OECD Trade Policy Studies

Illegal Trade in Environmentally Sensitive Goods

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BETTER POLICIES FOR BETTER LIVES

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Please cite this publication as:
OECD (2012), *Illegal Trade in Environmentally Sensitive Goods*, OECD Trade Policy Studies, OECD Publishing.
http://dx.doi.org/10.1787/9789264174238-en

ISBN 978-92-64-17422-1 (print)
ISBN 978-92-64-17423-8 (PDF)

Series: OECD Trade Policy Studies
ISSN 1990-1542 (print)
ISSN 1990-1534 (online)

European Union
Catalogue number: OA-31-12-757-EN-C (print)
Catalogue number: OA-31-12-757-EN-N (PDF)

ISBN 978-92-78-40914-2 (print)
ISBN 978-92-78-40912-8 (PDF)

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Foreword

The objective of this report is to provide an overview of the economic and policy issues involved in illegal trade in environmentally sensitive goods and to highlight a set of key policy messages for OECD and non-OECD governments. The work has been overseen by the OECD Joint Working Party on Trade and the Environment (JWPTE).

When taking forward the planned activity, the JWPTE agreed that the most added value from the work would be realised by focussing on selected cross-cutting issues, illustrated by examples belonging to different types of illegal trade flows in environmentally sensitive goods such as wildlife, timber, fish and fish products, chemicals and hazardous waste.

Examining the impacts of trade in environmentally sensitive goods, including its economic significance and environmental consequences, was the core objective of this work. The extent to which customs and licensing-scheme data analysis can be used to assess illegal trade was also examined by the group. In addition, the activity carried out under the guidance of the JWPTE aimed at better understanding the role of different broad types of policy instruments in addressing illegal trade in environmentally sensitive goods.

The publication is based upon a set of papers prepared by experts from Chatham House (U.K.) The main contributors were Duncan Brack, Jon Buckrell, Alison Hoare and Sam Lawson. The assistance of Šárka Svobodová (OECD Secretariat) in the preparation of the final manuscript is gratefully acknowledged.

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Executive summary

This publication reviews the evidence on the key drivers of illegal trade in environmentally sensitive goods. This includes factors such as differential costs, as well as enabling conditions such as regulatory and enforcement failures. It also provides an overview of the main economic, social and environmental impacts. The report reviews the data collected by customs and licensing schemes for selected environmentally sensitive goods, including wildlife, fish, timber, ozone-depleting substances (ODS) and hazardous waste. It examines the extent to which this information can be used to identify and measure illegal trade.

In this publication the role of national and international policy mechanisms to reduce illegal trade flows is assessed, with a focus on international licensing schemes (and associated trade restrictions). These are designed to allow importing countries to distinguish between legal and illegal products. In addition, the role of national environmental policy measures on illegal trade is assessed, focussing on property rights-based systems and economic incentives.

Drivers and impacts of illegal trade

It is important to understand what drives illegal trade and the circumstances that cause it to thrive, so that effective policies can be developed to counter it. As this publication shows, the key drivers may vary over time and from one location or sector to another.

Any form of trade (legal or illegal) arises when there are profits to be made for those involved. But illegal trade arises particularly when the expected returns are greater than for trade carried out within the law. For example, compliance with regulations concerning reforestation, waste disposal or the use of chemical products might incur costs that can be avoided by illegal trade.

Even if the legal alternative is not more costly, illegal trade might emerge when demand exceeds the supply of legal products. This is often the case for timber. It would, of course, also arise if demand exists for completely banned products and no legal alternatives exist. This is common in wildlife crime, where major sources of demand include the exotic pet and flower trade. Often,

the trade in environmentally sensitive goods is driven by changes in consumption. In the illegal wildlife trade, poverty has been found to be relatively unimportant, whereas strong demand from consumer countries may be.

The impacts of illegal trade can be wide-ranging. These will, of course, vary from country to country and locality to locality, and the precise impacts will vary with the sector. Illegal trade in natural resources – timber and fish – may have the most significant economic impacts, while illegal dumping of hazardous waste may have the biggest health impacts, and poaching may have the greatest impact on species survival. Illegal trade in ozone-depleting substances has slowed the resolution of a significant global environmental concern.

The economic and environmental impacts of illegal trade can be sufficiently important to disrupt whole economies and ecosystems, undermining environmentally sustainable activities and reducing future options for the use of resources. There can be spillover effects, with indirect consequences. For instance, in fragile states illegal trade can undermine the rule of law and can fuel armed conflict. Any serious attempt to tackle illegal trade in the sectors examined here would benefit from a systematic evaluation of the impacts.

Evidence of illegal trade

It should in principle be possible to identify illegal trade in some environmentally sensitive products by examining import and export data and analysing discrepancies between the two sources. Wide variations between different countries' statistics may indicate illegal trade in some form. However, such an approach is imperfect, and there is great uncertainty about the scale of illegal trade in all areas. Such discrepancies may merely be a reflection of differing measurement methods, data inputting or conversion errors and inconsistencies.

In this publication three sets of data comparisons are undertaken:

- Between customs data and data recorded by licensing systems.
- Between customs data from importing and exporting countries.
- Between licensing-system data from importing and exporting countries.

Different methods need to be used for different sectors and products, depending on the nature of the goods concerned, the associated control mechanisms in place, and on the extent to which customs records distinguish controlled goods from uncontrolled goods. In the case of timber and fish, for instance, no international control system exists, so the analysis is normally confined to customs data. For threatened wildlife products listed on CITES

appendices, licensing data for both exports and imports are sometimes available, but customs data are rarely sufficiently precise to be of use. For ozone-depleting substances (ODS), some licensing system data are available and some customs codes are sufficiently correlated to provide useful information. For hazardous waste, data are available on 'movement documents' issued by governments, and useable customs data are also available for certain categories of waste.

The general conclusion is that while more data could be analysed in some of these areas, it is by no means a straightforward task. The further elaboration of the Harmonized System codes would prove of use in many cases. In the area of biodiversity, inadequate taxonomic information has been recognised as a problem, and the Global Taxonomy Initiative has been launched to overcome this barrier to conservation (*www.cbd.int/gti/*). More generally, there is an ongoing dialogue between different international bodies such as the Secretariats of different Multilateral Environmental Agreements, the Food and Agriculture Organisation, the World Customs Organisation, and specialized bodies such as the International Tropical Timber Organisation. The benefits can be considerable, and examples in which this has been the case (*e.g.* Tanzanian timber) are provided.

International licensing schemes and trade restrictions

The growth both in the volume of international trade and in the practice of containerisation renders it increasingly more difficult to detect illegal trade. Licensing schemes can be an important tool in helping to detect and regulate flows. They have become increasingly common in recent years and can be regarded as an attempt to regulate particularly problematic trading sectors in a world where trade barriers are steadily being removed. They can also have important ancillary benefits, such as improving levels of governance and domestic policy.

In the publication six licensing agreements are reviewed: the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), the EU's Forest Law Enforcement, Governance and Trade Initiative (FLEGT), the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR), the Rotterdam Convention on chemicals, the Montreal Protocol on ozone-depleting substances, and the Basel Convention on hazardous waste.

None of the schemes reviewed have worked perfectly, although all can claim some measure of success. It will be interesting to see how the FLEGT licensing scheme performs, as to a certain extent it has been designed with an

eye to overcoming some of the other schemes' weaknesses. The following measures would be helpful in improving licensing schemes further:

- A systematic analysis of their operation and successes and failures; although in general most of the systems seem to be working, there are relatively few comprehensive data.
- A process for sharing information among those responsible for operating the systems, perhaps *via* the Green Customs Initiative, the UN Environment Programme (UNEP), or the G20. This could be of particular value to those systems new or just coming into existence (*e.g.*, the Rotterdam Convention, FLEGT).
- Independent verification of the issuance of licenses, increased cross-checking of licenses, and a switch from paper-based electronic systems could increase the effectiveness of the majority of licensing systems studied. More resources could usefully be targeted at these functions.
- There may also be some potential for the realisation of economies of scope, with some organisations carrying out the same functions for more than one agreement (*e.g.*, the WCMC could play a central monitoring role for CITES).

Implications of national policy measures for illegal trade

Policies introduced at the national level can have implications for illegal trade in environmentally sensitive goods. The effects of national environmental policy regimes on illegal trade depend largely upon the incentives for sustainable (or unsustainable) management of the resource or pollutant generated by the policy. A regulatory system which imposes costs on those exploiting the resource or emitting the pollutant will generate price differentials, which can provide incentives for non-compliance, with some of the output entering into international trade flows. This is, of course, a function of national enforcement capacity, supported in some cases by the international licensing schemes discussed above.

In recent years increased interest has been expressed in using economic incentives in the pursuit of environmental objectives, for example, to reduce pollution, protect biodiversity and habitats, and promote the sustainable use of natural resources. Such an approach is in contrast to, or complementary with, more traditional command-and-control regulatory approaches. In this publication the focus is on the effect of such measures on illegal trade.

While the evidence is partial there is some reason to suppose that the use of economic incentives at the national level may reduce illegal trade flows. On the one hand, some of the revenue generated by economic instruments (*i.e.* environmental taxes) can be used to reinforce enforcement capacity. On the other, the 'formalisation' of property rights implicit with the use of

economic instruments can provide incentives for a longer-term view of resource management, and can even provide incentives for self-enforcement among those exploiting the resource.

However, the use of economic incentives is not a panacea and in order to ensure that their implementation does not lead to illegal trade it is important to note that:

- Economic incentives can only work fully in a framework of good governance and law enforcement. Otherwise they risk exacerbating illegal activity, creating new opportunities for it, or shifting it to other regions or countries.
- As well as general good standards of governance, new governance structures can prove effective – *e.g.* community-based natural resource management, where local communities are given incentives to protect and manage the resource. Security of tenure or other forms of resource ownership will be an important factor.
- Economic incentives will be more effective when they form part of a co-ordinated range of interventions – *e.g.*, where alternatives to illegal behaviour are provided (*e.g.* legal alternatives to poaching, or legal means to dispose of waste).
- Where international trade is a factor, co-ordination with other countries is an important means of ensuring the effectiveness of economic incentives, either to avoid displacement of illegal activities or to facilitate the creation of new incentives.

In general, when designing national environmental policy measures it is imperative that the potential for encouraging illegal behaviour (including trade) is considered, so that the consequences can be assessed and considered (*e.g.* whether ivory sales are likely to lead to increased poaching) and enforcement activities and other possible interventions can be better targeted.

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Chapter 1

Defining illegal trade in environmentally sensitive goods

In this chapter we review the meaning of term "illegal trade in environmentally-sensitive goods". The five different areas presented in the publication are discussed, namely: wildlife; logging and its associated timber trade; illegal, unreported, and unregulated fishing; controlled chemicals (particularly in ozone-depleting substances); and hazardous waste. The chapter concludes by presenting the structure of the publication.

Before analysing the main impacts of illegal trade in environmentally-sensitive goods and ways to tackle the issue, a better understanding of what is meant by illegal trade in environmentally sensitive goods is first needed.

Over the last three decades, the national and international framework for the protection of the natural environment has evolved rapidly. As legislation has expanded, however, so too have the incentives and opportunities for individuals and companies to evade restrictions on the exploitation or trade of environmental goods such as wildlife and timber. Deliberate evasion of environmental laws and regulations by individuals and companies in the pursuit of personal financial benefit, where the impacts are transboundary or global – often referred to as "international environmental crime" – is a serious problem.

Five areas are generally considered to be of major importance: illegal trade in wildlife; illegal logging and its associated timber trade; illegal, unreported, and unregulated (IUU) fishing; illegal trade in controlled chemicals (particularly in ozone-depleting substances); and illegal disposal of hazardous waste. There are of course no accurate figures on the extent of these activities, but best guesses put their combined global value at about USD 30-70 billion a year, equivalent to perhaps 10-20% of the value of the illegal trade in narcotics or 15-30 % of the value of the trade in counterfeit goods (OECD, 2009a). This illegal trade in environmentally sensitive goods often leads to environmental damage.

There are other resources whose production and trade may involve environmental impacts, and which are traded illegally, including oil, diamonds and other gemstones, and minerals such as coltan. These topics have been much less well researched than the five listed above, and in general they seem to be less significant in terms of value. Havocscope, a website which collates information and data on black markets, includes only two other "environmental" subjects in its listing of 54 black-market products: oil smuggling (USD 12 billion a year) and diamond smuggling (USD 0.3 billion a year).[1] According to these figures, oil smuggling clearly is significant, but whether it leads to any more environmental damage than legitimate trade in oil products is not clear; it may be more frequently associated simply with tax avoidance.

A better picture of the scale of the problem can be given by data from specific studies, in particular comparisons of illegal with legal activities. For

example, a recent study suggests that 8-10% of the world's elephants are killed each year by poachers (Wasser *et al.,* 2010). Research in Tanzania found that the official timber harvest volumes in 2004 were just 4% of the actual volume being traded, and the revenue lost to the government amounted to USD 58 million (Milledge *et al.*, 2007). A study of hazardous-waste shipments undertaken in thirteen European countries found that over half of the waste shipments examined were illegal (IMPEL-TFS Seaport II, 2006). Research undertaken in 2006 in the Republic of Guinea found that IUU fishing was equivalent to 60% of the legal catch, representing an annual loss to the country of some USD 110 million. Although in general, environmental crime tends to receive less attention than other areas of criminal activity, specific attempts to assess it almost always reveal more than had been anticipated.[2]

Illegal trade occurs when a national law is broken. Trade can be associated with illegality in one of four ways:

- Where the good is produced legally within its country of origin, but its international trade is illegal – *e.g.* trade in some types of hazardous waste for disposal, or in endangered species whose trade is regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).[3]
- Where the good is produced legally within its country of origin, and is exported legally, but is then imported illegally into a consumer country. For example, ozone-depleting substances may be produced for export legally in one country but then imported – perhaps by smuggling – for consumption in another country in excess of its control limits.
- Where the good is produced and exported illegally in the country of origin, but then imported legally into another country. For example, at present, it is not unlawful to import timber produced illegally in a foreign country into most other countries (except in specific cases such as a breach of CITES regulations). In general, this is a problem in areas without international agreements to regulate trade, such as in timber. It has led to a number of initiatives to criminalise imports of illegal goods, such as the extension of the Lacey Act in the United States in 2008 to cover plants, including timber and timber products.
- Where the good is both produced and traded illegally. This is generally the case where international agreements, such as those of some regional fisheries-management organisations, regulate both production and trade.

In some cases, countries may have signed and ratified international agreements, but not incorporated the requirements of the agreements into national law. This is not considered to be "illegal trade" for the purposes of this paper since no national law has been broken; the country's failure to comply

with its requirements should be dealt with instead by the agreement's non-compliance regime.

Deciding what goods are illegal is not always straightforward, and there is often a very fine line between legal and illegal trade. This may be because laws are unclear or have not been fully implemented, or even, at times, because they are contradictory. This is all too common in the timber sector; for example, in Indonesia the process of decentralisation has resulted in contradictory national and regional legislation, allowing for different interpretations of what is legal (Casson and Obidzinski, 2007).

Similarly, many indigenous peoples continue to regulate their rights of ownership, use of and access to forests according to customary laws and institutions. Although international human rights laws and related jurisprudence increasingly recognise these rights, the extent to which they are recognised and accommodated in national constitutions and laws varies widely, and there can be a potential for conflict between customary and civil or common law.

In Indonesia, for example, although customary rights are recognised in principle in the constitution, there are no legal mechanisms in place to give legal recognition to customary forest tenure (Colchester *et al.*, 2006). It is estimated that millions of poor rural households depend on forestry activities that are technically prohibited under national laws (Kaimowitz, 2007). It has been suggested that, in efforts to tackle illegal logging, a distinction should be drawn between that which is contested as being illegal (for example by forest communities) and that which is not (*i.e.* which is widely accepted as being illegal) (Tacconi, 2007a).

Certainly, legal trade in environmentally sensitive goods is not always sustainable. For example, decisions about harvest levels in the fisheries and timber sectors may, in some cases, be driven more by short-term economic and political considerations than by concerns about long-term sustainable production or environmental protection. Within the forest sector, for example, there may be no requirement for logging companies to operate with a management plan, let alone one that has sustainability and environmental criteria. Even where there are laws that provide a legal framework for sustainable forest management, they may not be based on science nor kept up to date (Kaimowitz, 2007). Globally, deforestation is proceeding at an annual rate of about 13 million ha, or 0.2% of total forest cover (FAO, 2010). Perhaps only 8-10% of global deforestation is illegal (Seneca Creek, 2004). Similarly, fisheries catch quotas may reflect what is politically feasible rather than what is scientifically sound. Some 80% of global fisheries are being exploited at or beyond their replacement rate (FAO, 2008), while about 5-12% by value of the catch may be illegal (Agnew *et al.*, 2008).

Similarly, illegality does not always imply unsustainability. Low volumes of subsistence-level logging, fishing or hunting may not significantly impact the sustainability of particular ecosystems. This tends to be the exception rather than the rule, however. In general, illegal activities are associated with negative environmental impacts. Furthermore, although legal compliance does not always guarantee that these natural resources are being managed sustainably, companies that abide by the law tend to be associated with better management practices. Often, ensuring that their activities are legal is a first step to later ensuring that they are sustainable – for example, where logging companies employ systems of timber legality verification prior to adopting more complex schemes for the certification of sustainability.

For the purposes of this publication, the illegal activities described relate to cases where national laws are broken. However, in the absence of international regulation, the subsequent trade in these illegally procured goods may not be necessarily illegal. There are a whole host of activities that may make the product illegal: poaching of fish or wildlife; failure to comply with management or conservation measures within a fishery or logging concession; export and disposal of hazardous wastes in an unsafe manner; non-payment of taxes or duties; illegal accounting practices; mislabelling or fraud of certificates required for export; and many more. Illegality is somewhat different within each of the five sectors under consideration in this paper, and so the peculiarities of each sector are briefly considered in turn.

Wildlife

The international trade in species of wild plants and animals, identified as being threatened by such trade, is regulated by CITES. Under this agreement, trade in endangered species is subject to varying degrees of control depending on the level of threat to the species. Thus, no trade is allowed for species threatened with extinction (except under very limited circumstances), while trade in less endangered species can only proceed when export, and sometimes import, permits are issued. Illegal trading in species listed under CITES may include species for which trading is banned, trading without the correct permits, or tampering with or fabricating permits.

Species that do not fall under CITES may be protected under national conservation laws. In many countries, the hunting of certain animals for commercial purposes is outlawed, while many threatened species are completely protected. However, poaching is often a huge issue and there is a significant international trade in certain species, for example, for bushmeat.[4]

Timber

Legally logged timber is a vital source of income for communities in developing countries. However, the illegal production of timber is a significant concern. It encompasses a whole range of infringements within the producing country, including the illegal allocation of concessions, non-compliance with requirements for sustainable forest management, harvesting of protected species or harvesting outside the areas allocated for logging or above quota, or non-payment of taxes and export duties. The trade in illegally logged timber greatly affects communities, economies and the environment. The habitats of endangered species are especially vulnerable.

There is no international regulation controlling the trade in timber, although a few timber species do fall under CITES. However, consumer countries have taken a number of unilateral measures to exclude the illegal timber products from their markets. These measures include the extension of the Lacey Act in the US (which made unlawful to import into the US of timber produced illegally in foreign countries). As part of its Forest Law Enforcement, Governance and Trade (FLEGT) initiative the EU is in the process of negotiating a series of voluntary partnership agreements with timber-producing countries which will require that all imports of timber products to the EU from these countries are independently verified as legal. The EU timber regulation, approved by the EU Parliament in July 2010 and adopted by the EU Council in October 2010, serves a similar purpose to the Lacey Act, as would the proposed Australian Illegal Logging Prohibition Bill, which was introduced into Parliament at the end of November 2011. The New Zealand government adopted its illegal logging policy at the end of 2009. This supports voluntary industry efforts to verify the legality of imported timber instead of imposing regulation. In addition, several countries have public procurement policies in place which require government purchasers to source only legal (and usually, sustainable) timber.

Fish

Similarly, there is no global agreement specifically related to controlling trade in fish, although the FAO Code of Conduct provides a more general framework for fishing practices. Illegality therefore generally refers to fish that have been harvested in contravention of controls imposed by the relevant Regional Fisheries Management Organisation (RFMO/A) or by coastal states. RFMO/As have diverse remits. Some cover specific regions, for example the Western and Central Pacific Fisheries Commission (WCPFC) and the Atlantic Fisheries Organisation, and others such as the Indian Ocean Tuna Commission focus on particular species. These lay down rules related to the conservation and management of the fisheries in question, including rights of

access, fishing quotas, measures to reduce the incidental catch of seabirds and mammals, and measures designed to reduce catches of non-target fish species.

Within the fishing sector, the broader term "illegal, unreported, and unregulated" (IUU) fishing is most commonly used.[5] Illegal fishing is that fishing which is in contravention of any applicable rules; unreported fishing refers to catches that are under-reported or misreported; and, unregulated fishing refers to fishing operations undertaken where there are no management controls (for example, on the high seas) or where these are insufficient or not adequately applied. At the international level the FAO's "International Plan of Action to Prevent, Deter and Eliminate IUU Fishing" is particularly relevant. Although it is non-binding, the subsequent 2009 "Agreement on Port State Measures to Prevent Deter, and Eliminate IUU Fishing" will place binding controls on trade in fish and fish products once it is fully implemented.[6] The Agreement aims to prevent illegally caught fish from entering international markets through ports.

Hazardous waste

A number of international agreements regulate international trade in hazardous waste. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal came into force in 1992.[7] The objective of the Basel Convention is to protect human health and the environment against the adverse effects of hazardous wastes. Its scope of application covers a wide range of wastes defined as "hazardous wastes" based on their origin and/or composition and their characteristics. The Convention has two specific aims which relate to trade: the restriction of transboundary movements of hazardous wastes except where it is perceived to be in accordance with the principles of environmentally sound management; and a regulatory system applying to cases where transboundary movements are permissible.

The regulatory system of the Convention is based on the concept of prior informed consent. The transboundary movement of regulated waste may only proceed if and when all States concerned have given their written consent. In the event of illegal transboundary movement of hazardous wastes, the Convention attributes responsibility to one or more of the States involved, and imposes the duty to ensure safe disposal. This may necessitate re-import into the State of generation. The Convention also provides for cooperation between parties, including information exchange and the provision of technical assistance, particularly for developing countries.

An attempt was made to amend the Convention in 1995 through the "Ban Amendment", which would outlaw all forms of hazardous waste exports from

OECD to all non-OECD countries.[8] However, the amendment has not yet entered into force as it has not been ratified by a sufficient number of parties. Nevertheless, since 1998 its measures have been introduced into EU legislation through the European Waste Shipment Regulation, banning the export of waste for disposal to countries outside the European Union and the European Free Trade Association (EFTA), and of hazardous waste to countries outside the OECD.[9] Norway and Switzerland have similarly fully implemented the Basel Ban in their national legislation.

The Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa came into force in 1998. It was negotiated in response to the failure of the Basel Ban Amendment to be ratified. Its parties are members of the Organisation of African Unity. The treaty bans the import of hazardous wastes into Africa and their dumping at sea or in internal waters.[10] In the South Pacific, the Waigani Convention bans the exporting of hazardous or radioactive waste to Pacific Island Forum developing countries.[11] It also prohibits Forum island developing countries from importing such waste. The convention has been ratified by Britain, France and Japan.

The collection of data on hazardous wastes is notoriously limited, but about 8.5 million tonnes of such wastes are estimated to be produced every year, mostly within industrialised countries. Illegal trade in hazardous wastes may involve shipments not having the required consent, waste being shipped to countries without the necessary capabilities to manage and dispose of it, and waste being wrongly classified as non-hazardous or for recycling. In recent years, due to the growing amount of recycling, there has been a parallel increase in the amount of "sham recycling" – goods being labelled for recycling that is abandoned or illegally disposed – and this trend is expected to continue.[12]

Chemicals

The consumption (and production of) and trade in hazardous chemicals is increasingly subject to international as well as national regulation. The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade was agreed in 1998 to control the trade in banned or severely restricted chemicals and severely hazardous pesticide formulations.[13] Under this convention, such substances can only be exported if the prior informed consent of the recipient country has been given. The Stockholm Convention on Persistent Organic Pollutants was signed in 2001 with the objective of banning or regulating production, consumption and trade in a specified list of long-lasting organic chemicals. In 2009, negotiations began on an international agreement on the control of mercury. There have been no reports to date of illegal trade in any of these areas, although it can probably be

expected to develop, particularly if any of the substances regulated are extensively used and traded, which has not been the case so far.

There has been considerable experience, however, of illegal trade resulting from the implementation of the Montreal Protocol on Substances that Deplete the Ozone Layer, agreed in 1987to address the depletion of the Earth's stratospheric ozone layer. The Protocol aims at phasing out completely the production and consumption of all categories of ozone-depleting substances (ODS), of which the most extensively used were chlorofluorocarbons (CFCs).[14]

Illegal trade in ODS arose in part because of their staggered phasing-out in different countries, with developing countries being given a longer timeframe in which to eliminate their production and use. ODS ostensibly destined for developing countries were sometimes diverted into developed-country markets where the products were being phased out. This illegal trade declined in significance as CFC-using machinery was steadily replaced, but then started to appear in developing countries as they began to implement their own phase-out schedules.

This area is unique among those considered in this paper, as the phase-out process of all CFC-using equipment will gradually remove the problem at source. Nevertheless, the prevalence of cheaper illegal products (or even legal products, as CFCs can continue to be used legally as feedstock in chemical production) hinders phase-out efforts and delays the recovery of the ozone layer. In addition, although most CFC uses have now been completely phased out, phase-out schedules for HCFCs are longer, and some illegal trade in these substances has been detected (Banks *et al.*, 2008; Chatham House and Environmental Investigation Agency (EIA), 2006).

Structure of the publication

This publication consists of this introductory chapter (Chapter 1) and four thematic chapters (2 to 5).

- Chapter 2 looks at the key drivers of illegal trade in environmentally sensitive goods, such as differential costs, as well as at enabling conditions such as regulatory and enforcement failures. It also provides an overview of the main economic, social and environmental impacts.
- Chapter 3 reviews the data collected by customs and licensing schemes for selected environmentally sensitive goods. It examines the extent to which this information can be used to identify and measure illegal trade using new analyses carried out for the OECD. An Annex provides a list of commodity codes and descriptions (down to the 8- and 10-digit level, where applicable) used by several member countries to classify imports for a selection of environmentally sensitive products.

- Chapter 4 looks at the role of international licensing schemes designed to allow importing countries to distinguish between legal and illegal products. It draws some lessons learned from their implementation to address illegal trade in environmentally sensitive goods.
- Chapter 5 assesses the role of national environmental policy measures on illegal trade, with a focus on property rights-based systems and economic incentives.

Notes

1. *www.havocscope.com/indexes/products/*.
2. For example, an intensive one-day operation carried out by 90 customs administrations across the globe on 15 January 2009 resulted in seizures of 4 630 specimens of endangered wildlife, both live species and products. About 10 000 customs officers participated, representing, on average, almost one specimen for every two officers 'Global CITES operation nets over 4500 endangered species in one day', WCO press release, 2 February 2009; available online at *www.wcoomd.org/press/?v=1&lid=1&cid=6&id=174*.
3. *www.cites.org*.
4. Bush meat is meat of terrestrial wild animals, especially species indigenous to the humid tropics.
5. In UN terminology, illegal fishing generally refers to fishing activity that is unauthorized or is in contravention of national laws or international obligations; unreported fishing generally refers to fishing activity that is not reported, or is misreported, in contravention of national laws or international reporting requirements; and unregulated fishing generally refers to fishing activity in areas or for fish stocks for which there are no applicable conservation or management measures, or in areas under the competency of regional fisheries management organization by a vessel not from of a State that is Party to that organization, and such activity is inconsistent with international law. See FAO *International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing* (2001).
6. *www.fao.org/Legal/treaties/037t-e.pdf* and *www.faco.org/fishery/psm/enn*.
7. See *www.basel.int*.
8. *www.basel.int/pub/baselban.html*.
9. Regulation (EC) No. 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste, OJ L 190, 12.7.2006, p. 1.
10. *www.ban.org/Library/bamako_treaty.html*.
11. Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Republic of Marshall Islands, Nauru, Niue, Republic of Palau, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu, Western Samoa.
12. *http://inece.org/PDFDocs/transboun.pdf*.
13. *www.pic.int*.
14. *http://ozone.unep.org*.

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Chapter 2

Key drivers and main impacts of illegal trade

This chapter examines first the main drivers of illegal trade. This includes economic factors such as cost differentials on the supply side, as well as demand patterns. In addition, the role of governance failures is discussed. An overview of the economic, environmental and social impacts of illegal trade is then provided for five categories of goods: wildlife, fish, timber, ozone-depleting substances and hazardous waste.

Introduction

This chapter examines first the main drivers of illegal trade. An overview of the economic, environmental and social impacts of illegal trade is then provided for five categories of goods: wildlife, fish, timber, ozone-depleting substances (ODS) and hazardous waste.[1] Table 2.1 summarises these impacts, together with examples.

The drivers of illegal trade and the environment within which it operates are diverse, varying among sectors, localities and over time. Clearly, it is important to understand what drives this trade, and the circumstances under which it thrives, in order to develop effective policies to counter it. These drivers and enabling conditions are considered in turn below.

What drives illegal trade?

Differential costs between legal and illegal products are a key driver of illegal trade. The demand for scarce products for which legal substitutes are not available or accepted also drives it. The role of risk needs to be better understood as well.

Differential costs

Self-evidently, illegal (or, indeed, legal) trade only occurs when an economic return can be made from it, either in terms of profits generated or costs avoided, for the participants in the exchange. Illegal trade is likely to develop when the expected returns are higher for illegal than for legal activity. This may occur in two main circumstances.

