Transnational Environmental Crime in Greater China: A Case Study from the Perspective of Network Theories

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A thesis submitted for the degree of Doctor of Philosophy of the Australian National University

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DECLARATION

I declare that this thesis is the product of my own original work, and contains no material which has been accepted as part of the requirements of any other degree at any other university, or any material previously published or written by another person except where due reference is made.

Yunbo Jiao
August 2, 2017
ACKNOWLEDGEMENTS

For me, writing a PhD thesis has been a long journey replete with both enjoyment and struggling. I would like to take this opportunity to thank those who have kindly offered support of various sorts along the process of completing this thesis.

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ABSTRACT

The central goal of this study is to produce an in-depth understanding of the nature and dynamics of China-related transnational environmental crime (TEC). To that end, this study takes the Greater China – including mainland China, Hong Kong, Macau, and Taiwan – as the specific geographic focus for its investigation into three key TEC sectors (illegal trade in wildlife, forest products, and ozone depleting substances (ODS)).

Overall, this study seeks to achieve the central goal in a four-step sequence. First, it builds a network-centric conceptual framework based on the idea of “networked threats require networked responses” advocated by many influential scholars. This framework focuses on addressing two puzzles: what essentially constitutes a network threat; and what forms a networked response. Second, it applies the concept of networked threats to the study of China’s global trade in illegal wildlife, forest products, and ODS. Third, it examines China’s TEC-related legal frameworks and enforcement responses and identifies key challenges that China has encountered in each of the three selected TEC sectors. Fourth and finally, it combines the above three lines of understandings – the accounts of networked responses, the empirical findings of China’s illegal trade, and the key regulatory and enforcement challenges identified – to develop practical suggestions on how can China apply the notion of networked responses to the formulation of regulatory and enforcement strategies for addressing the identified key challenges.

This study makes two broad arguments: one theoretically oriented and one empirically directed. First, this study argues that while the concept of networked threats can be approached along the dimensions of transaction networks and directed networks, networked responses are not a standard, formatted mode of regulatory or enforcement responses. Instead, networked responses should be understood as a special way of thinking and acting: a way that sees a bright-side actor (e.g., enforcement agencies) as operating in an environment occupied by various networks and entities, which simultaneously present challenges in terms of amplified (networked) threats, as well as opportunities in terms of power amplifiers for the bright-side actor, in the sense that they could potentially be leveraged for tackling these threats.

Second, China’s global trade in environmental contraband is typified by the substantial scale of China’s black markets and the deep embeddedness of China in the international
and regional illicit trade chains. These two features, on the one hand, pose a serious challenge to the Chinese government in tackling its TEC; while on the other hand, they imply that Chinese effort and progress made toward addressing its illegal internal trade will likely have a substantive, positive overflowing effect on the whole of the international and regional illegal trade.
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<tr>
<td>AC</td>
<td>Air conditioning</td>
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<td>ACACA</td>
<td>Australia-China Agricultural Cooperation Agreement</td>
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<td>AOC</td>
<td>Asian organised crime</td>
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<td>BCM</td>
<td>Bilateral Coordination Mechanism</td>
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<td>CAA</td>
<td>China Association of Auctioneers</td>
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<td>CAF</td>
<td>Chinese Academy of Forestry</td>
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<td>CATVS</td>
<td>Chinese Association-guided Timber Verification Scheme</td>
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<td>CCPCJ</td>
<td>Commission on Crime Prevention and Criminal Justice</td>
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<td>CCSY</td>
<td>Chinese Customs Statistics Yearbook</td>
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<td>CEC</td>
<td>Commission for Environmental Cooperation of North America</td>
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<td>CFC</td>
<td>Chlorofluorocarbon</td>
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<td>CITES MA</td>
<td>CITES Management Authority</td>
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<tr>
<td>CGTVS</td>
<td>Chinese Government-guided Timber Verification Scheme</td>
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<tr>
<td>CITES</td>
<td>Convention on International Trade in Endangered Species of Wild Fauna and Flora</td>
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<td>CMIF</td>
<td>China Machinery Industry Association</td>
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<td>CNFPIA</td>
<td>China National Forest Products Industry Association</td>
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<td>COP</td>
<td>Conference of the Parties</td>
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<tr>
<td>CTC</td>
<td>Carbon tetrachloride</td>
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<td>CUE</td>
<td>Critical use exemption</td>
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<td>DRC</td>
<td>Democratic Republic of Congo</td>
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<tr>
<td>ECOSOC</td>
<td>Economic and Social Council</td>
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<td>EIA</td>
<td>Environmental Investigation Agency</td>
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<td>ETIS</td>
<td>Elephant Trade Information System</td>
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<td>EU</td>
<td>European Union</td>
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<td>FAO</td>
<td>Food and Agriculture Organisation of the United Nations</td>
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<td>FAOSTAT</td>
<td>Food and Agriculture Organisation Corporate Statistical Database</td>
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<tr>
<td>FLEG</td>
<td>Forest Law Enforcement and Governance</td>
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<tr>
<td>FLEGT</td>
<td>Forest Law Enforcement, Governance and Trade</td>
</tr>
<tr>
<td>GAC</td>
<td>General Administration of Customs, PR China</td>
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<tr>
<td>GEF</td>
<td>Global Environment Facility</td>
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<tr>
<td>HBFC</td>
<td>Hydrobromofluorocarbon</td>
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<td>HCFC</td>
<td>Hydrochlorofluorocarbon</td>
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<tr>
<td>HFC</td>
<td>Hydrofluorocarbon</td>
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<tr>
<td>HPMP</td>
<td>HCFC Phase-out Management Plan</td>
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<tr>
<td>HS</td>
<td>Harmonised Commodity Description and Coding System</td>
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<td>ICCWC</td>
<td>International Consortium on Combating Wildlife Crime</td>
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<td>ICR</td>
<td>Industrial and commercial refrigeration</td>
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<tr>
<td>ICT</td>
<td>Information and communication technology</td>
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<td>INECE</td>
<td>International Network for Environmental Compliance and Enforcement</td>
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<td>INTERPOL</td>
<td>International Criminal Police Organisation</td>
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<tr>
<td>iPIC</td>
<td>Informal Prior Informed Consent</td>
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<td>ITTO</td>
<td>International Tropical Timber Organisation</td>
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<tr>
<td>JWGF</td>
<td>Joint Working Group on Forestry</td>
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<td>KWS</td>
<td>Kenyan Wildlife Service</td>
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<td>LEER</td>
<td>Law enforcement effort ratio</td>
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<td>MAC</td>
<td>Mobile air conditioning</td>
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<tr>
<td>MEA</td>
<td>Multilateral environmental agreement</td>
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<td>MEP</td>
<td>Ministry of Environmental Protection, PR China</td>
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</table>
MIIT | Ministry of Industry and Information Technology, PR China
MIKE | Monitoring the Illegal Killing of Elephants
MLF | Multilateral Fund for the Implementation of the Montreal Protocol
MOA | Ministry of Agriculture, PR China
MOC | Ministry of Commerce, PR China
MOHURD | Ministry of Housing and Urban-Rural Development, PR China
MOP | Meetings of the Parties
MoU | Memorandum of understanding
MPS | Ministry of Public Security, PR China
NDRC | National Development and Reform Commission, PR China
NFUP | National Forest Protection and Utilisation Plan
NGO | Non-governmental organisation
NICECG | National Inter-agencies CITES Enforcement Coordination Group
NOU | National Ozone Unit
NPC | National People’s Congress, PR China
ODP | Ozone depleting potential
ODS | Ozone depleting substance/s
OECD | Organisation for Economic Cooperation and Development
PNG | Papua New Guinea
PU | Polyurethane
RAC | Refrigeration and air conditioning
REDD | Reducing Emissions from Deforestation and Forest Degradation
RINO A/P | Regional Intelligence Liaison Office for Asia and the Pacific
RWE | Roundwood equivalent
SAG | State Administration of Grain, PR China
SAIC | State Administration for Industry and Commerce, PR China
SAR | Special Administrative Region, PR China
SATCM | State Administration of Traditional Chinese Medicine, PR China
SBPCI | State Bureau of Petroleum and Chemical Industry, PR China
SFA | State Forestry Administration, PR China
SFDA | State Food and Drug Administration, PR China
SSP | Special State Protection
STMD | State Tobacco Monopoly Administration, PR China
TCA | Trichloroethane
TCM | Traditional Chinese medicine
TEC | Transnational Environmental Crime
TED | Trade and Environment Database
TIMN | Tribes, institutions, markets, and networks
TLVS | Timber Legality Verification Scheme
TRAFFIC | Wildlife trade monitoring network
UK | United Kingdom
UN | United Nations
UNDP | United Nations Development Programme
UNECE | United Nations Economic Commission for Europe
UNEP | United Nations Environment Programme
UNICJRI | United Nations International Criminal Justice Research Institute
UNODC | United Nations Office on Drugs and Crime
US | United States
WCO | World Customs Organisation
WEN | Wildlife Enforcement Network
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>WPL</td>
<td>Wildlife Protection Law</td>
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<tr>
<td>WPSI</td>
<td>Wildlife Protection Society of India</td>
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<tr>
<td>WTO</td>
<td>World Trade Organisation</td>
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<tr>
<td>WWF</td>
<td>World Wide Fund for Nature</td>
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<tr>
<td>XPS</td>
<td>Extruded polystyrene</td>
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1. INTRODUCTION

1.1. THE STUDY

As one of the emerging forms of cross-border criminality, transnational environmental crime (TEC) — the illegal trade and trafficking across borders of species, resources, wastes or pollutants — has become a growing worldwide concern that features highly on the policy agenda and discourse of many international conferences and organisations. TEC is a transnational issue, involving the cross-boundary movement of environmentally sensitive goods illegally taken or produced in the source countries to the consumer markets or disposal sites in a different country. Moreover, in line with the latest wave of globalisation and information revolution, TEC has truly become a global problem, as those involved capitalise on the “freer trade, increases in the frequency and volume of commodity shipments, fewer border controls, and easier transfers of funds through global financial and banking system” to extend their reach, as well as to hide, transport, and redistribute illicit goods, and launder the criminal proceeds into legitimate business (Elliott and Schaedla 2016, 4).

TEC is a serious crime with severe adverse impacts on the environment, economic, and social security. However, as opposed to its considerable gravity, TEC is not taken serious enough by both the academia and the wider transnational crime fighting community. Present approaches to TEC — which rely mainly on national resource management and conservation policy on the one hand (COP 2010, 10), and the individual and chance seizure strategies and administrative sanctions on the other — have largely failed to recognise the many facets of the complexity and severity of TEC. As a result, it leaves TEC as an area “where the risk of detection and punishment is all too low”, as the International Consortium on Combating Wildlife Crime (ICCWC) put

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1 At the Expert Consultation of the Fifth Session of the Conference of the Parties (COP) to the United Nations Convention against Transnational Organised Crime in October 2010, TEC was for the first time expressly identified as one of the emerging forms of transnational criminality along with cybercrime, piracy, and trafficking in cultural property, human organs, and counterfeit medicines.

2 In the field of transnational crime, the majority of scholarly attention has been given to drug trafficking, human smuggling, illegal cigarette trade, and transnational criminal networks as a whole. TEC and several other transnational crimes such as trafficking in arms, nuclear materials, and organised cybercrime have only received sporadic scholarly treatments. Moreover, even within the domain of TEC research, attention is not evenly distributed across TEC’s multiple sectors. This can probably be granted by a glance at the numerous resolutions adopted by UN’s associated bodies (e.g., the ECOSOC and CCPCJ) on environmental crime, among which, trafficking in wildlife and timber apparently remain the prioritised matters of concerns.

The discrepancy between the TEC challenge and existing policy and enforcement approaches implies an urgent need for advancing our understanding of the nature of environmental crime and the ways to deal with it more effectively. This provides the overall focus of the Australian Research Council Linkage Grant Project on Transnational Environmental Crime, with which this PhD research project is associated.

China – with its prominent role as the world’s leading supplier or consumer of a variety of illegal environmental goods including wildlife, timber, and ozone-depleting substances (ODS) – remains at the hub of the international and regional TEC chain. International perception of China’s expanding demand for, or supply of, illicit environmental commodities centres around the detrimental effects on the environmental, economic, and social dimensions in source and consumer countries involved in China’s transnational illegal trade. Such multifaceted negative outcomes mainly include deforestation (EIA 2012), biodiversity loss (UNEP 2013a), species endangerment (EIA 2007, 2009), revenue loss (Thornton 2005), damage to local livelihoods (Mackenzie 2006; Mackenzie and Ribeiro 2009), and ozone layer depletion (Clark 2005). In reality, not only does China’s illegal trade provide a striking counterpoint to the Chinese government’s political commitments to the “harmonious society” and “ecological civilisation” domestically and a responsible global citizen internationally, it also proves to be a thorny policy and enforcement challenge for other “victimised” countries entangled in China’s transnational illicit trade chain.

The substantial scale of China’s illegal trade and the deep embeddedness of China in the

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4 The ICCWC was formally established in November 2010 under the partnership of five lead intergovernmental organisations: the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Secretariat, INTERPOL, the United Nations Office on Drugs and Crime (UNODC), the World Bank, and the World Customs Organisation (WCO). Driven by the discontent with the “present situations where the risk of detection and punishment [on wildlife and forest crime] is all too low”, the alliance is devoted to assisting national law enforcement agencies and regional networks in developing a formidable and coordinated response to such criminal activity. CITES Secretariat. “ICCWC’s Mission is to Usher in a New Era Where the Perpetrators of Serious Wildlife Crime and Forest Crime Face a Formidable and Coordinated Response”.


5 This kind of need has also been recognised by the Commission on Crime Prevention and Criminal Justice Resolution 16/1 (CCPCJ Resolution 16/1 2007) and the United Nations 2010 Salvador Declaration (UN 2010), both of which stressed the relevance of “studying the nature of the challenge of environmental crime” and “identifying ways of improving national capability to prevent and combat such crime”.

6 The Transnational Environmental Crime Project is based in the Department of International Relations, Australian National University. It has been conducted by TEC research team and coordinated by Professor Lorraine Elliott.
international and regional illicit trade chain, on the one hand, pose a significant challenge to the Chinese government in tackling its TEC problems. While on the other hand, they also imply that Chinese effort and progress made toward the addressing of its illegal internal trade will likely have a substantive, positive overflowing effect on the whole of the international and regional illegal trade. These unique contextual features place China in a distinctive position where the Chinese government should seize the opportunity and take on a more important or even leading role in the international and regional effort to fight against TEC.

For such reasons, an in-depth understanding of the nature and dynamics of China’s illegal trade in environmental goods constitutes an important part of the intellectual preparation for the effective control of TEC at the national, regional, and international levels. However, much of the existing research on TEC as it relates to China is ad hoc in nature. In the meantime, a number of factors – including the transnational and large-scale nature of China’s black market, the involvement of a broad range of environmental goods, the engagement of sophisticated networks of diverse perpetrators, and the differentiated legislative and regulatory systems between China and its trading partners – have added extra layers of complexity and difficulty to the understanding of and fight against TEC.

Against this backdrop, this PhD research takes mainland China and three adjacent territories (Hong Kong, Macau, and Taiwan) as the specific geographic focus for its investigation into three key TEC sectors (illegal trade in wildlife, illegal trade in forest products, and illegal trade in ODS). In doing so, this study also adopts an interdisciplinary approach that draws the conceptual insights from sociology, economics, criminology, and political science to excavate and understand the utility and relevance of network models in facilitating TEC (for illegal operators) and addressing TEC (for law enforcement agencies).

Overall, this PhD research is designed to achieve two central objectives. First, it aims to theorise and systemise various scholarly understandings of the idea of “networked threats require networked responses” to build a cohesive “network-centric” conceptual framework. This framework focuses on addressing two critical questions: what essentially constitutes a network threat; and what forms a networked response. Second, this thesis applies the network analytical framework to the study of China’s illegal trade
in three selected categories of environmental goods and develops feasible suggestions on how the Chinese regulatory and enforcement agencies may themselves form networked responses to the TEC challenges facing them.

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1. **Aim One: Developing a conceptual framework based on the idea of “networked threats require networked responses”**.
   1.1. **Networked threats**: to understand the key aspects and utilities of networks that facilitate dark-side actors in structuring their organisation and undertaking their illegal business.\(^7\)
   1.2. **Networked responses**: to understand the key aspects and utilities of networks that make designs or arrangements espousing them a prospective solution for bright-side actors to deal with those dark-side threats.

2. **Aim Two: Applying the conceptual framework to the study of China’s illegal trade in three selected categories of environmental goods.**
   2.1. To investigate the nature and characteristics of criminal networks and illicit chain of custody involved in China’s global trade in illegal wildlife, forest products, and ODS.
   2.2. To identify the key challenges facing China in each of the three selected TEC sectors, and to develop practicable prescriptions on how the Chinese regulatory and enforcement agencies may apply the idea of networked responses to the formulation of their regulatory and enforcement strategies to deal with TEC.

The following pages of this opening chapter provide a brief overview of TEC in terms of its definition, scale, market value, and major characteristics. This chapter finishes with an outline of the thesis structure, the key issues each chapter intends to address, main methods employed, sources of data used, and the brief arguments.

\(^7\) “Dark-side actors’ is a term quoted from Raab and Milward (2003). In this thesis, dark-side actors or networks are used as a generic term to refer to entities in illegal or malign forms such as terrorism and transnational crime of various kinds, including perpetrators involved in environmental crime. Dark-side actors represent the opposite of the term ‘bright-side actors’ which refer to legal actors such as law enforcement agencies that strive to destroy those dark-side actors or networks.
1.2. **A BRIEF OVERVIEW OF TEC**

TEC generates profits of billions of dollars for individuals and criminal networks, undermines environmental protection and sustainable development, robs governments of income, compromises the rule of law, fosters corruption, brings violence to local community, and puts those who defend against this form of criminal activity in danger (Elliott 2012, 100).

TEC involves cross-border trading of environmental resources that either violates prohibitions or regulatory regimes set up by multilateral environment agreements or, contravenes national laws. Currently, there is no single conceptual roof under which TEC can be united. According to COP 2010, TEC or international environmental crime can be defined as encompassing the following two broad groups of activity: trafficking in natural resources and trafficking in hazardous substances (COP 2010, 9).  

Typical illegal practices under the rubric of trafficking in natural resources include: (1) trafficking and trade in endangered, threatened, and protected species of wild fauna and flora or derivatives and products thereof in contravention of the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); (2) trafficking and trade in timber when timber is logged, transported, bought, or sold in violation of national laws; (3) illegal, unregulated, and unreported fishing in transgression of controls imposed by Regional Fisheries Management Organisations; (4) exploitation of and trafficking in minerals and precious stones (e.g., oil, diamonds, gold, or other valuable metals and ores) that infringe on national laws.

Illegal practices under the heading of trafficking in hazardous substances include: (1) trafficking and trade in ODS in contravention of the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer; (2) dumping of toxic and hazardous wastes (including electronic wastes) in violation of international agreements such as the 1989 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal or the 1972 London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter.

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8 TEC and “international environmental crime” are used interchangeably throughout this thesis.
9 There are no binding international controls on the international trade in forest products, with the exception of a small number of endangered or threatened flora species under the protection of CITES.
Apart from above six main areas of TEC, scholars have identified some other emerging types of environmental offences that share similar characteristics with TEC. Among others, these offences include: (1) illegal market of genetically modified organisms and illicitly obtained genetic materials in contravention of the 2003 Cartagena Protocol on Biosafety to the Convention on Biological Diversity (Elliott 2007a, 1); (2) trafficking and trade in prohibited or regulated chemicals in violation of the 1998 Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade or the 2001 Stockholm Convention on Persistent Organic Pollutants (Elliott 2007b, 502); (3) carbon fraud and corruption with REDD projects (Reducing Emissions from Deforestation and Forest Degradation) (Elliott 2011, 2); (4) water management crime.10

1.2.1. ESTIMATING THE SIZE AND MARKET VALUE OF TEC

Highlighting the scale of a black market or the profits accumulate to it can generate important benefits, such as increasing attention paid to specific issues from decision makers and the public. However, as with most other forms of illegal trade, quantifying the overall size and cash value of TEC to a desirable level of accuracy can be a challenging task. This is in part due to the absence of an universally accepted definition of TEC either in the academic arena or among practitioners, in part due to the clandestine nature of TEC and the poor documentation of the illicit trade information concerning the involved products, trade volumes and values (Barber-Meyer 2010; Broad et al. 2003, 6–7). As a result, in many cases the evaluation of the scale of TEC relies on extrapolation from actual seizures and educated guesswork (Elliott 2012, 91).

Lawson (2007a) identifies three techniques which have frequently been used in the literature to produce estimates of the scale of a specific form of environmental crime, with each technique having a preferred application. The first method is to reach the estimates by extrapolating from anecdotal information such as media reports of the seizures of illegal environmental goods, market surveys, or admissions by illegal traders. Based on the analysis of seizures or other data, this method begins with coming up with a crude range estimate (e.g., 20–30%) of the level of illegal trade as a percent of

10 INTERPOL. “Environmental Crime”. http://www.INTERPOL.int/Crime-areas/Environmental-crime/Environmental-crime. According to the “Water Crime Research Project”, water crime takes different forms, including causing damage to water sources (e.g., surface water pollution) or to water management infrastructure; drinking water theft; and internal flooding or the deliberate poisoning of a water supply. Water Crimes. “What are Water Crimes?” http://www.watercrimes.eu/#about.
the legal trade. Then it applies the range estimate to the legal trade value in a selected year to produce the estimated annual value for the black market under study. The estimate by the non-profit policy institute, Chatham House, and the environmental NGO, Environmental Investigation Agency (EIA) of the global illegal ODS trade in 2006 at something between 10–20% (US$25–60 million) of legitimate trade is an example use of this method (Chatham House and EIA 2006, 5). In addition, there are scholars who rely not totally on speculation, but on developing a database with a fairly large number of seizure records to evaluate the magnitude of a black market. For example, Rosen and Smith (2010) used some 967 media reports of wildlife seizures occurred during 1996–2008 to assess the size of international illegal wildlife trade. In a recent publication *World Wildlife Crime Report*, the UNODC (2016) compiled some 164,000 wildlife seizures reported by 120 CITES States Parties to the CITES Secretariat during 1999–2015 to excavate the scale and patterns of transnational illegal trade in endangered wildlife species.

The second method is “input-output balance modelling”. This method estimates the level of environmental crime in a particular country by comparing the legal production (domestic legal production plus legal imports) against the actual consumption (domestic use plus legal exports), with the part where actual consumption exceeds the legal production being assumed to be made up from illicit production and/or imports. The input-output method is often employed in TEC sectors like illegal timber trade where seizures are often difficult to make due in large part to the lack of a mutually-accepted and enforceable definition of the legality of concerned goods between the importing and exporting countries. Lawson’s (2007b, 79, 83) estimates of the levels of illegal logging in timber producer countries Cameroon and Malaysia during 1997–2005 were based on this method.

The third method is “trade data discrepancies”, which produces estimates of the scale of illegal trade in environmental goods by calculating the discrepancies in trade data between importing and exporting countries. This method has been applied mostly in the ODS sector to identify and measure the illegal trade. For example, EIA’s analysis of ODS trade between China and Indonesia found that reported exports from China to Indonesia of CFCs from 2001 to 2004 were more than 1,000 tonnes higher each year than Indonesia’s reported imports of CFCs from China (Clark 2005, 16). UNEP’s study of transboundary movements of CFCs documented great discrepancies in reported CFC
trade data of up to 2,000 tonnes a year between particular importing and exporting countries in the Asia-Pacific (Liu and Bagai 2007, 10). In the two cases, the shortfall of 1,000 or 2,000 tonnes is regarded as an indicator of illegal trade.

By using the above techniques, a number of estimates have been made in the past as to the market value of illegal trade in certain environmental goods. In general, when it comes to illustrate the combined global value of different forms of transnational environmental crime, there are several oft-cited figures, which include US$22–31 billion (The U.S. Government 2000, 28), US$40 billion (Lovell 2002),11 US$30–70 billion (OECD 2012, 14), and more recently a pair of figures offered by UNEP and INTERPOL: US$70–213 billion (Nellemann et al. 2014, 13) and US$91–258 billion (Nellemann et al. 2016, 7). When narrowing down to specific sectors of TEC, for example, the global revenues generated from the trafficking in endangered wildlife species are estimated at EU€18–26 billion per year by European Police Office (Europol 2011, 30) or US$7.8–10 billion per year by Global Financial Integrity (Haken 2011, 11).12 The annual criminal proceeds yielded from global illicit timber trade are assessed to be of US$10–15 billion by the World Bank (2007, 1).

Table 1.1: The black market value for the five major TEC sectors

<table>
<thead>
<tr>
<th>Environmental Crime</th>
<th>Estimated scale or annual market value (in US$)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illegal trade in wildlife</td>
<td>6–10 billion (The U.S. Government 2000, 29); 5–20 billion (Wyler and Sheikh 2008, 1); EU€18–26 billion (Europol 2011, 30); 7.8–10 billion (Haken 2011, 11)</td>
</tr>
</tbody>
</table>

11 The original source for the US$40 billion estimate was attributed to Gavin Hayman (Lovell 2002).
12 Global Financial Integrity is a non-profit, research, advisory, and advocacy organisation located in Washington DC.
Illegal logging and associated trade

<table>
<thead>
<tr>
<th></th>
<th>Estimated Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Bank</td>
<td>10–15 billion</td>
</tr>
<tr>
<td>OECD</td>
<td>10 billion in global revenue loss</td>
</tr>
<tr>
<td>Nellemann et al. 2016</td>
<td>10–30% of the volume of wood traded globally or 30–100 billion</td>
</tr>
<tr>
<td>Nellemann et al. 2016</td>
<td>50.7–152 billion</td>
</tr>
</tbody>
</table>

Illegal trade in ODS

<table>
<thead>
<tr>
<th></th>
<th>Estimated Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chatham House and EIA 2006</td>
<td>10–20% of legitimate trade or 25–60 million for global illicit trade in CFCs</td>
</tr>
<tr>
<td>OECD</td>
<td>10–30% of legitimate trade or 25–60 million for global illicit trade in CFCs</td>
</tr>
<tr>
<td>Nellemann et al. 2016</td>
<td>5.7–15 billion</td>
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</tbody>
</table>

Illegal, unregulated, and unreported fishing

<table>
<thead>
<tr>
<th></th>
<th>Estimated Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>The U.S. Government 2000</td>
<td>4–5 billion</td>
</tr>
<tr>
<td>OECD</td>
<td>10–23.5 billion in 2003</td>
</tr>
<tr>
<td>Nellemann et al. 2016</td>
<td>11–23.5 billion</td>
</tr>
</tbody>
</table>

Illegal trade and dumping of hazardous wastes

<table>
<thead>
<tr>
<th></th>
<th>Estimated Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>The U.S. Government 2000</td>
<td>10–12 billion</td>
</tr>
</tbody>
</table>

**Total**

<table>
<thead>
<tr>
<th></th>
<th>Estimated Impact</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>29–211 billion</td>
</tr>
</tbody>
</table>

* Estimates listed in Table 1.1 have been tracked down as much as possible to their original sources to avoid mistakes that might occur in the course of circular quotation.

 Turning the focus to regional black markets, the Asian black market for illegal environmental commodities for example, in its 2010 “Transnational Organised Crime Threat Assessment”, the UNODC (2010, 17) provides some fresh data on the extent and annual value for illicit trade in selected wildlife products and illegally logged timber in this region. It is estimated that the East Asian market for ivory is worth around US$62 million per year, for rhino horn US$8 million per year, and for tiger parts US$5 million per year; the timber products illegally sourced from Southeast Asia are assessed to be worth US$3.5 million per year.

**1.2.2. The Characteristics of TEC**

In COP 2010, the cross-border nature, governance failure, and the established involvement of organised criminal groups have been identified as the three most prominent factors that sustain environmental crime (COP 2010, 9).

Environmental crime is by its nature transnational in terms of many of its basic components including the contraband involved, perpetrators, impact, and the movement of criminal proceeds. In commodity terms, in a context where the production and demand markets are globally distributed, environmental crime is similarly bound to be a transnational issue, involving wildlife, timber, ODS chemicals, and other environmental...
goods being illegally harvested or produced in source countries and smuggled across borders to the end-use markets which are often in a different country. In perpetrator terms, environmental crime involves multilateral exchanges of illegal goods and passages of illegal profits among an array of illegal operators who are diffused along the chain of custody and who are taking up different roles as harvesters or poachers, processors, couriers, middlemen or intermediaries, exporters, importers, wholesalers, and retailers. In impact terms, environmental crime can cause far-reaching, damaging environmental, economic, political, and societal influences that would never be confined within the national boundaries of individual countries, but rather extending downwards and upwards to multiple affected countries or localities along the trade chain. Moreover, stimulated by globalisation and technological change, the movement of nearly everything from people, goods and capital to information has been greatly increased. The vast magnitude of transboundary flows makes it extremely difficult for national governments to inspect or police every single flow, thus creating a sort of regulation vacuum in which illicit goods and legal ones are moved together through the “front door”, with paperwork provided through fraud, forgery, and corruption (UNODC 2016, 23).

Perceived as an area where the profits can be extraordinarily high, and the risks of detection and of facing penalties that match their crimes are often low, environmental crime has become an attractive option not only for organised criminal groups, but also for terrorist elements and armed insurgent groups. Organised criminal groups specialised in more traditional forms of transnational crime (e.g., trafficking in drugs, people) have taken advantage of their financial capability, established smuggling routes, and networks of collection, transportation, and distribution, diversifying readily their range of illegal undertakings into the area of environmental crime. This brings about a converging threat that approximates to what Bratton (2007, 22-24) referred to as the

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13 The organised elements in part of the international illicit trade in environmental goods have been increasingly recognised by the CITES Secretariat, INTERPOL, World Bank, World Customs Organisation, UN bodies (e.g., UNEP and UNODC), and other inter-governmental organisations. For example, starting from 2001, on recognising the involvement of organised criminal groups in all aspects of illicit trafficking in endangered species of wild fauna and flora, the United Nations Economic and Social Council (ECOSOC) has issued several resolutions that urged the Member States to consider treating such offences as a “serious crime” in their national legislation, especially when there are elements of organised crime involved (ECOSOC Resolution 2001/12, 2002/18, 2003/27, 2008/25, 2011/36, 2013/40). In 2014, the Commission on Crime Prevention and Criminal Justice (CCPCJ) adopted a similar Resolution (CCPCJ Resolution 23/1), calling for Members States to make illicit trafficking in forest products a serious crime, and to promote enforcement, research, and technical assistance measures to combat the illicit trafficking. According to article 2, paragraph (b) of the United Nations Convention against Transnational Organised Crime, “serious crime” is defined as “conduct constituting an offence punishable by a maximum deprivation of liberty of at least four years or a more serious penalty”.

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“mutation of illegal trade markets”, a new threat that blends traditional forms and emerging forms of transnational criminality.

There is a body of evidence confirming the organised nature and elements in the international illicit trade in environmental goods. Between 1989 and 2010, the Elephant Trade Information System (ETIS) recorded more than 55 large ivory seizures with an average volume weighing around 2.3 tonnes (UNODC 2010, 158). The magnitude of the volume and monetary value in ivory trafficking strongly suggests the involvement of well financed and systematically organised criminal groups. The 2011 Europol threat assessment report on organised crime noted that Chinese organised groups, mainly based in Hong Kong, have specialised in the supply of traditional Chinese medicine (TCM) containing ingredients of endangered species to several companies across the EU (Europol 2011, 40). In June 2010, some 12 cylinders of CFC-12 were ferreted out by the Gambian Customs together with a consignment of over two tonnes of cocaine (estimated value at around US$1 billion), demonstrating the link between illegal ODS trade and organised criminal groups involved in cocaine smuggling (WCO RILO A/P 2012).

In other cases, exploitation and trafficking in natural resources have rapidly become a key activity for terrorists and armed insurgent groups. For example, media reports showed that militants affiliated with Al Qaeda are raising funds for their causes through illegal poaching and trade of ivory, tiger pelts, rhino horns, and other animal parts in the Kaziranga jungle in northeastern India and natural parks and reserves in Nepal, Burma, and Thailand (Levy and Scott-Clark 2007). Militias, armed groups, and insurgent groups based in the Democratic Republic of Congo, Sudan, and Somalia have been reported in engaging in poaching of ivory and wildlife trafficking in Chad, Kenya, and other East and Central African countries (Cardamone 2012, 3–4).

Illegal operators have learnt to create new leverage to conduct their illicit business. A U.S. Congressional Research Service report observed that organised crime groups have now incorporated the outsourcing strategy into their illegal commerce through subcontracting portions of their operations offshore to avoid keeping it all “in-house” (Bjelopera and Finkleam 2012, 21). Advanced techniques and sophisticated concealment methods are adopted in the course of trafficking. Illicit goods are hidden deep inside or underneath genuine cargo, wrapped in aluminium foil to hinder detection.
by X-ray machines, painted to obscure their original appearance, or concealed in false bottoms or other hidden compartments in baggage, cargo containers, trains, boats, and motor vehicles (Sellar 2007). TEC also triggers and fosters other forms of criminal activities such as corruption, money laundering, certificates fraud, and others. For example, in an investigation into the illegal trade in Asian big cats in Linxia, China in 2009, researchers from EIA was informed by local wildlife traders that they often used animal skins and exotic goods to bribe local authorities in exchange for tacit permission to sell protected wildlife products (EIA 2009, 6).

