs. A Game Theoretic Perspective on Bottom-up Climate Regimes</u></i>
IEM	22.2005	<i>Fausto CAVALLARO: <u>An Integrated Multi-Criteria System to Assess Sustainable Energy Options: An Application of the Promethee Method</u></i>
CTN	23.2005	<i>Michael FINUS, Pierre v. MOUCHE and Bianca RUNDSHAGEN: <u>Uniqueness of Coalitional Equilibria</u></i>
IEM	24.2005	<i>Wietze LISE: <u>Decomposition of CO2 Emissions over 1980–2003 in Turkey</u></i>
CTN	25.2005	<i>Somdeb LAHIRI: <u>The Core of Directed Network Problems with Quotas</u></i>
SIEV	26.2005	<i>Susanne MENZEL and Riccardo SCARPA: <u>Protection Motivation Theory and Contingent Valuation: Perceived Realism, Threat and WTP Estimates for Biodiversity Protection</u></i>
NRM	27.2005	<i>Massimiliano MAZZANTI and Anna MONTINI: <u>The Determinants of Residential Water Demand Empirical Evidence for a Panel of Italian Municipalities</u></i>
CCMP	28.2005	<i>Laurent GILOTTE and Michel de LARA: <u>Precautionary Effect and Variations of the Value of Information</u></i>
NRM	29.2005	<i>Paul SARFO-MENSAH: <u>Exportation of Timber in Ghana: The Menace of Illegal Logging Operations</u></i>

(lxv) This paper was presented at the EuroConference on “Auctions and Market Design: Theory, Evidence and Applications” organised by Fondazione Eni Enrico Mattei and sponsored by the EU, Milan, September 25-27, 2003

(lxvi) This paper has been presented at the 4th BioEcon Workshop on “Economic Analysis of Policies for Biodiversity Conservation” organised on behalf of the BIOECON Network by Fondazione Eni Enrico Mattei, Venice International University (VIU) and University College London (UCL), Venice, August 28-29, 2003

(lxvii) This paper has been presented at the international conference on “Tourism and Sustainable Economic Development – Macro and Micro Economic Issues” jointly organised by CRENoS (Università di Cagliari e Sassari, Italy) and Fondazione Eni Enrico Mattei, and supported by the World Bank, Sardinia, September 19-20, 2003

(lxviii) This paper was presented at the ENGIME Workshop on “Governance and Policies in Multicultural Cities”, Rome, June 5-6, 2003

(lxix) This paper was presented at the Fourth EEP Plenary Workshop and EEP Conference “The Future of Climate Policy”, Cagliari, Italy, 27-28 March 2003

(lxx) This paper was presented at the 9th Coalition Theory Workshop on "Collective Decisions and Institutional Design" organised by the Universitat Autònoma de Barcelona and held in Barcelona, Spain, January 30-31, 2004

(lxxi) This paper was presented at the EuroConference on “Auctions and Market Design: Theory, Evidence and Applications”, organised by Fondazione Eni Enrico Mattei and Consip and sponsored by the EU, Rome, September 23-25, 2004

2004 SERIES

CCMP	<i>Climate Change Modelling and Policy</i> (Editor: Marzio Galeotti)
GG	<i>Global Governance</i> (Editor: Carlo Carraro)
SIEV	<i>Sustainability Indicators and Environmental Valuation</i> (Editor: Anna Alberini)
NRM	<i>Natural Resources Management</i> (Editor: Carlo Giupponi)
KTHC	<i>Knowledge, Technology, Human Capital</i> (Editor: Gianmarco Ottaviano)
IEM	<i>International Energy Markets</i> (Editor: Anil Markandya)
CSRM	<i>Corporate Social Responsibility and Sustainable Management</i> (Editor: Sabina Ratti)
PRA	<i>Privatisation, Regulation, Antitrust</i> (Editor: Bernardo Bortolotti)
ETA	<i>Economic Theory and Applications</i> (Editor: Carlo Carraro)
CTN	<i>Coalition Theory Network</i>

2005 SERIES

CCMP	<i>Climate Change Modelling and Policy</i> (Editor: Marzio Galeotti)
SIEV	<i>Sustainability Indicators and Environmental Valuation</i> (Editor: Anna Alberini)
NRM	<i>Natural Resources Management</i> (Editor: Carlo Giupponi)
KTHC	<i>Knowledge, Technology, Human Capital</i> (Editor: Gianmarco Ottaviano)
IEM	<i>International Energy Markets</i> (Editor: Anil Markandya)
CSRM	<i>Corporate Social Responsibility and Sustainable Management</i> (Editor: Sabina Ratti)
PRCG	<i>Privatisation Regulation Corporate Governance</i> (Editor: Bernardo Bortolotti)
ETA	<i>Economic Theory and Applications</i> (Editor: Carlo Carraro)
CTN	<i>Coalition Theory Network</i>