First, illegal trade can occur where compliance with regulations results in costs that may be avoided though illegal behaviour. For example, logging companies operating illegally are unlikely to comply with environmental and health-and-safety laws and so may reduce their operating costs. In addition, bribing corrupt officials may prove more cost-effective than meeting the costs of legal compliance.

During the phase-out process for ODS, the legal non-ozone-depleting alternatives often proved to be more expensive than the original substances, and sometimes additional costs were required for the conversion of equipment to use the substitutes (Hayman and Brack, 2002; Kozakiewicz, 2007). In China in 2007, for example, the price of CFC-12 was USD 4 per

kilogramme, whereas that of the main substitute, HFC-134a, was USD 7; the cost of adapting a CFC air-conditioning unit so that it could use this alternative was USD 100-200 (Coppens, 2007). It was therefore cheaper to source illegal CFCs. In addition, in the United States, an escalating excise duty was applied to CFCs to encourage phase-out, thus also increasing the cost differential between legal and illegal substances.

Table 2.1. **Types of impacts examined**

IMPACT	SECTOR	EXAMPLES
		Economic impacts
National level		
Loss of government revenue, natural resource base, and value of goods traded	IUU fishing	Worldwide economic losses in 2003 estimated at USD 10-23.5 billion Total value of IUU fishing in sub-Saharan Africa estimated to be USD 0.9 billion per year
	Timber	Global annual loss of USD 5 billion in government revenues Tanzania: government losing up to USD 58 million per year in revenues (2007) Indonesian government estimated in 2003 to be losing USD 3.7 billion per year
	Wildlife	Caspian Sea range state governments estimated to be losing USD 60 million due to the illegal trade in caviar in 2001
Undermining legitimate industry	Timber	Global annual loss of over USD 10 billion in market value of timber due to illegal trade Depression of global prices of timber due to illegal trade estimated at 7-16%, costing US firms USD 460 million in foregone exports Honduras: illegal felling of mahogany jeopardising the commercial viability of community forests
	ODS	Reduced incentives for industry to introduce substitutes and replacement technologies
	Hazardous waste	Undermining the legitimate waste treatment and disposal industries
Loss of income and employment in related industries and activities	IUU fishing	Illegal fish catches from Liberia being imported to Côte d'Ivoire for sale and processing
Local level		
Provision of income for rural communities	Wildlife	Vietnam – income from the wildlife trade for rural communities
Low income for producers	Timber	Nicaragua – forest owners and local cooperatives receive 5-10% of timber's value Indonesia – rural communities receive less than 10% of export value of merbau
Low profitability of illegal production	Timber	Cameroon – outlawing of small-scale logging in 1999 increased informal taxes and reduced market prices
Unsustainable profits	Wildlife	Vietnam, Pu Mat National Park – decline in hunters following crash in wildlife populations (in 1990s)
Undermining local / subsistence livelihoods	Wildlife	Mongolia – illegal trade in animals has undermined subsistence hunting and impacted local economy
Loss of future opportunities	Wildlife	Poaching undermining potential for wildlife tourism

Table 2.1. **Types of impacts examined** (*cont.*)

IMPACT	SECTOR	EXAMPLES
		Environmental impacts
Loss of biodiversity	IUU fishing	Depletion of fish stocks and reduction in biodiversity due to poor fishing practices, *e.g.* use of small mesh-size, longlines, destructive fishing practices (*e.g.* explosives), fishing in protected areas and over quota, etc.
	Wildlife	Decline in populations of rhino, elephant, etc. from poaching
Damaged ecosystems	Timber	Degraded forests are less productive, and so less effective at carbon storage; they are also more vulnerable to other factors (*e.g.* pests; invasive species; fire) Deforestation results in carbon emissions, and loss of habitats and biodiversity.
Pollution	ODS	Damage to the ozone layer – increased UV radiation damages organisms and affects ecosystem productivity
	Hazardous waste	Soil and water contamination from hazardous waste can damage ecosystems
		Social impacts
Corruption	Timber	Honduras, Nicaragua – collapse in civil governance associated with illegal logging
Organised crime	Wildlife	Use of the same smuggling networks for smuggling arms, drugs and wildlife; laundering of drug money through the wildlife trade; growing involvement of organised crime syndicates in ivory trade
	Hazardous waste	Involvement of crime syndicates in trafficking hazardous waste from Italy to eastern Europe and west Africa
	IUU Fishing	Russian crime syndicates earn as much as USD 4 billion a year from the illegal export of seafood South Africa: illegal fishing of abalone has strong links with illicit trade networks, drug trafficking and money laundering
Conflict	Timber	Illegal trade of timber provided a source of funds for Khmer Rouge, Cambodia Unregulated timber trade financed the Liberian civil war and rebels in Sierra Leone
Livelihoods	Timber	Tanzania: small-scale traders of illegal timber bearing the brunt of enforcement efforts Clashes between local communities and illegal loggers
	IUU fishing	Loss of livelihoods, particularly in coastal small-scale fisheries, clashes between artisanal fishers and illegal fishers, *e.g.* coastal areas of Africa
Health	IUU fishing	Abuse of crew and bad working conditions in illegal vessels
	Wildlife	Risk to poachers of being shot or imprisoned Spread of diseases carried by smuggled animals
	Hazardous waste	Harmful effects of electronic waste – *e.g.* lung and kidney disease, lead poisoning, cancer Case of Trafigura – illegal dumping of chemical waste in 2006 in Côte d'Ivoire
	ODS	Higher levels of radiation linked with suppression of the immune system, increased incidences of skin cancer and eye disease

The costs of properly disposing or recycling electronic and other hazardous wastes can be very high, so profits can be made by dumping the waste or by using cheap (and unsafe) procedures to recycle the components (Interpol, 2009). A 2009 estimate suggested that it was four times more expensive to incinerate waste in the Netherlands than it was to ship it to China, for example.[2] Another estimate suggested it might be 400 times cheaper simply to dump hazardous waste rather than dispose of it legally in the EU.[3]

A second set of circumstances under which illegal trade is likely to be profitable is where the demand exceeds the supply of legal products, or a demand exists for completely banned products and no legal alternatives exist. This is common in wildlife crime, where major sources of demand include the exotic pet and flower trade, ingredients for traditional East Asian medicine and cultural materials such as ivory for personal *hanko* seals in Japan and rhino horns for dagger handles in the Yemen.

It is the expected revenues that result in a thriving black-market trade. Prices are likely to rise significantly when the demand for a given product far exceeds the legal supplies, as is the case for caviar for instance (CEC, 2005).

The role of demand

Demand for environmentally sensitive goods stimulates trade. Whether or not any increase in supply is legal or illegal depends on the circumstances in each case. However, when the expected profits from illegal trade are greater than those from the legal trade, and where there is regulatory or enforcement failure, any increase in demand can lead to an increase in illegal activity. The main contribution to demand in these sectors is the growth in the world's economy, a consequence both of rising world population and rising levels of per-capita GDP. Both of these contribute directly to demand for a wide range of natural resources.

For example in the case of fish there is rising demand in East Asia stemming from high rates of economic growth. Even in the slower-growing OECD economies there have been changes in dietary habits which result in greater consumption of fish. According to the OECD-FAO Agricultural Outlook (2011) world per capita fish food consumption is projected to reach 17.9 kg per capita in 2020, from 17.1 kg per capita of the average 2008-2010. On the other hand, the growth of aquaculture may less the pressure on (at least some) wild fish stocks.

Similarly, increasing consumption has resulted in greater production of waste. Waste from electronic goods (*e.g.* mobile phones and computers) is growing the fastest – three times more rapidly than general waste. The development of recycling programmes is also contributing to increased

international movement of waste, since much waste is transported to other countries for recycling, in particular to China (Basel Convention, 2005; UN, 2003). As noted above, the trade in goods for recycling is sometimes used as a means to circumvent the Basel Convention's controls on the transport of hazardous wastes, with products sometimes being mislabelled as non-hazardous (UN, 2003).

China plays a major role in the sectors examined in this paper, as outlined in Annex 2.A1. It is the world's largest exporter of fish, as well as a major source of demand for wildlife products and recyclable waste. China is also now second only to the United States in terms of total timber imports, importing raw timber from many tropical countries and from the Russian Far East. China imports more tropical timber than any country other than Japan, each country importing roughly 10 million cubic meters of tropical timber in recent years. China's role is that of a processor and re-exporter, as well as that of a final consumer; this is particularly the case for timber. As much as 30% of the roundwood equivalent (RWE) volume of China's timber imports in 2007 may subsequently have been transformed and exported.[4] China exports plywood, panels, flooring, decking, window-frames and furniture to the EU, the United States and Japan; more than to the rest of the world combined.

China currently sources timber from more than 80 different countries and, according to the International Institute for Sustainable Development, "Chinese demand – whether for domestic use of for re-export – is often the most significant factor driving the growth of production and exports of China's principal supplying countries." Overall, the wood products industry depends on imports for more than 50% of its overall supply for forest products. Imports for the past few years have consistently been equal to or higher than China's peak domestic production levels of commercial timber (Xiufang and Canby, 2010). Amongst the top five suppliers of timber products are Russia, Thailand and Vietnam. For logs, Russia, Papua New Guinea, Solomon Islands and Gabon feature.

Some of the countries of origin may have little control or management capacity, and thus at least some of the supply is likely to comprise illegally logged timber.[5] However, as noted, this is difficult to ascertain with any degree of precision. Moreover, it is important to note that the markets for each timber-producing country differ. For example, Cameroon's main market for sawn timber is Europe, particularly Italy and Spain.[6]

In the EU and the United States, there is also a significant demand for wild animals and plants, in particular for exotic pets and horticultural plants. Millions of CITES-listed specimens have been seized while being illegally imported into the EU (Engler and Parry-Jones, 2007). RENCTAS estimates that Brazil accounts for about 10% of the world's illegal trade in wild animals, and

nearly half, mostly parrots and other birds, are exported to Europe and the United States.[7]

Foreign nationals based in Africa, in particular those with links to key markets for ivory, have developed the capacity to move large consignments of ivory directly to Asia. The increased involvement of organised-crime syndicates has coincided with a period of rapid globalisation of African markets and, according to a report produced for CITES COP14, Asian involvement in the procurement, processing and shipping of illegal ivory from Africa to Asia had never been greater. The report found that the vast majority of ivory (comprising consignments of over 1 tonne) was destined for China and to a lesser extent Japan, the Philippines and Thailand (TRAFFIC, 2007).

On the supply side, those engaged in illegal trade come from diverse backgrounds, and include rural villagers, large businesses, city-dwellers and the political elite. The scale of the expected economic net benefits is similarly diverse, for some representing an occasional or supplementary source of income and for others a hugely lucrative business (TRAFFIC, 2008). Therefore, the degree to which expected profit operates as a driver for these different actors varies widely.

For certain actors, particularly those engaged higher up the supply chain, potentially very high profits can be made. Specimens of particular rare wildlife species can command very high prices, for example, up to EUR 30 000 for a ploughshare tortoise and EUR 10 000 for an Angolan python (Engler and Parry-Jones, 2007). The value of wildlife can increase exponentially as it passes along the supply chain, in some cases by as much as 25 to 50 times (Hayman and Brack, 2002). For example, an African parrot may be worth USD 20 to the person in the Ivory Coast who catches it, but over USD 1 000 to a trader in the United States or Europe (Hayman and Brack, 2002); rhino ivory can enjoy a 20% mark-up as it moves from one trader to the next (Warchol, 2004).

The importance of price as a driver is clearly illustrated when prices change, either as a result of increasing demand or falling supply. For example, a rapid increase in the illegal ivory trade in 2006-07 was largely driven by an increase in prices in Japan and China, which rose from USD 100 per kilogramme in the late 1990s to USD 200 in 2004, reaching USD 750 in 2007 (Wasser *et al.*, 2007). Newspaper reports suggested the price in 2010 had reached USD 1 500 per kilogramme.[8]

While many of those engaged in illegal trading are motivated by the potential profits, for others, the decision may be one of necessity. A distinction here should perhaps be made between the criminal and the criminalized. Some rural communities have few other economic options, and illegal fishing or logging may provide the only means of earning a cash income. For example, a study of IUU fishing in southern Africa found that artisanal fishermen often

fished during closed seasons or areas because they have no other options for procuring food or income (SADC, 2008). Similarly, national forest codes may not create a specific operational framework for artisanal loggers, leaving them with no option but to log illegally.

Often, the trade in environmentally sensitive goods is driven by changes in consumption. For example, in the illegal wildlife trade the role of the poor has been found to be relatively unimportant in many cases; rather, the main driver is the rising wealth in consumer countries that has created a strong demand for the wildlife (TRAFFIC, 2008).

Enabling environments for illegal trade

Illegal activities tend to thrive when appropriate governance and regulation is lacking, including failures to determine or protect property rights (open access problems), inappropriate or weak regulation and corruption. Enforcement failure is also an enabling environment for illegal activities, including lack of capacity and political will, lack of appropriate penalties for non-compliance, and failures of coordination between enforcement agencies and between countries.

Governance and regulatory failure

Weak governance and corruption both encourage illegal activities and make tackling them much more difficult (EIA, 2007a; Hayman and Brack 2002; NOMOS-L-G, 2003). The links between weak governance, corruption and illegal trade have been widely documented. For example, a correlation between corruption and ivory poaching has been reported for some countries, because of the lack of law enforcement resulting from corruption of local officials (TRAFFIC, 2007). Similarly, research in Tanzania found that illegal logging tended to increase where management and law-enforcement authorities had limited capacity and supervision because of the increased opportunities for collusive and concealed transactions (Milledge *et al.*, 2007).

Weak governance can be exacerbated by political corruption. In the case of illegal logging, for example, there is evidence that the allocation of concessions and funds from logging enterprises have been used to buy political support and to undermine efforts to address illegal activities (Casson and Obidzinski, 2007; Contreras-Hermosilla *et al.*, 2007). For example, in spite of the efforts made by Indonesia to address illegal logging in the late-1990s and early 2000s, including by hosting of the East Asia Forest Law Enforcement and Governance ministerial conference in 2001, it has been estimated that the share of total logging which is illegal increased between 2000 and 2003 from 57% to 94%. Several factors seem to have undermined policy reform and enforcement including rent capture by the elite and competition between

regional and central governments (Tacconi, 2007a). After the change of government in 2004, however, attitudes changed, and although illegal logging remains a problem, it is thought to have peaked in 2004-05. It has been estimated that by 2006, following the major countrywide enforcement operations launched by the Indonesian government in 2005, the illegal logging rate had fallen from a peak of over 80% to as low as 40% (Chatham House, 2010).

Similarly, a strong correlation has been observed between levels of IUU fishing and governance (Agnew *et al.*, 2009; SADC, 2008). Effective governance tends to facilitate the implementation of fisheries management, including monitoring, control and surveillance systems, the enforcement of regulations and cooperation with neighbouring countries.

Illegality is further encouraged if regulations are unclear, contradictory, or do not have popular support. For example, the Republic of Guinea's wildlife code does not specify which species are illegal to sell, making enforcement virtually impossible (USAID, 2007). The forestry legislation of many countries is often out of date and highly complicated. This can make it difficult to operate legally, let alone sustainably. For example, Indonesia's process of decentralisation has resulted in a lack of clarity in forest legislation and over the authority of the central and regional governments. Consequently, there has been an increase in disputes over forest rights and illegal logging has been facilitated (Casson and Obidzinski, 2007; Smith *et al.*, 2007).

If laws are regarded by a large part of the affected population as unjust, then this may also encourage illegal activity as people may be unwilling to comply. For example, in some countries, fishing communities are not always effectively consulted in decision-making processes over fisheries management, and this has resulted in some cases of the communities being officially excluded from their traditional fishing grounds (SADC, 2008).

Unclear laws over the classification of waste have resulted in differences in interpretation between countries as to what is hazardous waste, and so on how different products should be treated. These inconsistencies undermine efforts to encourage compliance, and also make the task of monitoring much harder (Czarnomski *et al.*, 2006; IMPEL-TFS Seaport II, 2006).

In some cases, interactions between regulations to control trade and other areas of public policy may inadvertently result in regulatory or governance failure. Subsidies in the fisheries sector provide an example: while quotas for many commercially valuable fish stocks have been established, financial support for the fishing sector's use of fuel, and for boat construction and modernisation, have been maintained in many jurisdictions. Consequently, there is a substantial over-capacity in the world's fishing fleets while possibilities to fish legally are limited, hence making IUU fishing more

financially attractive (MRAG, 2005b; Oceana and ICTSD, 2009). A similar situation has arisen within the timber sector, where subsidies have been provided in some cases to establish mills or processing plants even though there is not enough legal timber available to meet their needs (Fern, 2008).

Differences in regulations between countries can also serve to drive illegal trade. For example, as noted, the different phase-out schedules for ODS between developed and developing countries underlay the original smuggling of these substances, in the early and mid-1990s (Hayman and Brack, 2002). Differences in regulations for the disposal and recycling of waste has also encouraged its smuggling, mainly to developing countries but also within Europe (Hayman and Brack, 2002; NOMOS-L-G, 2003).

While many regulations focus on the supply side of the market, addressing the demand side is also essential. For example, the demand for many wildlife products regulated under CITES remains strong, thus encouraging a parallel illegal market.

Enforcement failure

Even where levels of governance are good and regulations are clear, enforcement agencies may experience problems with applying and enforcing national laws. Developing countries often lack the resources and capabilities for effective law enforcement. Monitoring and surveillance of forests, coastal waters, the high seas, ports and land borders for illegal activities and illegal trade can be highly labour-intensive, and high-tech solutions, such as satellite imaging, can be very costly and of limited applicability.

For example, according to the OECD (OECD, 2005) the international regulatory framework for the high seas is incomplete and inadequately applied. As a result, certain fishing activities are beyond the reach of national and international regulations. Unlike their counterparts who fish legally, IUU vessels face extra costs to avoid being caught, to bribe officials and in the loss of reputation. However, the fish targeted on the high seas by IUU fishers, in general, have a very high market value. This factor, in connection with the lower operating costs faced by IUU fishers, more than offsets the relatively low costs of avoidance and fraud. Recent measures such as the "Port State Measures" may change the cost/benefit ratio in due course, but the challenge is great.

Efforts are being made to overcome such enforcement failures. For instance, the FAO is working with a number of South Pacific countries to improve forest governance. In 2011 APEC established an expert group on illegal logging. The objective is to identify means to promote trade in legally harvested forest products, combat illegal logging and associated trade, and build governance and enforcement capacity.[9] At the first APEC forestry

ministers meeting in China in 2011 the focus was on promoting sustainable forest management.

Another mechanism used to address enforcement failure is the negotiation of bilateral Memorandum of Understandings (MOUs) between countries. Examples include MOUs between Australia, Indonesia and PNG or the MOU between China and Indonesia. These MOUs usually include technical assistance to enhance capability and enforcement within producer countries.

Enforcement is a significant challenge. Unlike the situation with, say, narcotics, there is legal as well as illegal trade in most of the products considered in this publication, and it is not always easy to be able to distinguish between the two throughout the supply chain. In some cases, specialist knowledge or equipment – not in common supply, even in developed countries – may be needed to identify or detect particular endangered species in the wildlife trade, mislabelled waste products, or disguised ODS (Chatham House and EIA, 2006; Engler and Parry-Jones, 2007; Hayman and Brack, 2002).

Another common problem, in developed as much as in developing countries, is the lack of priority given to environmental crime, compared with, say, the illegal trade in narcotics or arms, or people-smuggling. Enforcement agencies generally afford the issue less attention and resources, and penalties for infractions are usually lower than in other areas. In some cases, even where fines are levied, they may still be below the levels of profit that can be made from the illegal activity, and therefore fail to act as much of a deterrent. In other cases, enforcement agencies may target operators at the low level on the supply chain – the illegal loggers or fishermen – but fail to take action against those further up the chain who tend to make the larger profits.

Trade liberalisation, and the expansion of international trade interact with illegal trade in various ways and presents a challenge for enforcement. Most obviously, when the volume of legal trade grows, it is likely that illegal trade will grow alongside it, because of the greater range of opportunities for concealing or disguising illegal products, or simply transporting them undetected.

Recent trends, like the growing tendency to containerise freight in maritime transport, has made it more difficult to inspect cargos in transit (Chatham House and EIA, 2006; TRAFFIC, 2008; UN, 2003; World Bank, 2006) and random inspections of cargos are not likely to be enough to detect illegal products. Carefully targeted measures, such as intelligence-led risk-analysis-based inspections of particular cargos and trade routes, may be more effective than random border inspections. Policy measures such as licensing or permit schemes, or prior informed consent systems, can also be an effective way to address illegal trade.

The impact of measures aimed at facilitating trade, such as the creation of free-trade zones, on illegal trade flows and law enforcement deserves further analysis The creation of free-trade zones, where regulations, including environmental regulations, may not be fully applied, have been linked to an increase in the illegal trade in hazardous waste and ODS (UN, 2003; Chatham House and EIA, 2006). Whether the reduction in border controls has actually increased illegal trade is not so clear, and no studies of the subject appear to have been made. The control of goods in transit, passing through one country destined for final sale or consumption in another, raises a particular issue for the enforcement and monitoring of illegal trade as in many countries there is no requirement to report on such movements of goods (Chatham House and EIA, 2006). Transit ports in particular have been found to be used frequently in ODS smuggling operations (UNEP-ROAP, 2007).

Some recent free trade agreements have sought to address such issues directly. For instance, revisions to the US-Peru free-trade agreement agreed upon in 2007 include new and significantly strengthened provisions related to illegal logging, with the addition of an entire annex on forest sector governance.[10] Similar provisions have been included in the FTA with Indonesia.

The impacts of illegal trade

The externalities or societal costs of illegal trade are not always obvious or are not always fully quantified. Consequently, this area of crime is often seen as "victimless" or is not considered to be that serious a problem. The failure to account for these wider costs and the full impact of environmental crime has meant that it is often a low priority for policy-makers or law enforcement.

The impacts of illegal trade can be divided into three areas: economic, environmental and social. Within each of these areas, the types of impact and their scale varies hugely depending on the sector and the type of illegal activity. Indeed, some illegal activities may have a positive impact, for example on the local economy. Further, illegal activities do not necessarily have a negative impact on the environment, or they may occasionally have a lower impact than legal activities. When devising strategies to counter illegal trade, close attention needs to be paid to the diversity of impacts, and the different "winners" and "losers" from such trade.

Economic impacts

For those engaged in an illegal trade, the economic impacts can be both negative and positive. As noted above, the potential profits that can be earned are one of the main drivers of the illegal trade in many products. The

economic impacts of illegal trade occur at different scales, from that of individuals or groups of stakeholders engaged in the trade to the national level.

Global value of illegal production and trade

The most common means of depicting the scale of the problem of illegal trade is to estimate its economic value. Table 2.2 lists the most commonly quoted estimates of the scale of international environmental crime, together with their sources, and estimates of illegal trade in other sectors for the sake of comparison.

Table 2.2. **Estimates of illegal production and trade**

Estimates of annual value of illegal activity	Production (USD)	International trade (US)	Source
International environmental crime			
IUU fish	10 bn-23 bn		MRAG – Agnew *et al.* 2008[11]
Timber	10 bn-15 bn 23 bn	 5 bn	World Bank, 2004 Seneca Creek Associates and Wood Resources International, 2004
Waste		10 bn-20 bn	US Department of Justice, 2000
Wildlife (not including fish or timber)		6 bn-10 bn	US government agencies, 2000
Ozone-depleting substances		25 m-60 m	Chatham House and EIA, 2006
Comparisons: other areas of international crime			
Comparisons: other areas of international crime			
Narcotics		322 bn	UNODC, 2007
Counterfeit goods		200 bn	OECD, 2007
Small arms		< 1 bn	Small Arms Survey, 2006

Source: Lawson (2007)

It should be borne in mind, however, that there are no reliable sources of data on international environmental crime. As with other categories of illegal trade, it is impossible to measure the volume or value of illegal environmental trade directly; if it *were* possible to measure it more accurately, it would be controlled more easily. The best that can be expected is extrapolations, proxy measurements and educated guesses. A previous paper reviewing data availability and possible areas for further work on illegal trade examined the sources and weaknesses of such data in more detail [COM/TAD/ENV/JWPTE(2009)5].

Direct national-level impacts

The economic impact of illegal trade at the national level is complex and varied. Developing countries tend to be most affected by the illegal trade in natural resources, both because of their dependence on them as a source of revenue, and also because they tend to be more vulnerable to illegal activities, with, in general, poorer standards of governance and law enforcement.

For example, as noted above, studies of IUU fishing have estimated that in 2003 worldwide economic losses amounted to between USD 10 billion and USD 23.5 billion (Agnew *et al.*, 2008). Of this, the total value of IUU fishing in sub-Saharan Africa has been estimated to be USD 0.9 billion per year (MRAG, 2005b).

These losses at the national level are due to a variety of factors. For natural resources, illegal trade results in the direct loss of the value of the goods traded. For example, illegal fishing in a country's Exclusive Economic Zone (EEZ) by local fishers will reduce economic benefits to the country. If the fishing is undertaken by foreign vessels means the value of this catch is lost. It can also undermine efforts to manage these resources sustainably, so reducing a country's ability to profit from them in the future. In the fisheries sector, illegality is often associated with unsustainable practices – for example, fishing beyond the allowable quota or using small mesh sizes on nets. Damaged and less diverse ecosystems have been found to be less productive, and so this has knock-on effects for the economic performance of fisheries (HSTF, 2006). Indeed, a correlation has been reported between regional estimates of IUU fishing and the number of depleted stocks in those regions (Agnew *et al.*, 2009).

For all resources, illegal trade also results in the loss of revenues due to the non-payment of taxes and revenues. The World Bank estimates that illegal logging in public lands results in a global annual loss of over USD 10 billion in market value and a loss of USD 5 billion in government revenues (cited in Tacconi, 2007b). In 2003, the Indonesian government estimated that it was losing USD 3.7 billion per year (Smith *et al.*, 2007). A study of illegal logging in Tanzania estimated that the country could be losing as much as USD 58 million per year in revenues (Milledge *et al.*, 2007). While some of this "lost" revenue will go to local people, much of it falls into the hands of elites, and so the contribution of the sector to development and poverty reduction is minimal.

There is a substantial illegal trade in caviar, and in some cases, the illegal trade has been greater than the legal trade. For example, in 2001, the illegal catch from the northern and western parts of the Caspian Sea was thought to be ten times greater than the legal catch. This represents a significant loss of

revenue for governments. These losses were estimated at EUR 60 million for the Caspian Sea range states (Engler and Parry-Jones, 2007).

Indirect impacts

In addition to direct macroeconomic impacts, illegal trade also has indirect impacts. These include the loss of income and employment in related industries and activities. For example, in the fishing sector, this would include the manufacture and sale of fishing gear and boats, and fish processing and packaging. Similarly, illegal exports of raw timber result in foregone profits from the processing and marketing of finished products. Any associated reduction in incomes by those engaged in these industries will also have impacts on the demand for goods more generally (MRAG, 2005b).

A study of IUU fishing found that in most of the cases investigated, the IUU catches were not landed in the country from whose EEZs they were taken; for example, illegal shrimp and tuna catches from Liberia are thought to be landed in Côte d'Ivoire. The loss of trade to a port will have secondary impacts – reducing income from port revenues, processing and re-export, transport, etc. (MRAG, 2005b).

Illegal trade also undermines legitimate industry. For example, in the ODS and waste sectors, illegal trade reduces incentives for industry to introduce substitutes and replacement technologies, and it undermines the legitimate waste treatment, disposal and recycling industries (Chatham House and EIA, 2006; Czarnomski *et al*., 2006). A recent report on the forest sector in Honduras found that the illegal felling of mahogany from within community forests was jeopardising their commercial viability. Some of the community co-operatives had also become involved in laundering the illegal timber, so undermining their credibility (Global Witness, 2009).

The lower production costs of the illegal trade can also depress prices for legal products. From the forest sector, data from Honduras show that it was 75% cheaper to produce and transport illegal wood than legal wood (Wells *et al*., 2007). One study estimated that illegal timber depresses global prices of timber by between 7% and 16%, costing US exporters at least USD 460 million a year (Seneca Creek Associates and Wood Resources International, 2004).

This reduction in prices undermines efforts to manage resources sustainably – the higher production costs that these entail mean that sustainably produced goods may not be able to compete on the market, reducing the incentive to continue such efforts. Illegal harvesters are also able to free-ride on the efforts of those who are striving to manage a resource sustainably, for example, those fishing illegally from managed fisheries or in conservation areas, so increasing the costs for legitimate operators.

Illegal trade may also result in environmental or other damage that necessitates economic costs to clear up. Examples would be damage to equipment because of the use of poor-quality ODS counterfeit products, or the costs of remediation after the illegal dumping of waste.

Local-level impacts

The economic impact of illegal activities at the local level and in rural livelihoods is complex and varied. It also remains poorly understood. This is particularly true in the wildlife sector, where studies have tended to focus on conservation impacts rather than on socio-economic effects.

In some situations and for certain stakeholders the illegal trade may be more profitable than its legal equivalent. For example, small-scale logging by local communities (which is deemed illegal in many countries) can provide better returns than would employment in large-scale timber operations (which are often deemed legal). In addition, illegal activities may be one of the few sources of income available, and so can provide an important source of income for rural and isolated communities. For example, in Vietnam the establishment of Pu Mat National Park in 1995 reduced the availability of land for agriculture, and consequently, the local population had a greater need to earn cash in order to buy food. With few other opportunities to earn income, local people turned to illegal logging and the wildlife trade, with 75% of households involved in the wildlife trade in the late 1990s (World Bank, 2006).