1.3. THE STRUCTURE OF THIS STUDY

This thesis is organised into seven chapters, with Chapter 1 as the Introduction and Chapter 7 as the Conclusion. Chapter 2 establishes the conceptual framework around the idea of “networked threats require networked responses”. Chapter 3–5 are three case studies of China’s global trade in illegal wildlife, forest products, and ODS. Chapter 6 examines China’s present legislative and regulatory frameworks and enforcement responses in each of the three TEC sectors, identifying key challenges facing China and developing feasible suggestions for how Chinese regulatory and enforcement agencies can deal with TEC in a networked manner. Because the three case studies involve the use of the network conceptual framework developed in Chapter 2, it is necessary to provide a brief synopsis of the context and main analytical components of the framework before jumping into the case-study chapters.

1.3.1. CHAPTER 2. NETWORKS: A FACILITATOR FOR CLANDESTINE ACTORS OR AN APPROACH TO THEM

As noted above, Chapter 2 is tasked with developing a network-centric conceptual framework, which can then be applied to the study of China-related environmental crime. In doing so, this chapter will synthesise and theorise the various insights about the utilities and relevance of networks from the interdisciplinary literature of network study to answer two central questions: what in essence are the so-called networked threats, and what in essence are the so-called networked responses.

1.3.1.1. DISCOURSE CONTEXTUALISATION

These two questions are fertilised and raised on the work of several influential scholars
from different disciplinary domains that points to a key proposition underpinning this PhD research: that is, *networks and networking matter*.

In short, on one side of the proposition, there have been scholars including among others Elke Krahmann (2003; 2005), David Ronfeldt and John Arquilla (1996; 2001) arguing that an array of dark-side actors, such as terrorist groups and transnational crime of various kinds, are adopting networks in designing their organisational structures and operational tactics. Within this research context, networks are claimed to afford illegal and covert actors a set of selective strengths that empower them to better adapt to and capitalise on the openness of globalisation and advances in information technologies, responding quickly to opportunities and constraints on a global scale. As a consequence, such dark-side actors are said to be evolving into a transnationalised, networked threat posing serious challenges to nation-states. On the other side of the proposition, in reaction to the networked threats, many eminent scholars including, *inter alia*, Anne-Marie Slaughter, Manuel Castells, and Phil Williams propose another chorus of assumption arguing for the great potential and prospect of networked approach for bright-side actors to deal with the networked problems. For example, Slaughter (2004, 160) claims that in the world of today where a diversity of clandestine actors are increasingly operating through global markets, global travel, and global information networks, the best strategy for governments to defeat these networked threats is to adopt a networked response. Williams (1998, 159) argues that governments and law enforcement agencies wishing to dismantle criminal networks have to think and act in networked terms.

Therefore, to some extent, networks present a seeming paradox, or a double-edged sword, in that they act simultaneously as a facilitator for actors on the dark side to achieve their “organisational success” (e.g., profitability, longevity) and a solution for the actors on the bright side for addressing those dark-side threats.

1.3.1.2. **STRUCTURE OF CHAPTER 2**

To disentangle this paradoxical puzzle, Chapter 2 is organised into three sections. First, considering that much of the network research involves theoretical expansion and application extension based on an assortment of conceptual tools developed by social network analysis, Section 2.1 offers a succinct overview of present network study in
sociological literature and identifies the ways in which the concept of networks is being approached and their tangible referents in specific empirical milieus.

Following that, Section 2.2 explores answers to the first facet of the paradoxical puzzle: what are networked threats. This section proceeds along “one trend and two central themes” that I have identified in the literature dealing with organised criminality. First, “one trend” refers to a tendency in which the concept of networks has been treated as a unifying theoretical framework for the analysis and interpretation of changes in the structures and operations of organising criminals. Second, “two central themes” refers to two key motifs that have repeatedly been underscored under the network analytical model. The first motif relates to a growing recognition in both academic arena and policy discourse that traditional theoretical approaches to the organisation of criminal groups and activities as a formal organisation (hierarchical model) or an economic enterprise (market model) are no longer adequate. Relatedly, it is claimed that various dark-side actors including terrorist groups, drug dealers, human traffickers, money launders, and other forms of transnational organised crime have been increasingly morphing into sprawling global networks. The second motif pertains to the argument that networks as a form of social organisation confer on illegal actors a set of organisational and operational strengths, which make them a prickly networked threat or “network-based threat” for state actors to handle. In Section 2.2, I draw on this body of literature to reflect on the notion of networked threats, exploring what are the key utilities and strengths that networks grant their organisational carriers and how network models function as a facilitator for dark-side actors in enhancing and improving their performance.

Section 2.3 explores answers to the second facet of the paradoxical puzzle: what constitutes a networked response. To that end, this section builds on the premise of “taking networks to fight networks” and further seeks to enrich this idea with insights from relevant strands of literature that treat networks as a key source of structural power and that see networking as an effective way of dealing with transnational issues. The main objective is to develop a nascent yet coherent account for the conceptual logic and underpinnings of the notion of networked responses.
1.3.1.3. Two forms of criminal networks identified within the framework

Two forms of criminal networks have been identified within this study’s conceptual framework. First, criminal networks are understood as “transaction networks” in which specific illegal commodities are moved along a series of dispersed independent individuals and/or groups who act around the black markets for illicit proceeds. Illegal operators involved in transaction networks can be diverse, ranging from opportunistic individuals, organised criminal groups, small ad hoc groups of associates, corporations, and corrupt officials. In this sense, transaction networks are employed to describe the basic dynamics of smuggling or trafficking activity and to portray the criminal markets or illegal industry as a whole. Transaction networks typically take the shape of a commodity chain that intersects the localities (e.g., territories, countries, or regions) of source and consumer, sometimes with a third party implicated as a transiting point.

When applied to TEC settings, transaction networks represent the overall chain of the black markets for specific environmental goods such as wildlife, timber, ODS chemicals, and hazardous wastes. As discussed in Section 1.2, environmental crime tends to assume a transnational character, involving cross-border movements of illegal environmental goods from the source countries to consumer countries. Therefore, the analytical focus of transaction networks is on the black market in its entirety. Investigation of TEC transaction networks helps to reveal many aspects that are directly relevant to the formulation of effective policy and enforcement responses to illegal trade. Points of investigation are identified as including among others the defining role (source/transit/consumer) of a particular country involved in the international/regional illegal trade chain, the scale and scope of the black markets, the magnitude and diversity of environmental contraband involved in trafficking or trade, the methods used in conveyance and concealment of illegal goods, the established smuggling routes, and the affected countries.

Second, criminal networks can be “directed networks”, created and sustained by a coterie of core organisers for specific purposes, for example, organised crime groups specialised in drug trafficking that employ networks as their organisational structure. Directed networks can take shape in two basic structural modes: the hub (also called “star or wheel”) networks and the all-channel (or full-matrix) networks. When applied to TEC settings, directed networks refer to the organised criminal groups involved in trading and smuggling of environmental goods. As shown in Section 1.2.2, the
involvement of organised elements in international environmental crime is fairly
evident. Directed networks can pose a significant threat to the international and national
efforts to protect the biodiversity, forest, and ozone layer. This is not only because of
their large-scale, systematic sourcing, smuggling, and supplying of environmental
resources, but also because of their usual linkages with crossover crimes such as
corruption, money laundering, and certificates fraud. Investigation of directed networks
may focus on their organisational structures, relationships among network members,
identification of key participants that are strategically important or unique for the
operation of the directed networks, and so forth.

For three reasons below, this study has decided to only focus on applying the concept of
“transaction networks” to the three case studies, while leaving for future research the
examination of whether or not there have been organised crime groups involved in
China’s illegal trade in environmental goods and whether or not these organised crime
groups are structured in directed networks.

First, in the absence of a robust literature that identifies and analyses China’s role and
utility in the international/regional illicit trade, a focus on understanding the
transnational and transaction dimensions of China-oriented illegal trade chain should be
the starting point. By “China-oriented”, I mean the transnational illicit trade chain where
China sits in the middle as a major source supplying the international black market with
illegal goods, or as a dominant consumer absorbing cross-border inflows of illegal
goods from around the globe. As will be revealed at length in the three case studies, the
part played by China in the international/regional illegal trade of environmental goods
changes by cases. In the wildlife sector, China acts as the world’s dominant consumer
for illegal wildlife; in the timber sector, China remains the world’s largest importer of
illegally felled and traded timber and the major exporter of value-added wood products
made of the imported illegal wood. In the ODS sector, China has emerged as the
world’s leading supplier of illegal ODS in the international black market. Therefore, a
deep mapping and thick description of China-related illegal trade in transnational and
transaction terms should be the first and prime task for understanding China’s global
trade in illicit environmental goods.

Second, by focusing the case study on mapping and analysis of China’s illegal trade
from the perspective of transaction networks, this study adopts a research design that is
akin to “plausibility probes”. That is, it takes the first but crucial step of applying the conceptual framework to grasp a great deal about the transaction dimension of China-oriented illegal trade chain, while in the process seeking to detect and accumulate potential signs for the involvement of organised crime groups in China’s illegal trade. Such signs may include significant financial support, international management of shipments, sophisticated forgery of paperwork, well-armed participants, the involvement of other illegal goods (e.g., cocaine) in the trafficking of environmental contraband, and so forth. Only after we have had reliable evidence supporting the existence of organised crime groups in China’s illegal trade, are we then able to investigate whether or not these organised crime groups are structured in directed networks, shaped in wheel or all-channel networks.

Third, evaluating whether or not perpetrators involved in China’s illegal trade fit in the directed networks in terms of their organisational structures and illegal undertaking requires a different kind of approach and different sources of data. As shown in the following sections, this study has developed, for each of the three case studies, a relatively large-scale empirical database for the mapping and analysis of transaction networks in China’s illegal trade. Collecting and compiling an extra mass of data specifically for directed networks goes beyond the scope of this individual effort.

Each of the case study chapters (as well as the discussion below in this introductory chapter) provides more detail on the sources of data that underpin the analysis. On the rationale for the selection of data sources, this research is informed by a multiple-method approach similar to the analytical approach known as triangulation. This approach integrates multiple data or evidence sources to offer a more detailed and balanced analysis that cannot be provided by any one type of data source. In social science, triangulation is increasingly accepted as an approach that can assist in the reliability and validity of research findings, add richness and complexity to the analysis, improve the understanding of a problem or research question and provide better

14 A plausibility probe is one of the many methods for designing case studies in social science. This method is comparable to a pilot study in experiment or survey research. Its main aim is to allow the researcher to refine the operationalisation of key variables, or to explore the suitability of a particular case as a vehicle for testing a theory or conception before engaging in a costly and time-consuming research effort (Levy 2008, 3–4).

15 For example, potential data sources for researching directed networks might involve judicial verdicts on cases of organised crime offences, interviews with those who are used to be a member of an organised crime group involved in TEC, detailed information about perpetrators involved in large-scale smuggling of environmental goods, media coverage and government reports of the large-scale seizures of environmental goods, and so forth.
guidance for decision-making (Olsen 2004; Downward and Mearman 2007). Data gathering in this thesis relies on a range of primary sources including the UN Comtrade Database, FAOSTAT Database, TRAFFIC Bulletin Seizures and Prosecutions, Chinese Customs Statistics Yearbook and others. Excel is chosen to be the main tool for data pooling and analysis. Numerical data such as bilateral trade information are directly input into the Excel. Textual data like media reports of seizures of illegal environmental goods are coded into a categorical database that encompasses categories like “date of seizure, country of origin/destination, method of transport, number of individuals or items seized”. Tables and figures have been greatly used in this thesis for a more readable presentation of the analytical findings. In addition, this evidence base has been supplemented through semi-structured and open-ended elite interviews conducted with Chinese officials, scholars and NGOs. It has also been supplemented through an extensive review of primary and secondary literatures, including official reports from international organisations such as UN bodies, CITES Secretariat and Ozone Secretariat.

In terms of the approach to the use of above data, this thesis draws lessons from some descriptive practices by “deep mapping” and “thick description”. In humanities deep mapping is characterised as an approach to place that involves intensive topographical exploration that aims to present diverse knowledge systems (e.g., histories, ecologies, poetics, memoires etc.) as being of equally important (Springett 2015, 624). Within this thesis’s context, I invoke the term to underscore my commitment to, by cross-referencing diverse sources of knowledge and information, developing a multi-layered and –faceted sense of networked responses and China’s illegal trade. For instance, in the process of developing accounts for networked responses in Chapter 2, I aspire to build a logical chain that is able to provide a step-by-step explanation of the drivers for, the consequences of, and the adaptive responses by both dark-side and bright-side actors to, the rise of global networks. While in this thesis’s case studies, I treat each source of data as equally important so that I can overcome the weaknesses borne with certain sources of information (for example, seizures only reflect a fraction (or the intercepted shipments) of the entire illegal trade). On the other hand, thick description as used in the fields of anthropology, sociology and religious studies refers to the process of paying attention to the contextual detail in observing and interpreting the social meaning of a human behaviour or an event. It often involves describing a phenomenon in sufficient detail such that the conclusions drawn from a specific case can have a cross-setting validity (Dawson 2010). In this thesis, I use the term in a more metaphorical way to
describe my endeavors to unpack in minute detail the complexity of the transnational and transaction dimensions of China-oriented illegal trade in environmental goods.

1.3.2. CHAPTER 3. CHINA’S GLOBAL TRADE IN ILLEGAL WILDLIFE

Chapter 3 represents this thesis’s first case study of China-related TEC with a specific focus on China’s illegal trade in wildlife. The primary objective is, based on extensive literature review and concrete hard data collected from public sources, to understand the transaction networks involved in China’s global trade in illegal wildlife.

This chapter is organised into three sections. Section 3.1 reviews the international legal trade in wildlife, identifies emerging trends in global trade, and discusses the conceptual range of illegal wildlife trade. In addition, given that existing published estimates of the scale and commodity structure of international wildlife trade are a little out-dated, this section produces an updated estimate by using the 2012 wildlife import and export data extracted from the UN Comtrade Database (the latest data at the time of drafting this chapter).\textsuperscript{16} Section 3.2 categorises the sources of “catalysts” that fuel a worldwide worry over China’s role in the international illegal trade in endangered wildlife.

Section 3.3 collates and analyses 363 anecdotal records of China-related seizures of wildlife drawn from the TRAFFIC Bulletin Seizures and Prosecutions (TRAFFIC 1997–2013).\textsuperscript{17} Time period for the seizure data span 16 years from March 1997 to April 2013. The term “China-related” is defined to include seizure cases involving China as the consumer or supplier of the seized wildlife, irrespective of whether the seizure occurring within China or outside China. Overall, the main objective of this empirical analysis is to, in triangulation with other sources of information such as field surveys by environmental NGOs, provide a comprehensive yet evidence-based understanding of China’s profile in the international and regional trade in illicit wildlife. More specifically, analytical effort has been given to a range of key issues associated with the transaction networks. These include: (1) the nature and scale of illegal wildlife trade in China and its territories; (2) the magnitude and diversity of wildlife illegally traded from

\textsuperscript{16} UN Comtrade Database contains import and export data reported by statistical authorities of close to 200 UN member countries or regions and is considered the world’s most comprehensive database for international merchandise trade. UN Comtrade Database. http://comtrade.un.org/.  

\textsuperscript{17} TRAFFIC Bulletin is a compilation of global media reports on wildlife seizures and prosecutions that took place worldwide in the past ten more years. It is updated and released regularly by TRAFFIC, an environmental NGO monitoring international wildlife trade.
and to China; (3) the hotspots, smuggling routes, and prevailing modes of transport and concealment for illegal wildlife products.

1.3.3. **CHAPTER 4. CHINA’S GLOBAL TRADE IN ILLEGAL FOREST PRODUCTS**

Chapter 4 is the second case study of China-related TEC with a specific focus on China’s illegal trade in timber and wood products. The main objective of this case study is to, based on extensive literature review and bilateral trade data collected from public sources, understand the “transaction networks” involved in China’s global trade in illegal forest products.

This chapter is organised into four sections. Section 4.1 reviews the present state of the world’s forest resources and deforestation. Section 4.2 summarises published estimates of the scale of illegal logging and trade at the global level and in individual countries and defines the term “illegal logging and associated trade”. Section 4.3 provides an overview of China’s global forest footprint, analysing the trends and patterns in China’s production, consumption, imports, and exports of forest products during 2000–2011 based on the bilateral trade data collected from UN Comtrade Database and FAOSTAT Database. 18

Section 4.4 draws upon the “import-source analysis” that incorporates two sources of baseline data: (1) the latest statistics of China’s forest product imports from China General Administration of Customs (GAC) and; (2) published estimates of the level of illegal logging or trade in China’s high-risk supplier countries from government reports or respected research institutions.

1.3.3.1. **IMPORT-SOURCE ANALYSIS**

In the case of China as the subject of investigation, import-source analysis calibrates the illegal content in wood flows from a particular high-risk supplying country to China by multiplying the total RWE (Roundwood Equivalent) volume of the forest products imported by China from that country with the estimated level of illegal logging or trade

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18 The Food and Agriculture Organisation Corporate Statistical Database (FAOSTAT), is an information system maintained by the Statistics Division of FAO. This database collects and disseminates information relating the global production and trade of food and agricultural commodities. FAOSTAT. [http://faostat3.fao.org/home/E](http://faostat3.fao.org/home/E).
in that country.\textsuperscript{19} Two sources of baseline data have been employed in this analysis.

\subsection*{1.3.3.2. Baseline data one: CCSY 2012}

This analysis uses the \textit{Chinese Customs Statistics Yearbook (CCSY) 2012} to calculate the physical volume of China’s 2012 imports of forest products. CCSY is the only official source of China’s trade statistics and generally regarded as the best approximation of the actual trade. The 2012 version of CCSY was the latest series available at the time of this analysis.

\subsection*{1.3.3.3. Baseline data two: published estimates of the level of illegal logging or trade in China’s supplier countries}

Estimates of illegal logging are available in the literature for most of the world’s significant high-risk producer countries such as Mozambique, Indonesia, and the Russian Federation. These countries are often amongst China’s major wood suppliers. Through an extensive literature review, this analysis has been able to garner estimates of illegal logging or trade for a total of 44 countries, which virtually cover all China’s outstanding high-risk wood supplying countries. Countries that are not on the list are often those from which wood flows to China are marginal in quantity. Therefore, excluding them from the analysis will unlikely affect the reliability of the ultimate assessment in any significant manner.

By doing so, this analysis intends to achieve two main objectives. First, most of the existing estimates of the share of illegal timber in China’s forest product imports tend to only cover a limited number of high-risk supplying countries and/or only consider an incomplete spectrum of wood-based products. This analysis elects to overcome those limitations by coming up with a conservative yet reliable estimate with a fairly broad coverage in terms of both the major forest products imported by China and the high-risk supplying countries involved in China’s imports. Second, this analysis develops a comprehensive study of the extent and commodity composition of China’s illegal wood flows, identifying the major high-risk suppliers and mapping out the routes for major tainted wood flows.

\footnote{\textit{RWE} is a standard measure of the volume of roundwood required for the manufacture of a unit of specific wood-based products.}
1.3.4. CHAPTER 5. CHINA’S GLOBAL TRADE IN ILLEGAL ODS

Chapter 5 is the third case study of China-related TEC with a specific focus on China’s illegal trade in controlled ODS. The main objective of this case study is to, based on extensive literature review and concrete hard data collected from public sources, understand the “transaction networks” involved in China’s global trade in illegal ODS.

This chapter is organised into three sections. Recognising that the scholarly treatments of many key issues of global trade in illegal ODS have been presented less systematically, Section 5.1 reviews the various discourses and lays them out in an organised and coherent fashion. In doing so, this section firstly brings clarity to the term “illegal ODS trade” which many scholars rarely attempt to clarify when they discuss the issue. Secondly, this section periodises the historical evolution of the international trade in illegal ODS into three phases: origins, proliferation, and history repeating itself. In each phrase, this section analyses the scale and scope, trading routes, major sources, transiting points, and leading destination markets.

Section 5.2 holds the view that the core mechanism behind the international illegal trade in ODS has been the special market conditions where demand remains unmet due to controlled and curtailed supply. Therefore, this section garners and collates treatments from the literature to categorise factors and drivers that are believed to be responsible for the formation of such market conditions.

Section 5.3 firstly uses the bilateral trade data drawn from the Ozone Secretariat Data Centre and UN Comtrade Database to document China’s history and present state of ODS production, consumption, and trade. Secondly, this section compiles and analyses 85 records of China-related ODS seizures that occurred during the period from January 2000 to April 2014. The seizure data is collected from a number of reports by government agencies, environmental NGOs, and international organisations. The main purpose of this analysis is to investigate China’s role in the international trade in illegal ODS, the scale of China’s black market, the magnitude and diversity of ODS chemicals involved, major destination markets for Chinese-produced ODS, and the prevalent methods for smuggling and concealment.
1.3.5. Chapter 6. China’s Response to TEC

Chapter 6 examines China’s legal frameworks and enforcement responses in the three selected TEC sectors. This chapter is organised into three sections. In each section, in conjunction with the empirical findings of the transaction networks by the case studies and the understanding of networked responses developed in Chapter 2, this chapter identifies the key challenges facing China in tackling its illegal trade, and pinpoints the critical points where China’s wildlife enforcement agencies can step in to maximise their effort.

1.3.6. Main Arguments

This study makes two broad arguments: one theoretically oriented and one empirically directed. First, this study argues that while the concept of networked threats can be approached along the dimensions of transaction networks and directed networks, networked responses are not a standard, formatted mode of regulatory or enforcement responses. Rather, networked responses should be understood as a special way of thinking and acting: a way that sees a bright-side actor (e.g., enforcement agencies) as operating in an environment occupied by various networks and entities, which simultaneously present challenges in terms of amplified (networked) threats, as well as opportunities in terms of power amplifiers for the bright-side actor, in the sense that they could potentially be leveraged for tackling these threats. In other words, in addition to the traditional logic of increasing resource power, network thinking emphasises cultivating connections or relational resources rather than cultivating physical or hard resources.

On the other hand, network thinking analyses an actor first by looking at whether or not it is a participant of an influential network, and whether it is placed in an advantageous or disadvantageous, a favourable or less favourable position in that network. Then, network thinking will consider strategies to move that actor from a less favourable position to a favourable one. This study argues that the overall logic underlying networked way of thinking and action is that, in an increasingly networked, horizontal world, power comes from connections with and the positioning of influential networks and, that power is critical for dealing with transnational issues (including TEC).
Second, China’s global trade in environmental contraband is typified by the substantial scale of China’s black markets and the deep embeddedness of China in the international and regional illicit trade chain. These two features, on the one hand, pose a serious challenge to the Chinese government in tackling its TEC; while on the other hand, they imply that Chinese effort and progress made toward the addressing of its illegal internal trade will likely have a substantive, positive overflowing effect on the whole of the international and regional illegal trade. In the meantime, this study argues that a good starting point for addressing China’s illegal internal trade is to overcome the regulatory and enforcement obstacles identified by this study.
2. **Networks: A Facilitator for Clandestine Actors, or An Approach to Them?**

Anne-Marie Slaughter (2012a, 45), a noted political scientist, once put it that in the world of the twenty-first century, the most important contextual transition in the international system is not the rise or decline of great powers, but the “ubiquity and density of global networks”. The last decades have witnessed the phenomenal expansion in the quantity, density, global reach, power, and influence of global networks of varying kinds with infiltration into nearly every domain of both “the world of states” and “the world of society”. A wide spectrum of social, economic, and political actors – whether in benign or malign forms, ranging from nation-states, government officials, financial regulators, to corporations, NGOs, universities, social and political advocacy groups, and to criminals and terrorists – are all interacting with their domestic partners and foreign counterparts through network-like associations of various scales and configurations to deal with a broad range of transnational issues (Slaughter 2004a, 159–61). Networks, Slaughter argues, are reshaping and redefining the ways in which individuals and institutions “communicate, produce value, consume, collaborate, compete, fight, organise, express themselves, lead and follow” in an era of globalisation and information (Slaughter 2012a, 46).

In the research areas of non-traditional security and transnational criminality, a number of other scholars including John Arquilla and David Ronfeldt (1996, 2001), Elke Krahmann (2003, 2005), Phil Williams (1994, 1998, 2001), Mark Duffield (2005) and many others, too, present a chorus of concerns with an ostensibly networked trend in contemporary international and national security environment. Inspired by the notion of “cyberwar”, in their coauthored report, *The Advent of Netwar*, Arquilla and Ronfeldt coined the term “netwar” to describe what they saw as an emerging form of low-intensity societal conflicts and crime waged by “social networked actors” in the information age. These new forms of conflicts and crime are distinguishable from traditional modes of conflict and crime, in which the protagonists prefer to develop “formal, stand-alone hierarchical organisations, doctrines, and strategies”. In contrast, these networked actors, such as transnational terrorist groups, criminal syndicates, law enforcement agencies, and militant groups, are employing “network forms of organisation, doctrine, and strategy” in an effort to improve their performance (Arquilla and Ronfeldt 2001, 7). Similarly, in her article *Security Governance and Networks,*
Krahmann (2005) draws attention to a networked transformation in the contemporary security environment. The scholar contends that a networked mode of coordination has proliferated remarkably both horizontally and vertically: among new fields of security threats such as terrorism, transnational crime (including TEC), and WMD proliferation, as well as among a multitude of state and non-state actors. The concepts of networks and security governance are said to be more precise in grasping the core aspects of the changing nature of contemporary security architecture.

With a review of above scholars’ work, an image of a confrontational interaction can be sketched. That is, at one side of the “battle”, an array of entities in malign forms including terrorism and transnational crime of various kinds, or “dark-side” actors as in Raab and Milward’s (2003) language, are adopting networks in designing their organisational structures and operational tactics. Within this research context, networks are claimed to empower illegal and covert actors, including those involved in TEC, to better adapt to and capitalise on the openness of globalisation and advances in information technologies, so as to respond quickly to opportunities and constraints on a global scale. As a consequence, dark-side actors are said to be evolving into transnationalised, networked threats posing serious challenges to nation-states.

While along the opposing line of the confrontation, an alignment of state actors including government institutions and military units as well as non-state actors such as international organisations, NGOs and other “bright-side” agents are also developing network-based strategies and coordination with a view to strengthening their capacity to deal with above new threats. The doctrine of network-centric warfare developed by the US military in countering terrorism and drug trafficking (Cebrowski and Garstka 1998; Ladymon 2001), the grand strategy of network centrality proposed by Slaughter (2012a), the emergence of multilateral intergovernmental and non-governmental networks on issues such as combating money laundering and global crime, freezing terrorist assets, and sharing vital information (Slaughter, 2004a), all are part of the tangible manifestation of a variety of networked forms of security, regulation, and enforcement practices and arrangements. “Networked responses to networked threats” seems to become a promising development favoured in the worlds of both theory and practice.
In a nutshell, to some extent, networks present a seeming paradox, or a double-edged sword, in that they act simultaneously as a facilitator for actors on the dark side and a solution or a toolset for the actors on the bright side for addressing those dark-side threats. Then the core question is how can networks simultaneously be a “capacity enhancer” for two opposing lines of actors? When we resort to the existing literature to garner treatments to flesh out our understanding of what in essence are the so-called networked threats and networked responses, we find significant knowledge gaps. That is, although the literature allows us to collect a number of suppositions, such as “it takes networks to fight networks” (Arquilla and Ronfeldt 2001, 15) or “networked threats require networked responses” (Slaughter 2004a, 160), these propositions have largely been dealt with in more general terms that lack in-depth diggings into the more nuts-and-bolts issues including, for example, what are the key aspects and utilities of networks that make designs or arrangements espousing them as prospective facilitators or solutions.

This chapter elects to address this gap. To disentangle this paradoxical puzzle, this chapter is organised into three sections. First, since much of the network research involves theoretical expansion and application extension based on an assortment of conceptual tools developed by social network analysis, Section 2.1 reviews the present network research in sociological literature to understand how the concept of networks is being approached by the relevant literature. Following that, Section 2.2 will address the first facet of the paradoxical puzzle of this chapter: in what sense do networks act as a facilitator for criminal actors in terms of improving their performance. It will do so by examining the literature of organised criminality research, and exploring the sets of defensive and offensive strengths that networks grant the dark-side actors. In the final part, Section 2.3 explores answers to the second facet of the paradoxical puzzle: what constitutes a networked response. In doing so, this section takes the proposition of “taking networks to fight networks” as the starting point and then, it will develop around this idea by absorbing various insights from the literature on how to treat networks as a key source of structural power and how can networking be an effective way of dealing with transnational issues. The focused aim is to develop a nascent yet coherent account for the conceptual logic and underpinnings of the notion of networked responses, which can then be used as the guidance for the development of suggestions on how the Chinese regulatory and enforcement agencies might formulate their own networked responses to TEC.
2.1. Present State of Network Research

Network research flourishes today in social sciences, invoking an upsurge of interest from sociologists, economists, and political scientists in the study of contemporary practices and arrangements and resulting in multiple productive lines of scholarship.\(^{20}\) Moreover, as network research advances along substantive strands of academic disciplines, the terrain of its application has been widened, including now a plurality of issues and topics that span over network governance, political and policy networks, issue networks, social networks, networked economy, cultural, scientific and scholarly networks, social movements, criminality and terrorism, and the network society (Freeman 2004, 5; Lewis 2010, 51).

Among the multiple lines of network scholarship, in addition to the allegorical use of networks, network theorists and analysts often distinguish between two separate yet interrelated branches of network literature, with each embracing a distinct approach to the concept of networks. In their seminal work, *Networks and Economic Life*, Powell and Smith-Doerr (1994, 368–70; 2005, 380) identify two independent strands of socio-economic literature on network research. The first is, in their vocabulary, “formal network analyses”, which is anchored deeply in sociology and organisational theory and employs networks as an analytical or empirical device to analyse associations of social actors. The key theoretical and empirical values of this vein of scholarship are on the instrumental role of networks in enabling analysts to explore and understand the patterns of sophisticated social relationships and their impact on economic outcomes. The second strand of network literature is more multi-disciplinary and theoretically oriented, invoking networks as a metaphor to characterise a form of economic organisation, governance, or organising motif that is fundamentally distinctive from the hierarchical or market-based kinds. Likewise, Thompson (2003, 5) provides a comparable account with respect to the conceptual positioning of networks in socio-economic literature. He demarcates networks as both “a method of thinking through the contemporary nature of social existence and a concrete form of social organisation; a conceptual category or tool of analysis and an object of analysis in the form of an actual

\(^{20}\) According to Knoke and Yang (2008, 1–2), the volume of social science publications with “social network” as a key concept has mushroomed exponentially since 1975; while Borgatti et al.’s (2009, 892) investigation of the published research with the topic of “social networks” in the “Web of Science” also indicates that its amount has nearly tripled in the past decades.
mode of coordination and governance”. Lewis (2005, 10–1; 2009, 51–2) agrees to the typology that approaches networks as a conceptual device and a form of governance and coordination. She adds that networks as a conceptual model can be further differentiated between networks as a theory and as an analytical technique, with the former serving as a means for thinking about the interconnectedness of actors and organisations, and the latter providing tools for measuring and analysing it.

2.1.1. NETWORKS AS AN ANALYTICAL TOOL

As an analytical device, network analysis contains a toolkit of concepts and a set of statistical techniques and methods, which originate largely in social network analysis and are then being introduced to other disciplines (e.g., politics, criminology). Network analysts following this line of research use a set of nodes connected by relations to represent a network. In a broad sense, nodes can be persons, groups, organisations, or other socially-relevant objects such as countries, neighbourhoods, departments within organisations, and positions and locations. Relations connecting a pair of nodes – also termed connections, ties or links – can vary among collaborations, friendships, trade ties, flows of information or resources, exchanges of social support and others (Marin and Wellman 2011, 11-2). A network connecting nodes via links reflects a pattern of relations, and can be conceived of as a type of structure (Ward et al. 2011, 246). Thus, the main focus of network analysis is on exploring the patterns of relations among social, economic, and political actors to understand how certain patterns of relations or certain types of network structure shape social, economic, and political outcomes.

Network analysts diagnose networks through two lenses: the network level and the node level. At the network level, analytical attention is given to how the network of interest is structured (for example, its components are densely or sparsely interconnected) as well as the effects of the network structures on the performance of the network. At the node level, the main concern of network analysis is the opportunities and constraints that are generated by a network position and their effects on the outcomes of the occupant of that network position. Borgatti et al. (2009, 894) classify outcomes at the node level into

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21 In Thompson’s (2003: 37) views, there is a nuanced difference between coordination and governance. Coordination refers to the state in which the constitutive elements of a given system “are somehow brought into an ordered pattern, considered and made to act together”, while governance points to “the regulation of these elements, the effectiveness of their reproduction, of their alignment and coordination”.