All too often though, rural producers and traders earn relatively little from their activities – as is suggested by the exponential growth of wildlife values up the market chain, cited above. This tends to be true for all those engaged at the bottom of a market chain – whether for wildlife, timber or waste – the greatest profits being won by those towards the end of the chain. For example, studies of the illegal timber trade in Nicaragua found that the forest owners and local co-operatives received just 5-10% of the timber's value, traders and exporters pocketing the rest (Colchester *et al.*, 2006). Similarly, in the Papuan province of Indonesia, rural communities involved in the illegal trade of merbau received less than 10 per cent of the export value of this timber, while officials and middlemen made huge profits (Banks *et al.*, 2008). (This pattern of returns is, of course, also common in legal trade.)

Typically, even where the value of a product increases significantly for rural producers and traders, so enabling greater profits to be won, urban traders then often take over (Roe *et al.*, 2002). Illegal production also makes producers and traders more vulnerable to "incidental" taxes and bribes. This can have a significant impact on profits, and in certain cases the illegal trade may be less profitable than the legal trade because of these costs. Although it may not make economic sense to operate illegally, there may be no choice,

either because of an inadequate legal framework or because more powerful operators benefit from the maintenance of the illegal trade. For example, small-scale logging was outlawed in 1999 by the Cameroonian government. This effectively meant that small-scale operators were forced to operate illegally, reducing market opportunities and thus the prices that could be obtained for their timber and making them more susceptible to demands for bribes from officials (Cerutti and Tacconi, 2006).

Where the illegal trade does bring significant income, all too often these benefits prove transitory or they are won at the expense of longer-term livelihood resilience. For example, in the case cited above of Pu Mat National Park in Vietnam, following an initial boom in the wildlife trade in the 1990s animal populations in the target species crashed. Consequently, many wildlife hunters and traders went out of business. In 2003, it was estimated that there were 250 professional hunters compared with four times this number four years before (World Bank, 2006).

Many of the natural resources that are traded internationally – wildlife, timber and fish – also have an important role for local economies and in meeting subsistence needs. Hunting and fishing provides the main source of protein for some rural communities, while many timber species are valued locally, both for their wood and often for other resources, such as fruits and medicines.

The sale of these resources for the international market reduces their availability for local use. The impacts of this are even more serious if their harvesting is unsustainable – as is often the case for the illegal trade – with potentially serious impacts on rural livelihoods and local economies. For example, the wildlife trade expanded rapidly in Mongolia, following the collapse of the Soviet Union and the opening of borders with China. Fur, meat and medicinal products are all traded, China being the main destination for both fur and medicines. This has resulted in a rapid decline in the populations of many species, with an 85% decline in saiga antelope populations and a 92% drop in numbers of red deer. This has meant that herders are less able to depend on hunting to supply them with meat for their own consumption, hence they either need to purchase meat or consume their own livestock, so reducing their potential to earn income (Wingard and Zahler, 2006).

Forest degradation and the depletion of wildlife populations can also limit opportunities such as the development of tourism or mechanisms for payments for environmental services (PES). For example, elephants are a major attraction for tourists, but poaching has decimated populations in some countries (Wasser *et al.*, 2007). Opportunities for PES have expanded in recent years, largely with the establishment of markets for carbon, and these could well grow significantly in the future if current negotiations within the UNFCCC

result in the establishment of an international mechanism for REDD (reduced emissions from deforestation and forest degradation). Therefore, any loss in forest area or quality could represent a significant loss of potential benefits from such a mechanism.

Environmental impacts

Environmental impacts can be divided into two broad headings: resource depletion and pollution. Of course, legal activities can have just as negative impacts, and illegal activities are not always worse (see the discussion above in Section 3). However, although legality does not always guarantee sustainability, it does tend to be associated with better management practices, as explained below.

Unsustainable resource use

Examples of illegal activity resulting in unsustainable resource use are to be found throughout the focus products in this paper. For example, those engaged in illegal fishing tend not to follow management rules and so can cause significant damage to ecosystems. Examples of bad practice include the use of small mesh sizes (resulting in high levels of by-catch), the illegal use of longlines and gillnets (which result in high levels of incidental capture of albatross and other birds), fishing in marine reserves, which may be protected for their high biological diversity or because they are breeding grounds, and fishing over quota (Agnew *et al*., 2009; SADC, 2008).

The illegal wildlife trade has resulted in the drastic decline in the populations of many species; for example, populations of African black rhino have plummeted because of poaching for their horn (CEC, 2005), and the ivory trade has resulted in massive declines in elephant numbers across much of Africa (Wasser *et al*., 2007) and even more seriously in Asia. The decline and extinction of some species can have wider impacts on the ecosystem because of the role that they play in natural processes – for example, as pollinators, carnivores, or a source of food for other wildlife.

In many parts of the world, illegal logging has contributed to forest destruction, with consequent loss of habitat and biodiversity. Deforestation often also increases the risk of floods and landslides from slopes stripped of forest cover. Forests play an important role in hydrological cycles, and deforestation on a large scale can even affect local weather patterns, resulting in a decline in rainfall and reduction in the availability of water. Forests are crucial for global climate processes: their role in water and energy cycles influences atmospheric circulation patterns and they also serve as an important carbon store (Hoare, 2007).

Indeed, the importance of forests as part of global efforts to mitigate against climate change has been recognised, and this has led to the current negotiations to establish an international mechanism to reduce deforestation.[12] Reducing Emissions from Deforestation and Forest Degradation (REDD) is intended to develop means of attributing a financial value for the carbon stored in forests by offering incentives to reduce emissions from forested lands.[13] REDD+ goes beyond the establishment of incentives for reducing emissions and seeks to encourage sustainable management of forests and enhancement of forest carbon stocks

Damaged local environments – marine, forest and other ecosystems – are more vulnerable to pressures brought about by environmental stress, such as might be the case with climate change. Loss of biodiversity due to over-fishing or hunting, for example, means that they are less able to cope with additional stresses. A recent report highlighted the importance of biodiversity in maintaining forest productivity and functions. Degraded and less diverse forests are less productive, hence less effective at sequestering and storing carbon; they are also more susceptible to disease and insect infestations, invasion by non-native species and to forest fires (Thompson *et al.*, 2009). Forest degradation was one of the factors contributing to the extensive forest fires in Indonesia in 1997-98 (Contreras-Hermosilla *et al.*, 2007).

Similar findings have been reported for marine ecosystems: less diverse ecosystems show lower productivity and are more susceptible to invasive species. Destructive fishing techniques and marine pollution also mean that fisheries are more susceptible to the effects of climate change, such as ocean acidification and changes in ocean circulations (Nellemann *et al.*, 2008).

The importance of marine ecosystems as a carbon sink and as part of the ocean carbon cycle is also being increasingly recognised. A recent report from UNEP highlighted the importance of these "blue carbon sinks" and the need to address the issues of pollution and unsustainable fishing as part of global efforts to mitigate climate change (Nellemann *et al.*, 2009).

Pollution and waste

The illegal trade in ODS and waste has a more direct environmental impact, since it is these substances themselves that are harmful. No significant illegal production of ODS has ever been detected or suggested; the illegal trade seems to be in substances that are legally produced but then transported to countries where their use is banned or restricted. In this sense, then, the illegal trade in ODS is not as serious as illegal trade in the other products examined here – but it does undermine efforts to phase out their use and so delays the recovery of the stratospheric ozone layer (UNEP-ROAP, 2007). The effect of ODS on climate change is also further exacerbated as CFCs and

HCFCs are generally potent greenhouse gases, so contributing to global warming (EIA, 2007b).

Illegal waste is often not treated properly, or at all, but is simply dumped, contaminating land and water (Basel Convention, 2006). This can have a significant impact on the environment. Contaminated surface-water can permeate all levels of an ecosystem. If the health of organisms at the bottom of a food chain is affected, the whole chain may be disrupted. Contaminants may also be accumulated in the bodies of organisms, with concentrations increasing up the food chain. Contamination of groundwater can also have widespread impacts, as in many parts of the world groundwater is used for drinking and bathing and to irrigate fields. Soil contaminants may be taken up by plants and so can then have an impact on the health of animals, or in the case of crops, humans. Air pollution can also cause respiratory problems or other adverse health effects, if the particles are absorbed into the body (Baker *et al.*, 2004).

Social impacts

Corruption, crime and conflict

Illegal trade can have a detrimental effect on the functioning of societies and state authorities. Indeed, it is often associated with corruption and sometimes with other areas of crime (Banks *et al.*, 2008; Brack, 2007b; UN, 2003).

Government officials may demand or be susceptible to bribes at all stages of the market chain – for example, to facilitate the illegal granting of logging concessions, to allow poaching or fishing in protected areas, to approve fraudulent certificates (*e.g.* for CITES-listed species or for hazardous waste) or to avoid customs checks. A vicious circle can be created in which corruption within the government encourages these illegal activities, while the financial benefits from these in turn help to maintain the corrupt systems and individuals (Contreras-Hermosilla *et al.*, 2007). In Honduras and Nicaragua, illegal logging and other associated criminal activities have contributed to the collapse of civil governance in many rural areas, with high levels of violence and the erosion of indigenous institutions (Wells *et al.*, 2007).

The extent of criminal involvement in these trade networks is uncertain, but there is much anecdotal evidence of links between environmental and other areas of crime and of the involvement of criminal networks in illegal trade (Brack, 2007b; Cook *et al.*, 2002; Sellar, 2007; UN, 2003). For example, the same networks have been found to be used for smuggling arms and drugs as for wildlife (Schaedla, 2007; World Bank, 2006). Seizures of illegal wildlife are often found together with drugs and arms,[14] and trade in wildlife has been

used to launder drug money or to trade for drugs, as well as being used to conceal drugs.[15] Within the illegal ivory trade, there is evidence of the growing involvement of organised crime syndicates, many of whom have links to political, economic or military elites (Banks *et al.*, 2008; TRAFFIC, 2007).

Interpol has found evidence of links between pollution crimes and organised crime, as well as links with terrorism. Crime syndicates have been found to be involved in the dumping and trafficking of hazardous waste – for example, from Italy to Eastern Europe and West Africa (NOMOS-L-G, 2003). This has also been reported from the United States, where criminal groups and networks have been known to buy hazardous-waste treatment facilities and then to illegally stockpile or dump the waste (Interpol, 2006 and 2009).

Within the fishing sector, criminal groups are thought to earn substantial incomes from illegal fishing. It has been reported that Russian crime syndicates earn as much as USD 4 billion a year from the illegal export of seafood (USDoJ, 2000). Criminal groups are deeply involved in the highly lucrative caviar trade, particularly in the countries of the former Soviet Union (Cook *et al.*, 2002; UN, 2003). Illegal fishing of abalone in South Africa has also been reported to have strong links with illicit trade networks, drug trafficking, money laundering, corruption and racketeering (SADC, 2008).

Illegal activities are also sometimes linked with regional and national conflicts. The illegal trade of timber in particular has provided a source of funds for warring parties and rebel groups in a number of countries, including Myanmar, Cambodia, the Democratic Republic of Congo and Liberia (Contreras- Hermosilla *et al.*, 2007; Koning *et al.*, 2008). For example, during the early 1990s, the illegal trade of timber from Cambodia into Thailand was being undertaken with the complicity of both countries' governments and to the financial gain of the Khmer Rouge. The value of this trade was estimated to be USD 10-20 million per month, helping to maintain the war efforts of the insurgents until the border was closed in 1995.[16]

A report published in 2001 by Global Witness examined how the timber industry in Liberia was playing an important role in financing the repressive government of Charles Taylor, including the purchasing of arms, as well as financing rebels in Sierra Leone. This logging was largely unregulated, resulting in widespread destruction of the country's forests.

Impacts on livelihoods

Illegal trade has a disproportional impact on the poorest and most marginalised sectors of society. It is often the poor who are engaged at the "front line" of these activities, for example, in poaching wildlife or smuggling goods across borders, and so they are most at risk of prosecution or at times, of physical danger, for example, being shot in anti-poaching operations (EIA, 2007a).

Indeed, it is often small-scale operators who are targeted in enforcement efforts rather than larger operators who tend to have more political clout. For example, in Tanzania, small-scale traders of illegal timber were found to be bearing the brunt of enforcement efforts while little action was taken against larger companies or officials who were implicated in the trade (Milledge *et al.*, 2007).

There may also be clashes between illegal operators and local populations, a phenomenon which has been widely reported in both the forest and fisheries sectors. For example, illegal land grabs and forest exploitation in many parts of the world have often involved violent clashes with indigenous peoples and cases of intimidation and violence by those engaged in illegal logging against local communities are also frequent (Banks, *et al.*, 2008; Koning *et al.*, 2008). Conflicts between IUU industrial fishers and artisanal fishers have also been widely reported from the coastal areas of Africa. These include physical clashes, which may result in the loss of fishing gear as well as personal danger (MRAG, 2005b; SADC, 2008).

The illegal trade in natural resources can also undermine the livelihoods of rural people. For example, many poor coastal communities are dependent on fish for most of their animal protein, and so they are heavily affected by reductions in catch, both immediately and for future livelihood opportunities.

Health impacts

Illegal trade can also have a negative impact on health. In all areas of illegal activity, the work environment is often a dangerous one, as employment and safety laws tend to be ignored. For example, employees may be working with hazardous chemicals without adequate protection or without adequate training or equipment in logging operations.

IUU fishing vessels often provide poor working conditions for their crew, with little regard for health and safety or for employment regulations (MRAG, 2005b; ICONS, 2001). Within the timber sector, illegal operations also tend to pay scant regard for safety, providing no training and often low-quality equipment, if any at all.

Those engaged in poaching wildlife often face very high risks compared with the potential returns. For example, many are financed and managed by outside traders, who pay them relatively little for their services. However, these poachers face the risk of being shot by enforcement agencies, and they are frequently injured or at times killed (EIA, 2007a). The smuggling of wildlife brings the additional risk of spreading disease, both to native animal and plant populations and to humans (CEC, 2005). For example, smuggled game birds from Mexico are thought to have been the source of an outbreak of Exotic Newcastle Disease which affected poultry in California in 2003 (Ferrior, 2009).

Some wild-harvested plants are transported in soil, bringing an additional risk of the spread of other plant species or of soil-borne diseases or pests. Many wild animals carry zoonotic diseases – diseases that can be transmitted between animals and humans – and some species may become invasive when introduced into a new habitat. Boa constrictors can illustrate both these scenarios: wild-caught specimens have been found to carry salmonella, and they became an invasive species in the Florida Everglades after their accidental release there (Ferrior, 2009, citing Reed, 2005).

Hazardous waste, when not handled properly, can have severe impacts on health. For example, persistent exposure to dioxins causes skin lesions, altered liver functioning and impairs the immune system (Basel Convention, 2008). Electronic waste contains a variety of toxins, including lead, arsenic and mercury. When not disposed of properly, people may be exposed to the toxins through air pollution or contamination of the soil and water, causing a range of illnesses including lung and kidney disease, lead poisoning and cancer. In addition, burning of such waste releases toxic dioxins into the atmosphere (Interpol, 2009). A recent case of the illegal shipping of waste illustrates the damage that can be caused. In 2006, the *Probo Koala*, a ship chartered by the Swiss metals and energy-trading firm Trafigura, illegally dumped a cargo of chemical waste in Côte d'Ivoire. In the following weeks, tens of thousands of people living near the dumping sites suffered from a range of illnesses and at least fifteen subsequently died.[17]

Any delay in the recovery of the ozone layer leads to longer periods during which the Earth's surface is subjected to higher levels of solar ultraviolet radiation. Higher levels of radiation are linked with increased incidences of skin cancer and eye disease and suppression of the immune system (UNEP, 2006).

Concluding remarks

Illegal trade in environmentally sensitive goods can damage economies and ecosystems, undermine environmentally sustainable activities and reduce future options for the use of resources. In many cases it undermines the rule of law and can fuel armed conflict. It is a serious problem, the impacts of which often go unrecognised, and it is frequently accorded only a relatively low priority when deciding on national and international law-enforcement priorities.

Any serious attempt to tackle illegal trade in the sectors examined here would benefit from a systematic evaluation of the impacts. These will, of course, vary from country to country and locality to locality, and the precise impacts will vary with the sector. As has been seen, illegal trade in natural resources – timber and fish – may have the most significant economic

impacts, while illegal dumping of hazardous waste may have the biggest health impacts, and poaching may have the greatest impact on species survival. A comprehensive evaluation of this spectrum of impacts would be extremely helpful in highlighting the – generally under-appreciated – environmental, economic and social effects of these types of illegal trade.

Such an evaluation could also usefully be accompanied by an analysis of the drivers of the illegal trade in each case. Although improved law enforcement may often be the most obvious solution, trying to suppress the demand at source, or improving systems of governance and regulation, may be just as, or more, valuable actions to pursue. Applying the lessons from what works in particular sectors to others can also be of value.

Similarly, efforts to reduce illegal trade will need to look at the wider political economy. For example, reducing IUU fishing will not only require building capacity for monitoring enforcement among developing countries, but also wider governance reforms within these countries. Strengthening of marine tenure systems will also be needed, as will the reduction of certain subsidies to the fishing industry that contribute to overcapacity and over-fishing, in order to reduce the global fishing effort (World Bank, 2008).

In recent years, there have been many efforts aimed at tackling illegal trade, but little systematic attempt to analyse best practice, particularly across sectors. A key step is to assess the impact and effectiveness of the various initiatives that are being implemented at both the national and international levels to address illegal trade, in order to learn lessons and identify priorities to move forward. This requires ongoing tracking of such initiatives, as well as of the level of illegal activities. Some efforts are underway to achieve this. For example, it is one of the goals of an international IUU fishing monitoring network established in 2007 (Agnew *et al*. 2009). Within the timber sector, Chatham House has recently undertaken an assessment of levels of illegal logging and trade in order to assess the impact of initiatives to tackle this issue.[18] Such efforts could be made more systematic and wide-ranging.

Notes

1. In this report, wildlife, fish and timber are collectively referred to as "natural resources".
2. "Smuggling Europe's Waste to Poorer Countries", *New York Times*, 26 September 2009; available online at *www.nytimes.com/2009/09/27/science/earth/27waste.html?_r=2&hp*.
3. "From toxic waste to toxic assets, the same people always get dumped on", *The Guardian*, 21 September 2009; available online at *www.guardian.co.uk/commentisfree/cif-green/2009/sep/21/global-fly-tipping-toxic-waste*.
4. Hewitt, pers. comm.; 27 March 2009.

5. IISD, "Sustainable Development and China: Recommendations for the Forestry, Cotton and E-Products Sectors", December 2008.
6. European Commission Delegation to Cameroon and the Ministry of Forests and Wildlife (MINFOF) (Cameroon), "FLEGT Voluntary Partnership Agreement between Cameroon and the European Union, Briefing Note", May 2010; available online at *www.illegal-logging.info/uploads/AW3602EFICameroonBriefingNoteEngvisual.pdf*.
7. *www.renctas.org.br*.
8. "Tanzania, Zambia Bid for Ivory Sales Nixed", CBS News, 20 March 2010; available online at *www.cbsnews.com/stories/2010/03/22/world/main6322522.shtml*.
9. *www.cfr.org/australasia-and-the-pacific/apec-leaders-declaration-november-2011/p26539*.
10. See *www.illegal-logging.info/item_single.php?it_id=2199&it=news*.
11. Includes both EEZ and high-seas fisheries.
12. unfccc.int/methods_and_science/lulucf/items/4123.php.
13. *www.un-redd.org/AboutREDD/tabid/582/Default.aspx*.
14. *www.theage.com.au/news/national/scales-of-justice/2007/08/17/1186857779290.html#*.
15. news.mongabay.com/2007/0520-meth.html.
16. *www.globalwitness.org/pages/en/khmer_rouge_and_civil_war.html* (Accessed 16/10/09).
17. *www.guardian.co.uk/world/trafigura-probo-koala*.
18. See *www.illegal-logging.info/indicators*.

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ANNEX 2.A1

The role of China

Demand for wildlife

Experience has shown that, as incomes rise, so too does demand for wildlife (World Bank, 2006). The rapid economic growth in China has resulted in an increased demand for animal products for food and medicine, one of the main factors behind the recent expansion in the wildlife trade (Lin, 2005; World Bank, 2006).

This trend is clearly illustrated by data on the ivory trade. In a recent assessment, based on data from 1989 to 2006, it was found that China is the main destination for large consignments of illicit ivory (TRAFFIC, 2007). Data on ivory seizures indicate that, globally, large-scale seizures have become more frequent and larger over time and that this ivory is primarily destined for China. For example, 30 of the 49 large seizures made between 1989 and 2006, totalling nearly 70 000 kg, were transported to China, Japan, the Philippines and the territories of Macao SAR, Hong Kong, China and Chinese Taipei. Two-thirds by volume of this trade was destined for China or territories whose ivory trade is inextricably linked to China. One-off large-scale seizures of ivory were also made in Egypt, Ethiopia, Portugal, Uganda, the United States and Vietnam.

The increase in seizures is in part a result of the country's enforcement efforts; China was the only country, of five most heavily implicated in the illicit ivory trade, to have demonstrated significant progress in addressing illicit ivory-trade issues. However, it is also thought to indicate a real growth in demand for ivory, a result of the population's increasing spending power.

Demand for timber

There has also been a dramatic increase in China's imports of timber in the last decade (TRAFFIC, 2006, Forest Trends, 2006). Between 1997 and 2005, China's wood-based product imports more than tripled in volume, from 40 million to 134 million m^3, representing an increase in value of USD 6.4-16.4 billion.

Per capita consumption is still relatively low, however, approximately one-seventeenth that of the United States (IISD, 2008). Nonetheless, in 2009 China was the only major global market posting positive increases in consumption. (Xiufang and Canby, 2010).

This demand is not only to meet domestic requirements, but also that from other countries for cheap wood products, such as furniture, plywood and flooring. China has become "the world's largest wood workshop" (White *et al.*, 2006:4). In the first half of 2007, Chinese exports of wood-based products rose by 41% compared with the previous year. A significant proportion, perhaps one third, of the total roundwood-equivalent volume of timber imported into China is subsequently exported after being transformed, particularly as products which are a composite of imported and locally grown wood. In recent years there seems to have been a shift in exports towards greater value-added products. For instance, between 2007 and 2009 exports of forest products decreased by volume, but barely decreased by value (Xiufang and Canby 2010). In particular, furniture is playing a greater role.

Although illegal timber is likely to account for as much as 40% of the total roundwood equivalent volume of timber which China exported during 2008, the illegal timber content likely varies by product, enterprise and destination. This trade is contributing to the increased flow of illegal timber into Europe, Japan, and the United States because of the sources of China's imports.

China's growing demand for timber has meant that it is importing from many more countries, including those that are deemed "high risk" – *i.e.* where illegal timber makes up a significant proportion of production. In 2005, the Chinese market was estimated to account for over half the log exports from Indonesia, Myanmar, and Papua New Guinea, and some 40% of exports from Russia and the Congo Basin (White *et al.*, 2006). In all these countries, illegal logging is a major problem, and the majority of China's imports from some of these countries may be illegal. Indeed, an estimated 90% of imports in 2006 from Equatorial Guinea, Indonesia, Myanmar, Papua New Guinea, and the Republic of Congo were then estimated to be illegal.

The percentage of illegal timber imports from these countries into China remained the same in 2009, with the exception of Equatorial Guinea which did not export any timber to China. Some 90% of China's timber imports from the Solomon Islands in 2009 were also estimated to be illegal. In fact, China's timber sector imports more illegal timber than any other, from high-risk countries outside the EU, in total (25.2 million cubic metres) and 66% of total imports.

In response, China has taken part in several international initiatives to combat illegal logging, for example the East Asia and Europe and North Asia FLEG ministerial conferences, which took place in 2001 and 2005 respectively. China has also actively engaged with the EU, the United States and Russia on

the subject and signed memorandums of understanding with timber exporting countries such as Indonesia and Myanmar. In 2009, the Chinese authorities produced "A Guide on Sustainable Overseas Forest Management and Utilization by Chinese Enterprises"; something that has yet to be replicated by other countries with significant industrial logging capacity operating abroad, such as France and Malaysia. In 2011 China hosted the first APEC forestry ministers meeting, where the the focus was on promoting sustainable forest management.

The increased focus world-wide on illegal logging, and the implementation of a series of measures aimed at excluding illegal timber from consumer markets (including the amendment to the US Lacey Act to extend its coverage to timber; the EU's voluntary partnership agreements with timber-producing countries and forthcoming timber regulation; and the use of public-procurement policy, in several countries, to source only legal timber) has given rise to a concern that timber-producing countries may increasingly seek to avoid such "sensitive" markets and export instead to countries with no such controls – of which the main one is China.

However, a Chatham House study in 2010 found little evidence to support this concern in any of the timber-exporting countries studied: Brazil, Cameroon, Ghana, Indonesia and Malaysia (Chatham House 2010). Of course, since China itself is a major re-exporter, Chinese products will themselves be subject to increased scrutiny in consumer countries.

Demand for fish

In 2005, China accounted for 33.6 of the 107 million tonnes (live weight equivalent) of fish available for human consumption. Asia, excluding China, accounted for 36.9 million tonnes, Europe 15.2 million tonnes, and North and Central America 9.8 million tonnes. China also consumes more fish per capita than any other country – 26.1 kg per person per year, compared with 13.9 kg for the rest of Asia and 24.1 kg and 20.8 kg for North America and Europe, respectively (FAO, 2008). Around 10% of the fish consumed in China is used as feed for its aquaculture industry, which raises 70% of the world's total production of farmed fish. As with timber, the country is also a major processor, importing fish from other countries and re-exporting it as fillets, chilled, frozen and canned products.

China is frequently in the news in relation to illegal fishing activities. In recent years, Chinese fishers and fishing boats have been apprehended or monitored engaging in illegal activities in the waters of many countries, including Australia, Guinea, Indonesia, Malaysia, Philippines, Sierra Leone, and South Africa.

In the Philippines alone, the authorities say they have arrested almost 600 Chinese nationals for poaching in the last nine years. Greenpeace and the

Environmental Justice Foundation have tracked illegally operating Chinese-flagged trawlers from the waters around Guinea to landing their catches in the Canary Islands, the Philippine authorities have arrested Chinese fishers for fishing in the prohibited waters of the Tubbataha Reef National Marine Park, and Chinese companies have been implicated in organised crime rings involving illegal fishing. (MRAG, 2005b; Greenpeace, 2006).

In more recent years, however, China does appear to have made efforts to improve its fish products traceability systems (Clarke, 2009). Again, as with timber, pressure from external players, for example regional fisheries management organisations implementing catch document and other schemes, and the EU's new control regulation for IUU fish, should provide incentives to China to more closely scrutinise its supply chain.

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Chapter 3

Assessing illegal trade flows based on customs and licensing scheme data

There are many possible indicators of illegal trade in environmentally-sensitive goods. In this chapter we review the evidence related to discrepancies in trade data from exporting and importing countries. Wide variations between different countries' statistics may indicate illegal trade in some form. However, caution must be exercised. Discrepancies may indicate any one or several of a wide range of other factors such as measurement methods, data inputting or conversion errors and inconsistencies.

Introduction

There are many possible indicators of illegal trade in environmentally-sensitive goods. For example data on seizures or outcomes of court cases could be used to obtain an indication of trends. In this report we focus on discrepancies in trade data. In principle it should be possible to obtain an indication of illegal trade in some environmentally sensitive products by examining import and export data and analysing discrepancies between the two sources. Wide variations between different countries' statistics may indicate illegal trade in some form. Equally, however, they may indicate any one or several of a wide range of other factors such as measurement methods, data inputting or conversion errors and inconsistencies.

This chapter examines this question in more depth and to underline cases where data discrepancies may indeed indicate illegal trade. It considers three sets of data comparisons:

- Between customs data and data recorded by licensing systems.
- Between customs data from importing and exporting countries.
- Between licensing-system data from importing and exporting countries.

The paper uses examples from five sectors: wildlife, timber, fish, ozone-depleting substances, and hazardous wastes. Different methods need to be used for different sectors and products, depending on the nature of the goods concerned, the associated control mechanisms in place, and on the extent to which customs records distinguish controlled goods from uncontrolled goods.

In the case of timber, fish and wildlife, for instance, no international control system exists,[1] so the analysis is normally confined to customs data. This is also generally true of fish products, where controls only tend to exist at the regional rather than the global level. For threatened wildlife products listed on Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) appendices, licensing data for both exports and imports are sometimes available, but customs data are rarely sufficiently precise to be of use. For ozone-depleting substances (ODS), some licensing system data are available and some customs codes are sufficiently correlated to provide useful information. For hazardous waste, data are available on "movement documents" issued by governments, and useable customs data are also available for certain categories of waste.

Data from customs and licensing records

One possible means of investigating data discrepancies involves comparing legal trade volumes (from licensing scheme data) with legal production and domestic-consumption volumes (from other sources). For example, a study comparing Polish import and export figures for cod and cod products with reported landing and national consumption figures showed a discrepancy equivalent to 49 000 tonnes of whole cod – over three times the reported national annual landings.[2] The inference is that, at the time, three-quarters of the cod consumed and exported by Poland was being illegally caught or otherwise unreported.

Alternatively, in order to assist national-level implementation of international conventions controlling trade in specific types of goods, in 2006 the WCO produced a table of six-digit HS codes (Box 3.1) which may potentially include items controlled under a range of conventions, including those related to the environment.[3] The table indicates in each instance whether all items under a given code, or only a subset, are controlled, and thereby gives a measure of the extent to which the HS is correlated with multilateral environmental agreements (MEAs). Of a total of 567 code-convention combinations covering the Basel Convention, CITES, the Montreal Protocol and the Rotterdam and Stockholm Conventions, there was direct correlation in only 21% of cases.