22 Borgatti et al. (2009, 893) categorise the dyadic relations between network members into four basic groups: similarities (in terms of locations, memberships, etc.), social relations (kinship, affective ties, etc.), interactions, and flows (exchange or transfer of resources or information).
two major categories: homogeneity and performance. First, node homogeneity refers to the similarity in attitudes or behaviours between a pair of actors. For example, social influence literature asserts that the convergence in attitudes and behaviours of two individuals can be attributed to the similarity in their social network positions, which cause the two to expose to similar constraints and opportunities, and thus push them to make the same choices (Christakis and Fowler 2007). Second, the performance of a given node can have multiple meanings under different research and social settings. For example, when the nodes represent individuals, the study of node performance might focus on how the opportunities and constraints bound to a network position function in the occupant’s attempts to find a job, get a promotion, or get financial capitals to start businesses. When the nodes stand for organisations, the study of node performance might be concerned with how the ties of a network position help or restrain its occupant in seeking access to valuable information and resources, to more rapid product development, or to enhanced innovation (Powell and Smith-Doerr 2005, 389; Marin and Wellman 2011, 17).

Network positions – which are defined as an actor’s structure positions in relation to other actors in a relational network – both empower and constrain the action of the occupants, in the sense that they impose limits as well as offer opportunities. Therefore, occupants of a network position that faces fewer constraints and enjoys more opportunities are in favourable structural positions, and enjoy a set of structural benefits brought about by the favourable positions (Burt 1993). The structural benefits – such as mobilising resources, selectively sharing information, exerting greater influence, drawing more attention, extracting better bargains in exchanges and so forth – can be translated into the node’s power and influence in certain social environments (Van der Hulst 2009, 107–8).

Although assessing whether a position is favoured or weak needs to consider in terms specific to concrete social contexts, normally, structural holes and centrality are two pragmatic kinds of advantageous network positions that are argued to afford occupants a range of competitive benefits. According to Burt (2009), structural holes refer to a gap between two disconnected actors who have complementary resources or information. Actors who are able to extend their social networks to cover the structural holes and

23 In explaining the correlation of particular network structures and network positions with particular outcomes, network researchers introduce four mechanisms or effects of networks: transmission, binding, adaptation, and exclusion. More details see Borgatti et al. 2009, 894; Lazer 2011, 62.
connect the two disconnected can use their position as a source of power by controlling the path of communication.

In social network analysis, the concept of centrality is differentiated among degree centrality, closeness centrality, and betweenness centrality. Degree centrality measures the number of direct contacts that a node has in a given network. Actors with high scores in degree centrality are assumed to have access to multiple behavioural alternatives. The kinds of power that generate from a network position with a high degree centrality embody in two aspects. First, by having more direct ties, the actor commands a degree of control over other nodes whose exchanges with one another rely on the path through the central actor. In other words, this kind of control power is a function of the circulatory effect of networks, which assumes networks as a structure through which things (e.g., information, social support) circulate. Second, by having multiple choices in terms of securing needs, the actor is able to remain less dependent on others. As Keohane and Nye (1998, 86) point out, “the ability of being less vulnerable to manipulate or escape the constraints of an interdependent relationship at low cost is an important source of power”.

Closeness centrality refers to actors who are closer to more other actors in a given network. Actors with high scores in closeness centrality are presumed to be able to transfer resources more quickly, or remain more reachable by other actors. By positioning closer to more nodes in a network, the actor can have his or her views being heard by larger number of nodes, which allows the actor to occupy the centre of attention. This structural benefit enabled by closeness centrality might prove vital in today’s information society, where the flows of information are often overloaded, and the attention becomes a scarce resource (Keohane and Nye 1998, 89). Betweenness centrality measures the number of paths that are required for an actor to reach all other nodes in a given network. Actors with high scores in betweenness centrality are assumed to be capable of transferring the items through the network in the fastest manner (Hanneman and Riddle 2005).

Since the opportunities and constraints associated with a network position are directly relevant to the occupant’s “ability to produce intended effects on the attitudes and behaviours of other actors” (Knoke 1990, 9), network positions are further employed in the study of power and influence (e.g., Brass 1984; Bonacich 1987). Power deriving
from a network position can be understood as both relational and structural expressions. Being relational is that it indicates the relatively preponderant influence that the occupant of a network position has over other network members. In this way, power is a consequence of patterns of relations. A pattern of relations reflects a type of structure. Therefore, power is also a structural expression of the network: certain network structural positions are more advantageous or favourable than others in terms of empowering their occupants.

In sum, network positions in a relational network empower or constrain the action of their occupants due to the limits or opportunities bound to that network position. Network positions that expose to fewer limits and more opportunities are advantageous or favourable positions. The empowerment mechanism of a favourable network position on its occupant speaks that the former is able to provide the latter with a set of structural benefits. Such benefits can enhance that occupant’s ability to alter the attitudes and behaviours of other actors in certain social contexts in order to produce the intended results.

2.1.2. NETWORKS AS A FORM OF GOVERNANCE AND COORDINATION

Empirical evidence for the prosperity of networking developments in substantive issue areas is plentiful. In the business world, firms and enterprises are engaging in an array of collaborative activities that involve various forms of relational contracting, for example, subcontracting, strategic alliances, joint venture, and research consortium, to coordinate and safeguard exchanges and to adapt to environmental contingencies (Powell 1990; Powell and Smith-Doerr 2005). In public management and policy sector, a new governance model wrapped in various packages such as “policy networks”, “inter-organisational networks”, and “horizontal government” has come along to be a strong addition to the traditional large-scale and bureaucratic public organisations in the delivery of public goods and services (Kim 2014). In non-traditional security domain, scholars claim that there has been a proliferation of networked modes of coordination that operate under the rubrics of either the transnational governmental networks that link legislative, judicial, regulatory and enforcement communities across borders, or the public-private partnerships that connect government officials, international organisations, and private actors (Krahmann 2003, 2005; Slaughter 2004b). In global environmental regulatory and enforcement arena, multiple regional and national
enforcement and regulatory networks have been established to bring together government officials from the source, consuming and transiting countries to cope with the cross-border nature of environmental offences (Elliott 2012, 98–9).

In the interdisciplinary field of network study, such network-like arrangements and practices are capped with different brands in different empirical ambiences. Socio-economists frequently use such terms as “network organisation”, “network forms of organisation”, “inter-firm networks”, or “business groups” to describe inter-firm collaborative networks and consider them as a distinct, separate form of coordinating economic activity (Powell 1990, 301; Jones et al. 1997, 913); the one with its own defining order and attributes (e.g., reciprocity and trust) that enable it to stand distinguished from bureaucratic structures (hierarchies) and formal contractual relationships (markets) (Thompson, 2003). Public policy research invokes the term “network governance” to characterise an emerging network-based governance model (Kim 2014). Security policy studies categorise the collaborative networks among public and private security providers under the notion of “security governance” – which is construed as a new mode of coordinative mechanism that allows “a set of public and private actors to coordinate their interdependent needs and interests through the making and implementation of binding policy decisions in the absence of a central political authority” (Krahmann 2005, 20).

Despite the differences in the names, aims, activities, and memberships of the above empirical referents, a shared core character cuts through all these diverse networked variations. That is, they are inclusive and lateral coordinative structures or processes that deny the presence of a formal contractual relationship or central command and invite the participation of a variety of public, private, and nonprofit actors. More prominently, behind the myriad networked manifestations, we might sense a shared logic of managing and dealing with contemporary social, economic, and political problems. It is the logic of “networking”: the one of joining things up toward a common goal, or bringing relevant autonomous agents into a distinctive governance and coordination structure that is specifically designed for the addressing of a particular issue.

Scholarly attempts have been made from different perspectives to explore the enabling conditions that foster the formation and thriving of networked coordination. The
enabling conditions will assist us in understanding the rationale behind the actors’ choices of forming networked coordination or governance rather than market or hierarchy-based ones. *Transaction Cost Economics Theory* (TCE) factors in three dimensions associated with an exchange: the uncertainty (e.g., deriving from the environmental complexity or opportunistic activity), the degree of asset specificity (e.g., the unique knowledge developed by participants in exchanges), and the interaction frequency between exchange partners (Rossignoli and Ricciardi 2015, 12). This theory argues that compared to markets and hierarchies, the strengths (e.g., fast access to information, responsiveness to changing demands) and social mechanisms (e.g., restricted access to exchanges, reputation, and collective sanctions) of networks make them a more cost-efficient form of governance in rapidly changing markets characterised by high levels of demand uncertainty, complex and customised tasks, and recurrent and frequent exchanges (Jones et al. 1997, 926).

In contrast with TCE that sees network coordination as a result of the firms’ initiatives to minimise transaction costs for increased profits, *Resource-dependency Theory* (RDT) offers an external perspective that focuses on the environment where the said actors operate. RDT ascribes the activity of one organisation forging external relations with others to the need for controlling and securing the resources that are critical to the organisation’s survival or grow. Studies of interorganisational relations assume that firms are not self-sufficient entities, but are rather operating in uncertain environments where resources vital for the firms’ survival or functioning are often in the hands of other organisations due to such factors as resource scarcity or industrial specialisation. In order to reduce environmental uncertainty, firms attempt to take measures to secure access to the complementary resources controlled by others. In contrast with integration-oriented strategies such as merger or acquisition, collaboration-based interorganisational partnerships or coalitions (e.g., joint venture alliances or long-term outsourcing agreements) proves a more agile, less costly, and less irreversible means to connect the resources (Preffer and Salancik 2003, 167). Just as Porter and Fuller (1986, 321) point out: “the choice of a coalition implies that it is perceived as a less costly or more effective way to configure than the alternatives of on the one hand developing the skills to perform the activity in-house or on the other hand of merger to gain the capabilities to perform the activities or to buy products or skills in arm’s-length transactions”. Additionally, arguments have been made from other theoretical angles for the comparative advantages of networked alliances over integration. For example,
scholars working on the theory of knowledge and learning laud the relevance of cognitive distance and discrete sources of experiences and knowledge among group members in promoting complementary cognition and devalue integration because it reduces the cognitive distance and forces cognitive convergence (Nootenboom 2004: 192).  

2.2. NETWORKS: A FACILITATOR FOR CLANDESTINE ACTORS?

There has been a trend in the literature of international relations and criminology on the study of criminal activities from the perspective of networks. The concept of criminal networks has increasingly become a “theoretical framework” or “theoretical paradigm” for analysing and interpreting changes in the structures and operations of the “organising criminals” (Van Duyne 1997, 219; Slaughter and Zaring 2006, 215; Eilstrup-Sangiovanni and Jones 2008, 7). Within this network research framework, two themes have repeatedly been emphasised.

First, it is claimed that traditional theoretical approaches to the organisation of criminal groups and activities as a formal organisation (hierarchical model) or an economic enterprise (market model) are no longer adequate (Williams 1998, 16; Waring 2002, 44–45; Shelley and Picarelli 2002, 305; Bruinsma and Bernasco 2004, 79; Bjelopera and Finklea 2012, 21). Findings in a number of empirical studies of various criminal activities, especially the market-oriented trafficking or smuggling activities, reveal a distinct form of social organisation in which the manner that criminal activities are organised and co-offenders are connected bears no resemblance to either the authority mode of hierarchy or the competition mode of market. For example, Natarajan’s (2006) study of some 2,408 wiretapped conversations among 294 members of a heroin-dealing gang in New York found that this criminal group did not form a unitary organisation; but instead it had developed into a loosely structured network with little or no hierarchy. Michael Kenney’s research on drug trade in Colombia suggested that the Colombian cocaine trade was largely patterned with “a fluid social system” filled with flexible exchange networks of various shapes, scales, and shades of organisational

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24 The concept of cognitive distance was proposed by Nootenboom and defined as a way “to interpret resource heterogeneity between the firms that hold these different resources”. It can be understood as the distance between the specialised knowledge bases of the actors involved in a collaboration (Balconi et al. 2012, 6).
sophistication, expanding and contracting according to “market opportunities and regulatory constraints” (Kenney 2007, 179).

Second, it is argued that networks as a form of social organisation afford illegal actors a set of organisational and operational advantages, which make them a thorny “networked threat” or “network-based threat” for whomever to combat. For example, Klerks (2001) stated that for present-day sub-legal activities such as producing and trafficking illicit products, the network form of organisation proved to be better adapted to modern modes of collaboration, trading, and communication than traditional hierarchical structures. Naim (2005) chronicled a range of illicit trading networks of trafficking in arms, drugs, people, and of intellectual piracy, contending that these networks were highly decentralised, agile, stateless, and capable of quickly entering into complex arrangements in response to market opportunities and threats.

In this section, I draw on this body of literature to reflect on the idea of networked threats, exploring what essentially the characteristics and utility can the network-based organisation grants its carriers and how does network models function as a facilitator for dark-side actors to achieve their “organisational success” (e.g., profitability, longevity). The purpose of doing so is to develop answers to the first facet of the paradoxical puzzle raised by this Chapter: what are networked threats.

2.2.1. CRIMINAL NETWORKS AND NETWORK STRUCTURES

Marin and Wellman (2011, 16) suggest that “one approach to applying a network perspective to a substantive area is to take a key concept within that area and define it in network terms”. Then what constitutes a “criminal network”? In its simple form, a network can be understood as a compilation of nodes that are connected through formal or informal links of communication and/or exchange of resources (Eilstrup-Sangiovanni 2005, 7–8). Networks vary along multiple dimensions including size, shape, membership, goal, portfolio of undertakings, and other parameters. When applied to illicit settings, extending from the work of Phil Williams (1998, 154; 2001, 69; 2006, 199), criminal networks, especially those revolve around certain black markets (including those involved in TEC), can come in two different but correlated forms: transaction networks and directed networks.
2.2.1.1. Transaction Networks

First, criminal networks can be “transaction networks”, in which specific illegal commodities are moved along a series of dispersed independent individuals and/or groups who act around the black markets for illegal proceeds. Illegal operators involved in transaction networks are diverse, ranging from opportunistic individuals, organised criminal groups, small ad hoc groups of associates, corporations, and corrupt officials.

Transaction networks are usually employed to describe the basic dynamics of smuggling or trafficking activities and to portray the criminal markets or illegal industry as a whole. In this sense, transaction networks can be equated literally with the concept of “commodity chains”, in that both concepts view the licit/illicit markets as a dynamic process composed of decentralised yet articulated activities at discrete custodian stages of the chain. Through the transaction chain, illicit goods are being produced, taken or harvested, processed, transported, exported, imported, distributed, sold, and consumed.

Transaction networks often assume a transnational character, engaging a multiplicity of illegal operators that spread in the countries of source, transit, and destination. They are typically characterised by properties of “self-organising, decentralised and horizontal structures, arm’s length transactions” and agents’ behaviours being disciplined by price and competition mechanisms (Kenney 2007, 31; Thompson 2003, 23).

2.2.1.2. Directed Networks

Second, criminal networks can be “directed networks”, created and sustained by a coterie of core organisers for specific illicit ends, for example, organised criminal syndicates specialised in drug trafficking which employ networks as their organisational structure. The interrelationship between transaction networks and directed networks lies in that transaction networks are made up of a web of dispersed directed networks and individual offenders whose self-interests-driven activities articulate with one another along the chain of custody and work as a whole in prompting the smooth functioning of the overall black markets.

The archetypal type of directed networks may take shape in two basic structural modes (Arquilla and Ronfeldt 2001, 7–8; Kenney 2007, 29–36). First, directed networks may be shaped in “hub, star or wheel” structures, which encompass a central actor (e.g., a
group or an individual) and a set of peripheral nodes that are all tied to the central actor. The defining characteristic of wheel networks is that the central actor assumes a preponderance of power, influence, and status within the network. There are no horizontal connections among peripheral nodes whose communication and coordination with other peripheral nodes thus must go through the central actor (Williams 2001, 72). Relationships among members of core nodes are often stable, usually underpinned by bonding mechanisms such as family, kinship, ethnicity, or common experiences. Core actors are undertakers of multitasks, involving making decisions, initiating and organising illegal activities, orchestrating the dispersed efforts of peripheral nodes, providing security and resolving disputes among participants, establishing and sustaining coordinative relationships with corrupted law enforcers and so forth. In short, core actors act as the “steering mechanism” for the wheel networks (Kenney 2007, 29).

By contrast, nodes in the peripheral zone are featured with “less dense patterns of interaction and looser relationships” (Williams 2001, 73). Peripheral nodes may be formal members with enduring, stable relations with a criminal network, yet they may be independent groups or individuals but contracted with the network to perform specific tasks or provide specific services (e.g., money laundering, commodity transportation or distribution). Accordingly, wheel networks may contain a stable core actor and a finite set of formal peripheral actors, but may enjoy a series of informal linkages, ties, or relationships with other criminal groups or individuals. For example, a research on Asian Organised Crime (AOC) operations reveals the “structural flexibility and fluidity” of many AOC groups in that members of some AOC groups simultaneously involve two or more roles (e.g., organiser or low-level labour) in different AOC groups at the same time (Beare 2010, 8).

Second, directed networks may be structured in “all-channel or full-matrix” model, in which every node is connected to everyone else. In the views of Arquilla and Ronfeldt (2001, 8–9), all-channel networks are the paradigmatic organisational structure that typifies netwar adversaries. All-channel networks are thought of as the one that is most difficult to organise and sustain due partly to the requirement for highly dense and secure communication capacity. Meanwhile, they are also the one that affords a host of strengths that are believed to be critical for both effective collaboration among network members and defence against law enforcement attacks. This is because all-channel networks are flat in organisational structures (relatively few management layers) and
decentralised in decision-making and operations. There is no single, central leadership, command or headquarter that can be targeted by law enforcers. This also means that dismantling single nodes will not necessarily lead to the dysfunction of the networks as a whole.

In practice, demarcating lines between various archetypal network structures are not always clear-cut. The more common case is that a variety of hybrids or mutations of network structures, or combinations of different organisational structures (e.g., networks or hierarchies), come into existence and obscure the theoretical classification.

First, components of a transaction network may be structured in wheel or all-channel forms. In wheel networks where the central actor dominates in terms of the influence and power, there may exist varying degrees of vertical connection (either one-way or two-way) between the central actor and peripheral nodes as well as varying degrees of lateral interaction among peripheral nodes, rather than the case that peripheral nodes exclusively rely on the central actor to exchange information with one another. Out of consideration for safety, between the core leaders and peripheral nodes, there may be firewall-like intermediaries or brokers who are authorised to exercise part of the leaders’ discretion in order to buffer the central actor from direct complicity in criminal activity. This thus adds a third organisational tier to the two-level wheel networks.

For example, by comparing three cases of the drug-trafficking networks, the Al Qaeda terrorist networks, and the diamond trafficking networks in West Africa, Raab and Milward (2003, 430) argue that attempts to find a united pattern of organisational structure in all these covert networks are fruitless. Network structures vary greatly depending on the specific opponents and competitors, “from complex overlapping and interlinked structures of the diamond and arms trade to the chain of bilateral contract relations of the heroin trade”. The need for survival in a hostile environment determines that illegal networks must have a flexible structure that would enable them to react rapidly to changing pressures from their legal adversaries and illegal competitors. Ming Xia’s study of contemporary organised crime in China suggests that Chinese criminal organisations may come in four different network structures: multi-polar networks, cobweb (zhizhuwang), production and distribution chains, and hub-and-spokes structures (lunfu). According to Ming Xia’s (2008, 17–21) interpretations, the “hub-and-spokes structures” and “production and distribution chains” are structurally equivalent
to the wheel networks and transaction networks respectively, while the remaining two network modes are actually the mutations of the archetypal wheel networks. For instance, the “multi-polar networks” can be construed as a web of multiple independent wheel networks connected by arms-length transactions. The “cobwebs” are in effect an enlarged wheel network, or dubbed by Ming Xia as “stratified unipolar system”, in which there are a few dominant leaders as well as a number of peripheral groups that, although taking orders from the central leader, act in relatively independent terms in developing their illegal businesses.

Second, networks may coexist with hierarchies at different organisational levels within a single structure. Rigid hierarchies, for example, may predominant at the core of some criminal syndicates, but hubs and chains preponderate in tactical operations. There may also be organisations that are overall structured in networks, but have particular nodes designed in hierarchies and vice versa (Arquilla and Ronfeldt, 2001, 8–9).

2.2.2. STRENGTHS AND CHARACTERISTICS OF CRIMINAL NETWORKS

Another frequently highlighted theme in the literature of organised criminality study is that the reliance on network structures confers on illegal actors a set of selective strengths which make them a threat difficult for state actors to cope with. The challenge further complicates in difficulty especially when the government authorities that are responsible for combating them reflect the qualities described by Williams (1998, 159) that they are, “composed of and reliant on large, bureaucratic hierarchies that operate according to standard operational procedures, and are bound by budgetary constraints, and are, for the most parts, cumbersome”.

On the basis of review of several scholars’ work on network strengths and characteristics (Williams 2001, 69–84; Williams and Godson 2002, 332–5; Arquilla and Ronfeldt 2001, 11–2; Eilstrup-Sangiovanni 2005, 9–10; Eilstrup-Sangiovanni and Jones 2008, 13–6; Kenney 2007), the coming section synthesises the strengths and characteristics of networks into two broad dimensions: defence and offence. Overall, network strengths can be briefly summarised as, on the defensive end, the networked design enables illegal actors to be resilient and resistant in the face of adversity. While in terms of the offence potential, illicit networks can be flexible and adaptable in response to both challenges and opportunities.
The defensive capability of criminal networks consists mainly in their resilience and resistance to the infiltration and disruption of their legal counterparts or illegal competitors. According to Julie Ayling (2009, 185), the resilience of criminal networks is their capacity “to absorb and withstand disruption” and “to adapt to changes when necessary”. The sources of resilience for criminal networks may include the environmental factor, and the network structural characteristics such as “loose coupling” and “redundancy” (Williams 2001, 80–1; Eilstrup-Sangiovanni and Jones 2008, 15–6).

Loose coupling indicates the little reliance of a node on other nodes within a network, especially among peripheral nodes that are susceptible to outside depredation. To achieve a loose-coupling structure, criminal networks may compartmentalise their peripheral nodes into separate, semi-autonomous cells that are relatively isolated from other network nodes. Decision-making authority may be devolved to “cell manager”, contacts between network members are minimised, and the sharing of information and intelligence is confined to a need-to-know range (Kenney 2007). Compared to the tightly-coupled systems where dependency and interaction among nodes are intense, loosely-coupled relationships make criminal networks more effective in limiting the “cascading or knock-on effects” caused by law enforcement attacks, allowing the resulted damage to be confined to parts where attacks are inflicted on, thus leaving other parts of the network remaining intact (Williams 2001, 80).

Redundancy is another source of resilience. In economic sociology, redundancy is a network property that reflects the degree of overlap among contacts in one’s social networks (McGloin and Piquero 2010, 65). Individuals with high redundancy (or with a high degree of overlapping contacts) in their social networks tend to have access to a limited versatility of information, knowledge, and opportunities. Although the empirical research on criminal entrepreneurs suggests that a high level of non-redundancy in individual social networks would improve one’s monetary earnings and status amongst co-participants (Morselli and Tremblay 2004, 777), redundant contacts prove useful for

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25 Ayling identifies three environmental sources for gang resilience: the thick crime habitats, community support, and a high level of interpenetration between gangs and legitimate businesses and state authorities. See Ayling 2009, 187–9.
criminal networks in developing ability to mitigate consequences and facilitate restoration from damage (Williams 2001, 81). Kenney’s (2007) research on Colombian drug trafficking, for example, discovers that local drug smugglers build network redundancy by contracting with multiple groups or individuals to provide the same kind of resources or services as a tactic to prevent law enforcement agencies from immobilising the entire operation of the smuggling networks by dismantling single nodes.

In summary, the defensive mechanisms of criminal networks in defending against outside depredation inform that networks can respond effectively in different ways at different temporal phases. First, before an attack is initiated, the personal nature of strong ties makes the members of a criminal network resistant to the temptations of exiting or betraying the organisation. Second, when external attacks are underway or parts of the network have been targeted, the loosely-coupled relationships among network members enable the criminal network to limit the possible damage to the extent that would not affect the network’s organisational integrity. Finally, when the damage does occur, the existence of redundant contacts or access to other latent functional equivalents allows the criminal network to be able to quickly replace the damaged nodes with the redundant ones, letting the network continue to operate as usual.

2.2.2.2. Offence: Flexibility and Adaptability

The offensive capability of criminal networks may well be demonstrated by their flexibility and adaptability reflected in many ways that the networks operate and expand in response to market opportunities. The loose and decentralised organisational structure implies that criminal networks can scale in a relatively free manner. Scalability here can be understood in two different ways.

On the one hand, scalability points to that criminal networks can expand in size or scope at domestic or transnational level through either absorbing new nodes into the range of their formal membership, or establishing (geographically-distant) informal, transaction-oriented or patron-client relations with relevant outsiders. These nodes possess valuable expertise, skills or resources needed for the networks to address specific problems facing them. Expansion in this kind makes Williams (2001, 77) label criminal networks
as the “boundary spanner”, an advantage of networks that allow them to “flow around physical barriers and across legal or geographical boundaries”.

In addition, the expansion may be mirrored in the ability of criminal networks to diversify their portfolio of illegal undertakings, extending their reach into areas where profit margins are largest and risks are the least (The White House 2011, 5). Organised criminal networks, especially those who have specialised in trafficking in drugs, arms, people, counterfeit goods, and other contraband, have less difficulty extending or transposing their reach from the established domains to unfamiliar ones. This is because such criminal networks often have a strong financial capacity to buy up a bulk of prohibited goods; they can take advantage of the existing smuggling routes and distributing networks, and use established linkages in law enforcement agencies to buy themselves the way in or out of the official checkpoints.

On the other hand, scalability also means that criminal networks can shrink their size or scope through abandoning redundant nodes that are targeted by law enforcers, while bringing little or no prejudice to their illegal operation. The size shrinking can be achieved via the dissolution of contract with nodes that are incapable of supplying satisfied products or services so as to prevent the networks from being locked in ineffective relationships.

In short, this section has thus far discussed networks as a form of organisation for illegal actors with respect to their definition, typology, and structures, as well as the strengths and characteristics of importance to the development of their defensive and offensive capacities. Insights into such attributes of networks will not only deepen our understanding of why networks have become particularly prevalent in contemporary organised criminality, but also provide critical implications for the strategic and operational aspects of approaching them. Here let’s revert to the first facet of the paradoxical puzzle proposed at the beginning of this chapter: what are networked threats. Based on above discussions, this chapter conceives of networked threats as containing two-fold meanings.

First, networked threats refer to transaction networks, which are difficult for state actors to deal with due largely to their nature of transcending national borders. The
transnational dimension warrants transaction networks a challenge that can hardly be successfully addressed solely by a state’s own effort and resources.

When applied to TEC settings, transaction networks represent the overall chain of the black markets for specific environmental goods such as wildlife, timber, ODS chemicals, and hazardous wastes. The analytical focus of transaction networks is on the black markets in its entirety. Points of investigation on transaction networks include among others the defining role (source, transit, or consumer) of a particular country (e.g., China) involved in the international/regional illegal trade chain, the scale and scope of the black markets, the magnitude and diversity of environmental contraband involved in trafficking or trade, the methods used in conveyance and concealment of illegal goods, the established smuggling routes, and the affected countries.

Second, networked threats point to directed networks, standing for the covert and illegal organisations that adopt networks as the organisational structure to deploy their members and align their relationships, or as a strategy or tactic to design their illegal operations. Networks applied in this manner afford covert operators a host of organisational and operational advantages, including the adaptability and resilience, over their legal foes the hierarchically-organised state actors.

When applied to TEC settings, directed networks refer to the organised criminal groups involved in trading and smuggling of environmental goods. As discussed in Chapter 1, the involvement of organised elements in international environmental crime is fairly evident. Directed networks can pose a significant threat to the international and national efforts to protect the biodiversity, forest, and ozone layer. This is not only because of their large-scale, systematic sourcing, smuggling, and supplying of environmental resources, but also because of their usual linkages with cross-over crimes such as corruption, money laundering, and certificates fraud. Investigation of directed networks may focus on their organisational structures, relationships among network members, identification of key participants that are strategically important or unique for the operation of the directed networks, and so forth.

For the three reasons clarified in Section 1.3.1 in Chapter 1, this thesis has decided to only focus on applying the concept of “transaction networks” to the three case studies, while leaving for future study the examination of whether or not there have been
organised crime groups involved in China’s illegal trade in environmental goods and whether or not these organised crime groups are structured in directed networks. In the following three case-study chapters (Ch3–5), I will use the notion of transaction networks and points of investigation as the guidance for the exploration of China’s global trade in illegal wildlife, forest products, and ODS. In each case study, I will develop a deep mapping and thick description of China’s illegal trade in the three selected categories of environmental goods from the perspective of transaction networks.

**2.3. NETWORKS: AN APPROACH TO CLANDESTINE NETWORKS?**

In reaction to networked threats, several influential scholars from different disciplinary backgrounds raise another chorus of assumption arguing for the great potential and prospect of the networked approach to networked problems. For example, in their conception of netwar and counter-netwar, Arquilla and Ronfeldt (2001, 15) stress the idea of taking networks to fight networks and assert that “whoever masters the network form first and best will gain major advantages”. Slaughter (2004a, 160) claims that in today’s world where a diversity of clandestine actors are increasingly operating through global markets, global travel, and global information networks, the best strategy for governments to defeat these networked threats is to adopt a networked response. Williams (1998, 159) argues that “governments and law enforcement agencies [wishing to dismantle criminal networks] have to think and act in network terms”. The scholar (2001, 95) further proposes that one important component of an effective attack on criminal networks is the mimicking of network structures into the creation of innovative law enforcement structures to overcome the many constraints associated with the normal bureaucratic ways of doing business.

Indeed, these propositions are thought provoking, but they only impart vague and aphoristic knowledge about our key puzzles (what are networked responses and how to achieve them, particularly in the context of countering TEC), and stop short of elucidating specific actionable prescriptions. Therefore, this section builds on the fundamental work of above scholars as the starting point and further seeks to enrich this idea of networked response with insights from other relevant lines of literature that treat networks as a key source of structural power and that see networking as an effective way of dealing with transnational issues. The main objective of this section is to
develop a nascent yet coherent account for the conceptual logic and underpinnings of the notion of networked responses, which can then be used as the guidance for developing practicable suggestions on how the Chinese regulatory and enforcement agencies might formulate their own networked responses to the TEC challenges (this part will be addressed in Chapter 7).

2.3.1. NETWORK SOCIETY

Understandings of the major trends in a constantly changing environment where the objects of analysis inhabit are undoubtedly crucial for the making of a solid policy. Joseph Nye (2008, 87–8) dubs such understandings “contextual intelligence”. In Section 2.2, I have identified an evident trend in the criminal market-oriented operations that implies a transnationalising and networked morphology in the organisational structure and illicit undertaking of clandestine actors. This part of contextual intelligence constitutes the answer to the first facet of the paradoxical puzzle of this chapter – that is, in what sense are networks understood as a facilitator for dark-side actors. Relatedly, a parallel question built on the second facet of the paradoxical puzzle can be expressed as: are there any major changes going on in the environment where the bright-side actors (e.g., enforcement agencies) operate?

For both scholars Anne-Marie Slaughter and Manuel Castells, the answer lies in the rise of global networks. In her preeminent work, A Grand Strategy of Network Centrality (more on this article later), Slaughter (2012a, 45–6) contends that the primary contextual shift in today’s international system is not the rise or decline of great powers, but the multiplication of diverse global networks among a range of actors that cover governmental and non-governmental, licit and illicit, and social, civic and market actors. The phenomenal rise of global criminal, political, economic, and social networks is in motion in transforming and reshaping the ways in which individuals and institutions communicate, collaborate, and conflict. On the other hand, in his magnum opus on the “network society”, Manuel Castells (2009, 25) poses a more radical assertion, arguing that in the global network society, “the core activities that shape and control human life in every corner of the planet are organised in global networks”. Network-organised activities and processes pervade in every domain of society, cutting across sectors of transnational production, management, and distribution of goods and services, mass
media, the Internet networks, international institutions, religions, culture and art, criminal economy, transnational NGOs, and the social movements.

If Slaughter and Castells’s empirical observation about the ubiquitous pervasive and significant potential of networks correctly grasps the core of the world we live in today, then following and extending from that, two questions can be elicited. First, what have been the conceptual logic underlying the explosion of networks? And second, what implications will this trend have on our understanding of the networked responses? To explore these two questions, I draw on the work of Castells and Jan Van Dijk on “network society” as well as the work of Ronfeldt and Arquilla on “TIMN (tribes, institutions, markets, and networks) Framework” and “Netwar”, with a view to unpacking an articulated chain of conceptual logic that account for the rise of networks and its implications.

In his trilogy, The Information Age: Economy, Society, and Culture, Castells traces the effects of three independent processes that occurred during the second half of the twentieth century – the information technology revolution, the economic crises of capitalism, and the blossoming of cultural social movements (e.g., environmentalism and feminism). The author proposes that these three processes’ coming together induced a new social structure (network society), a new economy (global informational economy), and a new culture (a culture of “virtual reality”). In the first volume of his trilogy, the concept of network society is defined as follows:

As a historical trend, dominant functions and processes in the Information Age are increasingly organised around networks. Networks constitute the new social morphology of our societies, and the diffusion of networking logic substantially modifies the operation and outcomes in processes of production, experience, power, and culture. While the networking form of social organisation has existed in other times and spaces, the new information technology paradigm provides the material basis for its pervasive expansion throughout the entire social structure… Presence or absence in the network and the dynamics of each network vis-à-vis others are critical sources of domination and change in our society: a society that, therefore, we may properly call the network society (Castells 2010a, 500).

26 For the purposes of this chapter, here I focus only on the concept of “network society”. The treatments of global informational economy and virtual reality can be seen in Castells (2010a, 2010b, 2010c).
In another co-edited book as well as in an interview with the University of California Berkeley, Castells further qualifies his definition by adding that, in simple and concrete terms, network society is a social structure made around networks activated by information and communication technologies (ICT) (Castells 2005, 7). By “social structure”, Castells refers to the “organisational arrangements of humans in relationships of production, consumption, reproduction, experience, and power” (Castells 2000a, 695; 2009, 24). So the network society in Castells’s formulation is not only about networks or social networks given the fact that networks as a form of organisation have long existed in history. Rather and more critically, it is about social networks powered by information and communication networks to process and manage information.

Van Dijk, another important contributor to the concept of network society, conceives of the network society as a new type of society where its prime mode of organisation at the individual, organisational, and societal levels is based on social and media networks. It is noticeable that the focus of the network society approach is on the changing organisational forms and infrastructure of the societies. This focus is what differentiates the network society from another popular concept – the “information society”, which concentrates its attention on the changing substances of social activities and processes (Van Dijk 2006, 19–20).

Several critical points that typify the network society can be highlighted from the work of Castells and Van Dijk. First, the network society concept specifies the advent of a new social structure built on networks or social networks supported by information and communication networks. It ushers in a substantive realignment in the organisation of production, power, and meaning-making from the previous “mass society” to the present information and network society. Second, the convergence of social

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28 The mass society, as defined by Van Dijk (2006, 29), is “a social formation with an infrastructure of groups, organisations and communities (masses) that shapes its prime mode of organisation at all levels. In contrast with the network society where networks or individuals linked by information networks constitute the basic units of the society, the main components of the mass society are all kinds of relatively large collectivities (e.g., groups, organisations, communities).
organisational evolution and information revolution created a solid organisational and material basis for the wide diffusion of networks as a dominant form of social organisation. Third, a self-expanding networking logic permeates all domains of social, economic, political, and cultural life, shaping key activities and functions in the network society, transforming or even redefining the nature and source of power and the way of domination and counter-domination. These three focal points, which comprise the key junctures of the conceptual logic chain for the rise of global networks (see Figure 2.1), will be discussed at length in sequence in the following sections.

2.3.2. NETWORKS IN THE NETWORK SOCIETY

For Castells and Van Dijk, the network society is made up of networks of various types. Networks become the basic components of network society. Then what constitutes a network? In abstract terms, networks are a set of interconnected nodes (e.g., individuals, groups, organisations, and states) among which flows of information, ideas, goods, values, and other resources take place (Castells 2000a, 695; Van Dijk 2006, 24). To create a network, there have to be at least three nodes and two links intersecting the nodes. A single link of two nodes only makes up a relation (Van Dijk and Winters-van Beek 2008, 3). Nodes exist and function as components of a network. The relative importance of a given node in relation to other nodes within a network is determined by that node’s ability to contribute to the network’s effectiveness in achieving its goals. A network may allow for the existence of some redundant nodes in case of contingencies. But when nodes cease to add value or even become an obstacle to the networks’ performance, the network can readily reconfigure themselves by deleting irrelevant and valueless nodes and adding new ones (Castells 2009, 19–20). This point concords with the scalability feature of criminal networks that we have discussed in Section 2.2.2.

When seen as a form of organisation, networks encompass a distinctive set of fundamental principles that serve to govern and coordinate the relations and activities of their components as well as distinguish networks from other forms of organisation such as hierarchies. Lipnack and Stamps (1994, 18) identify five most important organising principles for networks. The first principle is “unifying purpose”, which includes shared views, values, challenges, and goals that act as a “glue” to hold a network together. Second is the “independent members”, which requires the components of a network must have certain degrees of autonomy, so that they can stand on their own feet while
benefiting from being part of that network. This principle of networks rightly counterpoints hierarchies, of which the constituent parts are differentiated between higher and lower levels and the lower ones are fully included in the higher. The third principle is “voluntary links”, which enable networks to expand freely so long as flows of communication can be built between the network and other individuals or organisations. Note that the omnidirectional property of the links of networks does not mean that networks are a completely open system with no boundaries or no thresholds for entry. As will be discussed later, networks “communicate and incommunicate” at the same time (Castells 2005, 5), and the capacity to determine membership (inclusion/exclusion) is one of the central mechanisms to exercise network-related power in the network society.

The fourth principle is “multiple leaders”. Networks are leaderful, rather than leaderless. A network contains a few “bosses”, but it may be structured around a few clusters, each of which is led by a handful of individuals or organisations who have something unique to contribute to the shared purposes of the network and who are thus able to control a certain special structural position within the network. Recall that the multiple-leader organisation is akin to the cobweb structure (discussed in Section 2.2) in which a number of peripheral groups, though revolve around and take orders from the central actor, act relatively independently in their own illegal businesses. The fifth and final principle is “integrated levels”. Extending from the multiple leader principle, networks might internally consist of relations structured on different levels, such as individual relations, individual vis-à-vis clusters or groups, and clusters vis-à-vis clusters. This principle runs counter to one popular mistaken view in the network research literature that sees networks as an entirely flat and horizontal structure. As Van Dijk (2006, 110–1) points out that the introduction of networks may cause a decrease in the distance that communications need to bridge, but that does not always trigger the reduction in the number of hierarchical levels in an organisation, especially when control and authority are required.

In reality, the concrete referents of the nodes and networks appear in both natural and social systems, and abound in every sphere of society. There are networks of real-time financial transactions, production sites, markets, and labour pools that constitute the global economy. There are networks of firms or segments of firms organised around the performance of co-tasked business projects that frame the so-called “network
enterprises”. There are networks of environmental crime that link up professional poaching groups in source countries, brokers in transit countries, wholesale and retail groups in consumer countries, money laundering financial institutions, and corrupt officials. There are decentralised and networked social movements connected via the Internet and instant communication tools that spread across cities and countries. There are global media networks composed of nodes of television systems, entertainment studios, news teams, and mobile devices that influence public opinions or even implicitly shape public preferences (Castells 2000a, 695; 2010a, 501; 2010b, 427). In short, the pervasion of the network form of organisation goes for every domain of activity and every context, cutting across realms of production, distribution, financial circulation, power, information, communication, images and experiences (Van Dijk 2007). For Castells, it is these network-directed processes and activities that configure the main terrain of network society.

Social networks figure at all levels and systems of society. Based on social units, four levels of societal relations in the network society can be identified (Van Dijk 2006, 25–7). The first and most basic is the level of individual relations where individuals are connected by bonds of families, friends, acquaintances, neighbours, colleagues and so forth. The second one is the level of group and organisational relations. This is level on which various groupings and collectives, either contemporary and loose or permanent and fixed, interplay in competition and coordination. For Van Dijk, with the support of networks of information and communication, many organisations today have actually evolved themselves into network organisations, which internally build on networks of relatively independent departments and teams on the one hand, externally cooperate with other organisations or parts of them in the undertaking of a common task on the other.

The third is the level of societal relations that encompasses networks of individuals, groups and organisations in the societal subsystems of politics, economy, culture, and civics. The penetration of networks into these subsystems leads to the creation of a number of new phases. For example, a new economy called “network economy” — marked off by the diffusion of organisational networking of production, distribution, and management — has been argued as the key factor for the substantial productivity growth in many countries around the world. In this new economy, corporations of various sizes have adopted different networking strategies, with large corporations
decentralising themselves as networks of semi-autonomous units and, small and medium firms engaging to form business networks that act as providers and subcontractors to large corporations. Organisational units have shifted from being capability-oriented to being project-oriented. Strategic partnerships between large corporations and ancillary networks are built around a specific project under which employees, consultants and other businesses are assembled to work on a particular project, then separated and reallocated upon the completion of the project (Castells 2005, 9). Politically, a new form of governance called “network state” or “network governance” has come into existence and brought together the nation-states, supranational associations, international institutions, regional and local governments, and quasi-public NGOs in response to shared problems such as economic crises, political conflicts or social protests (Castells 2010b, 346, 364). The fourth and final level is the level of global relations where a web of government networks comprised of national governmental officials is increasingly working alongside the international institutions to address global problems (Slaughter 2004a, 162).

It should be noted that one level of relational networks is not exclusive of other levels. This is because, on the one hand, networks can realise interaction within and between levels, just as some sociologists argue that networks based on informal ties (e.g., friendship or tacit workplace norms) play an important role in bridging departmental boundaries and overcoming stifling organisational routines (Powell and Smith-Doerr 2005, 385). On the other hand, patterns and trends substantiated valid in one level of relations may be applicable to another level of relations. For example, theorising about the power of nation-states is indeed different from theorising about that of individuals. But some conceptual tools offered by social network theories do have cross-level utilities. As in the case of the positive correlation of centrality and power revealed in individual networks, this correlation may be equally guidable when analysing networks of groups or organisations.

2.3.3. SOCIAL ORGANISATIONAL EVOLUTION AND INFORMATION REVOLUTION

According to Castells (2010a, 502), the convergence of social evolution and information revolution formed the organisational and material basis for the diffusion and rise of networks throughout the entire social structure. In the regard, Ronfeldt’s “TIMN Framework” provides useful insights of the interaction between social evolution and
technology advances from a historical and organisational perspective.

In his 1996 report, *Tribes, Institutions, Markets, Networks: A Framework about Societal Evolution*, Ronfeldt devises the TIMN framework to sum up his findings of the historical evolution of social organisation. The author posits that most societies historically went through a process of structural change that began with tribal structures (T), then expanded into hierarchical institutions (I), and finally into the competitive markets (M). Each form, from tribes through hierarchies to markets, sprouted, matured, prevailed, and dominated in certain realms of society in different historical epochs, but all ended up with the failure in the continuation of being the dominant form of social organisation due to their inherent limits. The author explains that the tribal form faded into the background because of its inefficiency in dealing with problems of rule and administration. The hierarchies lost grip thanks to its incapability of processing complex exchanges and information flows. Finally, the market went into decline owing to its built-in tendency of creating social inequality and its inability to address such inequality. In the author’s views, networks – especially the multi-organisational networks buttressed by new ICT – are on the rise and continue to spread into the many realms of society including state, market, and civil domains.

Ronfeldt cautions that the rise of a new organisational form does not mean the complete abandonment of the old ones. From an overarching perspective of society evolution, the author argues that a society’s advance has always relied on its ability to combine new forms of social organisation with the established ones into a coherent functioning whole. Each combination will strengthen the society and make it more powerful and capable of dealing with more complex tasks. This is demonstrated by the replacement of government-planning economy by market economy, which certainly generated more tax revenues and thus enhanced the state’s ability to conduct its affairs at home and abroad. While for any specific hierarchically-organised institutions, Ronfeldt suggests that a responsive institution should evolve internally from hierarchical toward flexible models that mix hierarchies and networks.

On the point of the relations between networks and the old forms of social organisation, Castells develops another line of interesting analysis. Castells (2005, 4–5; 2009, 25–6) argues that network society is dependent on social networks and digital communication networks as its basic infrastructure. Both types of networks have the capacity to
transcend territorial, institutional, and cultural boundaries. Accordingly, this grants network society the potential to be networking globally and to configure its structure on a global scale. However, the global expansion of networks and network society is a gradual, uneven, and selective process, following a binary logic of inclusion/exclusion. Being “gradual” means that it takes time to incorporate previous social forms into the new dominant networking logic. As such, it is expected that for a long period, the network society might have to work on “the pre-existing sites, cultures, organisations, and institutions” and coexist with the “industrial, rural, communal, or survival societies”. Being “uneven” and “selective” is that not all entities will be included in networks and network society. Networks are self-configurable structures, but their configuration acts on a basic principle: incorporating nodes that are valuable to the performance and goals of the network on the one hand, and bypassing or rejecting territories, activities, and people that have little or nothing to contribute to the performance and goals of the network on the other. Just as Van Dijk (2006, 36) writes, “in the individualised network society, you have to fight for a particular place. You have to show your value for every network. Otherwise, you will be isolated in or excluded from the network”.

To elaborate the dynamics of the rise of networks, Ronfeldt develops a central proposition which states that the information revolution – as epitomised by the advance of new ICT, especially the Internet, mobile technologies, and various communication tools based on them – erodes hierarchical institutions, and in turn the erosion favours and strengthens multi-organisational networks. In further explanation, the author adds that on the one hand, the revolution diffuses power, ignores boundaries, and compels closed systems to open up. This process hurts and makes life difficult for institutions like government agencies that are traditionally built around hierarchies and that incline to operate alone. On the other hand, information revolution paves a concrete technical ground for the proliferation of multi-organisational networks as it allows small and dispersed actors to “connect, coordinate, and act jointly across greater distances and across more issue areas than ever before” (Ronfeldt 1996, 13).

The interaction between the new technical paradigm and networks has multiple effects. First, new ICT has helped to maximise the advantages of networks, while at the same time, overcoming their disadvantages. In contrast with other forms of social organisation (e.g., hierarchies), networks throughout the history had major upsides and
downsides. In terms of advantages, networks are flexible and adaptable organisational forms. As discussed in Section 2.2, networks are open, dynamic structures, able to expand in size by integrating new nodes whilst without imposing new limits on themselves, or shrinking in size by discarding redundant nodes whilst without threatening their balance and sacrificing their performance. These special qualities, once being realised, can make networks an ideal form of organisation for a volatile and mutable environment. On the other hand, the major disadvantage of networks is their embedded inability to “manage coordination functions beyond a certain threshold of size, complexity and velocity” (Castells 2000b, 15; 2004, 221). In addition, fostering and maintaining networks of relationships usually require a high level of mutual trust and reciprocity (Ronfeldt 1996, 12). For the potential of networks to be realised to an ideal extent, there also needs an infrastructural capacity for constant, dense flows of information and communication in order to enable a prompt and instant exchange of information (Arquilla and Ronfeldt 2001, 11). As such, in the past, networks were often confined within the domain of private life and were largely active mainly in personal interaction, solidarity building, and reciprocal support. The territories of mass production, power, and war were mostly occupied by large, vertical organisations such as states, religious apparatuses, armies, and corporations that were able to mobilise and marshal large pools of resources (Castells 2000a, 695; Castells 2005, 4).

These limitations encumbered networks and inhibited them from being a widely-adopted form of social organisation in history. However, the rapid advance of computers, communications, and software has substantially reduced the cost of information transmission and increased the number of transnational channels of communication, allowing for free, convenient, and affordable communication with distant parts of the globe. In turn, this technology advance makes it possible for the co-existence in a network arrangement of both centralised decision-making and a decentralised organisational layout and operations among geographically-dispersed, autonomous components of the network.

Second, the interaction between the Information Revolution and the spread of the network form has resulted in a process of power diffusion: a power rebalancing process characterised by “the rise of non-state actors” and “the relative decline of nation-states”.

In the first dimension of power diffusion, the cheapening of information transmission
has lowered the barrier for the entry into international collective action and thus opened the field to nonstate actors and individuals (Keohane and Nye 1998, 83). As Marvin Ammori (2005, 44–6) observes, the Internet has dramatically reduced the cost of receiving, producing, transmitting, searching, and advertising of information and in turn, this leads to the marginalisation of the cost for collaboration. This ability has helped online participants to overcome the technological, logistic, and organisational constraints of cooperation and enabled them to be more readily engaging in online and offline ad hoc organisation and coordination of political action.

Networks, as a social form, are value-free or neutral in nature. Networks can be employed by state actors (e.g., transnational governmental networks) and non-state actors (e.g., business network organisations), and by bright-side actors (e.g., NGOs or peaceful social activists) for productive and beneficial causes and uncivil actors (e.g., terrorists, organised criminals) for deadly and destructive ends. However, nonstate actors in both malign and benign forms seem to be often ahead of state actors in adopting the network form. This is not only because nonstate actors have strong interests in, and benefits to harvest from, becoming part of a collaborative network while preserving a degree of autonomy, but also because as compared to hierarchically-organised state actors, nonstate actors face less institutional limits and more pressure of survival and are thus more willing to adapt and experiment. The combination of the lowered cost of transnational communication and the adoption of network form allows nonstate actors to decentralise their organisational structure and performance along networks of relatively independent components, while still being able to communicate and coordinate with their dispersed parts toward the shared purposes prescribed by the network. As a culmination, what we have seen now are not only the growing number and influence of international organisations, private corporations, NGOs, and advocacy networks who are now competing with state actors in the stage of transnational politics and vying for greater participation in transnational policymaking and implementation. On top of that, we have also witnessed the growing threat posed by transnational criminal groups such as terrorist groups like Al Qaeda that increasingly operates as loose networks with a transnational franchise, or like the well-funded and well-organised wildlife smuggling networks that line up collectors and transporters of illegal wildlife products in the source country, and corrupt officials at the checkpoints and consumption sites (e.g., restaurants selling exotic meals, underground niche markets) in the consumer country.
In fact, in the report, *The Advent of Netwar*, by Arquilla and Ronfeldt (1996, 2001), the idea of the rise of networks and its impacts on the societal end conflict and crime has been reflected on in their discussion of the netwar and counter-netwar. Overall, the two scholars argue that the spread of multi-organisational networks among various dark-side actors such as terrorists and criminals alike has brought in new meanings to how social conflicts are being waged and unfolded in the Information Age, as well as to how countermeasures should be formulated and implemented for bright-side actors.

On the one hand, Arquilla and Ronfeldt herald that modern conflicts and crimes are more likely to be waged by uncivil networks (as opposed to hierarchies) that consist of dispersed organisations, small groups, and individuals who adopt network-related doctrines, strategies, and technologies to communicate, coordinate, and operate on a global scale. Recall discussed in Section 2.2, it is understood that the adoption of networks as either an organisational form or an operational design affords illicit bearers a range of offensive and defensive robustness and resilience. Moreover, the authors assert that the conduct and outcome of conflicts tend to increasingly rely on the actors’ ability to command knowledge and to use the soft power (discussed later). As in the cases of terrorist groups or environmental activists, the Internet and other media-oriented tools have become important channels for disseminating knowledge/beliefs, attracting public attention, competing for audience, and shaping targets’ preferences. Another good example for this might be an online network phenomenon called “Anonymous”, a loosely-associated international network of activist and “hacktivist” entities that operates on ideas, contests the alleged abuse of power by governments and corporation, and promotes transparency in politics and business (Yochai Benkler 2012). Taylor Owen (2015, 37) characterises Anonymous as a form of “disruptive power”, which thrives on the network attributes of “formless, instability, decentralised governance, loose and evolving ties”. Those are attributes that would weaken the power of a nation-state, but make individuals powerful and less susceptible to the manipulation, control, and suppression by traditional sources of power (e.g., surveillance).

On the other hand, Arquilla and Ronfeldt (2011, 15) advise that government officials, law enforcement agencies and other hierarchically-based actors need to engage fundamental adjustments if they want to avoid “having a difficult time fighting
networked threats”. In many cases, the adjustment requires not only the technical innovation and upgrading, but more critically, a willingness to innovate organisationally and doctrinally through, for example, building new mechanisms for interagency and multi-jurisdictional cooperation.

The second dimension of power diffusion is that traditional hierarchies will likely experience increasing faults and inefficiencies in performing functions and activities in responding to the growing complexity of many issues that they are tasked to address. As such, the influence and activity scope of traditional institutions are likely to decline in those areas. In Castells’s network society framework, this point has been discussed under the subtitle of “the crisis of the nation-states” (Castells 2010b, 356–66). Castells contends that in network society, nation-states are losing sovereign power largely as a consequence of the many key social, economic, political, and cultural processes no longer contained within the nation-states, but instead increasingly operating on a global scale. This leads to many central aspects of a state’s domestic policy susceptible to more influence of forces and factors outside than inside the national borders. In effect, the trend concerning the key processes increasingly going international can be seen as the resulting effect of the first face of the power diffusion: the proliferation of networks into the social, economic, political, and cultural domains of society and thereby, the increasingly diversified sources of power among networks of capital, production, communication, international institutions, non-governmental organisations, transnational religions, crime, terrorists, and social movements of all kinds (Castells 2010b, 357).

In political terms, Castells attributes the loss of (part of) the sovereignty to the rise of transnational issues, such as environmental degradation, global criminal networks, and global epidemics (e.g., AID, SARS). The cross-border component of these issues makes them hard to be fully addressed on a national basis. As a result of the inability of nation-

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29 Castells’s exploration of “the crisis of the nation-states” is a comprehensive one, involving discussion of changes in social, economic, political, and cultural dimensions that increasingly go internationally and that, acting together, contribute to the nation-state’s loss of sovereignty power. In economic terms, the loss of sovereignty is related to the increasingly important role played by the international financial market in the making and execution of national monetary policies on the one hand, and to the contradiction between the internationalisation of investment, production, and consumption and the national basis of taxation systems on the other. Militarily, means of violence are no longer exclusively controlled by nation-states, but slipping into the hands of terrorist networks and organised crime. Societally and culturally, nation-states are losing control over the media (see Castells 2010b, 356, 360, 362; Felix Stalder 2006, 105–10). These four axes of changes (including the political changes discussed in the main text) constitute the main areas in which nation-states are losing sovereignty in the network society.
states to act effectively alone in these areas, a host of non-state actors have entered the international domain and challenged the nation-state’s monopoly on international policymaking. It is worth noting here that in this chapter’s understanding, the transnational dimension is only one aspect of the changing nature of the issues facing nation-states. There are two more aspects that also contribute to the growing complexity of transnational issues (including TEC), that is, the requirement for interagency cooperation and multi-pronged approach. First, as revealed in Raad and Milward’s (2003, 414) *The Rationale for Network Collaboration*, problems confronting governments and public organisations in an increasingly complex and differentiated world of today are more often than not a problem with which any specific government institutions only intersects in part in their functional jurisdiction. This necessitates the interagency collaboration if progress in alleviating that chained problem were to be made. Second, solutions to such issues often require a multi-pronged approach that involves a combination of societal, economic, political, and enforcement interventions. Therefore, it demands a way of thinking about transnational issues from the perspective of an interaction of social, economic, political, and cultural causes that need to be addressed by a constellation of linked social, economic, political, and cultural instruments (Slaughter 2012a, 48).

Transposing the “changing-nature” model in the context of countering TEC, it will find that environmental enforcement agencies – if they fail to make adjustments or traditional way of acting alone perpetuates – will also likely experience “increasing difficulties and inefficiencies” in the face of the three aspects of environmental offences. First, as discussed in Chapter 1, in the context where the demand and production are globally distributed, environmental crime is bound to be a transnational issue that involves environmental goods being illegally harvested or taken in one country and moved to the consuming market in another country. Second, even within a single country such as China as the major consumer for illegal wildlife, from their first step landing on China’s territory to the final stop in the hands of consumers, illegal wildlife products wade through the jurisdictional provinces of a chain of law enforcement agencies that cover customs, forest police, industry and commercial bureau, and other government agencies. Transnational and cross-agency nature adds the first layer of difficulty for government institutions who have long been accustomed to acting alone in their own remit areas. Third, TEC is not only a legal issue, but also a societal, economic issue. For example, as will be discussed in Chapter 3, motivations behind wildlife
offences vary among cases. Some perpetrators hunting protected wild animals are
driven by poverty, expressed in the forms of hunting for self-subsistence use, or for
trade as an emergency source of income. But other professional criminal groups are
likely to be purely driven by the pursuit of illegal proceeds. Single-dimensional
measures such as enforcement crackdowns or poverty-improving policy might work in
either case, but may have constrained effects in reversing those galvanised by another
type of motivation.

2.3.4. Changing nature and sources of power in the network society

Nye (2011, 213) uses the metaphor of a three-dimensional chess game to describe the
current international relations and the world’s power distribution. This metaphor helps
us to position transnational actors and issues in the world economic and political system.
According to Nye, the top layer of the chessboard is the world of interstate military
power which is presently highly concentrated in the United States. The second layer is
the world of interstate economic power which is currently distributed in a number of
countries including the U.S., the EU, Japan, and the BRICs (Brazil, Russia, India, and
China). The bottom layer is then the world of nonstate actors and transnational issues
such as financial crisis, climate change, mass migration, pandemics, organised crime,
and international terrorism. Nye claims that measures developed from the military and
economic power on the top and second boards will do little good in solving the
problems arising from the third layer of the chessboard.

On the bottom chessboard, as a result of the power diffusion away from nation-states to
a variety of transnational actors, power is widely diffused and chaotically distributed, no
longer residing “in institutions, not even in the state or large corporations. It is located
in the networks that structure the society” (Castells 2004, 224). More profoundly, on the
bottom chessboard, the nature of power and the way of exercising it have transformed in
a way that traditionally-formulated understandings of power in terms of ranks in a
hierarchy or of resources make little sense.

Power is a fundamental property of both social structures and social relations (Goverde
and Tatenhove 2000, 106). Yet power is also a highly contested concept. Given the
focus of this thesis is on developing a “networked response” that will inform
enforcement agencies about how to enhance their ability to address TEC, this chapter
follows Joseph Nye’s (2011, 6) definition of power as “the capacity to achieve the desired outcomes”. Translating this definition into the context of this thesis, power is then construed as “the capacity of enforcement agencies to address TEC challenges”.

A distinction can be drawn between resource- and behaviour-based power (Keohane and Nye 1998, 86–7; Nye 2002, 8–9; 2011, 8–10). Both definitions have frequently been used in the theoretical and practical discussions of global affairs. Resource-based power defines power in terms of the tangible or intangible resources (e.g., economic or military resources) that an agent has at disposal and can utilise them to produce the desired outcomes. Behavioural power, also called relational power, refers to the ability to affect others to get the preferred outcomes. Despite the ultimate goal for both types of power is about obtaining the intended outcomes, the mechanisms of how to achieve the expected results are distinct. Resource power involves the crafting of smart strategies that helps convert the resources into realised power to produce the desired outcomes, while relational power relies on one’s ability to alter others by virtue of coercion, reward, and attraction to get the preferred outcomes. Depending on the nature of the means in use, relational power can further be differentiated between hard power – the use of threats or rewards to coerce others to change their behaviour against their initial preferences, and soft power – the use of co-optive means such as framing agendas, persuading, and eliciting positive attraction to alter others’ behaviours.

Traditionally, power is measured in terms of two objects of reference: resources at disposal and ranks in a hierarchy. In the first scenario, those possessing a relatively large amount of resources are regarded as more powerful than those having fewer resources. In the second case, those at the top of a hierarchy are seen as the most powerful within that system. This kind of power is being exercised via one-directional flows of command-and-control, with the one at a higher rank sending orders to and overseeing the performance of those inferior. However, on the third layer of the chessboard, especially for nation-states aspired to address those transnational issues, power has changed in a way that resource-based power loses strength to relational power and hard power outperformed by soft power.

The rise of transnational issues has made the national borders of all countries becoming so porous that even the most powerful country like the US will unlikely have all the resources required for the containment or solving of any substantive issues concerned.
Global climate change, the proliferation of WMDs, international terrorism, and transnational crime, to name but a few, are all beyond the resource-based capacity of any single nation-state. In TEC sector as the focus of this thesis, the “beyond-the-capacity” qualification instantiates specifically in the regulatory failures and institutional constraints suffered by governmental agencies, which substantially obstruct the national effort to tackle environmental crime. In illegal timber trade, for example, customs officials in importing countries rely entirely on the exporting countries’ legislation on timber legality before they can separate illegal imports from legal ones. In illegal wildlife trade, market demand in consumer countries has been one of the major drivers for wildlife poaching in source countries, but environmental enforcement in source countries often has little to do than banking on the consumer countries to temper or suppress their internal market demand. In addition to regulatory constraints, national enforcement agencies also face a number of institutional obstacles like constrained resources, untrained or undertrained staff, manpower shortage, and cumbersome administration, which all prevent the effective operation of the environmental control (more discussion in Chapter 5).

To Slaughter (2004c, 284), the contemporary states’ inability to govern effectively without external interference constitutes one of two fundamental challenges to the Westphalian notion of sovereignty, which emphasises states as a unitary entity with legitimate and complete control of its territory and with the right to be left alone, to exclude, and to counter any external meddling or interference. Therefore, Slaughter, along with other scholars such as Abram Chayes and Antonia Chayes (1995), argues for a new conceptualisation of sovereignty, one that focuses on the right and the capacity to participate in the trans-governmental regimes and international institutions that would allow states to work together toward the addressing of global and regional problems.

A shift has occurred in the course of states exercising the new sovereignty. Slaughter (2004a, 186; 2004b, 12) qualifies such shift as “disaggregating states”, in which nominally unitary states are effectively coming apart into their component government institutions – be they regulatory agencies, ministries, courts, and legislators – all of

30 According to Slaughter (2004c, 284), the second challenge to the Westphalian terms of sovereignty is the “interference challenge”. States can no longer assume that if they refrain from interfering in the affairs of other states, they will remain free from outside interference. This is much caused by a growing international consensus on the idea of “the Responsibility to Protect” and an increasing number of international legal regimes in fields such as human rights.
which are increasingly interacting in specific issue fields not only with their foreign and supranational counterparts, but also with the private and civic nonstate actors. The result of such interactions is the formation of an ever-denser web of government networks composed of national government officials of various kinds “operating across borders to regulate individuals and corporations operating in a global economy, combat global crime, and address common problems on a global scale” (Slaughter 2004c, 283). As such, it can be said that government networks become the major organisational carrier for the building and exercise of the new sovereignty power. These government networks conduct a range of routine practices, including exchanging regular information, developing databases of best practices, and offering technical assistance and professional expertise for members in need. Such routine activities facilitate the development of mutual trust and, with it, reputation, both of which will, in turn, engender more concrete actions such as law harmonisation and enforcement cooperation. For Slaughter, government networks help to compensate the decreasing territorial power by extending the global reach of individual government institutions.

Slaughter (2012b, 294–8) likens the landscape of government networks as the “Lego world”. Like the interlocking plastic bricks of a Lego-brand construction toy, government institutions as the building blocks of sovereign states can be taken apart, put together with one another and with a wide range of NGOs, civic and corporate actors in varying coalitions. The Lego world is a networked, horizontal world with no hierarchies and no “ladders”, and thus no playing field for hierarchy-based command power. A core element of power in the Lego world consists in the ability to mobilise relevant entities and connect them toward a common purpose. Such connectivity-based power is not the power to impose outcomes since “networks are not directed and controlled as much as they are managed and orchestrated” (Slaughter 2009, 100). Instead, it starts with one’s ability to build a maximum number of valuable connections and is exercised through developing skills and knowledge to harness those connections toward the addressing of shared political, economic, or social concerns.

Since the relationships between government officials and their foreign counterparts as well as between governmental officials and nonstate actors are equal and horizontal, as they are interacting as partners and competitors, then how do government officials excise such “connectivity power” to create government networks or to strive for a collective decision within that network? Slaughter argues that there are a set of tools of
soft power available to government institutions. The power flowing within the government networks is soft indeed. Even when in a vertical network where supranational entities coexist with their national counterparts, the former usually has no actual means of enforcing the latter to accept a special offer or take a special action. Therefore, government officials use “everything from expertise to endearments” – such as the force of example, distillation and dissemination of credible information, persuasion, and socialisation – to affect others in order to arrive at a collective decision designed to change behaviours (Slaughter 2004c, 291–2). But once a decision about certain changes has been settled, Slaughter adds, the national government officials operating in such government networks possess hard command power to enforce the decision within their domestic political systems.

2.3.5. THE POWER OF NETWORKS

Accordingly, we need to build a new narrative of power and a new strategy for the building of them, in light of the two aforementioned backdrops: (1) power shifts from resource-based to relational and from hard to soft in the sense of addressing transnational issues; (2) networks have actually become the major organisational carrier for the building and exercise of the new sovereignty power. This narrative should be able to help us identify the new potential sources or dimensions of network-related power emerging from the third layer of the chessboard. And this power-building strategy should be able to instruct government institutions about “networking and networked” ways of enhancing their capacity to better exercise the new sovereignty in terms of addressing transnational issues.

Based on Castells’s network theory of power and Slaughter’s grand strategy of network centrality, this section presents a conception of the power of networks that analyses power in three different dyads of relations: the power of a network over other individuals and collectives that are not members of that network, the power of a network over its members, and the power of one network member over other network members. This conception identifies two critical abilities as key sources of network-related power: the network-making power (connectivity-based power) – the ability to constitute networks or networks of networks; and the network positional power (favourable network position-based power) – the ability to occupy the advantageous network positions (e.g., centrality). While the former power largely depends on the
valuable connections that an agent builds, the latter ability stems mainly from the
circulatory or control effects associated with a specific advantageous network position.

a. Network-making Power

Based on her empirical observation of the rise of multifarious global networks, Slaughter (2012a) advocates a grand strategy of network centrality for the protection and advance of the political, military, diplomatic, economic, and societal interests of the United States in the twenty-first century. Within this grand strategy, Slaughter rejects a traditional view of the global environment as a configuration of unipolar, bipolar or multipolar system of nation-states. Rather, the scholar argues for a network perspective that sees states as participants in an ever-shifting landscape of intersecting global and regional networks. As such, the focal point of the grand strategy is on how to foster two important abilities of the states: the ability to mobilise, orchestrate, and create networks and the ability to position itself as close to the centre of critical networks. “Critical networks” are defined by Slaughter as those most relevant to advancing the intended interests in certain fields and those most connected to other networks in those areas. Slaughter values these two abilities as vital sources of power and best ways to achieve the desired national interests of the United States in a networked world of today.