Box 3.1. **Customs trade data - the Harmonised System**

The World Customs Organisation (WCO) maintains the Harmonised Commodity Description and Coding System (HS), a list of internationally agreed 2-, 4- and 6-digit codes covering goods in international trade. Almost all economies now use the system to classify, control and report on imports and exports. In addition to helping to harmonise international trade statistics and collect customs tariffs, the system is used to help facilitate the work of customs agencies in monitoring and enforcing regulations regarding controlled goods, including environmentally sensitive goods. Individual WCO members are required to use the 6-digit codes to classify goods, though each member can choose whether and how to break down each individual 6-digit code into further sub-categories using longer 8- or 10-digit codes*.

* The EU's TARIC (*Tarif Intégré* de la Communauté) system builds on the international harmonised system, using 10 digits or more.

Though no timber-specific licensing systems were included in the WCO table, examinations of the subject of the use of trade data to identify illegal trade and target enforcement which have taken place under the East Asia Forest Law Enforcement and Governance (FLEG) inter-governmental process

have also found problems of correlation and have recommended amendments to HS codes to aid future analysis.[4]

Ideally, the Harmonised System – and thereby official trade data – should correlate more closely with controlled goods. The WCO has been working increasingly closely with the relevant bodies, including the FAO, the ITTO, and MEA Secretariats, to try to address this problem, and some changes to the HS have been made in the past to assist in the implementation of MEA and other controls. However, the process for changing the HS is lengthy. New versions are brought out only once every five years, yet the definitions of controlled goods change continuously. Recognising this limitation, the WCO and MEA secretariats have recommended in some instances that parties should instead introduce appropriate optional 8-10 digit codes within their national commodity classification systems. Decision XIV/7 of the Parties to the Montreal Protocol, for instance, encouraged all Parties to develop their own sub-headings for the more commonly traded ozone-depleting chemicals.

These recommendations do not have the force of law, however, and therefore tend to be poorly implemented. They are also implemented differently in different countries, and the resulting 8-10 digit trade data are usually not included in international trade databases. Although such amendments can assist customs officials in specific countries to implement controls, unless they are co-ordinated and widespread they will be of limited use in trade-data discrepancy analyses.

On the other hand, in some cases those countries that trade in certain goods in greater volume tend to have specific national 8-10 digit codes in place already. Many countries publish such detailed data alongside the higher-level 6-digit data, and these can potentially be used to identify and measure illegal trade. The two case studies which follow, on ramin wood exports to Chinese Taipei and mahogany imports to the United States, explain how.

The case of ramin wood imports by Chinese Taipei

Ramin (*Gonystylus spp.*) is a threatened tropical timber species found principally in Indonesia and Malaysia. The species was listed by Indonesia on Appendix III of CITES in 2001, and was later promoted to Appendix II, effective in 2005.[5]

Chinese Taipei is one of the few economies in the world to have a specific customs code for sawn timber made from ramin. Prior to the original CITES listing in 2001, discrepancies were observed between customs trade data for sawn ramin exports as reported by Indonesia (which also has a specific customs code for ramin sawn timber) and imports as reported by Chinese Taipei. By 1999, Chinese Taipei was reporting imports of more than ten times as much ramin wood as was being legally exported (Table 3.1). This primarily reflected growing problems of

Table 3.1. **Trade in ramin sawn timber from Indonesia to Chinese Taipei, 1998-99**

Year	Exports reported by Indonesia (kg)	Imports reported by Chinese Taipei (kg)	Proportion recorded at export
1998	659 894	1 986 807	33.2%
1999	611 002	8 125 507	7.5%

Source: Indonesian Export Data – Global Trade Atlas; Chinese Taipei Import Data – Bureau of Foreign Trade website (*http://cus93.trade.gov.tw/ENGLISH/FSCE/*).

illegal logging and timber smuggling in Indonesia following the economic and political crisis in the country during 1998-99.

Once a species is listed on CITES, all legal shipments require licenses issued by management authorities in countries that are parties to the convention. Information on the licenses issued each year is sent to the CITES Secretariat and collated by UNEP's World Conservation Monitoring Centre (WCMC) in an online database. Though Chinese Taipei is not a party to CITES and does not therefore submit data, discrepancies between data reported by CITES parties for licensed exports of ramin to Chinese Taipei and the data collected by Chinese Taipei authorities[6] can be used to assess the level and extent of illegal trade.

An analysis of this type for the three years 2005-07 shows a strong correlation between the export data recorded by the CITES licensing system and the import data recorded by Chinese Taipei customs authorities (Table 3.2). There are discrepancies, but the pattern and scale of the discrepancies is insufficient to strongly indicate illegal trade. While in 1998 less than 10% of Chinese Taipei imports from Indonesia were being recorded at export, in 2005 this had risen to 80%; in 2006 and 2007, Chinese Taipei recorded importing less ramin from Indonesia than was reported exported to it – a reverse discrepancy. While illegal trade would probably see greater volumes recorded at import, over the three-year period as a whole Chinese Taipei actually recorded 5% less imports (6 031 cubic metres) than were recorded by CITES parties as exported (6 333 cubic metres).

There are many possible explanations for the small discrepancies which were seen during the years in question, including actual volumes of particular shipments occasionally being smaller than the licenses issued for them; misclassification of customs codes at import and differences in scaling and measuring methods employed by Indonesian and Chinese Taipei authorities. Time-series issues (shipments spanning the end of the calendar year) may also be a cause. Such legal causes might plausibly result in the discrepancy of

Table 3.2. **Exports of ramin sawn timber to Chinese Taipei, 2005-07**

	2005		2006		2007		TOTAL	
	CITES Exports	BOFT Imports	CITES Exports	BOFT Imports	CITES Exports	BOFT Imports	CITES Exports	BOFT Imports
Malaysia	2 542	2 825	883	811	1 958	1 305	5 383	4 941
Indonesia	482	606	262	279	151	67	895	952
Brazil	0	51	0	53	0	0	0	104
Vietnam	42	0	8	0	0	34	50	34
Italy	0	0	4	0	1	0	5	0
TOTAL	3 066	3 482	1 157	1 143	2 110	1 406	6 333	6 031

Source: CITES export data – WCMC CITES Trade database, *www.unep-wcmc.org/citestrade/*; BOFT Import data – Board of Foreign Trade website, *http://cus93.trade.gov.tw/ENGLISH/FSCE/*.

less than 20% for shipments from Indonesia seen in 2005, but could not plausibly explain the discrepancies of approximately 70-90% seen in 1998-99.

There is some evidence that CITES parties are beginning to see the value of such analyses, and are implementing national customs codes to assist. The Italian and New Zealand authorities, for instance, have also now introduced a new code for ramin timber, specifically in order to assist in enforcement of the listing. New Zealand also applies a separate customs code for Kwila (merbau) timber and timber products which is the main timber tree species imported into New Zealand that can be of dubious legal status.

The case of mahogany trade between Latin America and the United States

Mahogany (*Swietenia macrophylla*) was unilaterally listed on Appendix III of CITES by a series of Latin American range states between 1995 and 2001,[7] principally as a means to help combat illegal trade. Listings on Appendix III of CITES can be made at any time by a range state. Such a listing requires importing-country parties to ensure that a permit is presented for all imports of the listed products (a CITES export certificate in the case of a range state which has listed the species, a certificate of origin for other range states, and a CITES re-export certificate in cases of re-export by non-range states). As with all CITES listings, all parties are required to keep a record of all permits issued and received and to communicate summary data to the Secretariat.

A 2001 study examined the implementation of the CITES regulations for mahogany in the United States during the years 1997-99, by comparing CITES records of permits issued and received with US customs data (Blundell and Rodan, 2001). The analysis found significant discrepancies, with the US customs authorities reporting substantially more mahogany imports into the United States than were recorded in CITES data. A close examination of the

data showed that much of the discrepancy could be accounted for by changes in shipment volume after permits were issued, data transcription and unit conversion errors, and misclassification of other species as mahogany. Nevertheless, once these sources of error had been eliminated, the study found that around 10% of shipments appeared to have been imported into the United States illegally without the necessary CITES permits. Later analysis by US authorities concluded that most of these apparently illegal shipments had occurred early in the implementation of the CITES listing and had been mistakenly cleared through customs without being directed to the appropriate authorities for CITES inspection and clearance.

One particular problem with the CITES licensing system highlighted by this study, and other studies that have compared CITES import and CITES export data for other species (see next section), is that there is no requirement for a trader to ship the full amount of goods a given license allows. Although the trader may not exceed the quantity stated in the permit, they may legally ship less – indeed they may choose not to ship the goods at all. Thus, while CITES exporting countries will report the volume of goods for which export licenses were issued, CITES importing countries and customs agencies in both importing and exporting countries will usually record the actual volume of goods in trade, and this may be lower.[8]

There are a number of reasons why actual shipments may be smaller than the associated licenses. An important one is that it is often time-consuming for legal traders to obtain CITES export permits in source countries, and for this reason they may choose to apply for a license before the terms of a particular deal are finalised or all of the goods obtained, measured or checked. The mahogany study noted that, apart from confusing attempts to use data-discrepancy analysis to identify illegal trade, this issue of unused permitted trade makes it difficult for CITES scientific and management authorities in range states to assess actual amounts of trade against quotas designed to ensure sustainability.

Customs data from importing and exporting countries

In addition to data reported under licensing schemes, it is also possible in many cases to collect useful information from published trade data, by comparing exports and imports declared by countries under specific customs codes (obviously this is only possible where each country in the pair possesses specific codes for the same product). For areas where no international trade agreement yet exists, such as timber, this is the only feasible means of comparison.

Possible causes of discrepancies in customs data

Numerous studies have been conducted on discrepancies in trade data for timber. In 2001, the International Tropical Timber Organisation (ITTO) commissioned ten case studies of discrepancies in trade data for tropical logs, sawn timber and plywood between major producing and consuming countries (ITTO, 2004). The majority of the studies found that illegal trade was either a "significantly important" or "very important" factor in explaining data discrepancies. The summary report concluded, however, that a very wide range of other factors, many of them clearly not illegal, also contributed to differences in reported exports and imports (Table 3.3).

Table 3.3. **Possible causes of discrepancies in import-export data**

Legal
Errors in data entry or compilation by customs officials
Misclassification by traders or customs officials
Differences in measurement methodology or conversion factors
Differences in interpretation or definitions
Time period problems
Triangular trade and transhipment
No effective systems for monitoring, data collection or verification
Illegal
Falsification of origin of goods
False declaration of nature of goods
False declaration of quantities of goods
Smuggling (at one end of trade route only)

Illegal trade is one of the possible explanations of the discrepancies observed. One example is the discrepancies in data for the trade of logs between Malaysia and China. Following a ban on log exports by Indonesia in 2001, China began reporting vastly higher imports of round logs from Malaysia, which was not reflected in Malaysia's export figures. Further research confirmed that this was as a result of illegal timber traders routinely falsifying the origin of stolen logs smuggled out of Indonesia and bound for China (EIA/Telapak, 2005). Following a crackdown in Indonesia, this problem was brought under control, and the resultant discrepancy in trade statistics fell rapidly.

For other destinations of illegally exported Indonesian logs, there was no need for false declarations, and the discrepancy in trade data was apparent. In 2002, for instance, the United States recorded imports of logs from Indonesia worth more than USD 600 000, despite the ban on exports the previous year. Because the trade was only illegal at the point of export, there was no need for traders to falsify the origin of the logs.

In another example, analysis of global customs trade data for imports and exports of products made from sharks (*Lammidae)* has shown that total global imports exceed reported exports by 20 000 tonnes, or 20% of global trade. It has been suggested that the difference may be accounted for, at least in part, by illegally caught and traded specimens. However, once again it must be emphasised that other factors may be responsible for the discrepancies, including the use of different commodity codes by different countries.[9]

A study carried out for UNEP on transboundary movements of CFCs found discrepancies in reported CFC trade data of up to 2 000 tonnes per year between countries in the Asia-Pacific region, with some discrepancies indicating unreported imports of CFCs equal to more than 70% of national consumption (UNEP DTIE/Government of Sweden, 2005). While the study concluded that the discrepancies may be the result of illegal trade, it also noted that there were many other possible explanations, including failures in data recording and reporting.

A second UNEP study looked at data recorded in the *Global Trade Atlas*[10] for trade between pairs of countries in East and South-East Asia (Table 3.4) (UNEP Regional Office for Asia and the Pacific, 2006; also see EIA, 2004). The data presented in Table 3.4 are selected to highlight cases of significant discrepancies, and were in general lower for other years reported on. However, in no year and for no pair of countries did they match exactly. Another study, by the EIA, found that reported exports from China to Indonesia of CFCs from 2001 to 2003 were more than five times higher each year than Indonesia's reported imports of CFCs from China (EIA, 2004).

However, these data should be interpreted cautiously because it is clear that there are many possible causes of discrepancies in customs data. While

Table 3.4. **Import-export data discrepancies: Selected cases (tonnes of CFCs)**

Year	Exporting country	Exports	Importing country	Imports
2004	China	1 529	Indonesia	248
2003	China	1 288	Malaysia	414
2001	China	308	Thailand	1 653
2003	China	622	Philippines	412
2004	India	561	Philippines	235
2001	India	3 472	Thailand	877
2004	Singapore	801	Malaysia	124

Source: UNEP Regional Office for Asia and the Pacific, Illegal Trade in Ozone-Depleting Substances in the Asia and Pacific Region (2006). The data are selected to highlight the discrepancies, and were in general lower for other years reported on. In no year and for no pair of countries did they match. Also see EIA, Controlling the ODS Trade: The Need to Strengthen Licensing Systems (July 2004, updated November 2004).

many studies have pointed out major trade data discrepancies in environmentally sensitive goods and suggested illegal trade as a contributing factor, few have attempted to confirm the illegality by means of a more extensive and methodological analysis that seeks to eliminate other possible causal factors. The following case study on illegal timber exports from Tanzania provides an example of how this can be done.

The case of illegal timber exports from Tanzania

One telling example of the use of trade-data discrepancies to measure and bring attention to issues of illegal trade in environmental goods was a report by TRAFFIC on illegal logging in Tanzania, published in 2007 (Milledge *et al.,* 2007). One of the most attention-grabbing statistics in the report was a comparison between the legal exports of timber declared as exported by Tanzania to China with the imports of timber from Tanzania declared by China.

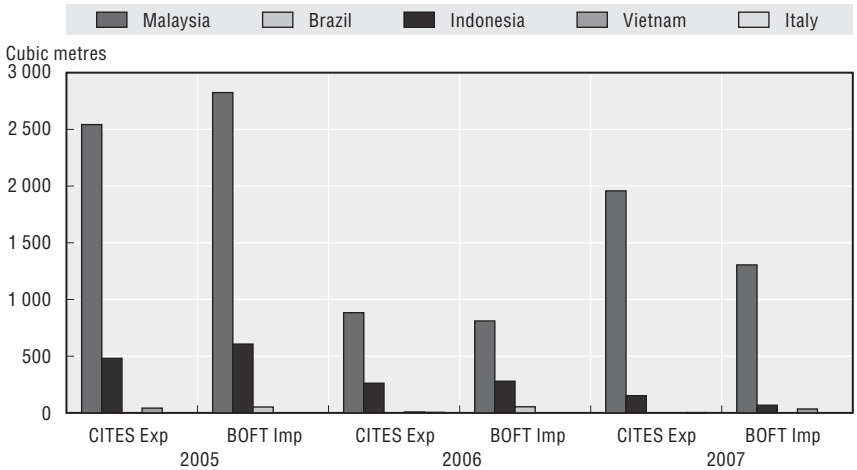
Analysis for the years 2003-05 found that ten times as much timber would have been arriving from Tanzania in China than had been legally exported. The implication was that almost 100 000 cubic metres of logs and sawn timber, worth as much as USD 40 million, may have been smuggled out of Tanzania destined for China during the three-year period. However, it must be emphasised that the estimates for 2003-2005 are based on 60% of overall trade reported by the Tanzanian Forestry and Beekeeping Department (FBD).

After TRAFFIC's findings were first brought to the attention of the Tanzanian government in 2006, significant efforts were made to crack down on illegal logging and timber smuggling. More recent analysis showed that the discrepancy fell dramatically in 2006 (Figure 3.1), indicating that illegal timber smuggling had been brought under much greater control. The discrepancy rose again in 2007, but remained well below the level of earlier years.

Further analysis can shed additional light on the situation, potentially aiding decision-making by those seeking to tackle illegal logging and timber smuggling. The original analysis, for instance, uses data on legal exports supplied by the Tanzanian forestry authorities. Published trade data, however, are supplied by Tanzanian customs. Comparison between the two suggests that, during the years when the timber smuggling problem was at its worst, some of the timber going unrecorded in forestry statistics was nevertheless recorded by Tanzanian customs authorities (Figure 3.2). This discrepancy had largely disappeared by 2005.

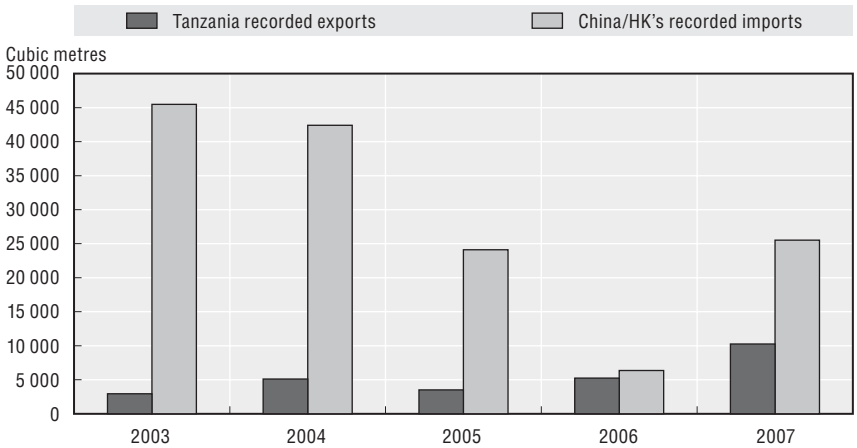
Further analysis also shows how the most recent discrepancies between the Tanzanian and Chinese data are skewed in terms of the products involved. All of the logs recorded as imported by China from Tanzania during 2007 went unrecorded, whereas China actually recorded importing 30% less sawn timber

Figure 3.1. **Timber exports from Tanzania to China and Hong Kong, 2003–07**



Source : China/HK Import figures – UN COMTRADE trade statistics database; Tanzania Export figures for 2003-05 are sourced from Simon A. H. Milledge, Ised K. Gelvas and Antje Ahrends, Forestry, Governance and National Development: Lessons learned from a logging boom in southern Tanzania (TRAFFIC, 2007) and are estimates based on 60% of overall trade reported by the Tanzanian Forestry & Beekeeping Department (FBD) being destined for China. For 2006-07 they are official FBD figures.

Figure 3.2. **Comparison of trade statistics for trade in timber from Tanzania to China and Hong Kong, 2003-07**



Source : UN COMTRADE (Tanzania Customs export data and China/HK import data); Tanzania Forestry and Beekeeping Department (FBD) figures for exports sourced as per Figure 2 above.

from Tanzania than Tanzania recorded exporting to China – a reverse discrepancy. One possible explanation for this may be the growth in Tanzania during recent years of imports and re-exports of sawn timber from

Mozambique: Tanzanian authorities may be recording this timber as Tanzanian for data purposes while Chinese customs record it as originating in Mozambique.

It is possible that some of the discrepancy in the log-trade data (and the reverse discrepancy for sawn timber) results from logs being incorrectly recorded as sawn timber. In some cases this may be deliberate misclassification. However, there is another possibility: that the data may be being confused by legal logs exported from Tanzania passing through a third country. Such shipments might be recorded by Tanzanian authorities as destined only for the third country, yet recorded by Chinese customs as originating in Tanzania, thereby creating a discrepancy unrelated to any illegal activity. This possibility can be easily tested by examining discrepancies in the data set as a whole. The only legal exports of logs recorded by Tanzania during 2007 were to India and the United Arab Emirates (UAE). If some of these logs were actually in transit to China then the Indian and UAE import mirror data should be lower than the Tanzanian data. In fact the opposite is true (Table 3.5). While this may be a consequence of smuggling, it may also be a reflection of the role of India and UAE as trans-shipment sites.

Table 3.5. **Trade statistics for exports of logs (HS4403) from Tanzania in 2007 (cubic metres)**

	Tanzania recorded exports	Partner recorded imports	Proportion recorded at export
India	5 226	8 501	61%
UAE	390	554	70%

Source: Import figures – UN COMTRADE; Export figures – Forestry & Beekeeping Department, Tanzania.

Previous studies that have examined the issue of trade-data discrepancies for timber have also noted that differences in measurement methods may be a contributing factor. This factor is difficult to eliminate for certain, but comparison of reported quantity data (in cubic metres) against weights and values should highlight any dramatic problems, alongside major data-entry errors – where quantities have been recorded incorrectly but weights and values recorded correctly, average weights and values will be far outside the normal range that would be expected for the product concerned. Differences in measurement methods are also unlikely to result in very large-scale discrepancies. For the Tanzanian case study, there is no evidence of major data entry errors and the scale of the discrepancies seen is too great to be explained by variations in measurement method.

By reducing other possible sources of discrepancy, this more detailed analysis provides support for the contention that in 2007 around 21 000 cubic metres of logs, worth USD 10 million, may have been smuggled from Tanzania to China,

Table 3.6. **Avoiding discrepancies in legal trade data**

Possible legal cause	Means of elimination	Questions
Misdeclaration or misclassification	Broaden examination to include other customs code categories into which goods may have been added	Do reverse discrepancies exist for the other customs code categories that are sufficient to explain the original discrepancy?
Triangular trade	Broaden examination to include other destination countries that may be transit points	Do reverse discrepancies exist for the other countries that are sufficient to explain the original discrepancy?
Time series issues	Broaden examination to include adjacent years	Do reverse discrepancies exist for the other years that are sufficient to explain the original discrepancy?
Measurement and scaling problems; typographical errors	Calculate average values and weights for different line items, using value and weight (kg) data	Are average values and weights within expected bounds? Are discrepancies large, in terms of volume, numbers of shipments and proportionally?

India and the UAE. This brief analysis demonstrates how a more comprehensive approach to the analysis of trade-data discrepancies can serve to provide more reliable and useful measures of illegal activity (see Table 3.6).

Comparing data from within licensing schemes and MEA reports

The final area for exploring data discrepancies is to look at data from MEA licensing schemes and reports. This section looks at examples from CITES, the Montreal Protocol and the Basel Convention.

Wildlife: CITES

Shipments of species of wildlife products that are listed in the appendices of CITES require CITES permits to be issued. For species on Appendix III, a permit is only required from the source country, though importing countries are required to record and report on permits received. For species on Appendix II, CITES itself only requires an export permit, but some countries (*e.g.* the EU) also require an import permit, and in all cases imports should be recorded in some way.

Numerous studies have been carried out that have analysed discrepancies in the data supplied by exporting and importing countries on quantities of CITES specimens in trade. As explained in the case study on mahogany, such analyses are constrained by the fact that not all specimens for which export permits are issued are actually shipped. Nevertheless, some studies have been able to show discrepancies that cannot be explained by unused export-permit allowances.

A 2006 study by TRAFFIC on the trade in bitter aloe (*Aloe ferox*), a succulent plant from South Africa listed on Appendix II of CITES, found substantial discrepancies between exporter and importer reports (Knapp, 2006). A number of EU member states such as Austria, Denmark, the Netherlands and the United Kingdom were found not to have reported any imports from South Africa, though South Africa had reported exporting many tonnes of aloe extract to these countries. The discrepancies were too large to be explained by unused permit allowances.

The study also looked at the possibility that discrepancies were arising from time-period issues, with exports and imports of given shipments recorded in different years, but concluded that the discrepancies were too large for this to be the only explanation; it showed also that similar discrepancies were occurring year after year. The study concluded that either South Africa was significantly over-reporting the volume of licensed trade, or that importing countries were systematically under-reporting it. Though data entry and collation errors might explain some of the discrepancies, the scale and regularity of these discrepancies again suggested that something more serious was going on, and it is probable that at least some shipments were being imported illegally without the proper import documentation. Although the data suggested that such shipments were nevertheless *exported* legally, and it is possible that the illegal imports were occurring as a result of ignorance on the part of traders, it is also possible that they were failing to report the imports and obtain the necessary clearances because additional illegal material had been added to the shipments after they were licensed for export in South Africa.

In another example, an analysis found that though Malaysia had banned the export of specimens of the Southeast Asian box turtle (*Cuora amboinensis*) in 2005, and that the Malaysian CITES management authority had reported issuing no CITES export permits for live specimens of the species during the year, China still claimed to have imported 33 969 individuals over the same period (Schoppe, 2008). The study concluded that this could be due to illegal trade and the use of false permits, though insufficient data were available to be able to eliminate other possible causes.

Ozone-depleting substances: Montreal Protocol

Discrepancies in import and export data for ozone-depleting substances, using trade data, were considered above. It is also possible to examine the data collected by licensing systems established under the Montreal Protocol.[11] There are limits to this method however, since unlike most other MEAs the Montreal Protocol does not prescribe a uniform licensing system, and national systems can vary in terms of the data they collect. Furthermore, import and export data are not reported publicly in detail; imports are reported by parties,

by substance, only in aggregate (*i.e.* the countries of origin of the imported substances are not identified). In 2005, the Ozone Secretariat revised its reporting format to encourage more comprehensive reporting of export destinations, so more recent data ought to be more informative.

No cross-checking of the import and export data reported to the Secretariat took place until an aggregated cross-checking exercise was conducted in 2004, with the intention of discovering whether or not global import and export data corresponded to each other.[12] Except for 2002, the total imports reported in metric tonnes always exceeded the total exports reported, the difference averaging about 5% (Table 3.7). Inclusion of imports and exports to non-Parties made little difference. ODP-weighted totals exhibited a much bigger divergence between imports and exports, however, which the Secretariat considered could be an indication of a mismatch between reporting of substances, namely that a party that exported one substance could result in the importer reporting a different substance.

Table 3.7. **Total imports and exports reported between 1997 and 2002**

Year	Imports MT	Exports MT	Difference	Imports ODPT	Exports ODPT	Difference
1997	367 332	358 054	-2.5%	233 149	217 622	6.7%
1998	361 534	361 291	-0.1%	215 343	205 296	4.7%
1999	415 999	370 538	-10.9%	229 282	191 421	16.5%
2000	385 471	341 753	-11.3%	195 811	159 368	18.6%
2001	347 063	314 557	-9.4%	154 778	122 410	20.9%
2002	342 261	355 919	4.0%	127 905	114 900	10.2%
Totals	*2 219 659*	*2 102 111*	*-5.3%*	*1 156 267*	*1 011 017*	*12.6%*

MT = metric tonnes; ODPT = ozone-depleting potential-tonnes.

At a more detailed level of analysis, broken down by annex group (Table 3.7), the divergences exhibit a larger variation compared with those in Table 3.8, indicating possible difficulties faced by Parties in reporting substances accurately. Most discrepancies involve imports exceeding exports, though the most significant discrepancy is that of methyl chloroform in 2002, where total reported exports exceeded total reported imports by 74%.

The reasons behind these discrepancies are not known. As with other reporting of trade and licensing-system data, some differences are always likely to appear; in the case of the Montreal Protocol, confusion between different substances with similar names adds another source of error. These should not usually be major, however, so combined with the trade data discrepancies described above, these figures do place some question marks over the accuracy of the data reported to the Secretariat and presented to the meetings of the parties.

Table 3.8. **Total imports and exports reported between 1997 and 2002 (MT)**

	AI – CFCs			BIII – methyl chloroform		
Year	*New imports*	*New exports*	*Difference*	*New imports*	*New exports*	*Difference*
1997	88 044	74 121	-15.8%	24 926	22 677	-9.0%
1998	79 736	63 289	-20.6%	22 494	21 247	-5.5%
1999	74 488	70 783	-5.0%	28 149	23 149	-17.8%
2000	73 917	62 571	-15.3%	30 540	23 604	-22.7%
2001	63 208	52 624	-16.7%	20 239	19 881	-1.8%
2002	53 196	54 166	1.8%	23 233	40 495	74.3%
Totals	432 587	377 554	-12.7%	149 583	151 052	1.0%
	BII – carbon tetrachloride			**CI – HCFCs**		
Year	*New imports*	*New exports*	*Difference*	*New imports*	*New exports*	*Difference*
1997	91 480	91 513	0.0%	118 769	129 092	8.7%
1998	83 280	91 267	9.6%	135 107	143 572	6.3%
1999	101 934	74 846	-26.6%	172 226	164 992	-4.2%
2000	72 921	56 852	-22.0%	171 788	165 306	-3.8%
2001	48 131	36 455	-24.3%	183 450	181 101	-1.3%
2002	34 773	24 515	-29.5%	203 645	213 471	4.8%
Totals	432 519	375 448	-13.2%	984 984	997 534	1.3%
	EI – methyl bromide			**AII – halons**		
Year	*New imports*	*New exports*	*Difference*	*New imports*	*New exports*	*Difference*
1997	42 361	39 057	-7.8%	1 496	1 574	-5.2%
1998	39 019	40 645	4.2%	1 491	978	34.4%
1999	38 078	35 772	-6.1%	1 068	996	6.8%
2000	35 213	33 009	-6.3%	1 006	411	59.1%
2001	31 039	24 127	-22.3%	981	368	62.5%
2002	26 227	22 885	-12.7%	699	387	44.6%
Totals	211 937	195 495	-7.8%	6 742	4 714	30.1%

Source: Chatham House and EIA, 2006.