To formulate and implement such grand strategy, Slaughter (2012b, 46) designs a series of steps. First, it should gather intelligence about existing networks in concerned issue areas, assess if there currently exists a proper network arrangement and which kinds of networks would best work for which affirmative purposes. Second, it should identify key players who have a stake in addressing such issues and who hold valuable resources, then it should invest into building relationships with the identified players, and create an official infrastructure to host and foster those networks. Depending on the major functions anticipated, Slaughter (2004a, 19–20; 2004c, 290–1) classifies government networks into three broad groups: harmonisation networks, enforcement networks, and information networks. This categorisation serves as a salutary reference when it comes to the need for figuring out which kinds of networks should be created. Harmonisation networks refer to the effort to standardise laws and regulations among network members in order for the establishment of a common regulatory standard in specific issue areas such as environmental regulation and regional or international trade agreement. Enforcement networks are intended for facilitating cross-agency and cross-border cooperative enforcement. Information networks are mainly built to assist
government officials in exchanging information, collecting and distilling good practices, and offering technical assistance and training programs. Although each of these three ideal types is designed to solve specific cooperative problems, in practice, their activities overlap substantially.

In his heuristic network theory of power, Castells argues that in the network society, power is principally exercised by and through networks. Under the social and technical conditions of network society, four distinct forms of network-related power can be discerned (Castells 2009, 42–7; 2011, 773–7). Among them, “network-making” power largely resembles the first form of power (the ability to create networks) discussed in Slaughter’s grand strategy, but Castells extends it to include the ability to create networks of networks.

Network-making power is acclaimed by Castells as the “paramount form of power” (2009, 47) or “the most crucial form of power” (2011, 776) in a world of networks. For Castells, network-making power is the power to set up and “program” a network. This form of power is exercised by two key roles designated by Castells as “programmers” and “switchers”. Programmers are those who have the ability to “constitute network(s), and to program/reprogram the network(s) in terms of the goals assigned to the network”. Switchers are those who are capable of connecting and ensuring “the cooperation of different networks by sharing common goals and combining resources, while fending off competitions from other networks by setting up strategic cooperation” (Castells 2009, 47).

Castells explicates that the capacity to program the goals of a network is decisive because “once programmed, the network will perform efficiently, and reconfigure itself in terms of structure and nodes to achieve its goals” (Castells 2009, 46). For Castells, networks are complex structures of communication constructed around a set of goals and operating procedures. Once the shared goals and rules of interaction and communication are clarified for a network, the structure of that network will keep evolving and reconfiguring along the path of an endless searching for valuable additions and more efficient networking arrangements. Thus the programming should be understood as involving prescribing the basic principles that will define how the network should reconfigure itself through adjusting its structure and including or excluding nodes so as to improve the network’s effectiveness in achieving its
established goals. This explains why programming capacity is vital. But how to program a unifying goal among multiple social agents whose interests and values diverge or even contradict? On this point, Castells accentuates the relevance of communication networks, and claims that the “control of, or influence on, networks of communication and the ability to create an effective process of communication and persuasion along the lines that favour the projects of the would-be programmers, are the key assets in the ability to program each network” (Castells 2009, 46).

On the other hand, the power of switchers mainly lies in their control of the connecting points between various strategic networks. Castells illuminates that in reality, switchers can be those controlling connections between political leadership networks and media networks to produce and diffuse specific political ideologies, or those manipulating connections between religious networks and political networks to advance a religious agenda, or those straddling criminal economy and legal financial markets to launder and legitimise the illicit “dirty” money (Castells 2004, 224; 2009, 46). Nonetheless, being at the intersection of a set of political, media, academic, and business networks enables switchers to mobilise and leverage the resources of each network toward desired outcomes. Therefore, the power of switchers can be seen in a way as the “amplified version of programmers”, only with the ability changed from creating networks to creating networks of networks.

A quick reprise, the potentialities and constraints of the network model, its processes of configuration and communication as well as the possibility to be programmed and connected with other networks are central elements that affect the making of power (Dragona 2013, 18). With the power to program the goals of a network and decide on the “protocols” for the network’s configuration and communication on the one hand, and with the power to block or enable connections between various strategic networks on the other, the programmers and switchers retain the main control of the networks.

b. Networking Power

In Castells’s network theory of power, networking power refers to the power of those included in critical networks that “constitute the core of the global network society” over individuals and collectives excluded (Castells 2009, 42). In each domain of social, political, and economic life, there are always some networks more influential than others due partly to the flows within such networks of the scarce resources and valuable
information that are in high demand by others. But the entry into these influential networks is controlled by “gatekeepers”, as Castells points out, a role that social actors can obtain by creating and programming a network that accumulates valuable resources and then by exercising their gatekeeping strategies to control (bar or allow) the access to the network.

A few points relating to the networking power deserve special attention. First, it is important to be present in a network and not to be excluded. There are benefits for being in the network and costs for remaining excluded. Tongia and Wilson’s (2007) study of the network exclusion reveals some interesting results. In a given size of sample population dyadically differentiated between those included in a network and those excluded from that network, an increasing number of the included means a growth in the size of the network and the number of connections, as well as the decreasing number of the excluded. By positing that the costs for being excluded from a network depend on the total number of people excluded, the scholars apply this assumption to three leading theoretical formulations proposed by the Metcalfe’s Law, Reed’s Law, and Odlyzko’s Law concerning the calculation of the value of a network and of those included. Findings show that both the value of being in the network and the costs for being outside increase exponentially as the network expands in size. Moreover, in all three formulation models of the network “Laws”, the costs of exclusion grow much faster than the increase in the value of being included. In particular, the penalties for exclusion will “get worse…as only a few people are left out of the network” (Tongia and Wilson 2007, 11), because of the declining number of opportunities in reaching other elements outside the network (Castells 2010a, 72).

Second, the selective inclusion/exclusion process operates on two criteria. The first criterion is that participation in a network is determined by the contribution that an actor can make to the specific goals of that network. Castells (2000a, 695) demonstrates that in theory all regions and countries around the world can integrate themselves into the global economy, but actually only those that can add value (e.g., providing raw/human resources or markets) to the value-making chain of the economy are admitted to be linked into the mainstream global exchanges. While those having little or nothing to contribute will have to face two fates: either being bypassed by the global flows of wealth and opportunities due to being treated as the redundant nodes, or being allowed into the exchange circle but forced to be the producers of “raw materials” (Stalder 2006,
118). Nonetheless, the subtle inclusion/exclusion suggests that in the network society, sometimes being connected is itself an indicator of an actor’s worthiness. Perhaps this is why Nye (2011, 18) argues that networks and connections become an important source of relevant power, and that the extent to which a state engages in the global networks can be an important point for assessing the state’s power in the twenty-first century.

The second criterion is that the entry into a network is conditional, those potential nodes wishing to join the network are mandated to accept a set of standards inscribed in the network. Such standards often stipulate the shared ways of communication and interaction among network components, and thus function as the enabler of coordination among multiple network members. The standards display a type of power called by David Singh Grewal the “network power” or the “power of a standard”.

c. Network Power

In his book *Network Power: The Social Dynamics of Globalisation*, Grewal (2008) pioneers a new theorisation of globalisation from the perspective of networks and standards. The author argues that globalisation involves social coordination enabled through the designating and propagation of common standards. Standards are shared norms or practices that are embedded in a network and that act to facilitate cooperation among network members (Grewal 2008, 21). In this way, globalisation can be understood as the process of creating and formatting international networks and standards that set the ground for social coordination on a global scale.

Network power or the power of a standard is then the power of the standards programmed in a network over its components. This type of power has triple effects. First, the standards of a network are imposed over the members of that network whose acceptance of and compliance with the standards are the prerequisite for inclusion in the network. Second, as the network expands in size, network power grows, and the pressure on non-network members to join the network intensifies. As Grewal (2008, 10) writes, “the larger the network, the more powerful [and more valuable] the standard underlying it will be – and the more pressure non-users will feel to adopt that standard”. This statement echoes the previously discussed point that both the value of inclusion in a network and the costs for exclusion go up in line with the network expansion. Third, a standard has the potential to become a universal convention so long as the number of people accepting and using it increases to a critical point. In the elevation of a standard
towards a convention, it associates with the possibility that that standard will eliminate other coordinating standards and become the sole solution to coordination in a specific issue area.

d. Networked Power

Networked power refers to power at the level of network positions. For Castells (2009, 10), networked power can be articulated as “the relational capacity that enables a social actor to influence asymmetrically the decisions of other social actor(s) in ways that favour the empowered actor’s will, interests, and values”. Castells ambiguously attributes the source of this type of power to the “structural capacity of domination” embedded in a network, but without a further expansion on what the structural capacity of domination is.

In Slaughter’s grand strategy of network centrality, the ability to occupy the central position of critical networks is an equally important source of power in parallel with the power of creating networks. The notion of network centrality – which is, as discussed in Section 2.1, exactly a special kind of favourable network position – has two implications on policy making and implementation. First, it requires the identification of existing critical global or regional networks that are most instrumental in addressing the issues concerned, followed by attempts to join the network and to subsequently become the most central node in that network. Second, it follows with the strategy that the actors invest resources into turning the network where the actors have a preponderant influence into the global or regional hub of a web of the same-kind networks. The assumption for the network centrality strategy is that the central position grants power to its occupant – whether being central in a network or being the hub of a web of networks.

Based on the above discussions, we are now able to draw a chain of conceptual logic that accounts for the rise of global networks (see Figure 2.1).

At the first logical juncture of the logical chain, the convergence of social organisational evolution and information revolution lays down the organisational and material basis for the proliferation of networks. Although networks, as a form of social organisation, have existed in other times and spaces, the present advances in ICT enable the networks to maximise their advantages and potentials, while overcoming their limits. The blend of
the network form and new ICT allows for the co-existence in a network arrangement of both centralised decision-making and a decentralised organisational and operational layout among geographically distant, functionally or managerially autonomous components of the network.

At the second logical juncture, the pervasive expansion of networks throughout the entire social structure induces a process of power diffusion on the bottom layer of the three-dimensional international system. In one dimension of the power diffusion, dark-side actors such as terrorism and transnational crime (including TEC) are adopting networks in designing their organisational structures and operational tactics. The unique defensive and offensive strengths that networks afford their carriers transform the dark-side actors into a transnationalised, networked threat for state actors. This links back to what we have discussed in Section 2.2.

In another dimension of the power diffusion, in the face of the rise of transnational actors and issues, hierarchically-based state actors experience increasing faults and inefficiencies in dealing with the growing complexity of such issues. This directly leads to the inability of the nation-states to govern effectively by acting alone. In a hope to enhance their ability to cope with transnational issues, unitary states are adapting by disaggregating themselves into the component government institutions, such as regulatory and enforcement agencies. These government units are interacting independently in specific issue areas not only with their foreign counterparts under the framework of government networks, but also with the private and civic non-state actors under various forms of public-private partnership. The landscape of the government networks and public-private partnerships is an analogue of what may be called a “Lego World”.

In this emerging Lego World, the nature and source of power – which is defined in terms of the capacity to address transnational issues – have changed in a way that resource-based power is losing strength to relational power and, hard power is increasingly outperformed by soft power (at least relatively). A core element of power in the Lego World consists in the ability to mobilise relevant entities and connect them toward a common purpose (e.g., tackling TEC). Against this backdrop, two critical abilities are identified as the key sources of network-related power that are most relevant for the addressing of transnational issues. The first is network-making power
(connectivity-based power), which stresses the ability to create networks or networks of networks. The second is networked power (favourable network position-based power), which focuses on the ability to occupy the advantageous network positions within an influential network.

Let’s return to the second facet of the paradoxical puzzle raised at the outset of Section 2.3: what are networked responses? Based on the understandings of the conceptual logic chain for the rise of global networks, this chapter argues that networked responses are not a standard, formatted mode of regulatory or enforcement responses. Instead, network responses should be understood as a special way of thinking and acting: a way that sees a bright-side actor (e.g., enforcement agencies) as operating in an environment occupied by various networks and entities, which simultaneously presented challenges in terms of amplified (networked) threats, as well as opportunities in terms of power amplifiers that could be leveraged for tackling these threats. In other words, in addition to the traditional logic of increasing resource power, network thinking emphasises cultivating relational resources rather than cultivating physical/hard resources.

On the other hand, network thinking analyses an actor first by looking at whether or not it is a participant of an influential network, and whether it is placed in an advantageous or disadvantageous, a favourable or less favourable position in that network, and then, it considers strategies to move that actor from a less favourable position to a favourable one. Again, the overall logic underlying networked way of thinking and acting is that, in an increasingly networked, horizontal world, power comes from connections with and the positioning of influential networks and, that power is critical for dealing with transnational issues.
3. **CHINA’S GLOBAL TRADE IN ILLEGAL WILDLIFE**

This chapter represents this thesis’s first case study of China-related TEC with a specific focus on China’s illegal trade in wildlife. The primary objective of this chapter is to understand the nature and patterns of transaction networks involved in China’s global and regional trade of illegal wildlife.

This chapter is organised into three sections. Section 3.1 reviews the international trade in wildlife, identifies emerging trends in global trade, and discusses the conceptual range of illegal wildlife trade. Section 3.2 categorises the sources of “catalysts” that fuel global concerns over China’s role in the international illegal wildlife trade. Section 3.3 analyses 363 anecdotal records of China-related wildlife seizures drawn from the *TRAFFIC Bulletin Seizures and Prosecutions 1997–2013* to disentangle China’s role and function in the global and regional transaction chain of illegal wildlife trade.

### 3.1. A BRIEF OVERVIEW OF LEGAL AND ILLEGAL WILDLIFE TRADE

#### 3.1.1. INTERNATIONAL TRADE IN WILDLIFE

“Wildlife trade”, in a straightforward term, refers to the sale and exchange by people of wild animal and plant resources (Broad et al. 2003, 4; Engler and Parry-Jones 2007, 9). It can involve a wide spectrum of live animal, plant, and fungal species – whether terrestrial or aquatic – being harvested and traded in many forms to produce a variety of products including food, clothing, ornaments and furnishings, pets and hobbies, ornamental plants, manufacturing and construction materials, and others (Roe 2008, 3–4).

Wildlife trade is a major element of global commerce, accounting for billions of dollars annually. Each year, hundreds of millions of live animals and plants from thousands of species as well as a vast array of products derived from them – e.g., food, exotic leather goods, wooden musical instruments, timber, tourist curios, and medicines – are being traded across the globe at local, national, and international levels to meet growing market demands.31 For many countries around the world, especially those cash-poor but biodiversity-rich countries in the Southern Africa, Southeast Asia, and South America, wildlife resources are critical natural assets that contribute significantly to both the

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national economies and the well-being of millions of rural households. Not only does wildlife resources trade generate a considerable proportion of government revenues, they also provide poor rural villagers with vital sources of food, fodder, fibre, medicines, and supplementary or even primary source of cash income. Conservative estimates of the number of people with varying dependence on non-wood forest products for living or (part of) cash income range from 200 million worldwide to one billion in the Asia-Pacific region alone (van Rijsoort 2000). Though the relative importance of wildlife trade as a source of income for rural households varies greatly across countries and regions, the World Bank estimates that an average of 20 percent of the overall income for poor rural families around the globe is from the trade of forest products (Roe 2008, 20). In Eastern and Southern Africa, Barnett (2000) estimates that 34 percent of household income derives from trade in wild meat.

Technically, quantifying the true scale and value of the world’s wildlife trade is a tough task. According to the literature, there are two main reasons for this. First, this relates to the nature of the business. Wildlife trade manifests itself at varying dimensions and scales (Roe et al. 2002). Wildlife resources harvested in a country may be used for subsistence purposes such as food and clothing, or sold into the local cash economy, or shipped across borders to neighbouring countries or more distant the regional and international markets. The dividing line between self-consumptive use and commercial trade is often blurred (Freese 1998, 10–11). Trade taking place at the local communities and markets accounts for over half of the world’s wildlife trade. However, the local-level trade is often carried out through “informal” trade networks, which sometimes involve various forms of non-cash barter. This wildlife trade’s predominantly local nature, especially when coupled with the practice of bartering and its importance for subsistence, often makes a substantial portion of wildlife trade go beyond the governments’ monitoring and statistical range and therefore remain unregistered (CEC, 2005; Karesh et al. 2005).

Second, where there exist statistics of wildlife trade, they tend to be vulnerable to many systematic shortcomings such as underreporting, double counting, inconsistent grouping among traded commodities, and the use of unrealistic pricing (Sial 1995). Broad et al. (2003, 7) point out two main sources of data on international wildlife trade: national

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32 For example, in Cambodia, wild plants and animals were a major source of foreign exchange between the first and 20th Centuries (Martin and Phipps 1996).
customs data as well as international trade data in the form of annual reports submitted by member states to the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). However, both sources of data suffer from significant informational deficiencies. On the former, customs agencies document information on reported trade volumes and declared values of imports and exports as well as detected illegal wildlife trade. Smuggling and illegal trading that have successfully escaped from official monitoring and detection remain undocumented and uncaptured by customs’ databases. As for the CITES reporting process, despite a relatively good performance by states in recording trade of CITES-listed species, such species only constitute a small fraction of the overall number of species traded worldwide. Trade in wildlife species that are not on CITES Appendices falls outside the purview of existing statistics.

Despite these practical difficulties and complications researchers face, various attempts have still been made to document as much as possible the size and value of international trade in wildlife since the late 1980s. Given different data sources and methods in use and each study’s different focus (in terms of the aspects and types of commodities of wildlife trade emphasised), these efforts have produced different estimates. For example, the wildlife trade monitoring NGO TRAFFIC made an estimate of the import value for international trade in the early 1990s at US$15 billion for wildlife products (not including timber and fisheries products). This figure jumped to close to US$160 billion when wild-sourced timber and fish were counted (Broad et al. 2003, 13). Based on the declared import value of 2005, Engler (2008, 4) assessed that the global trade in wildlife was worth between US$60.9 billion when excluding timber and fish, and US$332.4 billion with timber and fish included.

Overall, according to the literature, there have been two observable trends in the international wildlife trade. First, the global trade in wildlife has grown dramatically in terms of the trade value over the past three decades. In the 1980s, the import value of global wildlife trade was estimated to be around US$5 billion per annum (Roe 2008, 7). However, as noted above, this figure quickly surged to over US$15 billion in the early

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33 CITES is an international treaty drawn up in 1973 to protect wildlife against over-exploitation and to prevent international trade from threatening species with extinction. Presently, 180 Parties, including China, are signatories to CITES. The CITES Secretariat is administered by the United Nations Environmental Programme and is located in Geneva, Switzerland. It has a pivotal role, fundamental to the Convention and its functions are laid down in Article XII of the text of the Convention. See CITES. “What is CITES?” https://cites.org/eng/disc/what.php.
1990s, and further climbed to US$60.9 billion in 2005.\textsuperscript{34} Another trend pertains to the ongoing changes in the trade patterns and the roles of individual countries involved in global trade. On the one hand, though the general direction of trade flows is one of developing countries (e.g., Brazil, China, Indonesia, and Thailand) serving as the primary suppliers of wildlife products, and of developed countries and regions (e.g., the EU, US, and Japan) serving as the major consumer markets, in recent years there has been a notable increase in wildlife trade among developing countries as well as in intraregional trade like the Asia-Pacific and North America (Broad et al. 2003).

On the other hand, a shift pertaining to the role of individual countries in global and regional wildlife trade has taken place. As we know, there are three basic types of roles played by countries in transnational wildlife trade: supplier, consumer, and intermediary (as a point of transit or transhipment). In reality, the part played by a country in international wildlife trade is not always so clear-cut. A much more common scenario is one where states simultaneously take up more than one role, and they are distinguished only in terms of the extent to which the country may lean more or less toward one position or the other. As demonstrated in the case of Vietnam, thanks to the sharp shrink of its domestic wildlife resources driven by the overexploitation and illegal hunting and smuggling, Vietnam has transformed in the last four decades from being a major supplier to being a conduit through which wildlife legally or illegally sourced from Cambodia and Laos are shipped to China, Thailand, and South Korea (Lin 2005, 203).

Existing published estimates of the scale and structure of international trade in wildlife are a little outdated. As such, this section uses the UN Comtrade Database to extract and compile data on the declared import value of 2012 (the most recent for which data is available at the time of drafting this chapter) to produce an updated overview of the international wildlife trade.\textsuperscript{35} The UN Comtrade Database is chosen because it contains import and export data reported by statistical authorities of close to 200 UN member countries or regions and is considered the world’s most comprehensive database for international merchandise trade. Due to limits to availability of data, estimates are confined to international trade and China-related trade in wild animals and products in 2012; timber, fish (except ornamental fish), and non-timber forest products are not included. To facilitate the comparison with previous estimates made by the literature,

\textsuperscript{34} Timber and fishery products are not included in these three figures.
\textsuperscript{35} The Statistics Division of the UN Department of Economic and Social Affairs. “UN Comtrade Database.” http://comtrade.un.org/.
the 2002 Harmonised Commodity Description and Coding System (HS 2002) is chosen as the reference for search.\textsuperscript{36} Given the complicated nature of wildlife trade as discussed previously as well as the limitations and deficiencies associated with UN Comtrade trade data,\textsuperscript{37} estimates presented in Table 3.1 shall at best serve as a crude indicator of the broad outlook of 2012 international trade and China-related trade in wild animals and products.

Based on the 2012 declared import value, the total value of international trade in wild animals and products is estimated at approximately US$8.8 billion. From Table 3.1, it can be seen that among the imported items, mammal furs and fur products, with an import value of US$6.1 billion, constituted the single largest contributor to the international trade in wild animals and products. Natural pearls, reptile skins and products, ornamental fish, corals, shells of molluscs and crustaceans, game meat, and live primates amounted to the second largest group of contributors. A sum of the import value of the eight commodity categories accounted for 98.5% of the total import value in 2012.

In comparison with the 2005 estimate of US$6.9 billion by Engler (2008, 4), or US$7.9 billion after adjusted for inflation up to 2012 levels using the US GDP Deflator,\textsuperscript{38} there has been a ten percent increase observed in the 2012 estimate. This increase has an overall effect, as reflected in the rise of the import value of many categories of wildlife products. For example, the value of mammal furs and fur products in 2012 is estimated at US$6.1 billion, six percent growth compared to the 2005 figure (US$4.9 billion, or US$5.7 billion after adjusted for inflation). For reptile skins and products, its 2012 import value is assessed to be of US$538.1 million, 28 percent increase against the 2005 estimate (US$339 million, or US$387 million after adjusted for inflation).

\textsuperscript{36} The HS system is an internationally standardised system of nomenclature and codes to classify the merchandise in international trade. World Customs Organisation. “What is the Harmonised System (HS)?” http://www.wcoomd.org/en/topics/nomenclature/overview/what-is-the-harmonised-system.aspx.

\textsuperscript{37} Domestic trade is not included in UN Comtrade Database despite it constitutes the bulk of the world’s wildlife trade. Furthermore, as stated in the UN Comtrade “Read Me First (Disclaimer)”, there are a number of deficiencies associated with the UN Comtrade data, which include unreport or underreport of trade in certain commodities by countries due to confidentiality, inconsistent commodity classifications, discrepancies between the export and import values due to valuation and differences in inclusion/exclusion of particular commodities and so forth. UN Comtrade. “Read Me First.” http://comtrade.un.org/db/help/uReadMeFirst.aspx.

Table 3.1: Estimates of the value for the international trade and China-related trade in wild animals and products (excluding fish), based on 2012 import value (in US$)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Global trade value</th>
<th>China’s trade value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Export + Import</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Live animals, except farm animals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mammals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-- Primates</td>
<td>94.9 million</td>
<td>28.7 million</td>
</tr>
<tr>
<td><strong>Reptiles (including snakes and turtles)</strong></td>
<td>41.4 million</td>
<td>8.3 million</td>
</tr>
<tr>
<td><strong>Birds</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-- Birds of prey</td>
<td>4.4 million</td>
<td>-- --</td>
</tr>
<tr>
<td>-- Cage birds*</td>
<td>12.9 million</td>
<td>1.0 million</td>
</tr>
<tr>
<td><strong>Ornamental fish</strong></td>
<td>317.9 million</td>
<td>7.3 million</td>
</tr>
<tr>
<td><strong>Animal products for food</strong> (excluding fish)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primate meat</td>
<td>0.8 million</td>
<td>-- --</td>
</tr>
<tr>
<td>Reptile meat (incl. snakes and turtles)</td>
<td>4.7 million</td>
<td>-- --</td>
</tr>
<tr>
<td>Game meat</td>
<td>165.4 million</td>
<td>39.1 million</td>
</tr>
<tr>
<td>Edible snails</td>
<td>48.7 million</td>
<td>4.4 million</td>
</tr>
<tr>
<td>Frogs’ legs</td>
<td>5,153</td>
<td>-- --</td>
</tr>
<tr>
<td><strong>Animal products for clothing/ornamental</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mammal fur and fur products</td>
<td>6.1 billion</td>
<td>1.5 billion</td>
</tr>
<tr>
<td>Ivory (unworked or simply prepared)</td>
<td>15.4 million</td>
<td>18.4 million</td>
</tr>
<tr>
<td>Reptiles skins and products</td>
<td>538.1 million</td>
<td>4.2 million</td>
</tr>
<tr>
<td>Corals; shells of molluscs, crustaceans</td>
<td>177.8 million</td>
<td>24.5 million</td>
</tr>
<tr>
<td>Natural pearls</td>
<td>1.3 billion</td>
<td>330.9 million</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8.8 billion</strong></td>
<td><strong>2.0 billion</strong></td>
</tr>
</tbody>
</table>

(Source: The UN Comtrade Database 2012)

* Including parrots, parakeets, macaws and cockatoos

3.1.2. ILLEGAL TRADE IN WILDLIFE

The conceptual range of illegal wildlife trade or wildlife crime is itself an unresolved
There are scholars arguing that wildlife crime can be defined as a range of activities including poaching for trade or personal possession, illegal killing for bush meat, and killing animals due to human-animal conflict (Pires and Moreto 2011, 104). Others claim that illegal wildlife trade encompasses illegal exploitation of native species, illicit import of exotic species, and unauthorised internal trade in indigenous and exotic species (Bricknell 2010, 49). Outside academic circle, there are international organisations such as the INTERPOL that broadly define wildlife crime as “the illegal exploitation of the world’s wild flora and fauna”.  

There are two primary reasons for the inconsistent conceptual scopes and elements of wildlife crime. First, it pertains to the overriding lack of a comprehensive international legal norm that specifically deals with the many facets and aspects of offences in the wildlife sector. Over the past four decades, there has emerged a body of treaties, agreements, and declarations that seek to protect the environment, natural resources, habitats, and the world’s fauna and flora. Among them, CITES is the single most important international instrument in the wildlife sector to regulate and control (prohibit or limit) international trade in protected specimens of wild animals and plants so as to ensure the trade does not threaten their survival. To do so, the Convention creates three separate Appendices which combined cover a total of roughly 5,000 species of animals and 29,000 species of plants. Each Appendix houses a range of wildlife species according to their conservation status and risk from international trade, and each Appendix grants a different level of protection to the species within it. Under the CITES control system, import and export of species listed in CITES Appendices are subject to the licensing and reporting mechanisms. Further, under Article VIII of the Convention, Parties are required to “take appropriate measures to enforce the provisions of the present Convention and to prohibit trade in specimens in violation of thereof”.

39 “Illegal wildlife trade” and “wildlife crime” are used interchangeably in this thesis.  
41 As will be discussed in depth in Chapter 4, not only the wildlife sector, but also the forestry sector has also been experiencing the dilemma of the lack of an overarching international legal setup that specifically defines and tackles the problems of illegal logging and associated trade in forest products.  
42 In addition to CITES, there are other international treaties that might be applicable to wildlife conservation and to wildlife crime in certain circumstances. For example, the Convention of Migratory Species of Wild Animals, signed on 23 June 1979, aims to conserve terrestrial, aquatic, and avian migratory species throughout their range; the United Nations Convention against Transnational Organised Crime is appropriate for legal reference when organised criminal organisations are involved in the trafficking and trading of wildlife; and the United Nations Convention against Corruption can be invoked when wildlife offences are connected with corrupt practices.  
Specifically, such measures include “penalising” the illegal trade in, or illegal possession of, protected species, and confiscating illegally acquired or traded wildlife products.

Strictly speaking, CITES is an international trade agreement, not a vehicle of international criminal law. It works mainly through a system of licensing mechanisms that allows the member states to provide mutual protection to one another’s indigenous species covered under the CITES Appendices. Therefore, much of the transnational wildlife crime tends to come in the form of import or export of CITES-listed species without an appropriate import/export permit or certificate issued by the CITES Management Authority (MA) in the exporting/importing countries.\(^\text{44}\) This is evidenced by the China-related wildlife seizure data collected by this chapter (discussed in the second part of this chapter), which indicates that the majority of shipments of wildlife products to China were seized on the grounds of lacking valid import permits issued by the CITES China MA or legal export certificates issued by the MA in exporting countries.

From above, two points can be highlighted with regards to the CITES control framework. First, CITES does not provide a clearly delimited definition for wildlife crime, nor does it provide any guidance as to the design of wildlife crime under domestic law. Relatedly, it is left to the states parties to internalise the provisions of CITES into their national legal framework to define the nature, scope, and consequences of wildlife offences and to provide protection not only to native species but also to protected species from other parts of the world. However, the great distinctions of national legalisation and policies, culture, and the range of species in trade and under protection among countries lead to the absence of a widespread consensus about the exact scope and elements of the wildlife crime. Hence some undesirable and unsustainable wildlife practices may be identified as offences against the criminal law or as violations of administrative regulations in one country, but be deemed as legal activities in other nations. Second, current controls enabled by CITES are limited to regulating international trade (import/export), the trade of CITES-listed species and other related activities such as illegal harvesting or poaching that occur entirely within

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\(^\text{44}\) Under CITES, all Parties are requested to designate one or more national Management Authorities in charge of administering and issuing the permits or certificates for the import/export of CITES-listed species. CITES Secretariat. “How CITES Works”. [https://cites.org/eng/disc/how.php](https://cites.org/eng/disc/how.php)
the borders of a country are actually beyond the regulatory scope of CITES.\textsuperscript{45}

The absence of a widely accepted definition of wildlife crime in conjunction with the inability of CITES to directly regulate domestic wildlife trade can sometimes be a loophole exploited by individual countries. As will be explored in Chapter 6, although commercial trade in tiger parts and products is prohibited by CITES at the international level and banned by states like India on the national scale, internal trade of captive-bred tigers is enabled and legalised by the Chinese government’s “special marking scheme” and is going on at a commercial scale. The continuing presence of a national legal market with tremendous buying potential for endangered wildlife will certainly stimulate the poaching activities in source countries and undercut the efforts made by the international community and source countries to conserve endangered species.

Table 3.2: Wildlife crime and crossover offences at the custodian points of origin, transit, and destination

<table>
<thead>
<tr>
<th>Countries of Origin</th>
<th>Wildlife offences</th>
<th>Associated cross-over offences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) Poaching (illegal hunting)</td>
<td>Corruption</td>
</tr>
<tr>
<td></td>
<td>(2) Use of prohibited hunting equipment or methods</td>
<td>Tax evasion and non-payment of fees</td>
</tr>
<tr>
<td></td>
<td>(3) Taking of restricted prey (breeding females, young protected species)</td>
<td>Documentation fraud</td>
</tr>
<tr>
<td></td>
<td>(4) Violation of seasonal restrictions</td>
<td>Money laundering</td>
</tr>
<tr>
<td></td>
<td>(5) Illegal possession</td>
<td>Illegal possession of weapons</td>
</tr>
<tr>
<td></td>
<td>(6) Illegal processing of animal material</td>
<td>subject to police control</td>
</tr>
<tr>
<td></td>
<td>(7) Illegal export</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Countries of Transit</th>
<th>Wildlife offences</th>
<th>Associated cross-over offences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) Illegal import</td>
<td>Corruption</td>
</tr>
<tr>
<td></td>
<td>(2) Illegal possession</td>
<td>Tax evasion and non-payment of fees</td>
</tr>
<tr>
<td></td>
<td>(3) Illegal supply and sale</td>
<td>Document fraud</td>
</tr>
<tr>
<td></td>
<td>(4) Illegal processing</td>
<td>Money laundering</td>
</tr>
<tr>
<td></td>
<td>(5) Illegal export</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Countries of Destination</th>
<th>Wildlife offences</th>
<th>Associated cross-over offences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) Illegal import</td>
<td>Corruption</td>
</tr>
<tr>
<td></td>
<td>(2) Illegal processing</td>
<td>Tax evasion and non-payment of fees</td>
</tr>
<tr>
<td></td>
<td>(3) Illegal possession</td>
<td>Document fraud</td>
</tr>
<tr>
<td></td>
<td>(4) Illegal supply and sale</td>
<td>Money laundering</td>
</tr>
<tr>
<td></td>
<td>(5) Illegal consumption</td>
<td></td>
</tr>
</tbody>
</table>

(Source: UNODC 2012, 35. Revised by the author)

\textsuperscript{45} So long as the CITES-listed species harvested or traded do not enter the international market, it lies beyond the CITES control purview.
The second reason for the inconsistency in understandings of wildlife crime relates to the complexity of wildlife-related illegal practices. Such complexity – which tends to be one of the common characteristics throughout the many sectors of environmental crime – has two-fold meanings.