Hazardous waste: Basel Convention

Parties to the Basel Convention are required to submit data on permitted exports and imports of hazardous waste to the Convention Secretariat. Some broad research has been conducted in the past on discrepancies between the import and export data, and it found significant overall differences (Burns and Fuchs, 2004), although no detailed analysis was carried out on the nature of these differences or their possible causes. It has been noted in the past that the data recorded by the Basel Convention are to a large extent unreliable, due to the absence of a harmonised definition of "hazardous", which means that submissions cover different waste types and use different nomenclatures. A 2002 study found that only about a quarter of Basel Convention parties submitted routine data reports (Hayman and Brack, 2002).

Preliminary analysis of data reported on the Convention website shows significant discrepancies. For instance, during 2006 Brazil reported exporting

1 000 tonnes of electronic scrap to Singapore, which was not reported as having been imported in the Singapore customs authorities' data. Further research is required to elucidate the size of the discrepancies and to what extent they may be explained by illegal activity.

Concluding remarks

The examination of data discrepancies recorded in customs and licensing-scheme data may in some cases help to identify illegal trade. However, this is a difficult area in which to carry out analysis, for two main reasons: *i)* the large number of other factors which may explain data discrepancies; and *ii)* the poor quality and paucity of data itself. The five sectors touched on in this paper suffer from different problems.

For wildlife (CITES), the paper shows that a common problem is that traders are often granted licenses for greater numbers of specimens than in the end they transport, so the raw data from export and import permits frequently show discrepancies. Although it is possible to examine these in more detail, it would require direct contacts with individual management authorities and traders and therefore be relatively costly. Customs data are not generally helpful, because they almost never identify commodities by species (with a few exceptions, mainly for timber).

For timber, apart from the small number of species covered under CITES, most of which are not widely traded, there is no licensing system. Using customs data works better to examine potential illegal trade, as illustrated by the case studies above. Work on indicators of progress in tackling illegal logging and associated international trade is making use of such trade data as are available, and systematic monitoring may well be helpful in revealing the impact of the various consumer-country measures adopted by the United States, the EU and other countries in order to exclude illegal timber from their markets.[13]

For fish, as with wildlife, customs codes are of limited use, and those licensing schemes which exist are fairly narrow, and mainly used to support catch quotas rather than regulate imports and exports. Also as with wildlife, a detailed exploration of the data could be time-consuming and costly.

For ODS, as with CITES, better data could probably be acquired directly from individual licensing authorities in the states in question. But again, this would be fairly time-consuming. HS codes are of limited use. For hazardous wastes, the correlation between Basel Convention licenses and HS codes appears to be rather closer, but in general the data reported to the Basel Secretariat is incomplete.

The general conclusion, then, is that while more data could be analysed in some of these areas, it is by no means a straightforward task. The further

elaboration of HS codes would prove of use in many cases, and there is an ongoing dialogue between MEA Secretariats, the FAO, the ITTO and similar bodies and the WCO on this issue. The use of 8–10 digit customs codes would be of value, particularly if these codes were to be standardised across countries beyond the 6-digit level (this is not currently the case). It would also be useful if the use of 8-10 digit customs codes, to address the issues discussed here, was more widespread.

The case study on timber exports from Tanzania demonstrates how more advanced analysis than has generally been applied can serve to eliminate other possible causes of discrepancies in trade data and provide a more accurate picture of the extent and nature of illegal trade; this does, however, have cost implications. Conclusions from such analysis could be reinforced if there is parallel evidence of illegal trade, for example through NGO investigations. Assistance from enforcement agencies and co-ordination with NGO activities would be of value.

Notes

1. Except in the rare cases where species are listed by the Convention on International Trade in Endangered Species, CITES.
2. *Wiadomosci Rybackie* (*Fisheries News*), Mar-Apr 2005, Marine Institute in Gydnia, Poland; cited in Ocean Resource Conservation Associates (2007).
3. *www.wcoomd.org/files/1.%20Public%20files/PDFandDocuments/HarmonizedSystem/*.
4. Proceedings of the Second Working Meeting of the Asia FLEG Task Force and Advisory Group, Manila, 7-9 March 2006.
5. Appendix I includes all species that are threatened with extinction; Appendix II includes species that are not necessarily threatened with extinction now but may become so unless trade in such species is subject to strict regulation; and Appendix III includes species that an individual party identifies as being subject to regulation for the purposes of preventing or restricting exploitation, and where it needs the co-operation of other parties in controlling trade. For more details, see *www.cites.org*.
6. Data accessible on the Chinese Taipei Bureau Of Foreign Trade (BOFT) website: http://cus93.trade.gov.tw/ENGLISH/FSCE/.
7. Costa Rica, 1995; Mexico, 1998; Bolivia, 1998; Brazil, 1998; Peru, 2001.
8. Some CITES parties, for example Australia, use additional acquittal forms to record the exact quantities traded; but this is not common.
9. CITES Animals Committee, Document AC22 Doc. 17.3, 2006, "Trade-related threats to sharks".
10. *Global Trade Atlas*, Global Trade Information Services.
11. For more details, see Chatham House and EIA (2006).

12. See "Information provided by the Parties in accordance with Article 7 of the Montreal Protocol on Substances that Deplete the Ozone Layer" (UNEP/OzL.Pro.16/4, 18 October 2004), paras. 52-54.

13. See Chatham House (2009) and *www.illegal-logging.info/indicators*.

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Chapter 4

Licensing and trade controls for environmentally sensitive goods

In this chapter we assess of the role of licensing schemes in addressing illegal trade in environmentally sensitive goods. The experience of licensing systems is reviewed for six agreements: the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), the EU's Forest Law Enforcement, Governance and Trade Initiative, the Catch Documentation Scheme for Patagonian toothfish of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR), the Rotterdam Convention on chemicals, the Montreal Protocol on ozone-depleting substances, and the Basel Convention on hazardous waste.

Introduction

The previous chapter has drawn upon data from licensing schemes which, when used in conjunction with other data sources, can be used to obtain an indication of the extent of illegal trade for different resources and commodities. This chapter aims at better understanding of the role of licensing schemes in addressing illegal trade in environmentally sensitive goods. Licensing can be a pre-condition for regulating trade.

The experience of licensing systems is reviewed for six agreements: the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), the EU's Forest Law Enforcement, Governance and Trade Initiative (FLEGT), the Catch Documentation Scheme for Patagonian toothfish of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR), the Rotterdam Convention on chemicals, the Montreal Protocol on ozone-depleting substances, and the Basel Convention on hazardous waste.

Regulating international trade is critical to reducing illegal activities related to environmentally sensitive goods, or "international environmental crime". In illegal trade in wildlife, timber, fish, chemicals and waste, criminal activities are often driven by the large profits that can be earned in exporting to foreign markets. Overseas markets may offer higher returns than local markets, particularly for illegal products, which are generally cheaper than their legal counterparts.

In some cases, demand for these products may exist *only* from foreign buyers – *e.g.* some wildlife species used for traditional East Asian medicine (see Felbab-Brown, 2011). In other cases, differences in levels of regulation or law enforcement may mean that costs can be reduced through exporting substances abroad – *e.g.* where it is more costly to dispose of waste or chemicals in the home country compared with foreign countries.

However, it can be exceedingly costly to identify shipments of illegal products. Since the 1950s goods have been increasingly transported *via* containers stacked on transport ships. Over the last two decades, global container trade is estimated to have grown at an average annual rate of about 10%.[1] The share of containerised trade in the world's dry cargo shipping increased from about 5% in 1980 to about 25% in 2008 (UNCTAD, 2009). Today, approximately 90% of world-wide non-bulk cargo (*i.e.* excluding commodities such as iron ore, coal and grain) moves by containers; in 2005, a total of

18 million containers made over 200 million trips (Ebeling, 2009). The Australian CITES Management Authority (CMA) has undertaken a number of physical inspections of containers, at ports around Australia since 2006, prior to allowing timber to be imported. However, this is not the general practice, the contents of containers in transit being only rarely inspected by the relevant authorities in most countries.

Clearly, the growth both in the volume of international trade and in the practice of containerisation renders it more difficult to detect illegal trade. Customs authorities almost always carry inspections of imported freight shipments on a targeted risk-management basis, where information or suspicions suggest that there may be fraud or theft involved.[2] There are also a number of security-related initiatives (in addition to systematic checking) that contribute to the ability to detect illegal goods in trade. However, in most countries only 1-2% of imported freight shipments are inspected. In addition, for most of the products considered in this paper, legal trade exists alongside illegal trade (unlike in narcotics), and distinguishing legal from illegal goods is often very difficult.

The most common way of identifying goods for customs officers is through customs codes, which are designed and applied primarily to facilitate international trade, including the calculation of duty payments, and for the collection, comparison and analysis of trade statistics. The vast majority of countries now use the Harmonised Commodity Description and Coding System (Harmonised System, or HS, for short) administered by the World Customs Organisation (WCO). Code containing two, four or six digits are assigned to each product or group of products subject to trade; in the HS, more than 5 000 codes are currently provided at the 6-digit level across 96 chapters.

However, as has been noted in Chapter 3, the HS system is currently of limited relevance to the control of illegal trade. The coding system is fairly complex; mistakes in allocating codes are frequently made even where there is no deliberate intent to mislead. More importantly, most of the codes cover several different products (*e.g.* groups of ozone-depleting substances (ODS) rather than individual chemicals; types of animal or plant rather than specific species), and lack the "granularity" required for close monitoring. This is not really surprising: they were not designed for the purpose of allowing close monitoring of the trade in individual products. The further elaboration of HS codes could prove of use in many cases, and there is an ongoing dialogue among MEA Secretariats, the FAO, the ITTO and similar bodies and the WCO on this issue.

Moreover, licensing systems should not be used as a blanket approach. While licensing systems may be warranted for countries where governance and enforcement is ineffective, it is unnecessary for countries where the

legislative and regulatory frameworks are effective. In the case of trade of timber and timber products, imposing further trade controls through licensing schemes for countries where the level of risk for illegal harvesting assessed is negligible is unduly burdensome and costly. Such requirements can unintentionally stem the trade of legal forest products. It is necessary to take stock of the many useful measures and institutions already in place to deal with this issue. In particular, it is important to be mindful of multiple and competing legislative and regulatory approaches to addressing illegal logging. Harmonization of existing regimes may be more effective than the introduction of new controls.

Overview of licensing systems

The common solution developed to regulate trade in all of the product areas examined in this paper – wildlife, timber, fish, chemicals, waste and diamonds – has been the development of licensing systems (or permit or certification systems; the terms tend to be used interchangeably). Legal products are licensed as acceptable, and only licensed products are permitted to enter trade; these systems therefore offer a targeted way of allowing importing countries to distinguish between legal and illegal products, and exclude the latter from their market. This helps to create protected markets where legal (and sometimes sustainable) products can avoid being undercut by cheaper illegal (or unsustainable) material. The effectiveness of each system varies according to circumstances, as discussed below.

Over the last thirty or more years, this type of system has become increasingly common in multilateral environmental agreements (MEAs) and other agreements dealing with traded products. Licensing schemes operate in many areas including:

- Wildlife: the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Timber: the EU's Forest Law Enforcement, Governance and Trade (FLEGT) licensing system for legal timber (currently being constructed).
- Fish: catch document or catch certification schemes, including in particular the Convention on the Conservation of Antarctic Marine Living Resources Catch Document Scheme (CCAMLR CDS).
- Chemicals: the Rotterdam Convention and, for ozone-depleting substances (ODS), the Montreal Protocol.
- Hazardous waste: the Basel Convention.

In the cases of CITES and the Basel and Rotterdam Conventions, illegal trade was not the main motivation for the introduction of the licensing system. However, the effectiveness of CITES and the Basel Convention are

undermined by illegal trade. This is likely to be true of the Rotterdam Convention in due course. For the Montreal Protocol, and the timber and fisheries agreements examined here, illegal trade was the main reason for the introduction of licensing systems.

Licensing schemes are designed to enable enforcement agencies to distinguish between desirable and undesirable products – between, for example, legal and illegal timber, or between permitted and banned chemicals. Without the license, there is usually no other way to distinguish between legal and illegal products, which are often physically identical, or difficult to identify. ODS, for example, which are shipped in pressurised containers, can generally only be distinguished from each other by laboratory analysis. Normal shipping documentation (manifests, customs declarations, etc.) may not contain the necessary information on the origins and characteristics of the products or may be fraudulent. The license is the tool needed at the point of import, and in some cases also at the point of export, to allow customs agents to do their job. However, imports of forest products harvested in countries that are assessed and recognized as having a uniform, negligible risk of illegal logging, should be considered legal forest products.

Licensing systems can also be used to regulate the total volume of trade, production or consumption. When combined with quotas, licenses can be issued only up to the quota allowed for production, export or import. This is always the case for the Montreal Protocol, which sets maximum allowable production and consumption levels for ODS, and for the CCAMLR catch document scheme, which is used in conjunction with a set total allowable catch. It is sometimes the case under CITES, where range states may restrict the volume of export permits for particular wildlife species. In other case, however, the issue of licenses is not restricted in this way; they are used purely to distinguish legal or desirable products, which are awarded licenses, from illegal or undesirable products.

Where can licensing systems be most effective?

Clearly, the effectiveness of licensing systems (and trade controls more broadly) in reducing environmental crime is related to the extent of international trade in the products in question. Where the problem is wholly trade-related, trade controls have the greatest possibility of working effectively. Examples include the export of hazardous waste or chemicals from industrialised to developing countries to avoid stricter regulations, or to pay lower disposal costs, and the export of wildlife to meet consumer demand in other countries which does not exist domestically.

Where the problem is only partially trade-related, trade controls can have a significant impact but may not completely solve the problem. Examples

include most cases of timber, fish and wildlife, where demand exists in both domestic and external markets. In such cases trade controls may divert products to domestic markets. Where licensing systems are used to help create protected markets in consumer countries in which legal (or sustainable) products can avoid being undercut by cheaper illegal (or unsustainable) equivalents, the end result is higher rates of return for the exports, and therefore encouragement, for legal (or sustainable) activities. For instance, it is anticipated that the new EU timber regulation, which will prohibit the importation of (cheaper) illegally harvested timber and timber products, will potentially increase prices obtained for verified legal timber. Timber licensed by the relevant authorities in partner countries (those that have signed FLEGT voluntary partnership agreements (VPAs) with the EU) will be considered to have been legally harvested.

There can, however, also be indirect effects of putting in place structures for controlling trade; in some cases they can have a positive impact on governance more broadly, thus reinforcing other efforts to reduce environmental crime. This is seen most clearly in the FLEGT VPAs, which explicitly combine improvements in governance with the introduction of a licensing scheme for legal timber.

For trade in areas wherein some products may be desirable and others not – *e.g.*, hazardous chemicals – domestic regulation is used to control consumption and use. However, in some circumstances it may be administratively easier to use trade controls, such as licensing systems, as an imperfect proxy for domestic regulation. Trade controls can be applied to a more limited range of actors (importing and exporting companies), and at a more limited set of locations (ports and other entry and exit points) than would be required for domestic regulation. This is particularly true where the controls incorporate requirements for prior notification, which offers a relatively simple way to control imports.

Rather than using a licensing scheme to distinguish between products at the level of the product stream, another option would be a complete ban on trade with high-risk countries, those where a large proportion of the products in question are thought to be illegal. However, this is problematic in many respects. The definition of "high-risk" and the determination of which countries would fall into the category would be highly contentious. Exports of legal products would, of course, be banned along with illegal products, introducing perverse incentives. Illegal products could be trans-shipped *via* lower risk countries, disguising their origin and "laundering" them into international trade. And finally, discriminating in this way between similar products from different countries could be subject to a challenge under WTO rules. For all these reasons, bans have in practice been limited to cases of

non-membership of or non-compliance with an MEA, or in special cases, such as trade involving countries subject to UN sanctions.

Another option is to make the import of products illegally produced in foreign countries illegal. In general, with a few exceptions, in most countries it is not unlawful to handle products produced illegally in other countries. In the United States, the Lacey Act has been used to target illegal wildlife and fish, and it was extended to timber in 2008. The Lacey Act makes the import, sale or possession of wildlife, fish or timber illegally produced in foreign countries unlawful in the United States. It is therefore not a trade control as such, but an element of domestic criminal law. The Lacey Act is generally regarded as an effective piece of legislation for the domestic control of wildlife and fish (Kuruc, 1993). Several other countries have incorporated Lacey-type provisions in their fisheries laws, and the extension of this type of legislation was recommended for all port states by the High Seas Task Force, a group of fisheries ministers and international NGOs, in 2006 (High Seas Task Force, 2006).

It is still too soon to assess the impact of the Lacey Act with regard to timber, though the first enforcement action took place in November 2009. The American Gibson Guitar Corporation is under investigation by for violations of the Lacey Act related to the use of Madagascar rosewood imported from India. Suspicions arose because of inconsistencies in the customs forms (see Innes, 2010).

The new EU timber regulation, adopted by the Council of Ministers on 11 October 2010, also prohibits the importation of illegally harvested timber and timber products. The regulation is designed to provide the underpinning for the FLEGT licensing system; it applies to all timber imports, including those from countries not participating in the licensing system, and also to domestic EU products. It requires timber operators (producers and importers) who first place timber products on the EU market to introduce systems of due diligence designed to minimise their chances of handling illegal timber. FLEGT-licensed timber will automatically qualify without any further checks.

While the Lacey Act leaves it up to operators to work out what steps to take to avoid handling illegal timber, the EU's timber regulation goes into some detail on precisely what timber operators need to do to avoid handling illegal products. Both of them are likely to have the effect of encouraging the uptake of means for distinguishing legal from illegal timber, for example FLEGT licenses, in the European context, or private-sector sustainability certification and legality verification schemes.[3]

It remains to be seen how effective each of these options will be in excluding imports of illegal timber, though, as noted, the Lacey Act has a good record in the US with respect to wildlife and fish. Compared with licensing

systems, however, the Lacey Act lacks the identification mechanism that is inherent to the presence of the license, and in the European context FLEGT licences are likely to cover only a small proportion of the trade.

Licensing systems and WTO rules

Do licensing systems conflict with WTO rules? Although some of the systems analysed here have been in operation for many years, there has never been a GATT or WTO dispute involving any of them.[4] Moreover, it seems unlikely that any of the licensing systems examined in this paper would ever be challenged under the WTO's dispute settlement process. Countries enter into licensing systems, or the MEAs that establish them, or both, on a voluntary basis; they agree to these trade controls as a means of achieving the aims of the agreement. It seems unlikely that a country would file a WTO challenge, on the basis of impairment of trade, against a measure to which it had itself agreed. In cases of dispute between parties to an MEA, each agreement possesses dispute-resolution systems that offer more suitable forums in which to settle an issue.

The argument is different, of course, where trade measures are taken against non-parties, or non-complying parties; all the MEAs described here forbid trade in the products controlled by the agreement in these circumstances. In most cases, this has been an important element in encouraging participation in the agreements, and in ensuring compliance with their requirements.

There is an extensive literature on the relationship between MEA trade measures and the WTO agreements, revolving around the questions of whether the MEA measures breach WTO rules and whether, if so, they could be saved by the application of GATT's "general exceptions" clause, Article XX. More generally, there is a debate as to whether the WTO agreements or the MEAs should be considered to "trump" one another. No consensus has yet been reached on these issues. But they are not arguments primarily about the licensing schemes themselves, so they are not considered further here. In any case, it is important to remember that even the application of MEA trade measures against non-parties has never led to a WTO dispute. The next six sections look at individual licensing schemes in more detail.

Licensing systems for wildlife – CITES

The 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (sometimes referred to as the Washington Convention, but more commonly known as CITES) aims to protect endangered species from over-exploitation by controlling international trade, under a system of import and export permits. It currently has 175 parties.[5]

Species are placed on different lists: Appendix I includes all species that are threatened with extinction; Appendix II includes species that are not necessarily threatened with extinction now but may become so unless trade in such species is subject to strict regulation; and Appendix III includes species that an individual party identifies as being subject to regulation for the purposes of preventing or restricting exploitation, and where it needs the co-operation of other parties in controlling trade.[6]

Amendments to Appendices I and II are implemented by the Conference of the Parties, while the parties themselves can place species on Appendix III. Countries may enter a reservation to CITES for a specific listed species, either upon becoming a party to CITES or upon an amendment to the appendix by the Conference of the Parties.

Trade in any species under any appendix is not permitted except in accordance with CITES. The degree of control exercised over trade varies with the appendix on which the species is placed, but in all cases export permits cannot be issued if the specimen was obtained in contravention of the exporting state's laws.

- For Appendix I species, trade cannot be detrimental to the survival of the species and must not be for primarily commercial purposes. In effect, this is a "black list" of species for which trade is very strictly limited. Any trade in listed specimens must obtain both export and import permits, and certificates are also required for the re-export of specimens.
- Commercial trade in Appendix II specimens is allowed if it is not detrimental to the survival of the species. This is a "grey list" of species for which trade is permitted under certain conditions (which may include quotas). An export permit is required, and must be provided to the importing state's customs authorities. Unlike Appendix I species, an import permit is not required (though some parties, including the EU and Australia, apply stricter measures, including a requirement for import permits, to many Appendix II species).
- Trade in Appendix III specimens requires the management authority of the exporting state to issue an export permit. Importers must verify that the shipment is accompanied by an export permit if it originates from a state which has listed that species on Appendix III, or a certificate of origin if from another state.

Exceptions from these requirements are made for the transit or trans-shipment of species; specimens that are personal or household effects; specimens that were acquired prior to CITES applying to the specimen; non-commercial trade between scientists or scientific institutions; or certain specimens that are part of a travelling zoo, circus or other travelling exhibition.

In order to implement the Convention, parties must designate one or more management authorities, who administer the licensing system, and one or more scientific authorities, to advise them on the effects of trade on the status of the species. The former should only issue permits on the basis of the so-called "non-detriment" findings (which include, at least in theory, evidence of legal origin) by the latter.

The permit system[7]

The general requirements for export and import permits are laid down in the Convention itself, but successive resolutions of the Conference of the Parties have elaborated them in some detail. The main requirements are:

- The restriction of issuing authorities to national CITES management authorities.
- A separate permit or certificate for each consignment of specimens.
- A maximum validity of six months for export permits and re-export certificates and twelve months for import permits.
- The use of security stamps cancelled by an authorised signature and a stamp or seal, preferably embossed.
- The restriction of authorised signatures to those notified by parties to the Secretariat.
- The restriction of permit and certificate numbers to fourteen digits, to assist tracking and reporting.
- The recommended use of security paper for trade in wildlife specimens of exceptional value.
- The statement, on permits and certificates, of both the source of specimens (*e.g.* wild-caught, captive-bred, ranched or artificially propagated) and the purpose of the transaction (*e.g.* commercial, scientific or educational).
- The use of standard nomenclature adopted by CITES for names of species and specific numbers of specimens or units of measurement.

Permit fraud and inattention to these requirements by management authorities have proved to be a problem. To counter this, in 2001 the CITES Secretariat issued additional advice on permits and certificates (which indicates some of the problems encountered) by notification to parties:

- That traders be encouraged to apply for permits and certificates shortly before the time of export, not at the beginning of a year or harvest season, or at a time when annual export quotas are established (the fact that traders often apply for permits before they have actually acquired the specimens often leads to quite wide variations between the number traded and the number covered by permits).

- That quantities to be exported are exact (permits and certificates are commonly issued with quantities in round figures).
- That no replacement permit is issued until the original permit or certificate is returned to the issuing authority.
- That, if a trader claims that the quantities actually exported were smaller than authorised, the original document should be inspected and proof of the number exported should be obtained.
- That document and shipment inspections should be conducted at the time of export, particularly for live animal shipments.
- That the original copy of a permit or certificate be collected by customs or other border control authorities of the importing country, endorsed to show completion of the trade and forwarded to the management authority.

The permit system is overseen by the CITES Secretariat, but closer monitoring is carried out by the World Conservation Monitoring Centre (WCMC), once an NGO and now part of UNEP, which receives annual reports from CITES parties on import and export permits issued. As noted, there are often variations between the number of specimens traded and the number covered by permits. The discrepancies should, however, be picked up through reports from the importers, who usually (though not always) report on the basis of actual trade.[8] An export permit does contain a box for customs to fill in indicating how many specimens are actually included in the consignment, but this system only works in a handful of countries. The Australian CMA, for example, has a system in place to record the actual quantities imported and exported compared to the quantities authorised for trade. The WCMC also provides assistance to parties experiencing difficulty in operating permit systems.[9]

Effectiveness

No species listed under the CITES appendices has ever become extinct. In general, CITES possesses an effective non-compliance system, enabling action to be taken against non-complying parties, and has achieved many successes in regulating the international trade in wildlife. However, challenges to the effective implementation of CITES remain.

In circumstances in which export and import permits effectively acquire value, there will be incentives for fraud, theft and corruption in issuing them, or tampering while in use (such as by changing the numbers of specimens covered). Falsification of CITES permits is a problem, particularly for high-value products such as caviar. Theft and sale of blank documents similarly undermines this and other systems. In theory, for an export permit to be issued, the management authority of the exporting state must be satisfied that the specimen was not obtained in contravention of the state's laws for the

protection of fauna and flora. In practice, however, this is not always observed, thanks to a lack of capacity, or to corruption.

A second challenge relates to the cross-checking of the documents. UNEP-WCMC monitors CITES trade, receiving annual reports from the parties and, in many cases, copies of all import and export permits issued. Although strictly speaking it is not part of the WCMC's remit to investigate illegal trade, simple inspection of the permits sometimes reveals fraud. Countries wishing to know more about the validity of particular permits need to talk directly to each other; the CITES Secretariat maintains a list of all management authorities and their contact details on its website. Yet, in common with other MEAs, CITES lacks a comprehensive and independent system of monitoring and verifying the issuance and use of permits.

Interest is being expressed, however, in developing electronic permit systems, which should reduce the possibilities of fraud and tampering, improve communications between management authorities, and facilitate the permitting system. In 2005, the CITES parties established a working group to explore the use of information technology and electronic systems, and in 2009 the management authorities of Switzerland and the UK began a pilot project to test electronic export permits; in fact several other parties (an estimated 30% of the total) are now developing and implementing such systems (*CITES World* 2009). A toolkit for common formats, protocols and standards was published by the CITES Secretariat and working group in January 2010[10], and work is ongoing with UNEP-WCMC to develop a mechanism to facilitate the electronic exchange of information between management authorities. Progress was discussed at the March 2010 CITES conference of the parties, where the toolkit was welcomed, and parties were encouraged to adopt electronic systems; promotional and capacity-building exercises will be undertaken.

Specimens could also be marked, for example with indelible ink, tags, rings or microchips, to assist with identification and tracking; examples are the universal tagging system for crocodile skins, the implantation of microchips into live animals, and the universal labelling system for caviar. Nevertheless, the majority of wildlife in trade is still unmarked, and controls still rest on the use of permits.

The third key challenge lies in the cross-checking of the documents against what is actually in the shipment. As noted, only a tiny fraction of the huge volume of goods, including animals and plants, in international trade can ever be physically inspected. Even when a particular shipment is inspected, the authorities may not necessarily realise when it contains one or more of the 34 000 or so species listed in the CITES appendices, particularly if the shipment is accompanied by misleading documentation.

A further challenge is a simple lack of capacity in the many countries with insufficient numbers of adequately trained and paid staff. Basic equipment, including computers and identification manuals, may be lacking. The design of permits tends to vary slightly from country to country, and they may be printed in unfamiliar languages. Simple errors in issuing and monitoring permits may be just as much a problem as deliberate fraud and forgery. Delays in issuing permits may lead traders to try to trade without them.

Even in developed countries it is clear that the CITES permit system can be subject to abuse. An analysis of imports of mahogany into the United States in 1997–98[11] estimated that at least 25% of sawnwood imports (worth more than USD 17 million a year) was illegal; the figure did not include trade unreported to U.S. Customs and the true magnitude was therefore likely to be higher (Blundell, 2000). The United States subsequently put in place a series of measures to improve its monitoring of CITES permits.

The question of the validity of export permits arose in the UK in 2002 with regard to exports of big-leaf mahogany from Brazil. The species was then listed under Appendix III of CITES (at the 2002 Conference of the Parties it was placed under Appendix II), and in 2001 the Brazilian government ordered a complete ban on logging and export. Nevertheless, shipments continued to be exported to Europe and North America in the first few months of 2002. Shipments reaching the United States, Canada and a number of EU countries, including Germany, the Netherlands and Belgium, were seized by the authorities pending further enquiries.

In March 2002, the European Commission issued advice to EU management authorities that they should not accept imports of Brazilian mahogany since reasonable doubt existed over their legality. Subsequent to this a court case was brought by Greenpeace against the UK government, revolving around the question of whether export permits had been validly issued and under what circumstances the authorities in the importing state would be justified in delaying the shipments and requiring further information on the validity of their export permits. Greenpeace lost its judicial review in the Court of Appeal. In a ruling issued on 25 July 2002, two of the three judges concluded that to allow importing countries to query the validity of export permits, even when some doubt existed over their validity, would introduce too great a level of uncertainty into international commerce. The third judge, however, dissented, accepting the argument that the survival of endangered species should take a higher priority.

CITES resolution Conf. 10.2, adopted in June 1997, agreed that parties should "not authorise the import of any specimen if they have reason to believe that it was not legally acquired in the country of origin". The court's

decision would seem to run counter to this conclusion, though the phrase "reason to believe" is of course inevitably somewhat ambiguous.

Licensing system for timber – FLEGT

Relative to wildlife, timber and timber products (including plywood and engineered products such as panels, flooring, doors, window-frames, furniture, pulp and paper) is a major commodity in international trade, worth over USD 600 billion in 2008 (Pepke, 2010). Attempts to regulate the timber trade, for example to exclude illegal timber, therefore face the problem of possible disruption to a major legal activity. There was increased international attention focussing on the topic of illegal logging during the late 1990s, with the increasing evidence of its economic and social impacts – in terms of lost revenue and links to corruption and armed conflict – as well as its environmental effects. In particular, the inclusion of illegal logging as one element of the 1998-2002 G8 Action Programme on Forests helped to trigger widespread international discussions on the issue.