On the one hand, illegal wildlife trade involves complex multi-level “chains of custody” and the illegality can arise in many forms at any custodian points. As shown in Table 3.2, wildlife crime comprises a diverse range of offences from illegal hunting or poaching, processing, trafficking, export, import, supplying, to the unlawful acquisition, possession, and consumption of wild fauna and flora. In addition to the “mainstream” or proximate crimes, a list of crossover offences including document fraud, money laundering, tax evasion, and corruption might be involved as a means to facilitate the commission of the mainstream wildlife crime. These offences occur equally and often repeatedly at each custodian point from the country of origin, transit, to the country of destination.

On the other hand, illegal wildlife trade engages a constellation of perpetrators varying from harvesters and poachers, middlemen and intermediaries (sometimes called “brokers”), wholesalers, processors, and exporters, to importers and retailers. These illegal operators tend to draw different levels of proceeds from the collecting and marketing chain by either direct complicity in the mainstream wildlife offences or indirectly providing a variety of products and services (e.g., fraudulent documents, money laundering) which are necessary for the “smooth” undertaking of the mainstream wildlife crime.

Wildlife offenders appear to come from a broad spectrum of socio-economic profiles and are driven by a myriad of motivations. Some perpetrators are impoverished locals, tourists, and private collectors whose participation in illegal harvesting and trade is sporadic or at a small scale. The motivations behind this type of offenders vary by cases. In some cases, killing of wild animals is mainly for self-subsistence use (e.g., food, clothing, and medicines), or for trade as an emergency, supplementary or primary source of cash income, or for the purposes of private collection. In other cases, it is a response to the threat posed by animals to human property (e.g., livestock, crops) or human life (Treves and Karanth 2003; Warchol 2004; WWF 2006). TRAFFIC’s 2008 survey on the expert opinions about the legal/illegal wildlife trade in Cambodia,
Indonesia, Laos, and Vietnam indicates that wildlife harvesting for trade across the four countries is mostly carried out as a planned, rather than ad hoc or opportunistic, activity by local dwellers with poor economic status. The dominant motivation for harvesting for trade is the need for cash earnings, expressed either in the form of a long-term and persistent need for household income owing to the extremely restricted access to alternative livelihoods, or as a resort to unforeseen or emergency needs for cash income (TRAFFIC 2008, 26).

Opposed to the small-scale extraction and trade of wildlife, there are professional poachers and members of organised crime groups involved in large-scale, systematic cross-border sourcing, smuggling, and supplying of protected species. The motivation behind this type of offenders is often categorical, mostly for the high profits generated from illegal activities. Indicators of the organised nature of parts of the international illicit trade in wildlife can take many forms, including detailed planning, significant financial support, international management of shipments, sophisticated forgery of permits and certificates, well-armed participants, and others (Sellar 2007). By meeting many of the above benchmarks, seizures of large-scale and cross-border shipments are often a good measure of the presence of organised criminality. This is because the trafficking of large quantities of wildlife across a long distance from source countries to the end-use markets involves a complicated process that can only be handled with a competent level of expertise, financial resources, and the managing, organising, and marketing capabilities. As discussed in Chapter 1, between 1989 and 2010 the ETIS (Elephant Trade Information System) recorded over 55 large ivory seizures with an average seizure size of around 2.3 tonnes (UNODC 2010, 158).46 More recently, UNODC conducted a grand empirical analysis of some 164,000 wildlife seizures occurred globally during 1999–2015. Under the category of ivory seizures, during 2009–2014 some 99 large ivory seizures (each weighing over 500 kg) were made by enforcement agencies worldwide (UNODC 2016, 44). With the significant monetary value involved in any single of these large seizures, it is hard to deny the role of organised criminal groups in the trafficking.

Given the objective of this case study is to explore China’s role and function in the international transaction chain of illegal wildlife trade, this chapter adopts a definition

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that conceives of wildlife crime as containing two dimensions of illegal activities. First, at the international level, (transnational) wildlife crime refers to the import or export of wild fauna or products thereof that violates the regulatory regime established by CITES. As noted previously, this form of illegality makes up the majority of the detected transnational wildlife crime and often comes along as proceeding without a valid permit/certificate issued by the national CITES MA. Second, at the national level, wildlife crime refers to harvesting, transport, purchase, sale, or consumption that contravenes China’s wildlife-related laws and regulations.

3.2. **CHINA’S GLOBAL TRADE IN ILLEGAL WILDLIFE**

3.2.1. **GLOBAL CONCERN OVER CHINA’S ROLE IN INTERNATIONAL ILLEGAL WILDLIFE TRADE**

“The teenaged cook grabs a handful of slim green snakes from their cage outside the kitchen, seizing them by their necks as he wields his cleaver in the other hand. In a matter of minutes, he slits the skin of each snake from neck to tail, the squirming reptiles still alive and moving in a frenzy as they are chopped into a wok” (McLaughlin 2010).

The local restaurant, where the gruesome scene above was pictured, is just one among hundreds of the same kind secretly or even openly serving wildlife-based cuisine in Guangzhou, the capital of Guangdong Province. The snakes are also just one among thousands of wildlife species caught around the globe and moved legally or illegally to China to feed a burgeoning market.

In comparison with its role as a supplier of wildlife products (Wyler and Sheikh 2008; Nijman 2010), China has created a greater global concern over its shift toward being one of the world’s largest consumers of wildlife illegally sourced from within China, to its north and south neighbours, and to the African continent. Tens of tonnes of a wide spectrum of wild animals are reputed to be shipped to China on a daily basis (UNODC 2010, 159). A crude estimate of China’s annual black market value hovers around US$10 billion (McLaughlin 2010). This black market is claimed to have expanded as an outcome of the confluence of the increasing number of wealthy Chinese (Martin and Vigne 2011, 4; Vigne and Martin 2014, 79) and the “enabling” socio-cultural milieu for
wildlife consumption (Wasser and Jiao 2010; UNODC 2010, 154). Either because they are treasured for the purported medicinal benefits according to traditional Chinese medicine (TCM), or because they are regarded as status symbols or prized as pets or exotic meat, these wildlife species and their derivatives and products are being used for a variety of goods ranging from foods, medicines, pets, fashion and cultural items, industrial resins and extracts, and household decorations.

In July 2005, based on ETIS’s two successive analyses of the seizure records of ivory tusks and products, CITES Secretariat declared China as “the single most important influence on the increasing trend in illegal trade in ivory since 1995”.47 It seems that China’s role as the world’s major consumer coupled with its failure to take adequate measures to curtail its illegal internal trade have ignited a worldwide worry over a possible scenario. That is, if things remain unchanged, with its growing but somehow uncontrolled hunger China would be gobbling up the wildlife treasures of the world – from pangolins, turtles, and snakes in Southeast Asia, bears in the Russian Far East, to tigers and leopards in India and Nepal, Saiga antelopes in Kazakhstan, and to elephants and rhinos in Africa – to extinction.

It appears that there has always been a rich body of catalysts that fuel or even heighten this unease. With an extensive literature review, this chapter categorises such possible catalysts into three broad sources.

3.2.1.1. Source One: Large-Scale Wildlife Seizures

In recent years, there has been a spate of headline-grabbing large-scale seizures of illegal wildlife related to China as reported by law enforcement authorities and propagated by international media. These at least include large hauls occurred within China and its territories and those outside China, but evidence indicating the ultimate destination of the involved contraband was China.

For instance, within mainland China, in February 2013 along a border road connecting Ruili, Yunnan Province and the northern Burma, local police intercepted one of its largest ever-recorded seizures of illegal wildlife. Some 4,815 live snakes including

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cobras, vipers and Indian rat snakes (*Ptyas mucosus*), with their total weight at nearly four tonnes, were contained in 176 wooden crates loaded on a truck heading for inland China.48 On 7 June 2012, a bust into a rental apartment in Nanning, Guangxi Province brought the forest police a seizure of 343 frozen pangolins (weighing around 2.2 tonnes), 141 bear paws, 37 frozen big-headed turtles (*Platysternon megacephalum*), and 20 kg of meat believed to be harvested from the CITES Appendix I-listed species the Asiatic black bears (*Ursus thibetanus*). The haul, with an estimated value of CN¥20 million, marked the biggest seizure that the Nanning forest police had made in the past decade.49

In *Hong Kong*, on 6 August 2013, acting on a tip from customs officials in mainland China, the Hong Kong Customs seized 1,120 polished ivory tusks, 13 black and white rhino horns, and five leopard skins (combined weighing 2,266 kg) from a shipment arriving from Nigeria for Shanghai. The haul, with its value estimated at HKD$41 million (or US$5.3 million), came on the heels of a string of massive seizures of illegal wildlife exports that Hong Kong authorities had made in 2013 alone.50 And 1,120 ivory tusks came only to be the tenth large-scale ivory seizure made in Hong Kong since 2010.51

*Outside China*, on 8 February 2010, 447 bear paws (515 kg) loaded on two lorries destined for China were seized by the Russian border patrol agents at a Russian south border village.52 On 5 August 2008, the Indonesian National Police Criminal Investigation Bureau confiscated 14 tonnes of frozen Malayan pangolins (*Manis javanica*) and 50 kg of pangolin scales from a warehouse in Palembang, South Sumatra where the illegal cargo was stored and ready to be exported to China. A weight of 14 tonnes also broke the record of pangolin seizures that the Indonesian authorities have ever made.53

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51 CITES defines “large-scale” ivory seizures as equivalent to 500 kg or more. CITES Secretariat. “Monitoring of Illegal Trade in Ivory and Other Elephant Specimens (Elephantidae spp.).” [http://www.cites.org/eng/dec/valid16/16_78-83.php](http://www.cites.org/eng/dec/valid16/16_78-83.php).


Seizures are only indicative of a fraction of the actual overall illicit trade. However, they provide strong evidence to support two claims about China’s role in global illegal wildlife trade. First, mainland China stands as a prominent destination hub absorbing unremitting cross-border inflows by sea, air or land of illicit wildlife from multiple directions around this country. Second, Hong Kong is a significant transit point for illegal wildlife being smuggled by sea into mainland China.\(^{54}\)

### 3.2.1.2. **Source Two: Involvement of Chinese Nationals in Wildlife-related Offences**

There have been increasing incidences involving Chinese nationals being arrested or prosecuted for smuggling or illegal possession of wildlife in source countries in Africa and at flight transit points like the UK and Belgium in Europe. In particular, these involved two types of cases. First, Chinese tourists got caught at airports for possessing endangered wildlife products in their carry-on luggage without a legal permit when transiting the returning flights. During May–June 2010, for example, customs at the Brussels Airport in Belgium confiscated an accumulation of 3,000 dried seahorses (*Hippocampus*), 250 ivory items, and 25 bags made of crocodile skins from over 100 Chinese passengers when they transited Belgium from Guinea to Beijing. This had directly led the INTERPOL, CITES Secretariat, and World Customs Organisation (WCO) to officially notify China’s CITES MA about this unusual spike in Chinese-related seizures. Responding to the notice, the Chinese authorities had subsequently tightened up its customs control at the Beijing International Airport and launched a campaign to sensitis the Chinese tourists to the illegal nature of purchasing and carrying home the endangered wildlife products.\(^{55}\)

Secondly, Chinese labourers working overseas, especially those employed in infrastructure construction projects in Africa, have been reportedly involved in the illegal trade or even poaching of local wild animals. Michael E. Ranneberger, the former American Ambassador to Kenya (2006–2011), once accused in a cable the Chinese of “being behind the increasing incidences of poaching in Kenya” and the Chinese government of having not “demonstrated any commitment to curb ivory

\(^{54}\) As will be discussed later in this chapter, the role of Macau and Taiwan as transit points for smuggling wildlife into mainland China is not empirically conspicuous.

The evidence he used to support his allegations was the Kenyan Wildlife Service’s (KWS) reports on the marked increase in poaching incidences in wherever Chinese labour camps were located as well as the quote of KWS director Julius Kipng’etich’s, who stated that “ninety percent of all the people who pass through our airports and are apprehended with illegal wildlife trophies are Chinese” (McConnell 2011).

3.2.1.3. **SOURCE THREE: WIDESPREAD NON-COMPLIANCE IN INTERNAL MARKET**

The third source of catalysts relates to the observations of the present state of illegal wildlife trade in China. As exposed by several international and Chinese environmental NGOs through their market surveys and undercover investigations in many parts of China, the Chinese government has not imposed tight enough control over its domestic black market for wildlife. Specifically, the not-tight-enough-control assessment derives from two aspects of China’s current illegal trade.

On the one hand, protected wildlife and body parts and products were found widely available on local niche markets; restaurants and hotels were disclosed secretly or semi-openly serving wildlife-based meals. In 2007, a field survey aimed at understanding the status of wildlife trade as food in south China was carried out by the China Wildlife Conservation Association and TRAFFIC China. This survey involved field investigation of 25 niche marketplaces for pet birds, ornamental plants, aquatic and agricultural products as well as 50 luxury restaurants selected from five southern cities including Kunming, Nanning, Guangzhou, Fuzhou, and Haikou. Final results found that 13 (52%) marketplaces visited harboured protected live animals and their body parts and products in open sale, and 20 (40%) restaurants examined offered wild animal-based meals. Among the traded wild animals, two species were identified as under China’s first class special state protection (Class-I SSP), six species were under the second class special state protection (Class-II SSP), and two species were on CITES Appendix I, and fifteen species on CITES Appendix II (Meng et al. 2009).

In west China, in 2008 with the assistance of volunteers from the China Wildlife Trade

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56 Based on the grading and categorization of wildlife species, China adopts a three-level protection system. For species classified as rare and valuable or endangered, the State affords the highest level of protection as under “Special State Protection” (SSP), which is further differentiated between species under Class-I SSP and Class-II SSP. A more in-depth exploration of China’s wildlife protection system is provided in Chapter 6.
Monitoring Network, TRAFFIC coordinated a field survey on niche markets for birds as pets, animal furs, ornamental plants, traditional Chinese costumes, and jewellery craft in eighteen cities from Provinces of Qinghai, Gansu, Sichuan, and Yunnan. Investigation recorded a notable decrease in the number of observable sale of wildlife on sample marketplaces in contrast with the 2007 survey. However, wild animals under CITES Appendix I and Class-I SSP such as skins of snow leopard (*Uncia uncia*) and tiger as well as Tibetan accessories made of red coral (*Antipatharia* spp.) were still found openly displayed for sale (Xu 2008, 4–5).

On the other hand, government accredited workshops and pharmacies – where legal, regulated trade should at least be expected – have been discovered to be manufacturing and processing smuggled wildlife materials and selling Traditional Chinese Medicines (TCM) containing ingredients of protected species without a valid permit. The problem is particularly acute in the field of ivory trade. This is not only because of the disclosed industry-wide non-compliance, more important was such violations coming at a time after the Chinese government had levelled up its effort to regulate its domestic ivory market. In 2003, China introduced an official identification mechanism, stipulating that ivory items can only be crafted and sold in registered workshops and retail outlets. Every ivory item in sale or on exhibition is required to be accompanied by an identity card issued by the State Forestry Administration (SFA). However, in January 2011 a market survey conducted by the environmental NGO “Elephant Family” in Guangzhou and Fuzhou – two cities believed to be the most important centres for ivory trade in south China – uncovered alarmingly weak enforcement. In Guangzhou, 3,947 (61%) out of 6,437 ivory objects counted on display for sale were not affixed with a compulsory ID card. Some 72 (92%) out of 80 retail outlets did not present ID cards next to the ivory items in sale. While in Fuzhou, 282 ivory items in 39 stores were with not accompanied with ID cards (Martin and Vigne 2011).

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57 In August 2009, EIA conducted similar market surveys in Xining (Qinghai Province), Linxia (Gansu Province), Lhasa (Tibet), Shigatse (Tibet), and Nagchu (Tibet) and also found animal parts and products of Asian big cats (tiger and leopard) openly available for sale in local marketplaces (EIA 2009).

58 In addition, there was another media exposure concerning the non-compliance at ivory crafting workshops in China. In February 2011, Sky News undercover investigation at a government registered ivory workshop documented an ironic and contradict story. A manager of the workshop alleged that their business only accepts ivory tusks coming with a certificate to prove their legal origin. But when she left, one of her workers told the undercover crew privately that he had also carved smuggled ivory tusks. And to prove this, he showed off chunks of smuggled ivory. The detailed information about the city where this ivory workshop locates was undisclosed. Sky News. “China Ivory Demand Spurs Elephant Slaughter.” February 9, 2011. [http://news.sky.com/story/836138/china-ivory-demand-spurs-elephant-slaughter](http://news.sky.com/story/836138/china-ivory-demand-spurs-elephant-slaughter).
For China’s TCM trade, it can be seen in a 2007 report to CITES concerning China’s trade in Saiga horns (*Saiga tatarica*), a species listed in CITES Appendix-II and Class-I SSP. This report was based on a field survey of 195 pharmacies selected from 12 trading markets known as local TCM wholesale hubs in seven cities of four provinces.\(^59\) The survey results were truly astounding, not only because of a high percentage (66%, 122) of pharmacies in all four provinces found selling Saiga horns and derivatives without permits, but also because of the prevalence of distorted trading rules held tacitly by both the market dealers and regulators that trade in whole Saiga horns is illegal, but trade in Saiga horn parts or derivatives is tolerable and acquiescent (Li et al. 2007).

At a Press Conference on 18 February 2013, in answer to the questioning of China as the world’s leading consumer for ivory poached from Africa, the Foreign Ministry Spokesperson Hong Lei stated that:

> “The Chinese government has consistently attached great importance to the protection of wild animals including elephants. It has enacted a series of wildlife-related laws and regulations and established internal joint law enforcement mechanisms to orchestrate efforts from police, customs, and commercial department to combat and suppress wildlife-related crimes and offences. The government has also actively participated in international law enforcement cooperation to crack down on smuggling and trafficking of wild animals and their products. China’s efforts have achieved significant progress, as the number of smuggling and illegal trade of ivory products has declined remarkably.”\(^60\)

Nevertheless, the China- and Chinese nationals-related occurrences summed up above are clearly critical part of the ground that fuels the growing global concern over China’s role in the international illegal wildlife trade. Such incidents have generated significant unwanted “negative” impacts on China’s global image. Therefore, it is in China’s interest to do something about it if it is concerned with alleviating such global unease.

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59 These seven cities included Guangzhou, Zhongshan, Jiangmen, and Huizhou in Guangdong Province; Lanzhou in Gansu Province; Chengdu in Sichuan Province; Wenzhou in Zhejiang Province.

3.2.2. Profiling China’s role in global trade in illegal wildlife

An effective control of illegal wildlife is built on a better understanding of China’s role and function in the global and regional transaction chain of illegal wildlife trade. This requires not only a panoramic grasp of the overall illegitimate trade related to China, but also an evidence-based understanding of the many detailed facets (e.g., smuggling routes, hotspots) associated with the illicit transaction chain which can provide more directed and tailored guidance on the design of enforcement interventions.

Existing literature (including both English and Chinese written work) dealing with China’s illegal wildlife trade tends to either focus on illicit trade in selected wildlife species or products such as ivory (Martin and Stiles 2003; EIA 2007), Saiga antelopes (Li et al. 2007), or tiger skins (EIA 2004; Nowell and Xu 2007), or else focus on trade in selected localities such as Guangxi (Li et al. 2010), Yunnan (Li and Wang 1999; Gong et al. 2012), or the Himalaya region of China side (Li et al. 2000). In more common cases, research on China’s wildlife trade adopts a combined focus that studies illicit trade of selected species in selected localities, for example, Asian turtle trade in Southern China (Cheung and Dudgeon 2006). Currently, there have been no empirical studies that analyse illegal trade in China and its territories as a whole, and that consider a broad coverage of wildlife species involved in illicit trade.

This section collates and assesses China-related seizures of illegal wildlife trade, reports of which were extracted from the TRAFFIC Bulletin Seizures and Prosecutions (TRAFFIC 1997–2013). TRAFFIC Bulletin is an archive of global media reports on wildlife seizures and prosecutions that took place worldwide in the past ten more years. Typically, a seizure is made when a shipment of wildlife contraband is detected and intercepted by law enforcement agencies. Therefore, the quantity of seizures is indicative of both the presence and levels of severity of a problem and the endeavour and levels of effectiveness by law enforcement authorities to tackle it. Admittedly, seizures are imperfect data because they only represent the detected cases and the bulk of wildlife trafficking probably proceeds the undetected. However, when aggregated in relatively large numbers and triangulated with other information, seizure data are capable of providing more penetrating insights into the hidden patterns of black markets (UNODC 2016, 28).

In ideal cases, a complete media coverage contains information on the date of the
seizure, the country of origin, destination, and transit (if present), the name (common or scientific), number or weight of the confiscated, the CITES protection status, the methods for conveyance and concealment, the number of suspects detained (or arrested or prosecuted), the penalties applied if suspects were convicted and so on. The key objective of this analysis is to achieve a comprehensive yet evidence-based understanding of China’s profile and function in the global transaction networks of illegal wildlife. More specifically, attention has been given to the following critical sub-issues: (1) the scale and scope of illegal wildlife trade in China and its territories; (2) the magnitude and diversity of wildlife species illegally traded to and from China; (3) the hotspots, smuggling routes, prevailing modes of transport and concealment associated with China’s illegal trade.

Based on the localities where seizures took place, “China-related” is defined to include the following three classes of cases. “Class A” refers to seizures occurred within China (including its three territories) with evidence indicating that China was the destination for the contraband. “Class B” consists of seizures occurred outside China, but evidence showed that the involved contraband was ultimately destined for China. “Class C” comprises seizures occurred within China, but evidence indicated that the contraband was intended for illegal export, or seizures occurred outside China, but evidence confirmed that China was the source country for the contraband.

In the course of amassing the database, care was given to screen out the duplicated records. For example, the same incidents were reported twice: one was at the time when the seizure was made and suspects were arrested, the other was at the time when the suspected was convicted.

As such, I have compiled a total of 363 records of China-related seizures, which span 16 years from March 1997 to April 2013.61 Of the whole, Class A contains 256 records (71%), Class B has 89 records (25%), and Class C has 18 records (4%). The uneven

61 Two cases have not been pooled into the database. One case involved undisclosed numbers of Chinese nationals being detained on 11 February 2007 at a farm in Camperdown, South Africa for suspected implication in abalone (*Haliotis*) smuggling. From the farm garage, the local authorities recovered between 5 and 6 tonnes of abalone. There was no disclosed information showing China was the destination for the haul. Another case involved two Chinese tourists reported to be arrested at the Maputo International Airport, Mozambique in June 2012 for the possession of 25 kg of ivory in their luggage without a permit. The destination of the two Chinese was undisclosed. All Africa News. “Mozambique: Two Chinese Nationals Arrested for Ivory Trafficking.” June 5, 2012.

proportion among the three classes, with the sum of Class A and Class B constituting 96 percent of the total seizures, further substantiates the overwhelming role of China as the world’s leading consumer market for illegal wildlife than as a supplier. Only a very limited number of wildlife species and their products were found in illegal export out of China. These mainly included Tibetan antelopes (*Pantholops hodgsoni*), saker falcons (*Falco cherrug*), Chinese alligators (*Alligator sinensis*), and TCM-containing ingredients of protected flora and fauna such as pangolin scales, musk deer (*Moschus*), seahorses (*Hippocampus*), orchids (*Cymbidium*), and costus root (*Saussurea cotus*).

### 3.2.2.1. Scale of China’s Black Market for Wildlife Products

The annual number of recorded seizures varies greatly, from only six in 2003 to 64 in 2009. No clear directional patterns can be discerned as seizure number increased in general during the period between 2000 and 2009, but started to decrease since 2010 (see Figure 3.1). However, irrespective of the annual variation of seizure number, China’s illegal wildlife trade has been clearly enormous in terms of both the diversity of species and the volume of wildlife involved.

![Figure 3.1: Variation of the annual number of recorded seizures by year (March 1997–April 2013)](image)

More than 124 species of wild flora and fauna were traded illegally. Among them, 38 species involved in 213 seizures were listed on CITES Appendix I; 46 species in 159 seizures were listed on CITES Appendix II, and four species in two seizures were listed on CITES Appendix III. The illicit trade also stretched to a variety of species including, for example, sables (*Martes zibellina*), moose (*Alces alces*), red squirrels (*Sciurus*
vulgaris), and sugar gliders (Petaurus breviceps), which have not been designated as endangered or threatened. Besides, the protection status of seized species was not always clear and easy to identify as the taxon of some species was only recorded at the level of “Genus” in the taxonomic hierarchy. For example, in one case it was reported that “37 raw musk (Moschus spp.) pods” were recovered by customs officials. As species under the genus of Moschus spp. include both CITES Appendix I- and II-listed depending on the locations of the specimen’s habitats. In such cases, it is often unable to identify their accurate protection status under CITES.62

In total, 363 seizures contributed to the confiscation of over 108,077 animals including both live (75,160) and dead (32,917). Reptiles were the largest taxonomic group in terms of the total numbers of individuals seized (over 85,379). Although the number of seized mammals (15,395) was far smaller than reptiles, mammals and mammal parts and derivatives dominated the illegal trade as they comprised 76 percent (276 seizures) of all seizures.

Figure 3.2: Comparison among the major taxonomic groups of seized animals

Note: (1) “others” in this pie chart refers to those that fall outside the five major taxonomic groups (mammals, reptiles, birds, amphibians, and fish). In this case, they mainly consist of whale sharks (Rhincodon typus), black and stony corals (Antipatharia spp., Scleractinia), brown mussels (Perna, perna) and so on. (2) Figures in this chart stand for the number of seized animals, including both live and dead, of each taxonomic group. (3) The sum of these figures is smaller than the real total of the seized animals.

62 Under the CITES Appendices, the taxonomic ranks employed to classify fauna include, from low to high, species, genus, family, order, class, and phylum. An accurate recording of specific animals in seizure should reach to the level of “species”. CITES Secretariat. “Appendices.” https://cites.org/eng/app/appendices.php.
This is because in a number of cases seized animals were recorded in unconvertible units like “seven truckloads” or no records provided at all as to the number or weight.

3.2.2.2. **HIGH-PROFILE SPECIES INVOLVED IN CHINA’S ILLEGAL TRADE**

Of the high-profile species and derivatives illicitly traded to China, bears (paws, gall bladders), leopards and tigers (pelts, bones), ivory, rhino horns, pangolins (live, meat, scales), lizards, snakes, turtles and tortoises are on the list. Moreover, pangolins, ivory, bear paws, snakes, lizards, turtles and tortoises were often traded on a substantially massive scale. For example, a total of more than 12,227 live and dead pangolins plus 96,820 kg of pangolin meat and 12,512 kg of pangolin scales were recovered from 77 seizures over the 16 years studied. Some 100 seizures involved the forfeiture of around 62,723 kg of ivory tusks and products (e.g., bangles, beads, bracelets, carvings, chopsticks, sculptures, seals) by enforcement authorities within and outside China. Using the estimate of average tusk weight of 3.95 kg (Rosen and Smith 2010, 26), the impounded ivory represents harvesting from 7,939 elephants. In addition, some 3,949 bear paws, most from the Siberian brown bears (*Ursus arctos*) and few from Asiatic black bears (*Ursus thibetanus*), were netted from 33 seizures. In reptile taxa, some 68 seizures led to a total haul of 55,650 snakes, 11,353 lizards, and 28,871 turtles and tortoises (including both live and dead).

For Asian big cats, pelts and bones of tigers and leopards were most commonly seen in seizures. In total, some 78 tiger skins and 517.4 kg of tiger bones as well as 837 leopard skins were documented in 42 seizures. Although the scale of illicit trade in Asian big cats was not comparable with that of other high-profile mammals, existing scale was still shockingly large when considering their remaining small population size in the world.63 Other less well-known mammal species – for example, slow lorises (*Nycticebus coucang*), crab-eating macaques (*Macaca fascicularis*), rhesus macaques (*Macaca mulatta*), ring-tailed lemurs (*Lemur catta*), and sables – were also occasionally traded on a small scale.

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Table 3.3: High-profile species and derivatives involved in China-related illegal trade during 1997–2013

<table>
<thead>
<tr>
<th>Species and derivatives</th>
<th>Major indicators</th>
<th>Supplement indicators</th>
<th>Number of seizures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pangolins</td>
<td>12,227 individuals (both live or dead); 96,820 kg meat; 12,512 kg scales</td>
<td>--</td>
<td>77</td>
</tr>
<tr>
<td>Ivory</td>
<td>62,723 kg ivory tusks and products</td>
<td>1,150 pieces of ivory tusk and 2517 ivory products or items</td>
<td>100</td>
</tr>
<tr>
<td>Rhino horns</td>
<td>113 rhino horns plus 11.26 kg rhino horn</td>
<td>0.53 kg rhino horn products</td>
<td>17</td>
</tr>
<tr>
<td>Bears</td>
<td>3,949 paws,</td>
<td>27 bear gall bladders; 1 bear penis; 1 bear skin; 5 bear carcasses; 18 live bear cubs</td>
<td>33</td>
</tr>
<tr>
<td>Tigers</td>
<td>78 skins; 517.35 kg bones</td>
<td>543 pieces of tiger bones; 6 skulls; 4 paws; 7 carcases</td>
<td>23</td>
</tr>
<tr>
<td>Leopards</td>
<td>837 pelts</td>
<td>17 leopards (dead and live); 7 skeletons, 3 heads</td>
<td>19</td>
</tr>
<tr>
<td>Snakes</td>
<td>55,650 individuals (live and dead)</td>
<td>1,087 kg snake meat; 557 snake scales</td>
<td>The three reptile taxa consist of 68 seizures</td>
</tr>
<tr>
<td>Lizards</td>
<td>11,353 individuals (live and dead)</td>
<td>22.6 kg lizard meat</td>
<td></td>
</tr>
<tr>
<td>Turtles and tortoises</td>
<td>28,871 individuals (live and dead)</td>
<td>4,433 kg turtles and tortoises; 556 kg turtle scales</td>
<td></td>
</tr>
</tbody>
</table>

Shipment size varied tremendously, ranging from tiny numbers or little weight to thousands of individuals or tens of tonnes involved in just a single seizure. In particular, mammals and mammal derivatives (e.g., pangolins, ivory) and reptiles were most likely involved in bulk smuggling. For example, on 13 July 2010, Guangdong Customs foiled an attempt of cross-border smuggling to China of an enormous amount of pangolins. More than 7.8 tonnes of frozen pangolins (2,090 individuals) and 1.8 tonnes of pangolin scales were seized from a fishing vessel headed to Zhuhai, Guangdong Province. The biggest China-related seizure of ivory took place in Westports, Malaysia in December 2012 when local customs intercepted some 1,500 ivory tusks weighing over 24 tonnes.

from a shipment arriving from Togo en route to Malaysia for China. The largest China-related reptile seizure was made in February 2008 by Shantou Customs in Guangdong Province: some 5,776 monitor lizards (Varanus), 1,170 cobras, 260 Malaysian box turtles (Cuora amboinensis), and 370 giant Asian pond turtles (Heosemys grandis) were recovered from a vessel and a pick-up lorry.

Large-scale seizures often have decisive implications for the total haul. In ivory seizures, for example, some 20 large-scale ivory seizures had been recorded, with confiscated ivory involved in each seizure exceeding 500 kg. These 20 seizures, although only accounting for 20 percent of the total ivory seizures, constituted nearly 95 percent (59,416 kg) of the total ivory haul. As discussed early in this chapter, large-scale seizures are often a strong indicator for the organised elements in illegal wildlife trade. In this case, the sheer size of illicit ivory involved in individual shipments clearly suggests the devastating role played by professional and well-organised criminal networks in trafficking ivory from the source countries to China.

3.2.2.3. METHODS FOR SMUGGLING AND CONCEALMENT

A variety of methods has been employed in smuggling practices to conceal illegal goods and evade border inspection. In small-scale and tourist trafficking, aeroplane, ferries, cross-border commuting coaches, and trains were often utilised as transport vehicles. Small wildlife products were wrapped in clothing and packed in carry-on luggage, or bound to the passengers’ bodies with elastics and tapes, or hidden in passengers’ custom-designed clothing including vests and underwear with secret pockets. In some cases, illegal sellers deliberately provided buyers with special designs like belts with secret room for containing illicit goods as a trick to promote their business. International express services were sporadically used for smuggling in and out of China, with wildlife being packed in parcels and mislabelled as gifts, toys, or food.

For bulk shipment, trucks were usually seen in land transport. Wildlife products were packed in crates, cartons, and sacks and were mixed with legal or similar looking

commodities, or hidden in secret spaces like lorry tyres or under heavy materials like scrap metals or in secret purpose-built compartments like extra-built containers of oil tank outlook. Contraband was deliberately left unattended in public transport until arrival at the final destination. Unwitting drivers were hired to escort the illegal shipment through enforcement checkpoints. In a few cases, trucks with forged military or police registration number plates were used to ease the inspection intensity. There were also a number of cases in which contraband was transported openly across the border without any special effort at concealment.

Containerised cargo by air or sea was often used in large-scale, long-distance smuggling. Misdeclaration was used in collusion with faked or expired documentation. CITES Appendix-listed species were falsely declared as non-CITES listed species, and wild-caught specimens were misdeclared as captive-bred specimens. To decrease the risk of detection, officials working at airports, customs, border checkpoints, and post offices were sometimes bribed in exchange for green passage (nothing to declare). Speedboats were used in short-distance delivery to transport illegal wildlife from container transhipment terminals to nearby destinations, for example, from Hong Kong to neighbouring mainland coastal cities such as Guangzhou or Zhuhai.