There are a number of international organisations covering at least some aspects of forest management. For instance, the International Tropical Timber Organization (ITTO), which administers the International Tropical Timber Agreement, sets a variety of soft norms and guidelines for tropical forest management and trade, gathers and disseminates data and information, and provides some capacity-building and research assistance to Producer countries. The appendices to CITES list about twenty timber species, but most of them are not traded in significant quantities, and the vast majority of timber species in international trade are not listed. The Convention on Biological Diversity administers a Forest Programme of Work that encompasses both conservation and many aspects of sustainable use. The U.N. Framework Convention on Climate Change also deals with forests in the context of the Reducing Emissions from Deforestation and Forest Degradation (REDD+) initiative. With the exception of CITES, all of these Convention secretariats, plus many other international organizations (FAO, World Bank, etc.) have come together in the "Collaborative Partnership on Forests", established to provide support for the objectives of the United Nations Forum on Forests (UNFF). While non-binding the UNFF is the only international organisation solely focused on policy around sustainable forestry. It has universal membership and takes a holistic view of forests. The UNFF originally evolved out of the Rio Earth Summit in 1992, where leaders could not agree on whether to negotiate a forestry convention. Instead they agreed to the Forest Principles, a non-binding set of ideals covering all types of forests. In 2007 the UNFF adopted the Non-Legally Binding Instrument (NLBI) on All Types of Forests on sustainable forest management. The NLBI mechanism includes clauses on legality, however it is voluntary mechanism without guidance on

how aspirations are to be implemented or any monitoring and enforcement. In 2015, the UNFF is set to review the NLBI measure.

In 2003, the EU published its Action Plan for Forest Law Enforcement, Governance and Trade (FLEGT), the most ambitious set of measures adopted by any consumer country or bloc to date. The Action Plan includes:

- The negotiation of FLEGT VPAs with timber-producing countries. These include provisions for a licensing system designed to identify legal products and license them for import to the EU (unlicensed products will be denied entry), combined with capacity-building assistance to partner countries to set up the licensing scheme, improve enforcement and, where necessary, reform their laws.
- Consideration of additional legislative options to prohibit the import of illegal timber to the EU more broadly, particularly products originating from countries not participating in partnership agreements and therefore not covered by the licensing scheme. This led in due course to the new EU timber regulation mentioned above.
- Encouragement for voluntary industry initiatives, and government procurement policy, to limit purchases to legal sources.
- Encouragement for financial institutions to scrutinise flows of finance to the forestry industry.

At the core of the FLEGT approach are the bilateral VPAs with timber-exporting nations. Within the EU, the regulation to introduce the requirement for licensed products from VPA countries was adopted in December 2005.[12] The first three VPAs were agreed with Ghana in September 2008, the Republic of the Congo in March 2009 and Cameroon in October 2010.[13] Negotiations are, at the time of writing, under way with the Central African Republic, Gabon, Liberia and Malaysia; many other countries, particularly in Africa and South East Asia, have expressed an interest in entering negotiations.

In May 2011 the EU and Indonesia concluded negotiations on a timber licensing scheme under a Voluntary Partnership Agreement (VPA) which will stem the flow of illegal timber entering the European market from Indonesia. The VPA with Indonesia is the first the EU has concluded with an Asian country. The licensing scheme will cover a trade estimated to be worth US$ 1 billion annually. Once the VPA is operational, Indonesia will only permit the export of timber licensed from a national timber legality assurance system. The EU customs will prevent any unlicensed Indonesian products from entering the EU.

The licensing system

Because there is no international agreement on forests or the international timber trade, all measures adopted against illegal logging at an international level rest on definitions of what is legal in the country of harvest of the timber. However, in some countries, forest law is not always clear, and laws agreed by national governments sometimes conflict with those adopted by regional or local governments. Even where the laws are clear, it is important to determine which laws are relevant to the consideration of "illegal logging". Those relating to timber harvesting, for example, or the payment of royalties or export duties, are clearly relevant, but laws regulating the working conditions of truckers transporting the timber, for instance, may be more tangential. Under the VPA process, in Cameroon and Indonesia, multi-stakeholder processes have agreed operational definitions of "illegal logging", and in Ghana and the Republic of the Congo the VPAs both contain commitments to legal reforms, clarifying relevant legislation.

In each country, the VPA will define the scope of the applicable legislation, which is expected to include laws relating to:

- Rights allocation processes and access rights.
- Company registration requirements.
- Social obligations, including labour requirements.
- Rights of local communities and indigenous populations.
- Environmental safeguards, forest management, timber harvesting, processing operations and associated financial and fiscal obligations.
- Transport and commercialisation of timber.

For each requirement, the VPA will list criteria, indicators and concrete verifiers – such as the documents operators need to produce in order to prove compliance – that will form the basis for enforcement.[14] In many ways, this approach resembles the voluntary forest certification schemes (such as those of the Forest Stewardship Council, FSC, or the Programme for the Endorsement of Forest Certification, PEFC), with the important difference that it applies nationwide and is developed though a multi-stakeholder dialogue.

The FLEGT licenses will be issued by a designated licensing authority in the partner country based on proof of legality provided by the timber operator. The VPAs will include provisions allowing the timber to be tracked through the supply chain. The partner country's timber tracking system obviously cannot extend outside its borders to cover timber produced elsewhere, which may be imported into the partner country and then exported to the EU. However, under the VPA, the FLEGT license will indicate the country of harvest of the product, and partner countries will be prohibited from issuing licenses to products that include timber that has been illegally produced in any other

country. The draft Cameroon VPA restricts imports to products that already have a FLEGT or "other authorised" license (Cameroon is a major transit point for timber from many West African countries); and in both Cameroon and the Republic of the Congo mills will be required to use only legal timber, whether domestic or imported. How easily such provisions will be implemented in practice remains to be seen.

To ensure the system's integrity, the VPAs will contain provisions for independent third-party monitoring of the functioning of the system – considered by the European Commission and others to be an important element of the VPA, and one largely lacking in other licensing systems. The VPAs will set out the terms of reference for the monitoring organisations, and the extent to which their findings will be made public. Should major compliance problems arise, they will be discussed in the agreement's joint oversight committee, which comprises representatives of both the partner country and the EU. The ultimate sanction, should the system fail, would be suspension of the agreement, which either party can do.

The licensing system will only apply to timber products exported from the VPA partner countries to the EU; there is no requirement for FLEGT licences for products imported to the EU from other countries, even if these were originally produced in partner countries (for example, timber produced in Ghana, processed in China and then exported to the EU would not need to show a licence at the EU border). All the partner countries which have agreed VPAs so far, however, intend to license all their timber exports regardless of destination, so the system may begin to spread beyond the direct trade between the partner countries and the EU.

The inclusion of capacity-building support for the establishment of the licensing system, and for improving governance and enforcement, was always intended to be an important part of the VPAs. Although funding for the operation of the licensing system will have to be provided by the partner country – though of course the process is designed to reduce the level of illegal behaviour and thereby increase tax revenues – it was always recognised that in most cases the EU would need to provide assistance with its establishment. This is not formally part of the VPAs, but is being agreed alongside.

Illegal logging can be seen, at base, as a failure of governance or law enforcement. The legal and regulatory regime that should control timber exploitation may be inadequately designed, poorly enforced, undermined by corruption, or all three. Although the licensing system established by the VPAs is designed mainly to exclude illegal timber from the EU market, the FLEGT initiative may also have long-lasting effects on forest governance in the

partner countries.[15] Both the VPAs so far agreed will include:

- An analysis of existing legislation, as part of the process of drawing up the legality definition, together with a gap analysis and commitment to reforms where necessary.
- An agreement on independent monitoring of the functioning of the legality assurance and licensing systems, with outcomes available to the public.
- A commitment to national stakeholder involvement in the joint committees to be set up to oversee the process.
- Improvements in transparency, including annual reporting on the functioning of the system and in some cases agreement to make more information on forest-sector management (such as information on production, rights allocation, finances and audits) available.

The process of negotiating the VPAs itself has also helped to improve governance, primarily through the inclusion of partner-country civil society in the negotiations, which has improved standards of transparency in national forest management.

Effectiveness

The FLEGT licensing system is still being constructed; the details of how licenses will be issued and processed is not yet known, so it is not yet possible to assess any weaknesses in it. In its favour, the system has been constructed carefully with an eye to possible problems, and the inclusion of elements such as independent monitoring should prove helpful to supporting its robustness.

However, one potential problem has been identified. The way in which the FLEGT licensing scheme is being built up through agreements with individual countries renders it vulnerable to evasion: illegal products could simply be trans-shipped *via* non-partner countries to the EU to escape the need for a licence. After a long drawn-out process of analysis and consultation, in October 2008 the European Commission published its proposal for tackling the problem through the new EU timber regulation, mentioned above.[16] The regulation cleared its final legislative hurdle on 11 October 2010 when it was approved by the Council of Ministers.

As discussed, the regulation will require timber operators (both producers and importers) who first place timber products on the EU market to introduce systems of due diligence designed to minimise their chances of handling illegal timber. The system has been criticised, particularly for applying only at the first point of entry to the EU, and not further down the supply chain (there is some doubt that some EU member states will be able effectively to control imports).[17]

Licensing system for fish – CCAMLR Catch Documentation Scheme

No single global agreement governs fisheries management, although the UN Convention on the Law of the Sea (UNCLOS) recognises the rights of coastal states to jurisdiction over resources in their exclusive economic zones. The 1995 UN Fish Stocks Agreement facilitates the implementation of certain provisions of UNCLOS concerning the conservation and management of straddling fish stocks and highly migratory fish stocks. The 1995 FAO Code of Conduct for Responsible Fisheries is also relevant.

The biggest concern is IUU fishing, which continues for a number of reasons including weak flag-state and port-state controls and the challenge of tracking IUU fishing activities. Misreporting of catches and retention of undersized fish or fish caught over the allowed quotas is common. At the international level the FAO's "International plan of action to prevent, deter and eliminate illegal, unreported and unregulated fishing" is particularly relevant. Although it is non-binding, the subsequent 2009 Agreement on Port State Measures will place binding controls on trade in fish and fish products once it is fully implemented. [18]

Administratively, international fisheries regulations are developed mainly through Regional Fisheries Management Organisations/Agreements (RFMO/As). A number of RFMO/As have developed mechanisms designed to combat IUU fishing. One of the most effective (and the most researched) is the Catch Documentation Scheme for toothfish species which has been developed by the Commission for the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) and is implemented by parties to the convention.

The CCAMLR was concluded in 1980 and entered into force in 1982.[19] It established the CCAMLR Commission and sets out the area to which the convention applies. The Commission is responsible for giving effect to the objective and principles of the Convention – *i.e.* the conservation of Antarctic marine living resources in the Convention area – while allowing for rational use. All parties to the Convention are entitled to join the Commission, which currently has 25 members, out of a total of 34 parties.

In common with CITES, the Montreal Protocol and the Basel Convention, CCAMLR has put in place a number of trade-related measures as a means of enforcing the Agreement. This includes a prohibition on parties allowing landing or trans-shipment of toothfish from any vessel listed on the CCAMLR Contracting and/or Non-Contracting IUU list or toothfish not accompanied by required documentation. CCAMLR has established a range of other measures to support CCAMLR's compliance regime. These measures include an electronic vessel monitoring system (VMS) and a system of inspection which

enables members to designate CCMALR inspectors with the authority to inspect members' vessels operating in the CCAMLR Area.

CCAMLR members are required to report to the CCAMLR Commission on inspections completed in conformity with the CCAMLR System of Inspection. CCAMLR members that have their vessels inspected while in the Convention Area and which are found to be in breach of the rules set by CCAMLR are required to report to the Commission on prosecutions and sanctions imposed as a consequence. The Standing Committee on Implementation and Compliance (SCIC) considers all such reports and provides advice to the Commission on issues of compliance including inspections undertaken. If information is provided to the Commission that a fishing vessel has breached CCAMLR's Conservation Measures while in the Convention Area, or is operating in the Area without authorisation, the Commission can agree to list the vessel on CCAMLR's IUU vessel list.

The CCAMLR Catch Documentation Scheme[20] (CDS) for toothfish, a high-value commercially fished deep-sea species, became binding on CCAMLR members in May 2000. The CDS tracks legally caught toothfish from the fishing vessel, and area of the ocean where it is caught (inside or outside the CCAMLR Area), to the port where it lands and on to the country where the fish is consumed. The objective is to limit catches to the areas and levels approved by CCAMLR.

The Licensing System

CCAMLR members are required to ensure that their flagged vessels fishing for toothfish are specifically authorised to do so, and complete catch document forms for all toothfish landed or trans-shipped; catch documents can only be issued to authorised vessels. The catch document includes the following details:[21]

- the name, address, telephone and fax numbers of the issuing authority;
- the name, home port, national registry number, and call sign of the vessel and, if issued, its IMO/Lloyd's registration number;
- the reference number of the licence or permit, whichever is applicable, that is issued to the vessel;
- the species and weight toothfish landed or trans-shipped by product type, and (a) by CCAMLR statistical sub-area or division if caught in the Convention Area; and/or (b) by FAO statistical area, sub-area or division if caught outside the Convention Area;
- the dates within which the catch was taken;

- the date and the port at which the catch was landed or the date and the vessel, its flag and national registry number, to which the catch was trans-shipped; and
- the name, address, telephone and fax numbers of the recipient(s) of the catch and the amount of each species and product type received.

The catch document itself is identified by:

- a four-digit number, consisting of the two-digit International Organization for Standardization (ISO) country code plus the last two digits of the year for which the form is issued; and
- a four-digit sequence number (beginning with 0001) to denote the order in which catch document forms are issued.

All landings or trans-shipments of toothfish catches at CCAMLR members' ports are only permitted if they are accompanied by a validated electronic catch document. Any export or re-export of toothfish must also be accompanied by a validated export document countersigned by an authorised government official. Where shipments are split, as is often the case, the tracking of all subsequent shipments is maintained. Customs authorities require that appropriate documentation accompany any import or export of toothfish and will often carry out cross-checks of the weight of the fish against the data provided in the validated documents. Non-members of CCAMLR are entitled and encouraged to join the scheme and must meet the same requirements.

The CCAMLR Secretariat holds and administers the central catch documentation register, which records the details of each landing, trans-shipment and export validated under the CDS. In 2007 the United States made the use of electronic catch documents and centralised VMS a requirement for any toothfish imported into the United States and this seems to have had a beneficial impact in tightening up the scheme (Lack, 2008, p. 24). In 2009 the CCAMLR's CDS became completely electronic.[22]

In common with CITES and the Kimberley Process, flag states participating in the scheme nominate a government authority to issue and validate the catch documents.

Effectiveness

Attempts to evade the scheme have included some incidents of document fraud, but at a fairly low level, representing perhaps about 500 tonnes out of a total annual catch of 30 000 tonnes.[23] The introduction of the fully electronic system is expected to reduce the possible falsification of catch and export documents that may have occurred under the paper-based system. The electronic CDS allows authorities to verify the authenticity of

documents in real time and is expected to be a more effective measure than making the forms themselves more tamper-resistant. The electronic CDS also helps expedite the clearance of shipments where there is some doubt over the documentation.

There is some problem with conversion factors for estimating the weight of the fish after the heads and guts have been removed; fishers tend to estimate lower weights than customs officers, and a degree of variability, typically of 10–20%, should be expected. There is also the possibility of fishers simulating GPS signals to mislead the satellite-tracking technology. Trans-shipment also appears to provide a possible loophole: due to the remoteness of the area and ambiguities in CCAMLR's definition of trans-shipment, there is scope for the controls to be evaded by landing catches in non-cooperating parties or trans-shipping them at sea.

The scheme has certainly enjoyed success. It initially had a clear impact on the price of toothfish, with a 20-30% price differential developing between illegal and legitimately caught fish (Agnew, 2002). Overall, reported landings to CCAMLR fell by 35% over the five years from 2003 to 2007. Global trade in the species fell by only 25% per cent, however, suggesting either that non-members were catching more[24] or that illegal fishing remains significant. The CCAMLR Secretariat's estimates for the illegal catch as a proportion of the legal catch during 2003-07 ranged between 7% and 17%, averaging about 10% over the five-year period. However, an analysis by TRAFFIC and WWF for the same years, using trade data, suggested a range of 3-23%, with an average of 15% (Lack, 2008, p. 20).

Licensing system for chemicals – the Rotterdam Convention

The 1998 Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (the "PIC Convention") aims to promote co-operation and shared responsibility for the international trade in hazardous chemicals. The Convention applies to banned or severely restricted chemicals and severely hazardous pesticide formulations. Similar in principle to the Basel Convention's system of prior notification and consent (see below), exports of the listed chemicals and pesticides can only take place with the prior informed consent of the importing party. Importing countries are given the power to determine whether they wish to import a listed chemical or pesticide or ban it due to concerns that it cannot be managed safely.[25]

The system grew out of a series of voluntary commitments in the late 1980s. While developed countries were taking steps to ban the movement of hazardous wastes, developing countries frequently lacked the capacity to do so, and there was some concern that companies were exploiting this situation

by relocating their operations to less regulated countries. In 1989 the UN Food and Agriculture Organisation (FAO) and UNEP combined their control methods for, respectively, pesticides and industrial chemicals, to form the voluntary Prior Informed Consent (PIC) procedure.

The Convention itself was agreed in 1998 and entered into force in 2004. There are currently 130 parties. The United States is not a party, though its domestic regulatory system is very similar to that prescribed by the Convention. Many emerging economies, including Brazil, China, India, joined in 2005. The system is closely linked to the Stockholm Convention on Persistent Organic Pollutants and both are developing close links with the Basel Convention.

Annex III to the Convention lists the pesticides and industrial chemicals that are to be controlled for health or environmental reasons. The initial list included 27 substances, and 13 have been added subsequently (though some of these are different formulations of the same chemical). The procedure for amending Annex III is described in Article 22, paragraph 5. Parties that have themselves banned or severely restricted a pesticide or chemical must notify the Secretariat in writing of the fact, as soon as possible after the regulation is adopted. When the Secretariat has received at least one notification from each of two "Prior Informed Consent regions" regarding a particular chemical, or one for a severely hazardous pesticide formulation, that it has verified meet the requirements of Annex I (a list of information about the substance and about the regulations applying to it), it forwards it to the Chemical Review Committee, a committee of 31 government-designated experts in chemicals management.

The Committee reviews the notifications, and decides, in accordance with the criteria for listing banned or severely restricted chemicals set out in Annex II, whether to recommend the substance concerned for inclusion in Annex III. The Conference of the Parties then decides whether or not to accept the recommendation. So far the process of adding new substances has been relatively slow, as many countries have chosen to opt for gradual phase-outs, which do not trigger the procedure, rather than outright bans.

For each of the substances listed in Annex III, a guidance document is issued by the Secretariat to allow countries to decide whether to opt in or out of trade in the substance, or to apply certain conditions to its trade, such as a health department certificate. Decisions are usually made in a cross-ministerial manner, involving departments such as agriculture, environment and foreign affairs. All parties are required to take this decision – an "import response" – for each of the substances listed in Annex III. A listing of all import responses received by the Secretariat is circulated to all parties every six months.

Import decisions taken by parties must be trade-neutral – that is, if a party decides not to accept imports of a specific chemical, it must also stop domestic production for domestic use and refuse imports from any source, including non-parties (WTO rules require that its member economies not discriminate in this way in any case). If a country has banned a chemical domestically it can export it, but it must inform the importing country that the substance has been sanctioned by the producer country.

All exporting parties are required to ensure that exports of Annex III substances do not occur contrary to the decision of each importing party. They should ensure that the import responses circulated by the Secretariat are communicated to their own exporters and relevant authorities. Transit trade is not regulated by the Convention. Countries have the right to request transit information from the Secretariat but to date none have done so.

In force for seven years, it is still too soon to reach any conclusions on the impact of the Rotterdam Convention. Since the parties have not yet agreed a non-compliance procedure,[26] the Secretariat and the conference of the parties have no involvement, so far, in monitoring whether the system actually works. No trade data have been collected to date. However, this should become easier in the future, with the introduction in 2007 of a number of new HS codes for substances controlled by the Convention. Illegal activity – *i.e.* evasion of the PIC procedure – seems possible, but, despite requests, no party has yet reported any to the Secretariat.

A number of parties have still not published any import responses, and there is an ongoing debate about the extent to which the Convention should offer capacity-building assistance, and the possible use of sanctions against non-complying parties. Problems can be caused by a lack of knowledge of the origin of some shipments, which is not always clear, particularly in free-trade zones. The Secretariat is working with the Green Customs Initiative[27] to prepare training materials for customs officers.

The voluntary PIC procedure, which functioned before the Convention entered into force, operated with some success, and there is no reason to think that the Convention cannot emulate this. Most of the substances covered by the Convention are widely banned and are therefore not traded in any great quantities. A bigger test of the Convention will come when higher-profile, more extensively traded, substances are added. Examples include tri-butyl tin or chrysotile asbestos, both of which were discussed at the November 2008 conference of the parties. The former was added, but no agreement could be reached on the latter.

The strengths and weaknesses of the Convention in the area of pesticides was discussed at an OECD seminar on the "Illegal International Trade in Agricultural Pesticides" in 2010. Problems associated with trade in counterfeited

pesticides and trade in pesticides that are not registered in the country of destination were highlighted (OECD, 2011). While pesticides are among the most regulated products in the world, international shipments of counterfeit active ingredients and finished products often escape oversight by pesticide regulators and custom offices in OECD countries.

ODS and the Montreal Protocol

The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer establishes a series of phase-out schedules for the production and consumption of ozone-depleting substances (ODS) such as chlorofluorocarbons (CFCs). The Protocol currently has 196 parties – which equates to universal coverage, the first (and so far only) MEA to achieve that level of support.[28] According to the 2010 Science Assessment Panel, "a return to pre-1980 levels of ozone is expected around mid-century in mid-latitude regions and the Arctic, with recovery in the Antarctic expected to follow later this century. Global (90°S–90°N) annually averaged total column ozone will likely return to 1980 levels between 2025 and 2040, well before the return of stratospheric halogens to 1980 levels between 2045 and 2060."[29]

The Protocol did not initially require specific controls on individual shipments of ODS, though implicitly parties had to have some means of monitoring and controlling trade, as "consumption" is calculated as "production plus imports minus exports". In practice, many parties established import (and often export) licensing systems to ensure that they could meet their consumption phase-out targets.

This approach was formalised in 1997 through the Montreal Amendment, which introduced a requirement for export and import licenses for most categories of ODS for all parties ratifying the amendment. The licensing system was introduced primarily as a means of controlling the illegal trade in ODS that had emerged in the mid-1990s as developed countries neared the end of their phase-out schedules. It would certainly have been written into the Protocol from the beginning if such illegal activities had been anticipated.

Later, illegal trade became widespread in some developing countries, which have longer phase-out schedules. Estimates suggest that, by 2005, illegal trade was of the magnitude of 10-20% of the legitimate global trade (Chatham House and EIA, 2006). This area is unique among those considered in this paper, as the phase-out process of all CFC-using equipment will gradually remove the problem at source. Nevertheless, the prevalence of cheaper illegal products (or even legal products, as CFCs can continue to be used legally as feedstock in chemical production) hinders phase-out efforts and delays the recovery of the ozone layer. In addition, although most CFC uses have now been completely phased out, phase-out schedules for

hydrochlorofluorocarbons (HCFCs) are longer, and some illegal trade in these substances has been detected.

Licensing systems

Entering into force in November 1999, the Montreal Amendment requires those parties that ratify it to establish and implement a system for licensing the import and export of new, used, recycled and reclaimed controlled substances. Unlike other MEAs, the Protocol does not specify a single uniform scheme for these licensing systems, nor does it even define what it means by a "licensing system". As a result, systems developed by different parties can vary quite significantly.

The general concept, however, is in line with the other licensing systems described here. Before any ODS can be moved into or out of a country, importers or exporters must apply to the country's government for a permit that specifies the quantity of ODS, the countries involved in the transaction, what the chemicals will be used for and other relevant information.

Licensing systems also generally contain quotas, in order to provide a means to limit consumption to the levels required by the Protocol: licenses are awarded for specific volumes over specific periods. As most parties are importers, their import licensing and quota systems are usually the main mechanisms available to them to fulfil their obligations. Licences can also be designed to provide information on end uses, and to require all applicants for licences to register with the authorities, though these characteristics are not common.

Effectiveness

Each year since 2002, the annual meeting of the parties to the Montreal Protocol has recorded how many parties possess licensing systems, and has encouraged those parties lacking them to introduce them. While the figures have shown steady increases, from 115 in 2002 to 186 in 2009, in fact very little assessment has ever been made of the *effectiveness* of these systems, and whether they are operating as intended.

In June 2005, the Executive Committee of the Multilateral Fund (the Protocol's mechanism for providing financial assistance to developing countries to phase out ODS) published an analysis of licensing systems in nine developing countries, selected by region and level of consumption (UNEP, 2005). It contained several recommendations, but did not analyse the extent to which the licensing systems themselves were accurately recording imports and exports. The only analyses which have been carried out of export and import data have indicated major discrepancies between import and export figures. A 2005 study published by UNEP, for example, identified discrepancies

of up to 2 000 tonnes a year between importing and exporting countries in the Asia-Pacific region during 2001-04 (UNEP DTIE/Government of Sweden, 2005).

There are several reasons why these discrepancies may exist.[30] Some national licensing systems require permits for individual shipments, whereas in others, permits are issued to companies for periods of time (such as up to a year in some cases). Individual shipment licenses increase the burden on industry and customs, but allow more precise monitoring of movements. Even individual shipment licenses, however, may not describe accurately what is contained in the shipment. Few, if any, countries include in their licensing regulations a requirement for full and accurate labelling of the contents of each cylinder in each consignment, or a requirement for licenses to be accompanied by declarations certifying the accuracy of the information, either of which would help to raise the deterrence threshold against illegal shipments.

Licensing systems also vary in their coverage of ODS; the 2005 Executive Committee report found that, in general, only CFCs were covered comprehensively (UNEP, 2005, para 53). Despite the requirements of the Montreal Amendment, in some countries the licensing systems cover only pure substances, excluding mixtures, or only a list of selected individual substances or mixtures.

In most countries more effort has been devoted to establishing import licensing systems than to export licences (since far more countries are importers than exporters). The Executive Committee study found that only three of the nine countries studied had any system of export licensing (UNEP, 2005, para 46 and Table 4). However, the Montreal Amendment requires export as well as import licensing, and this is obviously an important means – if implemented properly – of monitoring international trade.

Even where means of regulating exports exist, they may not operate effectively to fulfil the aims of the licensing system. Research in 2004, for example, showed that the only check made by Indian exporters was whether the country of import was a party to the Montreal Protocol; no information was sought on whether the importing enterprise possessed a license or whether the shipment was within quota limits (EIA, 2004), although subsequently exporting companies in India reported that they did pre-check the existence of an import quota prior to export. Chinese exports were treated similarly, illustrated by the fact that China reported exports to a large number of Indonesian companies despite the fact that the Indonesian government had only licensed one company for import (China subsequently pledged to issue licenses for trade with Indonesia only to their one registered company).

Implementation of the licensing systems may be weak. As the Executive Committee report observed, "the effectiveness of import licensing and

prevention of illegal imports of ODS is highly dependent on the ability of customs officers to apply the regulations in force and to identify illegal shipments of refrigerants. For this the training of customs officers is crucial." Another aspect highlighted was the need for better communication between different government agencies, primarily those responsible for regulating ODS (usually environment or industry departments) and the customs agencies that check imports and exports.

If communication between government agencies within a country is difficult, communication between agencies in different countries is even more so. In particular, customs departments rarely, if ever, check whether what they record as imports from a given country is the same (in terms of products, volume, value, etc.) as is recorded as exports by the same country. The survey of data discrepancies in East and South-East Asia mentioned above, however, did help to provide the impetus for bilateral collaboration in the Asia-Pacific region aimed at understanding the causes of the discrepancy and tackling illegal trade where this proved to be the cause. This included the establishment of an 'informal prior informed consent' (iPIC) system in 2005-06, which is growing in coverage and has proved to be a useful tool in verifying information before issuing licenses. Similar systems are being established in the Europe and Central Asia and Latin America and Caribbean regions.[31]

These weaknesses in licensing systems have been discussed at meetings of the parties at several recent meetings, and parties are regularly urged to implement fully their systems. There has always been opposition from some Parties, however, to any greater centralisation of the operations of the Protocol, for example through establishing a uniform licensing system. Instead, in 2007 the Parties called for better implementation of national licensing systems, and also a series of voluntary commitments, including greater sharing of information with other Parties, such as by participating in an iPIC procedure; monitoring transit movements, including those passing through duty-free zones; establishing appropriate minimum requirements for labelling and documentation; and cross-checking trade information.[32] Technical and financial assistance is also available through UNEP for the formulation and revision of regulations, the introduction of export and import licensing systems, and training of customs and other officials in their operation.

Since there has been no systematic evaluation of licensing schemes, it is not known how widespread the potential weaknesses are, and how effectively they are being tackled, for example through the adoption of the iPIC procedure. If the import and export data reported centrally rely on figures derived from flawed licensing schemes, then the success of the Montreal Protocol in phasing out ODS may be doubtful. However, increasing numbers of countries have phased out the use of ODS entirely, and where there is no trade

at all, any weaknesses in the licensing schemes become much less important. In addition, both production data and observations of atmospheric concentrations of ODS indicate that ODS use is indeed declining sharply. Overall the Montreal Protocol can genuinely claim to be a highly effective treaty.

Licensing system for waste – Basel Convention

The 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal establishes a regime for controlling the international trade in hazardous and "other wastes". Agreed in 1989 and entering into force in 1992, the Convention currently has 172 parties.[33]

The Convention places a general prohibition on the exportation or importation of wastes between Parties and non-Parties. For Parties, the general objective of the Convention is to ensure that transboundary movements of wastes are reduced to a level consistent with environmentally sound and efficient management. The movement must be conducted in a manner which will protect human health and the environment. Parties have the right to prohibit the import of hazardous waste, and an export ban applies to states that have not given written consent to a specific import.

The prior notification and consent system

The Convention establishes a system of "prior notification and consent" for transboundary movements of waste. The exporting state, generator or exporter must notify the importing state and any states of transit of any proposed transboundary movements. A movement document must accompany any shipment of waste from its origin to its disposal. A standard form is used, with the design approved by the Conference of the Parties. The document must specify:

- the exporter of the waste;
- the generator and site of the waste generation;
- the disposer of the waste and site of its disposal;
- the carrier of the waste;
- the date the transboundary movement of waste started and the date and signature on receipt by each person who takes charge of the waste;
- the means of transport;
- a general description of the waste;
- a declaration that the competent authorities of all concerned states do not object to the shipment;

- certification by the disposer of receipt at designated disposal facility and an indication of the method of disposal and of the approximate date of disposal.

Any traffic in waste that does not meet the notice and consent requirements, or fails to conform with the accompanying documents, or results in deliberate disposal in violation of the Basel Convention and general principles of international law, is held to be illegal and considered a criminal act. Transport and disposal of hazardous and other wastes can only be carried out by authorised persons, with the movements meeting generally accepted and recognised international rules and standards of packaging, labelling and transport, taking into account relevant internationally recognised practices.

Importing states respond to the notice in three ways: by giving consent (with or without conditions); by denying permission; or by requiring additional information. Written consent and confirmation from the importing state of the existence of a contract between the exporter and the disposer specifying environmentally sound management of the wastes is needed. Where the terms of the contract cannot be fulfilled, the exporting state has a duty to re-import the waste. Written consent is also needed from the transit state(s). Written consent can include conditions on the supply of certain information, such as the exact quantities or periodic lists of hazardous wastes or other wastes to be shipped.

Notice and consent covers a twelve-month period as long as the waste has the same characteristics and is shipped regularly to the same disposer through the same exit office of the exporting state, entry office of the importing state, and customs office of the transit state. The forms can be issued to cover a twelve-month period, or can be issued for individual shipments. Importing states and transit states can also require the wastes to be covered by insurance or another guarantee.

Traffic in waste controlled by the Convention is considered to be illegal where it is carried out: without notice to all the parties concerned; without the consent of all parties concerned; where consent of the state was obtained through falsification, misrepresentation or fraud; with lack of conformity in a material way with the accompanying documents; or where there was a deliberate disposal in violation of the Basel Convention or general principles of international law. If the waste is deemed to be illegal, the exporting state, or the exporter or generator, has a responsibility to take back the waste, or if this is impracticable, to dispose of it in accordance with the Basel Convention, within thirty days of receiving notice of the illegal traffic. Parties are required to introduce national or domestic legislation to prevent or punish illegal traffic.

Effectiveness

Implementation of the Basel Convention, through better regulation of the trade in hazardous waste, appears to have contributed to a reduction in the dumping of this waste in developing countries, which was a high-profile problem in the 1980s. However, it has not brought an end to the problem. In November 2005 a joint enforcement operation of European environmental authorities in seventeen European seaports showed that a number of waste shipments were illegal under EU regulations (though that did include a large number of relatively minor violations).[34] In 2006, the *Probo Koala*, a ship chartered by the Swiss metals and energy-trading firm, Trafigura, illegally dumped a cargo of chemical waste in Côte d'Ivoire. Tens of thousands of people living near the dumping sites subsequently suffered from a range of illnesses, and at least fifteen died. The case made the headlines in 2009 because of Trafigura's attempts to suppress a series of reports claiming that the company knew the waste was toxic when it was dumped.

Data collection for hazardous wastes is notoriously poor, but about 8.5 million tonnes of such wastes are estimated to be produced every year, most within industrialised countries. Data on the effectiveness of the prior notification and consent system itself is not generally available and no systematic survey has been conducted. There is no obligation for the Convention Secretariat to be sent copies of the movement documents, there is no requirement for any independent verification of the system, and the Convention's Implementation and Compliance Committee has received no submissions to date. The Secretariat is trying to develop the prior notification and consent system in various ways, for example to introduce an electronic version of it (it is currently entirely paper-based), but is constrained by a chronic shortage of funding. Closer co-operation with the Rotterdam and Stockholm Conventions may help to overcome this problem, at least to a certain extent; the joint meeting of extraordinary conferences of the three conventions held in February 2010 marked an encouraging start.

Main lessons from licensing and concluding remarks

Drawing on the experience of the systems analysed above, this section highlights the key components that can make a licensing system work more effectively.

Broad membership

The greater the number of relevant countries – *i.e.* those engaging in the trade in question – covered by the system, the more effective it will be. Most of the licensing systems examined here do have universal, or near-universal coverage, as they form part of agreements with large memberships. The FLEGT

system is quite different, being built up through a series of bilateral agreements between the EU and individual timber-producing countries. This opens up the possibility of illegal products evading the controls by being trans-shipped through other countries not party to the system ("circumvention") and of partner countries importing products produced illegally in other, non-partner, countries ("laundering"), since it is difficult for the partner country to know whether products have been produced legally elsewhere.

One solution to this problem is universal membership of the system (or, at least, membership by the main producing, consuming, processing and trading countries), as in the MEA-based licensing systems. This also, incidentally, makes trade measures taken against countries not participating in the licensing system (as in CITES, the Montreal Protocol and the CCAMLR CDS) more feasible, since they allow or require parties not to trade with non-parties in the products covered by the agreement.

However, even in some of the MEAs, non-participation by key countries may cause problems. In the absence of universal membership, there are a number of steps that could still be taken. Membership of the system by the bulk of key countries might still allow trade measures to be used, excluding non-members. Partner countries applying the license to all their exports, regardless of whether the importing country requires it, might help avoid the problem of circumvention; this seems likely to emerge under the FLEGT system.

Comprehensive product coverage

Coverage of products is also important, particularly where some categories of products can be transformed, or processed, into others. This is particularly the case with timber: much of the international trade in timber consists of processed products such as plywood, flooring, or furniture, or pulp and paper. In this case, if the processed products are not covered by the licensing system, processing offers a possible way round the controls. Although it was originally envisaged that the FLEGT system would apply only to the more basic timber products (logs, sawnwood, plywood and veneer), in fact the partner countries in all the VPAs agreed so far have decided to extend the licensing system to all timber products.

Similarly, the Montreal Protocol's licensing system does not cover all categories of ODS in all countries. Recycled or reclaimed substances are often omitted, which offers a potential loophole to those trading in illegal virgin ODS.

Reliable licenses

Licensing systems are only as strong as the licenses themselves; if the licenses cannot be trusted to guarantee that the products they accompany are

legal, then the system is open to abuse. Quite apart from simple administrative error, though, the problem with any licensing system is that the licenses themselves acquire a value, opening up possibilities for fraud, theft and corruption. Licenses can be stolen, altered or forged; personnel in the licensing authorities can be bribed or intimidated.

Experience with existing licensing systems leads to a number of conclusions about how licenses can best be designed when they are required to provide assurances of effective governance and law enforcement:

- Licenses should be of uniform design, rather than varying between countries. Both CCAMLR and the Basel Convention and to some extent CITES use uniform designs for their licenses (though there can be some variations, including the use of different languages, which causes some problems). In the Montreal Protocol the licensing system has been introduced on a country-by-country basis, its details being specified in the agreement itself.
- They should be based on electronic, not paper, systems. Electronic systems speed up communication and collection of data, and make tampering much more difficult. An electronic system is now in place in CCALMR, and is developing within CITES; some countries use it for Montreal Protocol licenses. Obviously, this requires greater investment of resources than paper-based systems, but the evidence suggests that it is far more effective.
- Licenses should be cross-checked against each other – *i.e.* someone should check whether what is licensed as being exported is the same as what is licensed as being imported. This is a key weakness in many licensing systems, and glaring discrepancies are often found when even rudimentary cross-checking is carried out. In the Montreal Protocol, for example, analyses of export and import data for pairs of countries have indicated significant discrepancies. If it is not possible to carry out the cross-checking individually (where, for example, shipments are broken up and re-routed in transit) it should be done in aggregate. Electronic systems of data collection again make this process much easier. CITES possesses a rudimentary cross-checking system through the monitoring function of the UNEP-WCMC.
- What is in the shipment should also be cross-checked against the description on the license. This happens to a greater or lesser extent in most of these agreements, including in particular CITES and CCAMLR, partly depending on the capacity of the country concerned. This can pose significant difficulties, including identifying the contents of the shipment (CITES appendices list about 34 000 species, for example; most ODS require chemical analysis for identification), particularly where they may be hazardous (waste and many chemicals).

All of these functions are easier with a central co-ordinating body, promoting or overseeing uniform design of licenses, collecting copies of all of

the licenses issued and used, collating data and examining discrepancies. A number of these agreements' Secretariats, including those of CCAMLR, or related bodies, like WCMC for CITES, play this role, but others, including the Montreal Protocol's, do not; the Kimberley Process does not possess a central organisation, which is now leading to problems with its implementation. Some of these steps – cross-checking of licenses against what is in the shipment, and against each other, and the establishment of central co-ordinating bodies – do of course have resource implications. These need not be very heavy, particularly where electronic systems are in place, which makes the second and third of these steps much easier – the WCMC's role of collating CITES permits is fulfilled mainly by one person, for example (and that is for paper permits). Cross-checking the licenses against the content of the shipment would undoubtedly be more labour-intensive, and would probably only be carried out in high-risk cases or where intelligence suggests problems may be occurring (for example following data cross-checks showing significant discrepancies).

Licenses for all stages of trade

Licenses can be required at all stages of trade: import, export and transit. Export licensing should only be required when the risk assessed is not negligible. The Montreal Protocol is unusual among international agreements with licensing systems not always monitoring exports (although the 1997 Montreal Amendment, which set up the licensing system, requires this, many countries have not implemented it). Most of the other licensing systems examined here – CITES, FLEGT, CCAMLR, and Basel Convention (but not the Rotterdam Convention) – all require Parties to issue export permits or licenses and to report them to a central body.

Import licenses are clearly necessary when the importing country is limiting imports, *e.g.* through a quota, as in the Montreal Protocol, or in applying stricter rules than the exporting country, as in some cases under CITES. In other instances they should not be necessary, but if there is any doubt over the validity of the export license, they can provide a second point at which products can be checked. If this is to be effective, however, it will require a source of information independent from the exporting country's authorities.

Tracking the movement of goods through transit countries, particularly when they are simply trans-shipped (which is often not recorded by customs), is difficult – but such trans-shipment can be used to disguise the origin of the product. The Basel Convention does require countries of transit to require the presence of permits or certificates; similarly, CITES requires re-export permits. Information is lacking on how these processes work in practice, though they do not appear to cause any substantial difficulties.

Additional complications are caused when products are processed in a country other than their country of origin. This is a problem mainly for timber, where some countries import large volumes of raw timber, process it (*e.g.* into plywood, flooring or furniture) and export it to final consumer markets. Under normal trading rules of origin, the country of origin of the product is the country of last significant economic transformation.

So even if, for example, China joined the FLEGT licensing system, all it would guarantee would be that no illegality had taken place in China itself. This highlights the weakness of a licensing system built on bilateral agreements: if a multilateral system was in place, China's imports ought to be licensed as legally produced, and the license could stay with the product even when processed. However, in general, processing is a possible means of disguising the origin of the product. It is noteworthy that the U.S. Lacey Act (under its import declaration requirement for timber), the EU's timber regulation, and the VPAs so far agreed will all require timber shipments to indicate their country of harvest, not just the country of origin.

Two of the agreements analysed here – the Rotterdam and Basel Conventions – explicitly require some kind of prior informed consent (PIC) (or "prior notification and consent") to the transboundary movement of controlled products. The Basel system appears to work well in practice, though information on its operation is not easy to find. The Rotterdam Convention is a development of voluntary systems that operated effectively for more than fifteen years. An informal PIC system has also been used for ozone-depleting substances in south and south-east Asia, with effect, and the practice is now spreading to other regions.

In each case the PIC system can be seen as a substitute for effective domestic controls, which may be difficult to establish and implement. Control of imports, which is what a PIC system effectively sets up, is generally easier to implement because of the smaller number of points at which controls need to be exercised. It is not a coincidence that developing countries were among those most enthusiastic to establish all these PIC systems: often lacking the capacity to establish effective domestic regulatory systems covering the wide range of companies and individuals involved in any given sector, they have tended to prefer to control access to their markets through import restraints.

Effective enforcement

Needless to say, licensing systems need to be enforced effectively. It is sometimes the case that although a country may have a well-designed licensing system in theory, it is poorly enforced in practice; the discrepancies noted above in the case of the Montreal Protocol are an example. Nonetheless one major advantage of a licensing scheme is that it brings to bear the efforts

of two sets of enforcement agencies on the illegal trade – not just the authorities in the country of origin (which, frequently based in developing countries, may often be lacking in capacity) but also those in the country of import (often developed countries with – usually – correspondingly higher law enforcement capacities).

A specific issue with the implementation of licensing systems arise within free-trade zones (or export processing zones), special areas where some normal trade barriers, such as import or export tariffs, do not apply and bureaucracy is minimised (often by outsourcing it to the zone operator); corporations setting up in the zone may be given tax breaks as an additional incentive. Most free-trade zones are located in developing countries, often in particularly underdeveloped localities, in order to attract employers and thus reduce unemployment and poverty.

The reduction in bureaucracy offered in free-trade zones may often involve the non-application, or non-enforcement, of environmental regulations, therefore often providing a route for illegal products to be traded outside any form of monitoring or regulation. None of the agreements discussed here provide any latitude for exempting parts of parties' territories, such as a free-trade zone, from any of their requirements, so licensing systems should be enforced just as strictly in the zones as anywhere else.

Verification and compliance

Most of the systems analysed here are not subject to independent or third-party verification; the agreement's Secretariat has to rely on data reported by parties, which may often be inaccurate. In some cases, such as the Montreal Protocol, the only reporting required on licensing systems is whether they have been established, not on whether they actually work (and such investigations as have been carried out often reveal that they do not). In the case of CITES, there have on several occasions been doubts about the validity of licenses issued by exporting countries.

There is no question that licensing systems would benefit from external verification, whether by independent third parties (FLEGT) or *via* peer review (Kimberley Process) or through intrusive inspection procedures (CITES). This is particularly important where illegal trade is widespread and the original data, or government-operated licensing systems, may not be completely reliable without such oversight. Similarly, licensing systems should be subject to regular analysis and review, to check to what extent they are working as intended. (Although the CCAMLR CDS is not subject to auditing, CCAMLR itself has completed an independent review process, which included a review of the effectiveness of its CDS.)

Finally, licensing systems also need to be supported by robust non-compliance mechanisms, so that there are real incentives for non-complying parties to return to compliance. CITES and the Montreal Protocol both contain effective non-compliance systems, resting on the ultimate threat of suspension of trade in the products controlled by the agreements, with a good record of success.

Cost-effectiveness of schemes

It is obviously important that the licensing scheme does not entail excessive costs to establish and implement, whether the costs are borne by government or industry. Several of the steps recommended above in improving the operation of a licensing scheme imply the need for extra resources – including, in particular, independent verification and the use of electronic systems.

No one has ever attempted to carry out a cost-benefit analysis of any of the licensing schemes examined above, and there would be serious methodological problems in doing so. A few general points can be made, however:

- None of them appear to involve large numbers of dedicated staff to run the systems centrally (either at the country level or in MEA Secretariats).
- Enforcement, however, requires some level of knowledge and awareness among, potentially, a large number of customs officers. Training is essential for general customs agents. The use of specialised customs teams (such as the CITES team in UK customs) can often be valuable.
- Collaboration between different agencies – customs, police and the judiciary, and environment, forest, fisheries, and industry ministries – is generally required but not always present. Dedicated task forces or operations (such as the US "Operation Cool Breeze" aimed at ODS smuggling) often prove effective.
- If the licensing system works effectively, in some cases there should be economic benefits to the government, in terms, for example, of higher tax and export duty revenues, which should help offset the costs; this should be particularly true for timber.
- Similarly, there may also be direct benefits to industry, for example if protected markets can be created in which legal products are not undercut by cheaper illegal equivalents. Putting in place the type of chain-of-custody and tracking systems necessary to underpin the licensing system may also have beneficial spin-offs, in the shape of better management systems, reductions in waste.

- There is a role for donor assistance in improving licensing systems in the ways suggested here. This is recognised in the FLEGT VPAs, where the EU will provide capacity-building assistance with establishing (though not with running) the timber licensing scheme; and there have been many other examples of bilateral and wider assistance with particular initiatives, such as piloting the electronic permit system in CITES. Coordinated international assistance with training, examples of best practice, etc., such as that provided by the Green Customs Initiative, is also extremely valuable.

Role of industry

It is, of course, seldom governments that undertake international trade in the products controlled by these agreements; rather, it is commercial enterprises that actually export and import. The involvement of the main international diamond companies in the Kimberley Process has proved helpful to its success so far; another example is the Coalition of Legal Toothfish Operators (COLTO), a private-sector initiative designed to address IUU toothfish fishing. Close involvement of industry in licensing system design, implementation and review should be encouraged.

In some areas, particularly timber and fish, many companies are already implementing voluntary means of controlling supply chains, generally through certification or legality verification schemes (either international, or company-based), with the aim of excluding illegal and unsustainable products from their own supplies. If the licensing system recognises these systems – for example, if certified timber could automatically qualify for a FLEGT license – then they should run more smoothly.

However, there is a danger in relying on voluntary certification schemes to guarantee legality. This is not what they were designed for, and they may not be able effectively to police themselves if determined attempts are made to subject them to abuse. There are already anecdotal reports of suspiciously large volumes of Forest Stewardship Council (FSC)-certified timber being exported from China. However, since access to government-procurement contracts increasingly relies on certification, this is an issue which will have to be tackled at some point.

Conclusions

Licensing systems have become increasingly common in recent years, not only in the areas examined here but also in others (*e.g.*, the Cartagena Protocol on genetically modified products). They can be regarded as an attempt to regulate particularly problematic trading sectors in a world where trade barriers are steadily being removed. They can also have associated benefits, such as improving levels of governance.

None of the schemes mentioned here have worked perfectly, though all can claim some measure of success. It will be interesting to see how the FLEGT licensing scheme performs, as to a certain extent it has been designed with an eye to previous schemes' weaknesses. The following measures would be helpful in improving licensing schemes further:

- A systematic analysis of their operation and successes and failures; although in general most of the systems seem to be working, there are relatively few comprehensive data.
- A process for sharing information among those responsible for operating the systems, perhaps *via* the Green Customs Initiative, the UN Environment Programme (UNEP), or the G20. This could be of particular value to those systems new or just coming into existence (*e.g.*, the Rotterdam Convention, FLEGT).
- Independent verification of the issuance of licenses, increased cross-checking of licenses, and a switch from paper-based electronic systems could increase the effectiveness of the majority of licensing systems studied. More resources could usefully be targeted at these functions. There may be scope for using some organisations to carry out the same functions for more than one agreement (*e.g.*, the WCMC could play a central monitoring role for CITES and FLEGT).

Notes

1. Although, UNCTAD (2010) reported a 9.7% decrease in container throughput at ports in 2009.
2. UK HM Revenue & Customs, personal communication.
3. See Brack (2010) for a longer discussion.
4. In 2002 a number of participating states in the Kimberley Process applied to the WTO General Council for a waiver from their WTO obligations with regard to the Process's certification scheme. The waiver was duly granted in February 2003, and then extended in 2006; it is now in effect until January 2013. Most Process signatories, however, did not support this move, implying as it did that the Process contravened basic WTO rules, an argument that was not generally accepted.
5. See *www.cites.org*.
6. For a good summary of the operation of CITES, see Reeve (2002).
7. Taken from Reeve (2002), pp. 32-34.
8. The Australian CITES Management Authorities (CMAs) use acquittal forms to record the actual quantities imported into, and exported out of, Australia.
9. All information in this paragraph: John Caldwell, UNEP-WCMC, personal communication.
10. Available at *www.cites.org/common/cop/15/doc/E15-30-01T.pdf*.

11. Mahogany is the most commonly traded timber species listed under CITES, and the United States account for about 60% of mahogany imports.
12. European Council Regulation No 2173/2005 of 20 December 2005 on the establishment of a FLEGT licensing scheme for imports of timber into the European Community.
13. The text of only one VPA is currently available publicly, that with Ghana; see *www.illegal-logging.info/item_single.php?it_id=802&it=document*.
14. Julia Falconer (European Commission). FLEGT VPA Update. Presentation at the Illegal Logging Update Meeting, Chatham House, June 2009; available at *www.illegal-logging.info/item_single.php?it_id=369&it=presentation*.
15. For more details, see Falconer, "FLEGT VPA Update".
16. "Proposal for a regulation laying down the obligations of operators who place timber and timber products on the market", COM(2008)644/3, October 2008.
17. For a full analysis, see Brack (2008).
18. *www.fao.org/Legal/treaties/037t-e.pdf*.
19. See *www.ccamlr.org/*.
20. See *www.ccamlr.org/pu/e/cds/intro.htm*.
21. Taken from CCAMLR Conservation Measure 10-05 (2003) Catch Documentation Scheme for *Dissostichus Spp.*, available at *www.ccamlr.org/pu/e/cds/p1.htm*.
22. See CCAMLR Conservation Measure 10-05 (2009).
23. David Agnew (Imperial College), personal communication.
24. China became a member of CCAMLR at the annual Commission meeting in 2007.
25. See *www.pic.int*.
26. See UNEP/FAO/RC/COP.5/16 at *www.pic.int/TheConvention/ConferenceOftheParties/Meetings anddocuments/COP5/tabid/1400/language/en-US/Default.aspx* for a discussion of progress to date.
27. *www.greencustoms.org/*.
28. *http://ozone.unep.org/*.
29. See *http://ozone.unep.org/Assessment_Panels/SAP/Scientific_Assessment_2010/*.
30. For more detail, see Chatham House and EIA (2006).
31. See *www.mea-ren.org/ipic_network.php*.
32. Decision XIX/12, "Preventing illegal trade in ozone-depleting substances" (2007).
33. See *www.basel.int*.
34. *www.basel.int/legalmatters/illegtraffic/index.html*.

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Chapter 5

The effect of domestic environmental policies on illegal trade

This chapter assesses the role of domestic environmental policies on illegal trade in environmentally sensitive goods. The focus is on incentive-based mechanisms. The first section looks at the role of property rights regimes for resource management. It is followed by a review of selected taxes and charges related to pollutants and waste. In the third and final section, the case of economic incentives targeting trade flows directly is assessed, with a case study on the timber trade.

Introduction

In the previous chapter we focussed on measures which targeted trade flows through international policy mechanisms. However, as has been noted, policies introduced at the national level can have implications for illegal trade in environmentally sensitive goods.

The effects of national regulatory regimes on illegal trade depend largely upon the incentives for sustainable (or unsustainable) management of the resource or pollutant generated by the policy. A regulatory system which imposes costs on those exploiting the resource or emitting the pollutant will generate price differentials, which can provide incentives for non-compliance, with some of the output entering into international trade flows. This is, of course, a function of national enforcement capacity, supported in some cases by the international licensing schemes discussed above.

In recent years increased interest has been expressed in using economic incentives in the pursuit of environmental objectives, for example, to reduce pollution, protect biodiversity and habitats and promote the sustainable use of natural resources.[1] Such an approach is in contrast, or complementary, to more traditional command-and-control regulatory approaches. This chapter focuses on the effect of such measures on illegal trade.

While the evidence is scant there is some reason to suppose that the use of economic incentives at the national level may reduce illegal trade flows. On the one hand, some of the revenue generated by economic instruments (*i.e.* environmental taxes) can be used to reinforce enforcement capacity. On the other, the 'formalisation' of property rights implicit with the use of economic instruments can provide incentives for a longer-term view of resource management, and can even provide incentives for self-enforcement among those exploiting the resource.

Unfortunately, the possible impact of economic incentives on illegal trade has received little attention in the literature. This chapter attempts to explore this question in more depth in three sections. The first section looks at the role of property rights regimes for resource management. It is followed by a review of selected taxes and charges related to pollutants and waste. In the third and final section, the case of economic incentives targeting trade flows directly is assessed, with a case study on the timber trade.

The establishment of property rights over environmental resources

One problem common to much environmental policy is the lack of clear property rights; although atmospheric pollution or the destruction of habitats, say, have clear negative impacts on human welfare, property rights – who "owns" the atmosphere or the habitats – are generally not well-defined. Establishing clear property rights and systems of governance can have benefits for environmental outcomes.

Indeed, the establishment of property rights is generally an essential precondition for any system of economic incentives to work effectively, as without it benefits and costs cannot be assigned to individual economic actors. Property rights are often particularly ill-defined or poorly protected in developing countries, and simply establishing and enforcing them may have similar effects to using economic incentives, creating a stable and predictable structure of costs and benefits.

The case studies below illustrate how property-rights-based approaches can be used to improve environmental outcomes and reduce illegal behaviour, with implications for trade flows. It is important to note, however, that in two of the cases discussed property rights are not vested in the individual, but rather in a broader community of resource users.[2]

Peruvian vicuña[3]

Efforts to protect the vicuña – a small, doe-like Andean camelid which produces the finest quality wool in the world – from poaching provide a good example of how addressing the incentives behind environmental crime through better governance can yield dramatic results. They are all the more striking for being successfully driven by a relatively poor developing country, Peru, without much help from richer consumer states.

In the 1950s and 1960s, poaching for its wool drove the vicuña to the brink of extinction. It was listed as "endangered" in the 1970s International Union for the Conservation of Nature (IUCN) Red List, with a population of less than 10 000 animals remaining, most of which lived in Peru. Despite a ban on hunting, a large wool-processing industry remained, centred in Bolivia, and the wool continued to be widely available in luxury salons across the world. Use of an international trade ban, under an Appendix I listing in CITES, was essential to address this problem. However, the ban failed to stem the general decline of the vicuña because the animal was still under pressure due to competition for forage with alpaca herds owned by local *campesinos* (small, mainly subsistence, farmers) in the Andes.

A semi-autonomous unit created by the Peruvian government and tasked with coming up with solutions decided to rehabilitate the international market for the vicuña's wool. There were six key elements of their approach:

- The Peruvian government ceded the right to wool shorn from live vicuñas (and live animals only) to local *campesino* organisations, and revived the ancient Inca tradition of the *Chaccu*, whereby the local community encircls all the vicuñas in an area and shears them one by one. This gave local *campesinos* an interest in the animal's conservation since a live vicuña came to be worth at least five times the value of a dead poached one. Because only partial rights were transferred (to the wool from live animals), the incentive to cull vicuña herds was removed.
- The government maintained a monopoly right to buy this wool (for a guaranteed price) at the time of the *Chaccu*. The government thereby became the international market-maker for vicuña wool.
- Monopoly control over international trade was granted to a single international trading and processing cartel to maximise the exclusivity of the resulting products.
- All processed products were certified with a unique identification label.
- A clever use of the "stricter domestic measures" provisions under Article XIV of CITES imposed a double-check procedure on exports from Peru and assisted in policing the trade.
- As well as international trade co-ordination through CITES, in 1969, vicuña range states agreed the Convention for the Conservation of the Vicuña to co-ordinate all their conservation and market interventions. This also allowed Peru to provide focused technical assistance to other range states (especially Bolivia).

These controls represent a coherent attempt to govern both supply and demand pressures and to align the incentives of the various actors involved. *Campesinos* came to see the live animal as more of an asset than a competitor over resources. Meanwhile, the trade cartel had an interest in policing the international marketplace and preserving the exclusivity of their product. The government also built a series of double-checks and safeguards, enabling it to cross-check wool production and trade flows.

Although there have been some challenges along the way[4], the results speak for themselves: in 2008 the vicuña population reached almost 350 000 animals and the IUCN Red List reclassified its status as of "least concern".[5]

The CAMPFIRE initiative in Zimbabwe

The Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) was initiated in Zimbabwe in the late 1980s. Its aim was to give

rural people management rights over wildlife so that they would have an incentive to ensure its sustainable use, and so help to prevent poaching.

The establishment of national parks, game reserves, and safari areas in Zimbabwe (then Rhodesia) in the late 1920s may have helped avert biodiversity loss, but it also displaced rural communities from land that had been traditionally theirs (Fischer *et al*., 2005). Cultivation and grazing land was expropriated, and subsistence hunting became illegal. Wildlife from the parks roamed freely in surrounding areas, destroying crops and threatening livestock and people. Central government owned the wildlife in trust for the country and reaped all the benefits, by selling licenses for hunting (forbidden in national parks, but allowed to a limited extent in safari areas) and charging fees for wildlife services such as tourism. Illegal poaching became a major problem, and since wildlife posed a nuisance, local communities would often turn a blind eye or even collaborate with the poachers.

CAMPFIRE focused on communal areas adjacent to the national parks, where wildlife intrusion was most severe. Communities were given co-ownership, with local councils, of the natural resources, and these provided the basis for a variety of income-generating activities, including trophy hunting concessions, natural-resource harvesting, tourism, live-animal sales, and raising animals for meat. District councils were responsible for management strategies and received any resulting income, although the intention was that they would devolve decision-making and benefits to the communities which they represented. Standard practice was that 50% of revenues were kept by the managing authority and 50% allocated to communities (Shyamsundar *et al*., 2005). Communities decided themselves on how their share of the profits was to be used, whether for community projects or as direct payments to households.