Modes of transport and concealment change over time, usually as an adaptive response by illegal traders to enforcement interventions, for example, avoiding using vehicles for smuggling that have been evaluated by local authorities as prioritised targets for random inspection. As noted in an early study of China’s saker falcons smuggling, foreign trappers and smugglers shifted their means of transportation from aeroplanes and trains to taxis for crossing the Chinese borders, which directly resulted in the increase in difficulty for detection by law enforcement (Ming, 2004).

Pangolins, birds, and reptiles were often trafficked alive, but with many perishing during transit due to the poor conditions. In one case, Malaysian authorities seized over 900 crab-eating macaques which were believed to be destined as food in China or for laboratories in the Netherlands. Some monkeys were so hungry that they started to eat their new-born offspring and hurt each other in desperation. In another case of live pangolin trafficking, smugglers used sedatives to tranquilise pangolins before they

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walked them through the checkpoints at the train station. Even more reprehensibly, they used a high-pressure jet to stuff live pangolins with water so that the extra weight can be added to the pangolins and additional profits can be made when sold to the buyers. Some of the point-noised animals were so full of water that they could not survive even when rescued.\textsuperscript{68}

### 3.2.2.4. Smuggling Routes and Hotspots

As seen from the above statistics, China is surely one of the world’s leading consumers for a large share of illegal wildlife sourced from around the globe. Despite the distinctions in the variety of wildlife in supply, seizure data offer strong evidence that Indonesia, Malaysia, Myanmar, Thailand, and Vietnam in Southeast Asia, DR Congo, Kenya, South Africa, and Tanzania in Africa, and India and the Russian Far East are specifically outstanding suppliers for China of a broad diversity of wild animals and products. While ivory tusks and rhino horns dominate the illegal export of wildlife from Africa to China, Southeast Asia and the Russian Far East provide a more diverse spectrum of wildlife spanning over many specimens under the taxa of mammal and reptile and their derivatives and products.

![Figure 3.3: China’s major suppliers of illegal wildlife (based on the seizure numbers)](image)

**Note:** Only half of the total seizure records provide information on the country of origin for the wildlife involved.

After wildlife being collected from the wild, a variety of routes is being used to funnel them into China. While Hong Kong continues to be the most important point of entrance for wildlife being smuggled by sea into mainland China, terrestrial border areas of China are also evidently a point of vulnerability for transnational wildlife trafficking. Every direction of China’s border areas— from the northeast (Heilongjiang Jilin) and north (Inner Mongolia), to the west (Xinjiang), and to the southwest (Tibet) and south (Yunnan, Guangxi)— all have reported seizures involving large volumes of illegal wildlife. Again, although these seizures only stand for the failed trafficking attempts, they imply much more about behind the scene a sizable scale of illegal wildlife trade going on regularly and successfully.

a. Hong Kong, Macau, and Taiwan

Hong Kong serves as a significant transhipment point through which vast amounts of wildlife illegally harvested in Southeast Asia and Africa enter mainland China. Overall, 47 Hong Kong-related seizures of illegally imported or exported wildlife have been extracted from the TRAFFIC Bulletin 1997–2013. Among them, 28 records containing explicit information regarding the destination for the seized wildlife showed that mainland China was the intended end-use market. Source countries involved in this line of trafficking mainly concentrate in Southeast Asia and Africa, with Malaysia, Indonesia, Thailand, and the Philippines constituting the leading suppliers of lizards, pangolins, snakes, and turtles and tortoises, and Cameroon, Kenya, South Africa, and Tanzania comprising the major suppliers of ivory and rhino horns.69

Another publicly accessible source of data on seizures of illegal wildlife made by Hong Kong is the biennial reports submitted by Hong Kong Agriculture, Fisheries and Conservation Department to the CITES Secretariat during 2003–2010, with 2010 being the latest data at the time of writing.70 Biennial reports only contain numeric figures for seizures of illegal exports, imports, and possessions, without providing detailed information on the content of the seized or the source countries for the imported and the destination markets for the exported. As shown in Figure 3.4, import-related seizures accounted for the largest share of total seizures. But considering the realities concerning

69 Since international commercial trade in ivory was banned in 1989, global seizures of illegal ivory peaked in 2002, 2006, and 2009. While in the 2006 peak, some 2,600 kg of seized ivory in Hong Kong and 5,200 kg in Taiwan were substantiated by the DNA test to be originated from Selous (Southern Tanzania) and Niassa (Northern Mozambique) (Wasser et al. 2010).
Hong Kong’s role as one of the world’s busiest container ports and its limited wildlife consumption capability (Seabrooke et al. 2003), it is reasonable to speculate that the illegal wildlife involved in many of these import-oriented seizures was likely for re-export to mainland China. Accordingly, the main reason that illegal dealers choose to transit through Hong Kong is likely to be for the expected lower rate of inspection, because the huge volumes of daily cargo throughput that Hong Kong has to handle make its over-stretched customs authorities unable to police every shipment.

After illegal wildlife arrives in Hong Kong, high-power speedboats are often used in transferring the goods from Hong Kong’s container terminals (e.g., Kwai Chung container terminal) to several key coastal cities in mainland China, including Chaoyang, Shenzhen, Shekou, and Shantou in Guangdong Province, Beihai and Fangchenggang in Guangxi Province, and Xiamen in Fujian Province. Owing to the fact that wildlife is being transported mostly by sea via containerized cargo and few by air cargo, large-scale seizures most likely take place along this line of trafficking. As noted early in this chapter, since 2010 the Hong Kong Customs officials have intercepted ten significant seizures of ivory products, with each haul weighing over 500 kg. In effect, Hong Kong has been in the past years the most important transit point for smuggled ivory sourced in Africa en route to mainland China. This can be verified by another piece of evidence: the statistics released by the MIKE (Monitoring the Illegal Killing of Elephants) and
ETIS about the volumes of seized ivory between 1989 and 2011, mainland China, Hong Kong, and Taiwan were all high on the top-ten list (see Figure 3.5).

Figure 3.5: Top ten countries by the amount of seized ivory during 1989–2011 (kg)

As mainland China has surpassed Japan and Hong Kong to become the dominant ivory manufacturing centre in the Asia-Pacific (Martin and Vigne 2011), it is expected that Hong Kong’s role as the transit route will perpetuate into the foreseeable future. Large quantities of smuggled ivory from Africa will likely continue to be transported by sea via Hong Kong into the Mainland China, processed and crafted there, and re-exported through Hong Kong again to Europe, Japan, North America, Singapore, and Thailand (Milliken et al. 2009).

Macau’s role as a transit point for illegal wildlife to be channelled in or out of mainland China is not empirically conspicuous. While there are no records of wildlife seizures in Macau that can be found in the TRAFFIC Bulletin 1997–2013, I collected one media report on Macau-related ivory seizure from the Timeline of China and the (Illegal) Ivory Trade 2008–2011, a collection of online news on ivory trade released by the

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71 MIKE is an international collaboration established in pursuance of the resolution made at the 10th Meeting of the Conference of the Parties to CITES in 1997. Its overall goal is to record the illegal killing of elephants, to provide information needed for elephant range states to make appropriate management and enforcement decisions, and to build capacity within the range States for the long-term management of the elephant populations. CITES Secretariat. “Monitoring the Illegal Killing of Elephants (MIKE).” https://cites.org/eng/prog/mike/index.php.

environmental NGO “Save the Elephant”. The Macau Daily Times reported that on 16 October 2010, in a joint operation with Guangdong Border Defence Bureau, the Macau Customs busted the biggest ivory smuggling case since 1999. Around one tonne of ivory tusks and crafted ivory contained in nylon bags and wooden crates were recovered on the shoreline of Hac Sá Beach, Macau, where the goods were believed to be awaiting transhipment by speedboats to mainland China.

The biennial reports provided by Macau Economic Services to CITES Secretariat confirm that wildlife seizures in Macau have been restricted in scale in the past eight years. During 2003–2010, there was only a total of 200 wildlife seizures made by Macau authorities (see Figure 3.6). The declining pattern in the number of seizures by year is visible, down from 112 in 2003–04 to only 12 in 2009–10. Interesting is that all seizures documented in the biennial reports have been written as illegal imports as they violated “the requirement of prior authorisation”, not a single seizure being recorded under the heading of “illegal export” or “illegal possession”. In addition, the 2009–10 report indicated that the weight of the confiscated ivory tusks and products between 2009 and 2010 was only 230 kg. Clearly, the ivory seizure in October 2010 mentioned above was, for unknown reasons, not included in the biennial report to the CITES Secretariat.

Figure 3.6: Seizures of illegal wildlife made by Macau authorities during 2003–2010

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75 Again, no information on the source countries of the illegal imports was provided in the biennial reports. Macau SAR. “Biennial Report.” https://cites.org/eng/resources/reports/biennial.php.
**Taiwan**, based on seizure statistics, appears to be more of a consumer than an intermediate point for illegal wildlife transiting to mainland China. In total, some 42 anecdotal reports on wildlife seizures made in Taiwan during 1996–2013 have been drawn out from the *TRAFFIC Bulletin 1997–2013*. Illegal imports made up the dominant share of total seizures, with some 34 (81%) seizures containing destination information clearly pointing out that Taiwan was the intended end-use market. Only a handful of cases (4) involved illegal wildlife seized in Taiwan were bound for Hong Kong or Manila. On the taxonomic composition of seized wildlife, reptiles and mammals and mammal derivatives constituted the most traded, then followed by the trade of limited scale in amphibians, birds, fish, and plants.

Illegal trade in turtles and tortoises and their derivatives – with live turtles and tortoises being used as pet and food and chelonian shells being consumed as an ingredient for TCM – represents a significant proportion of Taiwan’s black market for wildlife. Despite the size of confiscated turtles and tortoises recorded in the database being incomprehensive (only 1,823 turtles and tortoises (live and dead) recovered from 15 seizures), existing studies on Taiwan’s TCM market suggest that imports of turtle shells for TCM use have been vast in trade volume terms. Based on Taiwan Customs trade statistics, Chen et al. (2009) reported that during 1999–2008, Taiwan imported a total of 1,989 tonnes of shells of hard-shelled chelonians from mainland China, Cambodia, and Indonesia and 290 tonnes of shells of soft-shell turtles from mainland China. Trade volumes of turtle shells for TCM in Taiwan fluctuated substantially, with the import of shells of soft- and hard-shell turtles and tortoises surging to its ten-year-peak in 2002 (346,396 kg) and dropping by year gradually to 177,201 kg in 2008. However, after many of the common species traded in Taiwan TCM market were added to CITES Appendix II between 2002 and 2005, the trade volumes – including trade in CITES protected species like Malayan box turtle (*Cuora amboinensis*), Malayan snail-eating turtle (*Malayemys subtrijuga*) and black marsh turtle (*Siebenrockiella crassicollis*) – still maintained a very high level.

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76 The remaining four seizures did not contain information about destination countries. However, it is surprising that there was not a single seizure involving mainland China as the destination for the seized wildlife.
b. Sino (Heilongjiang, Jilin, and Inner Mongolia)–Russia

Illegal trade in animal parts is widespread along the Sino-Russia borders. Bear paws and gall bladders, frogs, tiger bones and pelts, deer musk, and the genitals of spotted deer, which are valued by Chinese for their medicinal, aphrodisiac, decorative, and ritual dish qualities, are smuggled into China on a daily basis.77

Along this line of trafficking, several Russian border parts including Primorsky Kray, Amur Oblast and their contiguous counterparts at the China side were identified by this analysis as being used intensively as channels for border crossings. Through Primorsky Kray, smugglers use trucks and jeeps to transport wildlife poached in the Russian Far East to Dongling in Heilongjiang Province and Hunchun in Jilin Province. During 2002–2008, the Russian authorities made at least five China-related seizures in several localities including Leninskoye, Khorol settlement, Pogranichny, and Polyavka in Primorsky Kray. Among the five seizures, four were of substantially large-scale, leading to the interception of a large batch of protected animal parts including bear paws, tiger skins, Saiga horns and other mammal furs. On 19 March 2004, customs officers at Poltavka, Primorsky Kray seized what was reported to be the largest haul of poached animal parts in Russia over the past decade.78 Included in the haul were 768 bear paws (believed to be from the Himalayan black bear, *Ursus thibetanus*), 24 bear gall bladders, 5,500 fur skins,79 280 musk deer pods, 64 deer penises, 142 deer antlers, 338 kg of sea cucumber (*Stichopus japonicus*), and 49 kg of frog fat (estimated to be from 100,000 frogs). The involvement in the smuggling of vast amounts of a wide portfolio of animal parts as well as the arrest of the Chinese driver escorting the shipment within Russian territory might reveal that Chinese organised smuggling rackets have stretched their reach into the source countries. Moreover, it may also reflect a specific trafficking tactic: using vehicles to move large volumes of wildlife at one time to reduce the transport cost on the one hand, while hiring unwitting drivers to downsize the risk of detection on the other.

Amur Oblast, another Russian border territory adjoining Heilongjiang Province of China, is also a primary conduit for wildlife entering China’s underground markets. On

79 Fur skins were derived from Siberian Weasels (*Mustela sibirica*), Sables, Raccoon Dogs (*Nyctereutes procyonoides*), Red Foxes (*Vulpes vulpes*), and Red Squirrels (*Sciurus vulgaris*).
15 July 2010, Amur Customs foiled an attempt to smuggle by road from Russia to China 6.7 tonnes of animal furs from Muskrats (*Ondatra zibethicus*), weasels (*Mustela*), and sables. Blagoveshchensk in Amur Oblast, a border city opposite to the Chinese town of Heihe, has been reported as a hotspot for wildlife trade and smuggling. With its location at the confluence of Heilongjiang River and the Zeya River in China’s Northeast, it is reputed that in Blagoveshchensk, bear meat-made dumplings, must deer venison, and wild boar are openly displayed behind frosted glass for sale at local meat markets. Usually a casual inquiry at a butcher counter or dialling the phone number advertised on the bulletin board at the marketplace would find the way to illegal wildlife dealers.

Aside from the smuggling routes between Amur Oblast and Heilongjiang and between Primorsky Kray and Jilin, Manzhouli in Inner Mongolia Autonomous Region is also a reported entry point for illegal wildlife from Russia to China. During the period from 2007 to 2012, at least four seizures involving smuggling by trains or trucks from Russia to China of bear paws, tiger bones, and sables had been made by law enforcement agencies in Manzhouli, Inner Mongolia. On 22 May 2013, the biggest seizure of smuggled bear paws ever made by Chinese customs occurred in Manzhouli, where local customs intercepted 213 bear paws hidden in five tyres (plus a spare tyre) of a minibus together with the arrest of two smugglers of Russian national. An officer working at the Manzhouli Customs disclosed that he and his colleagues had witnessed several similar attempts of smuggling a small number of bear paws via Manzhouli into China during winter and early spring. However, it was unusual both to see a single shipment involving such a large quantity and to see it being carried out in the summer time, since the hot weather is unfavourable for keeping the paws fresh during transport.

c. Sino (Xinjiang)—Kazakhstan

The number of recorded anecdotal reports on China-related wildlife seizures occurred in border areas straddling Xinjiang Uighur Autonomous Region and Kazakhstan was limited. Only five seizures were extracted from the *TRAFFIC Bulletin 1997–2013*. While three out of the five involved poaching of local protected animals including snow

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leopards, sables, and red deers, only the other two documented transnational smuggling of Saiga horns from Kazakhstan to Xinjiang. For example, on 30 March 2012, during a routine check at Jimunai Port bordering Kazakhstan, Altay Customs recovered 876 (163 kg) horns of Saiga antelope from a China-registered international coach plying between Xinjiang and Kazakhstan. These horns were concealed in an extra purpose-built container of oil tank outlook within the luggage compartment. It is worth noting that there was no report on arrests. This probably suggests another tactic used by smugglers to decrease the risk of detection: leaving the contraband unattended intentionally during transport but collecting at the final stop.

Despite the limited number of records of cross-border illegal wildlife trade, existing literature indicates that Xinjiang remains a significant avenue for Saiga horns – a signature commodity to this line of trafficking which is highly valued in TCM in China – being smuggled from Central Asia into China (Li et al. 2007). According to CITES data on import and export of Saiga horns during the period 1995–2004, while Kazakhstan and Russia stood as the world’s two largest exporters, China was the world’s biggest importer and Hong Kong was a prominent hub importing unprocessed Saiga horns mainly from Singapore and Malaysia and re-exporting Saiga horn products (e.g., TCM, ribbons, healthcare products) to Singapore and Japan (Meibom et al. 2010).

At the 59th Meeting of the Standing Committee of CITES in Doha, Qatar 2010, concern was raised that “China seems to have continued to import large quantities of Saiga horn from Kazakhstan after the recommended trade suspension” (CITES Secretariat 2010, 25). During 1999–2007, the anti-smuggling department under the Urumqi Customs in Xinjiang documented an accumulation of 5,386 kg of seized Saiga horns (Saiga Conversation Alliance 2009, 6). No further information was provided on the possible source of these horns. However, given the fact that since 2004 the range States of Saiga antelopes have banned the commercial trade in Saiga horns, and China has no wild Saiga antelopes living within its borders, so the likely sources for these seized horns were illegal imports from the range states in Central Asia such as Kazakhstan, Turkmenistan, and Uzbekistan.

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d. Sino (Tibet)–Nepal–India

The India-Nepal-Tibet line represents a relatively well-investigated route for the international illegal trade of Asian big cats. Animal parts and products of tiger, leopard and other endangered big cats have been poached mostly in India and smuggled overland via Nepal into Tibet, China (EIA 2004, 2009; UNODC 2010; Raza et al. 2012). Table 3.4 is an extraction from the TRAFFIC Bulletin 1997–2013 of China-related seizures occurred in India, Nepal, and Tibet during the said period. In total, 15 seizures involving smuggling wildlife products via Nepal in or out of China have been recorded. Among them, four took place in India, nine in Nepal and two in Tibet. Tiger skins and bones, leopard skins, otter skins, shahtoosh shawl, and wool of Tibetan antelopes were the most frequently traded goods in the trans-Himalayan area. The first four items are often being smuggled into China and the last one the Tibetan antelope wool being smuggled out of China into India for the making of shahtoosh shawls. Besides, a number of less commonly traded commodities like pangolin scales, rhino horns, and ivory products were also observed in several seizures.

From the source to end-use market, animal parts and products go through a number of staging points and a transnational relaying chain of couriers before their ultimate arrival. At the starting point, India acts as the primary source along this transaction chain. By holding 70 percent of the world’s tiger population, India is naturally the chief target for illegal skin traders. Several seizure records containing information on the origin of the confiscated wildlife identified India as the source country. Tigers and other Asian big cats were poached from India’s major conservation spots like the Sariska National Park and Kaziranga National Park which owe a high tiger population in India. In October 2003, officials at a police checkpoint in Sangsang, Rikaze (Tibet) intercepted a large consignment of animal furs which included 31 tiger skins, 581 leopard skins, and 778 otter skins stowed under sacks of wool and loaded on a truck heading for Lhasa.

The skins born several bullet holes and the newspapers used to wrap the skins were

84 Shahtoosh, also known as “Chiru wool”, “the King of wool”, or “ring shawls”, is the down hair of the endangered Tibetan antelope which can only be obtained by killing the animal. WWF. “Biggest Ever Seizure of Shahtoosh in Nepal.” January 11, 2013. http://www.wwfnepal.org/?207229/Biggest-ever-seizure-of-Shahtoosh-in-Nepal.


found printed in an Indian language. These tips suggested that this batch of skins was highly likely sourced from poached animals in India. In addition, the coordinated field trips of EIA and WPSI (Wildlife Protection Society of India) to many major and remote markets in Tibet during 2004–2006 substantiated with the statement of local illegal traders that “all the tiger skins and most of the leopard skins” available on Tibetan market were sourced from India (EIA and WPSI 2006, 4).

On 6 April 2005, the New Delhi police seized 45 leopard skins and 14 otter skins from two Indians and one Nepalese who were acting as couriers delivering the goods to Nepal. Marks in Tibetan script were found on the surface of the skins, indicating that these items were pre-selected. The confession of the arrests confirmed that Tibetan buyers stationed in Nepal travelled to India and purchased illegal skins from local organised criminal rackets specialised in procuring and processing animal parts. They checked and selected the goods for quality, signed or marked the skins in a unique way that was hard to be tampered with. After that, they barely took the risk of moving the goods themselves, but instead hired experienced local couriers to handle the storage issue and transport the items to designated destinations. As a result, despite there were some chance seizures with the arrests of Nepalese and Tibetan individuals in India, Nepal, and Tibet, most of those arrested tended to be the couriers, tanners, and middlemen (EIA, 2004). There have been very few cases of successful bust of the so-called “big fish” (relatively high level individuals in the transitional smuggling networks). Such big fish actually remains as the main force that control and perpetuate the cross-border trafficking and illegal trade.

Nepal shares an extended stretch of international borders with both India and Tibet. Porous border lines and widespread mountainous terrain in the Himalayan region make monitoring and control of border crossings a challenge, while position Nepal to be a geographically well-suited transit route for wildlife trafficking between India and China. Several China-related seizures made by Nepali authorities indicated that a number of Nepali districts – including Kathmandu, Surkhet, Sindupalchok (bordering Nyalam in Tibet), Rasuwa (bordering Gyirong in Tibet), and Gandaki (bordering Zhongba and Gyirong in Tibet) – were heavily used by smugglers as staging points for the transshipment of animal parts originated in India to Tibet.

Table 3.4: China-related wildlife seizures occurred in Nepal, India, and Tibet during 1997–2013

<table>
<thead>
<tr>
<th>Date</th>
<th>Seizure location</th>
<th>Intended destination</th>
<th>Seized</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-Nov.-97</td>
<td>Meghalaya, Assam, India</td>
<td>Via Myanmar to mainland China</td>
<td>113 kg of ivory, a piece of tiger skin measuring 9 feet, 13.5 kg of tiger bones, 4 pieces of leopard skins, 13 pieces of river Otter skins, 20 kg of Pangolin scales</td>
</tr>
<tr>
<td>8-Oct.-03</td>
<td>Sangsang, Ngamring, Tibet</td>
<td>Tibet</td>
<td>31 tiger skins, 581 leopard skins and 778 otter skins</td>
</tr>
<tr>
<td>6-Apr.-05</td>
<td>Delhi, India</td>
<td>Via Nepal to China</td>
<td>45 leopard skins, 14 otter skins</td>
</tr>
<tr>
<td>5-Jun.-07</td>
<td>Kathmandu, India</td>
<td>India</td>
<td>Illegal sale of 19 pieces of shahtoosh shawls (made of Tibetan antelope furs)</td>
</tr>
<tr>
<td>4-Jan.-08</td>
<td>Surkhet District, Mid-Western Region, Nepal</td>
<td>Tibet</td>
<td>1 tiger skins, 125 pieces of tiger bones, 22 dried meat pieces</td>
</tr>
<tr>
<td>6-Jan.-08</td>
<td>Rasuwa, Nepal</td>
<td>Tibet</td>
<td>5 full size tiger skins, 113 kg of tiger bones, 37 leopard skins, 238 otter skins</td>
</tr>
<tr>
<td>23-May-10</td>
<td>Quxu, Lhasa, Tibet</td>
<td>Via Zanda, Ngari, Tibet into India</td>
<td>101.65 kg of wool of Tibetan Antelope</td>
</tr>
<tr>
<td>4-Jun.-10</td>
<td>Guwahati Airport, Assam, India</td>
<td>Mainland China</td>
<td>2 Bengal tiger skeletons, 600 kg of pangolin scales</td>
</tr>
<tr>
<td>8-Aug.-10</td>
<td>Nilopul district, Kathmandu, Nepal</td>
<td>Mainland China</td>
<td>1 rhino horn (1.278 kg), 2 bear gall bladders (396 kg)</td>
</tr>
<tr>
<td>22-May-10</td>
<td>Barhabese checkpoint, Sindupalchok, Nepal</td>
<td>Tibet</td>
<td>46 kg of pangolin scales</td>
</tr>
<tr>
<td>25-Jun.-12</td>
<td>Kholkundol Bazaar, Sindupalchok, Nepal</td>
<td>Tibet</td>
<td>40 kg of pangolin scales</td>
</tr>
<tr>
<td>13-Oct.-12</td>
<td>Lamosangu checkpoint, Sindupalchok, Nepal</td>
<td>Tibet</td>
<td>37.8 kg of pangolin scales</td>
</tr>
<tr>
<td>11-Jan.-13</td>
<td>Manaslu Conservation Area, Western Region, Nepal</td>
<td>Tibet</td>
<td>4 tiger skins, 53 kg of tiger bones</td>
</tr>
<tr>
<td>12-Jan.-13</td>
<td>Manaslu Conservation Area, Western Region, Nepal</td>
<td>Tibet</td>
<td>5 tiger skins, 114 kg of tiger bones</td>
</tr>
<tr>
<td>6-Jan.-13</td>
<td>Gorkha, Western Region, Nepal</td>
<td>Unknown</td>
<td>Over 1,000 kg of shahtoosh</td>
</tr>
</tbody>
</table>

(Source: TRAFFIC Bulletin 1997–2013)

Illegal wildlife goods were firstly trafficked to Nepal-Tibet border wildness. Soon thereafter, these smuggled items were divided into several batches as a tactic to avoid
“putting all eggs in one basket”. Seasoned porters were paid a high price for trekking with the goods through the mountain passes into Tibet. EIA investigation revealed that the price in 2010 was CN¥9,000 (or US$1,300) for each trip (EIA 2009, 6). In September 2005, Nepali Army personnel at Langtang National Park seized a shipment of five full tiger skins, 113 kg of tiger bones, 37 leopard skins, and 237 otter skins from a lorry heading toward Syphru Bensi, Rasuwa district. From there, the contraband was reported to be carried across borders to Tibet by porters owing to the lack of passable roads for vehicles. Along with the seizures was the detention of two Nepalese and one Tibetan conveying the shipment. Wildlife Conservation Nepal (WCN) uncovered from the admission of one of the arrests that the owner of the consignment was Tashi Tsering, a notorious international trader alleged to be camouflaged within the Tibetan community in Nepal and implicated in a string of criminal activities involving transporting animal parts and products of tiger and leopard from India and selling in China (WCN 2005, 1).

Tibetan market demand for parts of Asian big cats remains the key driving force for the trans-Himalayan wildlife trade. Tiger and leopard bones are used in TCM with the latter sometimes being prescribed as the substitute for the former (Raza et al. 2012, 7). Pelts of tiger, leopard, and otter are consumed by Tibetan minority, either being cut up into trims or making materials for the traditional costumes “chupas”, or being sold as a single whole to foreign and Chinese Han tourists who prize pelts as prestigious gifts, taxidermy, or home decorations (e.g., rugs, wall hangings, sofa coverings). There have been signs that the pelt market in Tibet is shifting toward the demand for whole skins as decorative use in homes among an assortment of consumers including European tourists, military stationed in Tibet, local government officials, and wealthy Chinese from Beijing, Chengdu, Taiwan, and Hong Kong who are willing to pay exorbitant sums for the luxuries (EIA 2004; EIA and WPSI 2006).  

Wildlife products enter Tibet via several border entry points including Gyirong, Mount Kailash, Ngari, Yadong, and Zhangmu. In addition to employing porters to haul animal parts through mountain passes, wildlife products were also smuggled into Tibet via official border checkpoints, with the intensive effort given to concealment such as sandwiching contraband in cargo, packed in sealed trucks, or hiding in passenger luggage like sleeping bags.
Lhasa, the capital city of Tibet, is the primary destination and distribution point for the majority of wildlife sourced in India. While a portion of the wildlife products is digested by local markets, the remaining is dispatched to other trade hubs in west China including Nagchu in Tibet and Linxia in Gansu Province. In 2005, 2006, and 2009, EIA conducted three separate field surveys in Lhasa and other neighbour cities. All three trips found parts and products of Asian big cats on sale at stalls concentrated in Barkhor area and Hui District in Lhasa (see Table 3.5). Traders in Lhasa expressed a variety of ways for their procurement of animal parts. Some crossed into the source country regularly to purchase the skins and bones of big cats from local middlemen and poaching gangs. Others travelled to Tibetan border towns like Ali and purchased wildlife products at local seasonal markets or from the Nepali and Tibetan nomads who involved in sporadically bringing skins of tiger and leopard from Nepal to Tibet for profits. Still others claimed that they had relatives in Nepal or India, so they could ask their relatives to collect desired animal products and arrange return shipments to Tibet (EIA 2009, 7–10).

Linxia in Gansu Province has long been a traditional centre for wild animal skins market in Western China (Meng et al. 2009). Meanwhile, Linxia also harbours China’s biggest market for otter skins. EIA’s 2006 field trip to Linxia recorded over 1,800 skins of otter species including Eurasian and smooth-coated otter (see Table 3.5). Furs of tiger, leopard, and otter are brought by dealers in Lhasa to Linxia and sold to local Hui Muslin-Chinese minority who are highly skilled tanners with generations of experiences in turning out soft, pliable skins. Chups made of animal skins are in turn sold to Tibetans in Sichuan, Gansu, and Qinghai Provinces (EIA and WPSI, 2006).
Table 3.5: Summary of findings by EIA’s three field trips to Lhasa, Linxia, and Nagchu, China

<table>
<thead>
<tr>
<th>City</th>
<th>EIA 2009 field trip</th>
<th>EIA &amp; WPSI 2006 field trip</th>
<th>EIA &amp; WPSI 2005 field trip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lhasa in Tibet</td>
<td>- 3 full tiger skins</td>
<td>- 11 whole tiger skins, 1 tiger skull</td>
<td>- 3 whole tiger skins</td>
</tr>
<tr>
<td></td>
<td>- 2 full leopard skins</td>
<td>- 8 whole leopard skins, 1 leopard skull</td>
<td>- 7 leopard skins</td>
</tr>
<tr>
<td></td>
<td>- 4 full snow leopard skins</td>
<td>- 60 leopard and snow leopard claws</td>
<td>- Chupas: 24 tiger skin chupas, 54 leopard skin chupas, and over 300 otter skin chupas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 1 tiger skin chupa, 3 leopard skin chupas, and 38 otter skin chupas</td>
<td></td>
</tr>
<tr>
<td>Nagchu (Tibet)</td>
<td>9 people wearing tiger skin chupas, 25 people wearing leopard skin chupas</td>
<td>5 people wearing tiger skin chupas, 33 wearing leopard skin chupas, and dozens wearing otter skin chupas</td>
<td>-----</td>
</tr>
<tr>
<td>Horse Festival</td>
<td>5 people wearing tiger skin chupas, 33 wearing leopard skin chupas, and dozens wearing otter skin chupas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linxia in Gansu</td>
<td>- 5 full leopard skins</td>
<td>- 1 tiger skins</td>
<td>- 60 snow leopard skins, 4 snow leopard waistcoats</td>
</tr>
<tr>
<td></td>
<td>- 7 full snow leopard skins</td>
<td>- 42 leopard skins</td>
<td>- 160 whole fresh leopard skins;</td>
</tr>
<tr>
<td></td>
<td>- 2 full clouded leopard skins</td>
<td>- 1,800 skins of different otter species including Eurasian and smooth-coated otter</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 1 snow leopard rug</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 5 skulls of leopard and smaller cats</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- several pieces of bone and around 100 leopard claws</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Source: EIA and WPSI 2006; EIA 2009)

e. Sino (Yunnan and Guangxi)–Burma, Laos and Vietnam

Southeast Asia overlaps four of the world’s biodiversity hotspots and encompasses about 20 percent of the global plant, animal and marine species (Sodhi et al. 2004). Owing to this character, illegal trade from Southeast Asia to China covers a more diverse range of wildlife species than that of other China-oriented transnational trade chains like Xinjiang–Kazakhstan or Inner Mongolia–Russian Far East.

With China remaining as the major consumer and Burma, Cambodia, Laos, and Thailand acting as the suppliers or re-exporters, illegal trade in wild animals in the
Greater Mekong Sub-region has been at its most intensive point for the past two decades (World Bank, 2005). For example, it is estimated that approximately 20 million seahorses are taken each year from the South China Sea and the Gulf of Thailand, 95 percent of which believed to be transported to China for TCM use to treat a variety of ailments (e.g., asthma, heart disease, impotence) (Gray 2004). Much of the bear parts illegally extracted in Burma is traded at several border wildlife markets between Burma and Yunnan, China (Shepherd and Nijman 2007, 36).

By bordering Burma, Laos, and Vietnam, Yunnan Province is strategically located as a land bridge between Southeast Asia and mainland China. Historically, the province has been reported as a crucial terrestrial gate for the trafficking of wildlife sourced in Vietnam, Laos, Indonesia, and Malaysia to Guangdong, Sichuan, and Tibet (Li and Wang 1999, 21). From the TRAFFIC Bulletin, some 29 seizures made by enforcement authorities in Yunnan during 1997–2013 were recorded. Repeatedly occurred localities in the illegal trade include Baoshang, Dehong, Honghe, and Linchang in Yunnan, all of which are border prefectures. In particular, Dehong Prefecture turned to be a vital smuggling tunnel. Through border counties Lianghe, Ruili, and Yingjiang in Dehong, a range of wildlife sourced in Burma or other Southeast Asian countries – including Asian elephant tusks, pelts and bones of tiger and leopard, pangolin scales, meat and scales of various snake species (e.g., Asian cobras, rat snakes, vipers, pythons), and turtles and tortoises (e.g., Burmese eyed turtles, Indian flapshell turtles) – were brought into Dehong. From Dehong, the majority of smuggled wildlife was transported to the provincial capital Kunming, processed and further dispatched to Guangdong or other consumer centres in mainland China.