The first CAMPFIRE project was established in 1988, and the initiative spread rapidly, with projects covering 75 wards within four years. Early projects focused on sport hunting of large mammals, but in the 1990s eco-tourism initiatives were also set up. As communities started to reap economic benefits from the legal use of wildlife they began to perceive game as a resource. Consequently, opposition to poaching increased, with public arrests of poachers by some communities and incidences fell drastically in some areas (Fischer *et al*, 2005).

CAMPFIRE was initially regarded as a success, and over USD 20 million was paid to participating communities between 1989 and 2001, 89% of which was generated by sport hunting (Frost and Bond, 2008). In some areas, the implementation of CAMPFIRE resulted in higher incomes for community members and improved resource management (Child, 1993). This was put down to effective decentralisation of decision-making powers to local

communities, which meant that they instituted resource-management systems where previously there had been open access.

In other areas, CAMPFIRE had less of an impact. This was partly because of differences in the availability of natural resources, but also due to different approaches to decentralisation (Alexander and McGregor, 2000; McDermott Hughes, 2002). In some areas councils did not delegate responsibilities and decision-making powers to the communities, so that they felt alienated from the project. In the context of a long history of excluding people from the land, some communities considered CAMPFIRE to be just another initiative to undermine traditional tenure rights. Furthermore, some councils only shared a low proportion of the income generated with communities, and there were also conflicts between communities over the distribution of profits.

Another factor has been that some communities did not wish to become engaged in wildlife management – this being regarded as a backward way of life. Consequently, in parts of the country, CAMPFIRE projects were met with hostility or rejected, and poaching of wildlife and other natural resources continued, and in certain cases, increased. Presumably much of the resulting material entered into international trade, although no hard data on this are available.

Overall, however, the experience of CAMPFIRE in the 1990s was felt to be largely positive (Fischer *et al*., 2005). Unfortunately, once the government's land-reform programme began in 2000, which included the seizing of game parks, CAMPFIRE fell into disarray. Coupled with the collapse of the tourism industry, and the general political instability, hunting and poaching became widespread.

Individual transferable fishing quotas

In 2002 it was reported that over 15 countries had established market-based instruments for fisheries, and that these were being used to manage some 60 species (Newell *et al*., 2002). Since then a large number of additional schemes have been introduced. Under such systems, a total allowable catch (TAC) is decided and this is divided up into individual fishing quotas. In many fisheries, these systems have brought benefits through improved incomes for fishers and more sustainable management of the resource.

However, if not enforced effectively these incentives may also encourage illegal behaviour. It has been estimated that the cost of IUU fishing may be as much as USD 10-23.5 billion a year (Agnew *et al*., 2009). In addition to exceeding quotas, fisheries can face problems with poaching (harvesting by ineligible fishermen), unreported high-grading (discarding low-valued fish to make room for higher-valued fish) and the discard of by-catch (non-targeted

species). These latter practices in particular are difficult to control as they take place at sea.

Since 37% of the global fish harvest enters into trade, it is likely that a significant proportion of the catch from this IUU fishing activity is traded (FAO, 2010). Moreover, there may be greater incentives for those fishers engaging in IUU fishing to land their catch in foreign ports if this reduces the likelihood of being subject to enforcement. Indeed, a number of countries (Chile, United States, the European Union) have used trade measures in an effort to reduce IUU fishing in distant waters (FAO, 2010).

These problems are endemic to all fisheries-management systems and an effective system of enforcement is therefore crucial no matter what. However, incentives for IUU fishing differ according to the instrument used for fisheries management. By increasing the profitability of the sector, ITQs can increase incentives for non-compliance (Tietenberg, 2003). On the other hand the revenue generated by the ITQ system can (at least in part) cover this. In many fisheries, for example, those in Australia, Canada, Iceland, and New Zealand, the fees levied on quota owners pay for administration and enforcement.

Perhaps more importantly, in some instances, implementation of quotas has in fact resulted in improved co-operation between industry and enforcement agencies and better compliance. This is because the fishermen recognise that illegal fishing undermines the resource base and so damages the value of their quota rights (Tietenberg, 2003). If the rights are seen to be secure by the rights-holders they have incentives to ensure that IUU fishing is minimised.

Conclusions

The case studies analysed above are examples of rights-based natural-resource management, in which there has been considerable interest in recent years. They illustrate a number of reasons as to why this approach can affect illegal activities and trade:

- Poachers decide to become legal harvesters: those engaged in illegal activities may decide to stop because the new governance regime means that they have more to gain from participating in the sustainable management of resources.
- Improved monitoring and control of resources: this is often an important factor in reducing illegal activities. Better controls may be instituted by a community because they are gaining economically from the resource and so they have the incentive to monitor it; or another factor may be that the new regime gives them the powers to monitor and control their resources, when previously they lacked them.

- The conversion of poachers and IUU fishers into legal operators: in some cases, rights-based natural-resource management can facilitate the conversion of poachers or illegal loggers into legitimate harvesters and resource managers.
- In some circumstances, however, rights-based natural resource management may encourage new types of illegality or create new opportunities for illegal activities – for example, where poachers' attention switches from large mammals (the focus of the new regime) to smaller game, which can be caught with snares rather than firearms and is therefore harder to detect (Shyamsundar *et al.*, 2005).

Studies of other examples of community-based natural resource management lead to some further conclusions. The institutional arrangements for revenue distribution are generally key to determining the success of the approach. In one example of participatory forest management in Kenya, young men who had been active in illegal harvesting of timber poles and charcoal saw few of the benefits of the new management regime, and consequently often did not change their behaviour (Schreckenberg and Luttrell, 2009). In another example, in the case of a community forest in Mexico, unfair distribution of the benefits from forest use resulted in widespread illegal harvesting of timber. The forest was managed by an elite from the central village, with most of the profits being invested and jobs generated there; outlying settlements saw little benefit and also perceived corruption amongst the village leaders and so felt justified in illegally felling trees (Klooster, 2000).

There are, however, examples of successful initiatives in this area, as the case study of Peruvian vicuña management shows in particular. A number of factors seem to contribute to the success of such initiatives:

- Adequate levels of governance and law enforcement are necessary, so that the resource owners can be sure that their rights will be upheld.
- Security of rights in particular is important, especially in community forest management. In some situations people may be willing to forgo short-term benefits, or to pay short-term costs, if they believe that there will be longer-term benefits, but they must be assured that they will be able to enjoy them.
- Decision-making powers and benefits need to be decentralised to those who are engaged in managing the resource.
- Co-ordination with broader national and international efforts can reinforce local management regimes, such as the control of trade in the resource in question. Such co-ordination can also help to avoid displacement of illegal activities from one region or country to another.

- Economic incentives are not the only factors in decision-making: cultural and social factors are also important in the decisions people make about resource use, and these need to be borne in mind when designing interventions.

Taxes, charges and payments for environmental resources

This section reviews case studies of the effects of taxes and charges. Such measures are used to incorporate environmental costs into economic decision-making; increasing the price of the products by applying taxes or charges is one way of incorporating these environmental externalities into the price of a product, and thereby discouraging the production and consumption of those products which cause environmental damage. This section includes cases-studies where such measures have been applied explicitly to reduce environmentally damaging behaviour, and seeks to identify possible implications for illegal trade.

The ODS tax in the United States

In 1989, the US Congress adopted a law applying an excise tax to those ozone-depleting substances (ODS) controlled by the Montreal Protocol, which had just entered into force: chlorofluorocarbons (CFCs) and halons (Hoerner, 1996). Carbon tetrachloride and methyl chloroform were added in 1990 after the Protocol was extended to those chemicals. The tax was initially set at USD 1.37 per pound (USD 3 per kilogramme) for 1990 and 1991, and escalated in value every year thereafter; later, legislation increased the rates further but retained its annual escalating nature. The tax also varied by a factor representing the ozone-depleting potential (ODP) of the chemical.[6]

The tax applied to manufacturers' and importers' sale or use of the chemicals and was levied when the chemicals were first sold or used in manufacturing. Imports of products manufactured with or containing the chemicals were also subject to the tax, but exports of the same products qualified for tax rebates, so as not to damage industry's international competitiveness. The tax immediately doubled the price of CFC-11 and CFC-12, the two most commonly used ODS, and by 1995 the taxed price was nearly triple the untaxed price.

In line with its obligations under the Montreal Protocol, the United States also adopted overall caps on production and consumption, and achieved total phase-out of all the targeted ODS by the Protocol's target date of January 1996. It is difficult to identify the precise impact of the tax, given that allowable consumption limits were falling, and industry knew that a total phase-out was approaching. Some observers have argued that the tax contributed to a more

rapid phase-out than would otherwise have been the case (Hoerner, 1996; Cook, 1998).

However, other developed countries succeeded in phasing out the use of the same chemicals just as quickly by using regulatory caps on production and consumption rather than taxes. In general, manufacturers found it easier and cheaper to phase out most uses of CFCs than had originally been foreseen, and the effectiveness of the excise tax compared with other measures in encouraging this cannot be determined definitively.

Illegal trade in CFCs was first detected in the United States in 1992, growing rapidly in the following years: by the mid-1990s it was estimated that CFCs were the second-most valuable commodity smuggled through Miami after cocaine (Brack, 1996). Estimates suggested that, in 1994, 20-40% of CFC-12 imported into the United States (9 000-18 000 tonnes) was illegal.

Although it is difficult to determine the drivers behind this illegal trade, it seems likely that the application of the excise tax was a factor. Black markets can be expected to develop where cost differentials between legal and illegal goods become significant and where enforcement is weak (the excise tax resulted in a near tripling of prices of CFCs 11 and 12). Indeed, one of the first indications of the extent of illegal trade in the United States was the failure of CFC prices quoted to retailers to rise in line with the tax increases. Weak enforcement also played a role. The network of small users of CFCs that characterised the US market – garages maintaining and repairing cars – represented a significant challenge for enforcement efforts.

However, these were not the only factors underlying the black market in the United States. In the early days of the ODS phase-out, it was not, in general, possible for CFC alternatives to be used simply as "drop-in" replacements in refrigeration or air-conditioning equipment; the systems themselves usually had to be replaced entirely. In 1995, the cost of replacing a vehicle's air-conditioning system was typically USD 200–300, but occasionally as much as USD 800 (Brack, 1996), whereas the cost of keeping the existing one topped up with CFCs was a few dollars a year. These costs alone created a powerful incentive for garages to source black-market CFCs in order to keep their customers' costs down.

The proximity of the United States to CFC markets in Latin America and the size of the CFC market within the United States were also factors that are likely to have encouraged the illegal trade. For example, Miami developed as a major entry point for illegal CFCs mainly because it is a common transit port for goods from Europe bound for Latin America, and it proved relatively easy to divert goods supposedly in transit into the domestic market. The market for CFCs in the United States was also far more extensive than that in other developed countries; in the early and mid-1990s, approximately 90% of US cars

were fitted with air-conditioning systems which needed regular refilling with coolants, compared with about 10% in the EU.

Nevertheless, the fact that imports of illegal CFCs entailed tax evasion as well as other criminal behaviour gave the US authorities a powerful incentive to take action. Enforcement was slow to start, but it increased steadily; in the ten years to 2001, the US authorities seized 1 125 tonnes of CFCs, representing an estimated 11.5% of the total volume of these products entering illegally (this compares with an estimated seizure rate of 12-14% of narcotics, the area of illegal trade afforded the highest priority by enforcement agencies) (Montreal Protocol, 2002).

To conclude, it is difficult to disentangle the impacts of the US tax on illegal trade in CFCs. The price differential between legal and illegal products to which it contributed is likely to have encouraged the development of a black market in these products. However, as has been seen, there are several other possible reasons that could have contributed to the development of the black market here, including the challenges of enforcement. One lesson that can be learnt is that where a policy is likely to create incentives for a black market, enforcement measures should anticipate this and be strengthened from the outset.

Waste taxes and charges in the European Union

Taxes and charges on waste disposal have been used in many countries to increase the incentives to reduce volumes of waste and to reuse and recycle products. Taxes are generally aimed at raising the costs of disposing waste through landfill. For instance, in the European Union, the aim of the 1999 Landfill Directive was to reduce landfilling through prioritising waste prevention, reuse, recycling and recovery. It set targets for progressively reducing the amount of biodegradable municipal waste landfilled up to 2016. Member states introduced a range of measures in response to this, including closure of landfills, increasing the costs of landfills, increasing incineration capacity and establishing separate collection of biodegradable waste (EEA, 2009a).

A study analysing the effectiveness of these measures concluded that landfill tax rates needed to be relatively high if they were to be effective, although public perceptions of the tax burden are also important (EEA, 2009a). Estonia, for example, has among the lowest landfill taxes in Europe. These stood at EUR 30-36 per tonne in 2004, compared with EUR 80-90 per tonne in Italy and Germany at the time. However, these had increased significantly since 1996 (by 700% in the decade to 2006, equivalent to an annual rate of increase of 23%). Therefore, the tax was perceived to be high and so it was

effective, contributing to a drop in the amount of municipal waste being landfilled, from 90% in 2000 to 60% in 2006.

An increase in exports (legal and illegal) could also be expected to follow a rise in disposal costs and differences between countries. Exports of notifiable waste (mostly hazardous waste) from EU Member states increased fourfold between 1997 and 2004, mostly to other EU member states (EEA, 2009b).

A policy for diverting waste from landfills can only succeed, however, if the waste-management system is able to receive and manage the resulting waste flows. Thus, factors such as the existence of separate collection schemes and the system's recovery capacity also influence the effectiveness of the policy. If alternatives are not in place to manage the diverted waste flows, strict landfill policies can encourage illegal dumping and the export of untreated waste. For example, in Estonia, the closure of landfills resulted in an increase in illegal dumping because there were insufficient alternative means of waste collection.

In the United Kingdom, which has historically relied on landfill more than most other EU countries, a landfill tax was first introduced in 1996, applying to commercial, industrial and municipal waste. It was a weight-based tax, with different rates for inactive and active waste[7] (GBP 2 per tonne and GBP 7 per tonne respectively). A 2001 assessment found that the tax had reduced the amount of inactive waste going to landfill (largely due to increased reuse of construction and demolition waste), but the amount of active waste remained unchanged. There had also been an increase in illegal dumping (commonly known as "fly-tipping" in the UK) and in the misclassification of waste (as inactive rather than active) in order to reduce tax liabilities (Davies and Doble, 2004).

These findings led to recommendations for further increases to landfill taxes – which were then among the lowest in Europe – and for at least some of the revenue to be used to provide alternative waste-management options. Rates have subsequently been increased and now (FY 2010/11) stand at GBP 2.50 per tonne and GBP 48 per tonne for inactive and active waste, respectively; the rate for active waste is set to escalate by GBP 8 per year until at least FY 2014/15, when it will reach GBP 80 per tonne. The tax raised GBP 420 million in its first year of operation, and about GBP 1 billion in FY 2008/09. Some of the revenue raised has been allocated to various programmes to assist industry to reduce waste volumes. Since the introduction of the tax, the proportion of waste sent to landfills has fallen by around a third, accompanied by a similar increase in recycling (Seely, 2009).

It would be expected that the increase in the rates of landfill tax would lead to an increase in illegal disposal, as indeed was reported in 2001. Data

were not collected systematically until 2004, and even these are not wholly reliable (for instance, there is no single definition of fly-tipping, so reported incidents vary widely in size; and data are only collected for fly-tipping on public land, not private). However, such information as is available does in fact suggest the reverse: in FY 2007/08, fly-tipping in England fell by 7.5% (Seely, 2009) and in FY 2008/09 by 9.3% (reaching 1.16 million incidents).[8]

There are a number of possible reasons for this. Over 60% of the reported fly-tipping incidents involved household waste, but householders do not pay landfill tax directly (their local authorities do) and so fly-tipping by householders will not have been influenced by the tax.[9] In addition, enforcement action has risen significantly; local authorities and the Environment Agency are devoting more attention to the issue than in previous years, and so this may account for the fall in the number of incidents.

Reported illegal shipments also grew: IMPEL (EU Network for the Implementation and Enforcement of Environmental Law) investigations and individual EU member state studies have suggested that as much as 85% of non-hazardous waste is shipped illegally or is non-compliant, whilst initial findings of the IMPEL Sea Port II project suggested a figure of around 40% (IMPEL, 2005). An investigation into the illegal shipment of waste among IMPEL member states (the EU plus Croatia, Macedonia, Norway and Turkey) found that the main drivers for the illegal trade were the high cost of treatment or disposal of waste, coupled with poor enforcement (IMPEL, 2005).

As with ODS, the application of waste-disposal taxes such as landfill taxes is likely to result in an increase in illegal disposal. Illegal disposal can be minimised if alternative means of disposal are provided, and industry and local authorities are assisted in learning to handle waste differently. Also important is ensuring that there is a sufficient level of enforcement. However, there are a number of other factors which also influence illegal behaviour, making it difficult to assess the precise impact of taxes. Thus, as countries increasingly limit the volume of waste going to landfills, the cost of this means of disposal would be expected to increase with or without taxes; and costs will also vary between countries, creating an incentive to export waste (legally and illegally).

Export taxes on timber

There are various ways of intervening to affect a country's exports of timber. For instance at the international level, REDD+ can play a role in reducing illegal logging. A letter of intent signed between Norway and Indonesia committed the latter to develop its forest management enforcement capacity in return for $US 1 billion in support from Norway.[10]

More directly, export taxes or duties can be applied differentially to encourage particular categories and discourage others – for example, to discourage the export of logs and encourage the export of processed timber, thereby creating incentives for the domestic wood-processing industry. Alternatively, a government may attempt to achieve the same objective by a non-economic incentive such as banning the export of logs. The primary aim of such measures is typically not an environmental one, but they can have an impact on management practices and illegal trade. The following case study compares the experience with regulating exports through an economic incentive (export duties) and a non-economic incentive (trade ban).

In 2005 the Russian Federation announced its intention to revise its forest policy. The government's stated aims were to develop the domestic timber-processing industry in order to increase employment and encourage economic growth, and also to improve the productivity of Russian forests and reduce illegal harvesting. From 2006 export duties on logs were increased. For example, for coniferous roundwood and birch logs exceeding 15 cm in diameter export duties were set at a minimum of EUR 10 per cubic metre (20% of the export value) from July 2007; and in April 2008, the duty was raised to a minimum of EUR 15 (25% of the export value). In January 2009 it was to be raised further to a minimum EUR 50 (80% of the export value) (Karjalainen *et al.*, 2010; Sokolov, 2010), but in fact this last increase was postponed twice.

Although these export duties have served to reduce exports of raw timber, the output of processed timber within Russia has not risen significantly. Exports of roundwood from Russia were estimated to have fallen from a peak of just over 50 million cubic metres in 2006 to just over 20 million cubic metres in 2009 (Sokolov, 2010), although the economic recession was also partly responsible for this. Exports of sawn timber increased slightly in 2007, but fell thereafter while exports of plywood fell slightly throughout the period and exports of newsprint rose slightly. This failure to increase exports of processed timber is the result of a shortage of capacity within the Russian timber-processing industry, while the planned investment largely failed to materialise (except for some Chinese investment, as outlined below).

Russian roundwood is exported predominantly to two countries, Finland (25% of exports in 2007) and China (55% in 2007). In Finland, the immediate impact of this policy was a decline in the competitiveness of Russian timber and a resulting fall in output of the Finnish processing industry, though the recession also played a role in this. Log exports to China fell similarly, but sawn timber exports began to rise. The response from China's industry was to invest heavily in timber processing facilities in Russia, and this resulted in a 13% increase in the volume of timber processed in Chinese-owned facilities in 2005-06 (Hongfan Li, 2007).

The actual impact on illegal activities is not known. Illegal logging in Russia was estimated at about 18% of the total timber harvest in 2004 (Seneca Creek, 2004), and is probably higher in the Russian Far East (a region which mainly exports to China) than in other Russian regions. A reduction in total trade from Russia should result in lower exports of illegal timber, but whether it is having any impact on illegal behaviour within the country is not yet known. If the trade simply switches from logs to sawn timber (as it may do in the Far East, given Chinese investment), then it may make no difference at all.

The Russian example can be compared with a regulatory instrument applied by the Indonesian government for similar goals. In late 2001, a complete ban was imposed on the export of logs, the government stating that its main goal was to aid law enforcement and reduce illegal logging and timber smuggling; at the time the country was suffering from a very high rate of illegal logging, probably of about 70-80%. Support for the processing industry, particularly through increasing the supply of legal logs to plymills, were also objectives[11] (Resosudarmo and Yusuf, 2006).

Trade data showed that illegal exports were significant before the ban was implemented; China reported importing up to 1 million cubic metres of logs from Indonesia in 2001 which were not reported as having been legally exported (Chatham House, 2010). Instead of halting the smuggling, however, the ban served only to change the methods used by the smugglers. This is demonstrated by the fact that while the discrepancy in reported log trade volumes between China and Indonesia rapidly declined after the ban, over the same period trade between China and Malaysia rapidly increased. Traders were either smuggling logs into Malaysia for export from this country or were simply declaring illegal Indonesian logs as Malaysian on arrival in China (EIA/Telapak, 2005). However, a major enforcement operation in Indonesia in 2005 led to a sharp fall in illegal log exports; trade data suggested the level fell to about 120 000 cubic metres a year (Chatham House, 2010).

In late 2004, three years after banning exports of logs, the Indonesian government also banned the export of most forms of sawn timber, again with the aim of reducing illegal logging and trade. As for log exports, discrepancies in trade data prior to the ban suggested that large volumes of illegally exported Indonesian sawn wood were being imported by various countries, including China. Trade data indicated that, after an initial lag, illegal exports fell steadily from 1.6 million cubic metres in 2004 to less than 0.4 million cubic metres in 2008 (Chatham House, 2010). However, improved enforcement since 2005 will have also played a role in this outcome.

As is common with studies of illegal behaviour, the shortage of data makes firm conclusions difficult to reach. The impact of the Russian export taxes on illegal logging and illegal trade is not known. Similarly, the

Indonesian log and sawn timber export bans do not appear to have had much impact by themselves on illegal exports. Rather it was improved domestic enforcement that seems to have been most effective.

If the export bans had been reciprocally enforced by other countries – for example, if China and other export destinations had refused to import Indonesian timber after the bans – then the measure may have had more of an impact, though the disguising of Indonesian timber as Malaysian might have negated this. It is this kind of difficulty in excluding illegal timber from international trade that partly lies behind some of the recent actions taken by consumer countries, which have modified their legal and trade systems to make it easier to restrict trade. Examples includes the amendment of the Lacey Act in the United States (which makes importing illegally exported timber and timber products unlawful in the United States); the Voluntary Partnership Agreements being established between the EU and timber producing countries (which would provide a means of excluding illegal timber exports from the EU market; negotiations are currently under way with Indonesia, among other countries); and the EU "Timber Regulation" currently, which requires timber operators to establish due diligence systems to ensure they are not handling illegal timber.[12]

In theory, both export duties and export bans are likely to encourage illegal trade, the former making illegal timber cheaper (compared with their legal equivalents) and the latter potentially raising the value of illegal timber to importers. If the international policy framework continues to develop as it is, bans may prove more practical to implement and enforce than high export taxes, with destination countries assisting the exporting country in applying these. In either case, however, effective domestic enforcement is essential.

Concluding remarks

There are relatively few studies and little data that look specifically at the relationship between market-based policy instruments and illegal trade. This situation is exacerbated by a lack of baseline information and before-and-after quantitative studies, making it difficult to link particular interventions to specific outcomes (Shyamsundar *et al.*, 2005). However, some trends can be observed and some tentative conclusions listed:

- Economic incentives can only work fully in a framework of good governance and law enforcement. Otherwise they risk exacerbating illegal activity, creating new opportunities for it, or shifting it to other regions or countries.
- As well as general good standards of governance, new governance structures can prove effective – *e.g.* community-based natural resource management, where local communities are given incentives to protect and manage the

resource. Security of tenure or other forms of resource ownership will be an important factor.

- Economic incentives will be more effective when they form part of a co-ordinated range of interventions – *e.g.*, where alternatives to illegal behaviour are provided (*e.g.* legal alternatives to poaching, or legal means to dispose of waste).
- Where international trade is a factor, co-ordination with other countries is an important means of ensuring the effectiveness of economic incentives, either to avoid displacement of illegal activities or to facilitate the creation of new incentives.
- Economics is not always the key driver of illegality, however. For example, poor governance or cultural values may also have a role. In such cases, economic incentives are likely to be less effective unless these other drivers are addressed.

In general, when designing economic incentives it is imperative that the potential for encouraging illegal behaviour (including trade) is considered, so that the consequences can be assessed and considered (*e.g.* whether ivory sales are likely to lead to increased poaching) and enforcement activities and other possible interventions can be better targeted.

Notes

1. See, for example, Pearce *et al.* (1989). The OECD uses a definition of "economic instruments" in this context as: "fiscal and other economic incentives and disincentives to incorporate environmental costs and benefits into the budgets of households and enterprises. The objective is to encourage environmentally sound and efficient production and consumption through full-cost pricing. Economic instruments include effluent taxes or charges on pollutants and waste, deposit-refund systems and tradable pollution p+ermits." *http://stats.oecd.org/glossary/detail.asp?ID=723*.
2. See Johnstone and Bishop (2006) for a discussion.
3. This case study is extracted from Hayman, 2007, updated where appropriate.
4. These have included the collapse of management systems in Peru during the Shining Path insurgency in the early 1990s (Hayman, 2007); and ongoing poaching in some regions (Lichtenstein, 2010).
5. *www.iucnredlist.org/apps/redlist/details/22956/0*.
6. For instance, the ODP of CFC-11 = 1.0; that of halon-1301 = 10.0.
7. Active waste has the potential to undergo physical, chemical or biological changes when disposed of to landfill, *e.g.* timber, plastic, or paper; waste sites containing active waste need to be managed much more extensively than if they contain inactive waste.
8. UK government "Flycapture" website, at *www.defra.gov.uk/environment/quality/local/flytipping/flycapture-data.htm*.

9. *www.defra.gov.uk/environment/quality/local/flytipping/flycapture-qa.htm*.
10. For an assessment of the LOI see *www.wri.org/stories/2010/07/whats-next-indonesia-norway-cooperation-forests*.
11. *www.itto.int/en/news_releases/id=2610000*.
12. *http://ec.europa.eu/environment/forests/timber_regulation.htm*.

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Chapter 6

Illegal trade in environmentally sensitive goods: Conclusions

In this report we have examined the evidence, drivers and governance of illegal trade flows in environmentally sensitive goods such as wildlife, timber, fish, chemicals and hazardous waste. In some cases, the 'illegality' of the trade is a function of the characteristics of the good itself (*e.g.* protected species, ozone-depleting substances) and in some cases it is a function of the means by which it is harvested, exploited or manufactured (*e.g.* timber, fish).

The analysis has been constrained by the difficulty of assessing the magnitude of the trade flows. This is true of all illegal activities; there is a self-evident benefit from concealing the activity. However, this is likely to be particularly true of trade in environmentally-sensitive in which the 'illegality' is a function of the means of harvest, exploitation or manufacture and not 'intrinsic' to the good itself.

There are some general lessons arising out of the research. Firstly, in many cases illegal trade in environmentally-sensitive goods and services is primarily a function of local conditions. In particular, shortcomings in domestic regulatory capacity will give rise to unregulated management of natural resources and negative environmental impacts. In such conditions, "illegal" trade is the ancillary consequence of local governance failures, and every effort should be made to increase regulatory capacity in 'supplier' countries, whether the goods are destined for local or export markets.

However, in some cases international trade can play an important, and even predominant, role in encouraging the 'illegal' exploitation of natural resources and the natural environment overseas. For example, for many types of wildlife species which are protected under CITES (and for which trade is illegal) the primary markets are overseas. In such cases, the importing countries – as the primary outlet for the environmental good – have an important role and responsibility to play in discouraging unsustainable practices.

Indeed, since the benefits from more sustainable resource and environmental management practices are likely to be enjoyed globally, importing countries have an interest in 'policing' such trade effectively. Whether an ODS is emitted from home or overseas the consequences remain the same. In addition, in many cases the importing countries may have greater capacity to regulate imports than the 'supplier' countries have to regulate exploitation and management. Effective trade regulation can be the most efficient means of ensuring domestic sustainable resource management.

In this regard, the review of international licensing agreements has highlighted some of the essential characteristics of successful agreements, including:

- Broad membership of exporting and importing countries
- Comprehensive coverage, including relevant substitute goods
- Reliable design of the licenses which facilitate least-cost enforcement
- Involvement of relevant stakeholders, including the private sectors

However, there is only so much which can be done at the point in which trade arises. National governance systems are the most important factors in abetting and constraining trade in environmentally-sensitive goods. This is not just a function of 'weak' governance per se. Irrespective of the nature of the resource and environmental management system adopted close attention should be paid to the implications for incentives for 'illegal' trade. Effective property rights regimes and the use of market-based incentives can provide strong incentives for resource users to ensure that exploitation is sustainable, with the ancillary consequence that incentives for illegal trade are less acute. However, this outcome is not a given.

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OECD PUBLISHING, 2, rue André-Pascal, 75775 PARIS CEDEX 16
(97 2012 05 1 P) ISBN 978-92-64-17422-1 – No. 60167 2012

OECD Trade Policy Studies

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Please cite this publication as:

OECD (2012), *Illegal Trade in Environmentally Sensitive Goods,* OECD Trade Policy Studies, OECD Publishing.
http://dx.doi.org/10.1787/9789264174238-en

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ISBN 978-92-64-17422-1
97 2012 05 1 P

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With the financial assistance of the European Union