Guangxi is a coastal province, bordering Vietnam. As with Yunnan, Guangxi has long been the main passageway for wildlife sourced in Cambodia, Laos, Indonesia, and Vietnam being smuggled via land or sea into China (Li and Li, 1998). During the first half of the 1990s, it was argued that much of the live wildlife sold in markets in Guangzhou, Shenzhen (Guangdong), Hong Kong, and Macau came from Vietnam, mainly through the Guangxi border (Lau et al. 1995).

In total, some 15 seizures made by Guangxi authorities over the studied period were gathered from the TRAFFIC Bulletin. Baise, Fangchenggang, Rongsui, and the provincial capital Nanning in Guangxi were identified as entry points for wildlife
trafficking. Bear paws, elephant tusks, monitors, pangolins, rhino horns, and turtles and tortoises were the primary targets of traffickers along the Guangxi–Vietnam borders. In January 2013, Guangxi forest police caught the ever biggest rhino horn trafficking since 1993, leading to the seizure of 14 rhino horns, one tiger skins, a tiger skeleton and 55.5 kg of ivory as well as the arrest of three suspects including a Vietnamese national. A recent report by Xinhua News indicates that Guangxi enforcement agencies seized around 150,000 animal products during crackdowns on illegal wildlife trade in 2014 alone, which were 40,000 less than the number of products seized in 2013. In the latest seizure case in November 2015, border patrol forces in Fangchenggang, Guangxi busted an illegal shipment of 970 kg of pangolin scales and 307 kg of ivory.

3.3. CONCLUSION

In this case study, based on the analysis of 363 seizure records coupled with the cross-reference to other sources of information, this chapter has scrutinised China’s global trade in illegal wildlife with respect to its scale, high-profile wildlife commodities, methods for conveyance and concealment, and the smuggling routes and hot spots. Weaving the various pieces of information together, this chapter is able to derive a comprehensive understanding of China-oriented transaction chain of illegal wildlife trade. Following is a number of key findings concerning China-oriented transaction networks in the global trade in illegal wildlife summarised from this case study:

- In the international and regional transaction chain for illegal wildlife, China sits at the core by acting as a dominant consumer. China’s burgeoning internal market demand for wildlife products for a variety of uses – including among other TCM, food, healthcare products, clothing, house decorates, and means of financial investment – has tended to be the most relevant driver for China-related transnational illicit trade and smuggling of endangered wildlife.

- China’s illegal wildlife trade has been enormous in terms of the diversity of species and the volumes of wildlife involved in illicit trade. On the one hand,

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over 124 species of wild fauna and flora, many under the CITES protection and China’s SSP, were traded to China recurrently. On the other hand, more than 108,077 animals, live or dead, were seized by enforcement authorities around the world during 1997–2013. The bulk of the seized were intended for export to China. Considering that the seized only represent the failed attempts and often account for a fraction of the entire illegal trade, it is arguable that the real scale of China-related illegal wildlife trade is likely much more sizable than what has been detected.

- Bear paws, tiger and leopard pelts and bones, ivory, rhino horns, pangolin scales and meat, lizards, snakes, and turtles and tortoises constitute the high-profile species or goods in the illegal trade. In particular, pangolins, ivory, bear paws, snakes, lizards, turtles and tortoises were often traded on a substantially massive scale.

- A multitude of methods has been employed to smuggle and conceal illegal goods and elude border inspection. Some are simple, but others are sophisticated, involving, for example, hiding contraband in secret, custom-designed compartments, or hiring unwitting drivers to escort the shipment. Moreover, modes of trafficking may change over time as an adaptive response to enforcement interventions.

- Indonesia, Malaysia, Myanmar, Thailand, and Vietnam in Southeast Asia, DR Congo, Kenya, South Africa, and Tanzania in Africa, and India and the Russian Far East have been identified as leading suppliers for China of a broad diversity of wild animals and products.

- Multiple trafficking routes exist around the borders of China. While Hong Kong continues to be the most important entrance gate for wildlife being smuggled by sea into mainland China, the role of Macau and Taiwan as an intermediary point for illegal wildlife transiting to mainland China is not nearly as prominent according to available empirical records.

- Terrestrial border areas of China are evidently a point of vulnerability for transnational trafficking and illegal trade in wildlife. Seizure data have
disclosed that among every direction of China’s border areas – from the northeast (Heilongjiang Jilin) and north (Inner Mongolia), to the west (Xinjiang), and to the southwest (Tibet) and south (Yunnan, Guangxi) – all have reported seizures involving large volumes of illegal wildlife. Each of the directional trade routes, for example, Sino-Russia, Sino (Xinjiang)-Kazakhstan, and Sino (Tibet)-Nepal-India, can actually be seen as a chain of bilateral or multilateral transaction networks. Each of the transaction chains connects nodes in China as the consumer and specific neighbouring countries as the source or transit. And each of the transaction chains is typified by the trafficking or trading of a specific range of wild animals. Knowledge about these China-oriented transaction chains will be instrumental in assisting China’s border enforcement agencies in developing a more targeted enforcement intervention strategy.
4. **China’s Global Trade in Illegal Timber and Wood Products**

This chapter is the second case study of China-related TEC with a specific focus on trade in illegal timber and wood products. The main objective of this case study is to understand the “transaction networks” involved in China’s global trade in illegal forest products.

This chapter is organised into four sections. Section 4.1 reviews the present state of the world’s forest resources and deforestation. Section 4.2 summarises published estimates of the scale of illegal logging and related trade at the global level and in individual countries and defines the term “illegal logging and associated trade”. Section 4.3 provides an overview of China’s global forest footprint, analysing the trends and patterns in China’s production, consumption, imports, and exports of forest products during 2000–2011 based on the bilateral trade information collected from UN Comtrade Database and FAOSTAT Database. Section 4.4 draws upon the import-source approach that employs two sources of baseline data: China’s forest products imports from Chinese Customs Statistics Yearbook; and published estimates of the level of illegal logging or trade in China’s high-risk supplier countries from government reports or respected research institutes. The purpose of doing so is to present a full diagnosis of the nature and patterns of China’s global imports of illegal forest products and identify the major transaction chains of illegal wood between the high-risk supplying countries and China.

### 4.1. A Brief Overview of Present Global Forest Resource and Deforestation

Forest resources, thanks to their renewability, recyclability, versatility, and sustainability, have played, and will very likely continue to play in the future, an increasingly important role in global economic life. According to the *State of the World’s Forests 2012* by the Food and Agriculture Organisation (FAO), existing forests cover around 31 percent (4 billion hectares) of the earth’s total land area, corresponding to an average of 0.6 ha per capita (FAO 2012, 9). Non-tropical (temperate and boreal) and tropical forests share a similar proportion in the composition of global forests (Contreras-Hermosilla et al. 2007, 7). Global distribution of forests exhibits an
extremely uneven pattern, with Brazil, Canada, China, the Russian Federation, and the US constituting the five most forest-rich countries. In aggregate, the five countries’ forests account for more than half (53 percent) of the world’s total forest area (FAO, 2010a, 10).

Deforestation, the long-term or permanent losses of forest cover caused by the human-induced removal of a forest or stand of trees, continues today at a high rate. Globally, each year during 2001–2010 an estimated 13 million ha – an area roughly equivalent to the size of Greece – of the world’s forests was cleared and converted to other land uses (mainly agriculture) (FAO 2012, 5). Even taking account of the countervailing effect of the remarkable gains of forest areas from afforestation (large-scale planting trees on previously unforested land) and forest natural expansion over the last decade, the estimated annual net loss of forest area at the global level is still on a very high order, reaching an average of 5.2 million ha per year (FAO, 2010a: 17).

Equally, global deforestation rates and net changes of forest area display an uneven pattern among regions. While South America and Southern Africa continue to suffer from the largest net loss of forest during 2000–2010, Asia and the EU have achieved a varying extent of net gains (FAO 2010a). In addition, concerns were raised in recent years by the UNEP and INTERPOL that the efforts to reduce deforestation in one geographic location have been offset by increases elsewhere (Nellemann 2012). In Indonesia, for example, the decline in logging after 2005 in several parts of the country has triggered an increase in demand in elsewhere including Burma, Papua New Guinea (PNG), and the Greater Congo Basin (Serge Wich et al. 2011, 67). Studies on the issue of “leakage” – an increase in deforestation in one country caused by the reduction of deforestation elsewhere – reveal a more explicit correlation between the increase-vs.-decrease balances. Research on forest transition in Vietnam by Meyfroidt and Lambin validates such a relation between Vietnam and other countries. The scholars argue that a national-scale shift from the net deforestation to net reforestation in Vietnam since the 1990s was achieved in essence by “exporting” domestic forest extraction at an average annual rate of 2.5 million cubic metres to its neighbouring countries, notably Cambodia and Laos (Meyfroidt and Lambin 2009, 16140).

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The drivers of deforestation and forest degradation are multifaceted. While various proximate and underlying factors often interplay as a whole resulting in the eventual forest loss (Geist and Lambin 2001), the agents of the drivers that are most relevant for the deforestation in a particular country or continent vary a great deal (Boucher et al. 2011, 1). However, it is for certain that deforestation is now becoming more driven by enterprise-led and market-related processes in which timber operations, oil and gas development, large-scale farming, and exotic tree plantations all play a critical part in the forest loss occurred in many areas of the world (EU Commission 2013, 5).

Adding to that, illegal logging (especially industrial logging) and related trade – that is, harvest and trade of timber that violate national laws – are also perceived as a “reasonably important” cause of forest loss and a multitude of negative social impacts in, in particular, the developing countries (Lawson and MacFaul 2010, 82–83). During 2003–2007, recorded annual wood removals internationally amounted to 3.4 billion cubic metres annually, valued at over US$100 billion per year (FAO 2010a, 86). Of the total wood removed, it is estimated that half was being used for basic energy needs such as cooking and heating, while half went into the industrial roundwood sector (Contreras-Hermosilla et al. 2007, 11). Given that the forests that are removed informally for subsistence use (e.g., woodfuel) or removed clandestinely for illegal profits are usually not grasped by official statistics, the true scale of the world’s total wood removals is unquestionably more substantial.

4.2. THE SCALE AND DEFINITION OF ILLEGAL LOGGING AND ASSOCIATED TRADE

Since the landmark event of the 2001 East Asia Forest Law Enforcement and Governance Ministerial Conference, illegal logging and associated trade have become a growing concern on the agenda of many international conferences on forestry governance. A series of regional and national level efforts, for example, the expansion of Forest Stewardship membership,92 the EU Forest Law Enforcement, Governance, and

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92 Forest stewardship is a voluntary worldwide certification and accreditation governance system run by the Forest Stewardship Council (FSC), an international non-profit, multi-stakeholders organisation established in 1993. The stated mission of FSC is to “promote environmentally appropriate, socially beneficial and economically viable management of the world’s forests”. FSC does so by setting standards and granting certification to forest products and forest practices that meet the FSC standards. Three types of certification exist under the FSC certification framework: forest management certification, chain of custody certification, and controlled-wood certification (or FSC mix). With these various kinds of certification and the trademarks and labels associated with them, forest stewardship is then able to
Trade Action Plan, the Africa Forest Law Enforcement and Governance have been put in place to promote the political process and the development of a general framework under which coordinated and concerted actions at both the regional and national dimensions can be undertaken to tackle the issue.

4.2.1. THE SCALE OF ILLEGAL LOGGING AND ASSOCIATED TRADE

Illegal logging is a substantial yet worldwide epidemic, taking place in all types of forests and across all continents. For the world as a whole, there are some credible estimates of the magnitude of illegal logging and related trade. An early but widely recognised study by Seneca Creek estimates that each year about eight to ten percent of roundwood, lumber, and wood-based panels are being produced globally from illegally logged timber. Based on the value of 2002 global forest product trade, the annual monetary value of the illegal share is assessed to be at US$23 billion. Of this amount, only around US$5 billion (22%) worth of wood products of suspicious origin enters international trade, with the remaining bulk being consumed domestically (Seneca Creek 2004, 6). A more recent study by UNEP and INTERPOL reports that 15–30 percent of wood traded worldwide, or 50–90 percent of timber harvested in key producer tropical countries in Amazon basin, Central Africa, and Southeast Asia, is illegal. This represents an illicit commerce with an annual economic value estimated at somewhere between US$30–100 billion, or 10–30 percent of the global trade value of forest products. Moreover, UNEP and INTERPOL add that the 15–30 percent is just a conservative estimate as it did not consider the illicit part that was laundered into the legal volume or deliberately under-reported. With the escaped share being factored in, the final estimate would suggest that 20–50 percent of log harvested worldwide is illegal (Nellemann 2012, 6). More estimates can be seen in Table 1.1 in Chapter 1 of this thesis.

Breaking down the picture, the relative gravity of illegal logging varies considerably among regions and individual countries, with the majority occurred in Amazon basin, Central Africa, Southeast Asia, and the Russian Far East where forest governance and

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93 The terms “forest products”, “wood-based products”, and “wood products” are used interchangeably in this thesis.

94 A more conservative estimate provided by World Bank (2012) points out that illegal logging generates around US$10–15 billion annually worldwide.
management are weak. In the Russian Far East, for example, illegal logging of valuable temperate hardwoods is claimed to have reached a point of “crisis proportions”. As illustrated in the case of the harvest of Mongolian oak (the most valuable hardwood species in the region), the illegally logged volume of this tree species during 2004–2011 was estimated to be two to four times higher than the permitted harvest volume (Smirnov et al. 2013, 9). Throughout the Congo Basin in Africa, Asian and European-owned transnational logging companies, international banks, and financial institutions have been reported to be directly or indirectly implicated in the large-scale illegal industrial logging, causing forest loss and other dire consequences for local people and wildlife (Megevand et al. 2013). In Southeast Asia, vast areas of valuable tropical forests in PNG, Solomon Islands, the Philippines, and other countries have been logged by logging companies from China, Malaysia, and the UK to the extent of commercial exhaustion (Greenpeace 2005; UNODC 2013). Illegal logging has also been an extensive problem in Latin America’s treasured natural forests. In Brazilian Amazon, illegal logging is estimated to be as high as of accounting for 35–72 percent of the total harvest from the area (Lawson and MacFaul 2010, xvii). In Bolivia, as much as 80 percent of total wood production is thought to be from illegal sources (Seneca Creek 2004, 5). In Ecuador (Hembery et al. 2007), Honduras and Nicaragua (Contreras-Hermosilla el al. 2008), Mexico (Hirschberger 2008), and Peru (Seneca Creek 2004), the proportions of illegal logging in relation to its total in-country harvest as suggested by the literature all exceed 50 percent (see Table 9.4 in Appendices).

4.2.2. DEFINING ILLEGAL LOGGING AND ASSOCIATED TRADE

As with illegal wildlife trade, there have been no harmonised definitions of illegal logging and associated trade. While what is illegal largely depends on clarification by national laws, diverges exist between government institutions and environmental NGOs as to the range of the illegalities that should be covered by the term. On the one hand, following the viewpoints of James Turner et al. (2007, 12) and Hembery et al. (2007, 14–18), government agencies incline to hold a narrow conceptual embrace with a limited focus only on the extent to which the involved wood can be traced back to an officially sanctioned logging operation. On the other hand, conservation organisations tend to subscribe to a broad concept that may not only cover the commonly understood non-compliances occurring during harvesting, transport, purchase, and sale. In some cases, it may also include other forestry issues such as whether forests are managed
sustainably, whether royalties or fees are levied at a fair rate, or whether the concession award process conforms to relevant laws and policies. Matthias Dieter (2009, 601) disagrees with the adoption of a broad definition, arguing that not only does it detract from the key concerns that are due to illegal logging – that is, the deforestation and forest degradation, it is also likely to lead to assessments based on such an extensive concept being vulnerable to overstatements of the extent of illegal logging. Nonetheless, such diverges in definitions are certainly an indicator of the complexity of the issue and a reflection of the differentiated philosophies of the organisations concerned (Miller et al. 2006, 11).

Within this research confine, illegal logging and associated trade refer to forestry practices or activities where the involved timber is harvested, transported, processed, bought, or sold in violation of relevant national or international laws.95 This is a generic definition drawn from the World Wide Fund (WWF). However, it remains the most commonly used by the existing literature and includes all the essential elements that entail illegal logging and related trade an urgent concern to the international community.

Illegal logging and associated trade involve a range of “chain of custody” forestry practices, which begin with the illegal removals or harvesting of timber, through illegal transportation and processing, to the illegal sale, export, and import. At each custodial point, there are a variety of ways that the involved timber can become contraband (see Table 9.1 in Appendices). At the harvesting point, for example, logging operations can go illegally as proceeding without an authorised licence or with a fraudulent licence, harvesting of protected tree species, extracting from protected forest areas or outside the authorised concessions, or taking timber in excess of authorised quotas (Hayman and Brack 2002, 53; Toyne et al. 2002, 10; Elliott 2007b, 503). Additionally, illegality can take place at the downstream chain after logging even if the logging operations are of themselves in accordance with national laws, however, so long as any of the processing, transportation, and trade proceeds in defiance of the procedures or regulatory controls imposed by the source, processing, or consumer countries. These may include among others unreported or unauthorised movement of timber across state boundaries, processing at unlicensed facilities, and misdeclaration to customs upon export or import to avoid taxes or other charges (Bricknell 2010, 95; UNODC 2010, 162).

95 WWF. “What is Illegal Logging.” http://wwf.panda.org/about_our_earth/about_forests/deforestation/forest_illegal_logging/.
Similar to illegal wildlife trade, to facilitate the smooth undertaking of the “mainstream” logging or trading activities, cross-over practices such as corruption, document fraud, and money- or timber-laundering occur equally and repeatedly at each stage of the chain of custody. Moreover, the UNEP and INTERPOL note that in the last few years, a list of more advanced methods for concealment and timber laundering has been increasingly used by illegal operators in conducting logging, laundering, selling, and trading of illegal logs. Some of the methods may be more of a continuation of the old strategies such as falsification of logging permits or bribes to obtain logging permits. But some other practices emanate emerging and innovative characteristics, such as hacking government websites to obtain transport permits for larger volumes or transport and laundering timber by establishing roads, ranches, and palm oil or forest plantations (Nellemann et al. 2012, 6–7).

4.3. CHINA IS AT THE HEART OF THE CONCERN

4.3.1. DISTINCT DISCOURSES OVER CHINA’S ROLE IN GLOBAL TIMBER TRADE

In 2010, China overtook Japan as the world’s second largest economy by nominal GDP and by purchasing power parity. In 2012, with its global import and export value totalling US$3,867 billion, China ranked the world’s second largest merchandise trader only to the US (WTO 2013, 15). Sure is that during this escalating process, China has earned itself a host of superlative “hats” such as “the world’s largest exporter of goods” and “the world’s biggest manufacturing economy” (Sims 2013). However, among the many superlatives, there has been one that is definitely unpleasant for the Chinese government and people: the world’s largest importer of illegally harvested timber and leading exporter of illegal wood products.

This appears to be a scenario very analogous to what China has been experiencing in the field of illegal wildlife trade examined in Chapter 3. In recent years, voices from international environmental NGOs concerning China’s global forest footprint have continually surfaced, reproaching China’s disgraced role as the world’s largest workshop for illegally sourced timber. It has been argued that through its uncritical wood import activity, China is in effect “exporting the deforestation to” (EIA 2012, 8)

or “importing rainforest destruction from” (Greenpeace 2005, 9) countries around the world so long as they are forest-rich and suffering from poor forest governance and high levels of illegal logging problems. In West and South Africa, for example, the Chinese presence and trade in the continent’s forests is crystallised by Thornton (2005, 2) as “predatory” in nature, or epitomised by Mackenzie (2006; 2009) as “Chinese takeaway” – an activity of smuggling back to China large quantities of precious industrial tropical hardwoods in the assist of unscrupulous local businessmen and corrupt members of government and forest service.

Overall, critics focus on three aspects of China’s wood trade. First, China’s rising demand for and uncritical sourcing of cheap wood materials have fairly fuelled or exacerbated the illegal logging problems in some of its supplier countries, especially those in the developing world. Second, China’s strong import preference over unprocessed or marginally processed wood has stripped much of the value in the supply chain, leaving little attainable for local poor and disadvantaged and handicapping the development of the processing industry in wood export countries. Third, by importing illegally logged timber and exporting finished wood-based products made from the imported illegal wood, China is virtually laundering the illicit wood into licit goods and flooding them into the export markets.

Moreover, such critics resonate particularly acutely when China is positioned in a global context where national governments and international donors have poured huge amounts of money and resources into trying to stop the corruption and illegality that plague the forest sector. Recent legislative developments and governing efforts from the EU, US, and Australia to establish licensing systems for verified legal wood and prohibit the import of illegal wood have often been treated as an exemplary example of an increased concerted effort from the consumer side. In contrast, as one of the world’s leading wood consumers, progress to date in China towards dealing with the trade in illegal timber has been characterised as “little effective” (Global Timber 2011) or “limited” (Morrison 2008, 10; Lawson and MacFaul 2010, 43), with major developments largely restricted to bilateral agreements or Memorandum of Understandings (MoUs) concluded with Indonesia, Myanmar, the US, and EU. Feasible national action plan and proper legislation to prevent and tackle the import and export of illegal timber have been missing in China. As such, China has been accused of “standing firmly on the side-lines” in the past years (EIA 2012, 1). Expectations from
the international community are now high on China to step up its concrete effort to, if unable to staunch the entire illicit flows, at least contain the extent of illegal timber entering its territory.

When confronted with accusations and pressures from abroad, Chinese government officials and scholars have expressed a distinct discourse. Some argue that despite China has emerged as a major importer of illegally logged timber, China is actually “paying the bill” for developed regions and countries including Japan, the EU, and US as they essentially remain behind the real consumers for the bulk of finished wood products manufactured from China’s imported illegal timber. Without those leading consuming countries taking a fairly proportionate share of the blame, the assertion that China’s timber imports alone are responsible for the vast depletion of tropical forests in developing countries does not hold water (Zhu 2006).97 Others claim that the motives of such critics are to be questioned. Although NGOs are largely intended for conservation purposes, the major concerns of many developed countries such as the US is not the illegal logging issue per se or the deforestation in producer countries, but the downward pressure of illegal timber on the international wood prices that directly reduces the profits the forest-related industry in those countries would otherwise receive (Fu 2010). In a few cases, some Chinese scholars even draw a connection between the illegal timber trade and political coercive strategy, contending that some western countries are overstating the part of Chinese market in driving global illegal logging and wielding the issue as a political device – as with other sensitive issues such as human right, intellectual property, and Renminbi rate – to force the Chinese government to make concessions in other areas of desired interests (Chen and Song, 2008).

Despite the substantial divergences in cognition, this chapter argues that even if speaking purely from the standpoint of securing China’s long-term interests in the global timber trade, the Chinese government has to make changes in its policy concerning the import and export of wood products. But before getting to explain why it is so, this chapter firstly reviews in the following section the historical record and present state of China’s production, use, and trade of forest products.

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4.3.2. AN OVERVIEW OF CHINA’S TIMBER TRADE

China’s production, consumption, and trade of forest products have grown tremendously since the mid-1980s (Robbins and Perez-Garcia 2012), and such growing pattern continued into the 2000s. Today, China assumes the role as the largest processing hub in global market for forest products, each year importing vast volumes of raw wood materials (e.g., logs, lumber, and wood chips) from over 100 countries and re-exporting the value-added wood products (e.g., plywood, wooden furniture and works) mainly to Japan, the US, EU and, to a lesser extent, to Russia, the Middle East and elsewhere.

Driven by a multiplicity of factors including rapid economic growth, a large population base, improved living standards, expanded domestic wood-processing capacity, and increased demand from both internal and external markets for wood-based products (Sun et al. 2004a, 3; Canby et al. 2008, 1, Potts and Runnalls 2008, 6; Global Witness 2009, 97), China’s demand for raw wood materials has burgeoned over the past decade. In order to meet this domestic and export-oriented demand, massive amounts of wood must be either produced domestically or imported from abroad.

To bolster its domestic timber production, the Chinese government has invested great effort in recent years in developing large-scale plantations, notably in the middle-southern and south China such as the rubber plantations in Yunnan and Hainan Island Province (Zhang et al. 2007; ITTO, 2012). In China’s Twelfth Five-Year Plan 2010–2015, medium-term goals have been set to raise China’s total forest cover to 21.66 percent of its land and forest stock by 600 million cubic metres by 2015.98 In another forest-sector blueprint National Forest Protection and Utilisation Plan 2010–2020 (NFPUP 2010–2020) proposed by the State Forestry Administration (SFA) and approved by the State Council in September 2010, more specific and systematic objectives have been outlined. The country is devoted to increasing the forest cover and forest stock to 23 percent and 15.8 billion cubic metres respectively by 2020, and in the meantime to improving the forest yielding efficacy and restricting the encroachment of construction sector on forested land (SFA 2010, 11–2).

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However, due to constraints including low per capita forest resources, low quality and stand productivity levels of the plantations, and stringent domestic forest protection programs (e.g., the 1998 nationwide logging ban), China’s domestic production though saw itself increased during this period, largely grew at a slow pace that was constantly outstripped by its consumption growth. During 2000–2011, China’s domestic production of industrial roundwood grew in roundwood equivalent (RWE) volume from 94.6 million to 142.6 million cubic metres and sawn wood increased from 9.2 million to 63.8 million cubic metres (Figure 4.1). Yet during the same period, China’s domestic and export-oriented use of logs soared from 108.2 million to 184.9 million RWE m$^3$ and total use of sawn wood jumped from 14.4 million to 94.6 million RWE m$^3$ (FAOSTAT 2000–2011). As a result, importing from abroad becomes the easiest short-term approach for China to bridge this supply gap.

Figure 4.1: China’s domestic production and consumption of logs and sawn wood during 2000–2011

![Graph of China's production and consumption of logs and sawnwood during 2000–2011](image)

(Source: FAOSTAT 2000–2011)

Note: Historical data on China’s production of industrial roundwood and sawn wood are sourced from FAOSTAT database. Consumption is defined as “production plus imports minus exports”.

As shown in Figure 4.2 and 4.3, between 2000 and 2011, China’s imports of timber, pulp, and paper products increased sharply, growing in RWE volume from 61.2 million to 232.3 million cubic metres and in value from US$11.8 billion to 39.9 billion (UN Comtrade Database 2000–2011). Trade data from the Chinese Customs Statistics

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99 RWE is a standard measure of the volume of roundwood required for the manufacture of a unit of specific wood-based products.
Yearbook 2012 (CCSY 2012) confirmed the continuation of the growing trend in China’s forest product imports. In 2012 alone, China’s total imports of forest products mounted to 237.2 million cubic metres in RWE volume and US$36.4 billion in value.

Figure 4.2: China’s imports of forest products by volume during 2000–2011


Note: Data for China’s imports of forest products during 2000–2011 were sourced from the UN Comtrade Database, except the part for the volume of China’s imports of paper and paperboard which was extracted from FAOSTAT database. For the purpose of aggregating and comparing different forest products, forest products are grouped into three broad categories: timber products, pulp, paper and paperboard. Delimitation on the constitution of each category is provided in Table 9.2 in Appendices. In addition, the physical volume or mass of each category of forest product was converted to RWE volume by using corresponding conversion factors provided in Table 9.3 in Appendices.

Figure 4.3: China’s imports of forest products by value during 2000–2011

With respect to the product composition of China’s imports, while paper and paperboard imports remained at a consistently marginal level between 2000 and 2011, pulp and timber products made up the bulk and a growing proportion of China’s imports. In timber product sector, while industrial roundwood and sawn wood overwhelmingly dominated the timber product imports, the share of wood-based panels diminished from 14 percent in 2000 to only an edge of two percent in 2011. This further validates the observation concerning the marked expansion of China’s timber processing industry with a growing favour over imports of unprocessed or marginally processed wood products (e.g., logs, lumber) as opposed to the finished or semi-finished products (e.g., plywood, veneer, fibreboard).

Figure 4.4: China’s imports of timber products during 2000–2011 (in 1,000 RWE m³)

Presently, China’s wood products industry depends on imports for nearly 50 percent of its overall supply for forest products. Many of these imports are sourced from the so-called high-risk producer countries such as Cameroon, Brazil, Indonesia, and Russia, whose exports to China are believed to include a significant proportion of illegally logged timber and whose forest resources have often in the meantime undergone rapid depletion (see Table 9.4 in Appendices). However, with the critical absence of a legislative or regulatory arrangement that specifically prevents and tackles the trade of illegal timber, it is inevitable that China’s illegal wood imports from these high-risk countries have grown considerably in parallel with the aggressive expansion of its legal
trade. Following the chain, it is also inevitable that the value-added wood products exported from China have been linked with an increasing risk of being manufactured from imported illegal wood.

According to the NFPUP 2010–2020, China’s consumption of forest products is speculated to rise to 457–477 million cubic metres by 2020, leaving a long-term annual consumption-supply gap of 100–150 million cubic metres (SFA 2010, 9). It is certainly that such an enduring and yawning deficit will have substantial implications for both China and its trading partners.

4.3.2.1. Changes in China’s Import Markets

On the one hand, for those supplier countries, China represents a stable and resilient export market in the decade to come, being able to provide rigorous and consistent external demand which is essential for the economic recovery and development of domestic forestry industry. China’s wood imports account for more than 40 percent of Russian timber production, 50 percent of Indonesia’s, 90 percent of Mozambique’s, 70 percent of Equatorial Guinea’s and several other African countries (Canby et al. 2008). As such, the International Institute for Sustainable Development remarked that “Chinese demand is often the most significant factor driving the growth of production and exports of China’s principal supplying countries” (Potts and Runnalls 2008, 5). However, such a fast-paced growing demand from China also implies substantial profits that can be made through engagement in feeding what China needs by either legal or illegal means. Therefore, China’s full appetite has the potential to fuel or exacerbate the illegal logging problems and challenge the established effort by governments and environmental NGOs in countries in Southeast Asia, South America, and Africa, which have long been suffering from high levels of deforestation and corruption (see Table 9.4 in Appendices).

On the other hand, China is now facing a constantly changing trading environment at both ends of China’s import and export markets. Over the past decade, the sheer scale and threat posed by illegal logging and related trade have gradually grasped the due attention from the international community and promoted an array of concrete actions in many parts of the world. In producer countries such as Malaysia and Indonesia, increased measures have been taken to crack down on domestic hot spots for illegal logging and to eliminate the illegal timber from exports (e.g., Obidzinski et al. 2006).
Moreover, in hopes of protecting and promoting the development of domestic timber processing industry, several of China’s major suppliers including Burma, Cameroon, and Indonesia banned the export of unprocessed tropical hardwoods and the resulting shortage in the supply directly forced China to turn to temperate hardwoods as a substitute.

As such, although China’s uncritical, import-reliant wood sourcing strategy worked desirably in the past in the sense of easing its domestic pressure on wood supply and facilitating the rapid expansion of its wood processing industry, this strategy causes unwanted stains on the global presence of Chinese logging and trading enterprises. Thus, this strategy, coupled with its high susceptibility to the policy changes in wood supplier countries, can nurture risks of uncertainty and instability in the prospect of securing China’s future wood supply.

4.3.2.2. Changes in China’s Export Markets

In major export markets for China’s value-added wood products, a number of forestry laws, regulations, and policies bet on promoting environmentally and socially responsible forest products have been subsequently introduced into force in the US (US Lacey Act 2008), Australia (Australian Illegal Logging Prohibition Act 2012), the EU (EU Timber Regulation 2013), Japan (Japanese Green Purchasing Policy) and other developed countries. One of the shared key objectives among the various efforts is to exclude illegally sourced wood from the market. This aim is expected to be achieved either through imposing a compulsive “due care” (US Lacey Act) or “due diligence” (EU Timber Regulation and Australian Illegal Logging Prohibition Act) on market operators to attest to the legality or sustainability of the wood products produced domestically or imported from overseas, or through implementing public procurement preferences over verified legal and sustainable sources. In response, many large timber enterprises in Japan, the EU, and US and several multinational retail corporations (e.g., Wal-Mart, Carrefour) are shifting from high- to low-risk sources and favouring certified wood products (ITTO 2012, 6). When dealing with wood products imported from high-risk sources such as the plywood from China which are linked with a high risk of being manufactured from the imported illegal wood, international buyers are increasingly becoming more sensitive and requiring the accompanying of the third-party verified proof (Sun and Canby 2010, 33).
Current policy and legislative establishments in China’s major export markets are likely to have a durable and rigorous vitality as their host countries have strong incentives to do so. A number of predictive studies using Global Timber Trade Modelling confirm that the elimination of illegal timber from the international market would have a couple of significant effects (Seneca Creek 2004; Turner et al. 2007; Dieter 2009). Of which, the most attractive one to those host countries might be the presumably 7–16 percent increase in the prices in the international market for timber products exported from countries such as New Zealand, the US, and states in the EU where suspicious domestic production is believed to be minimal. This would help bring back the lost revenues that the wood industries in those countries would otherwise receive in a market environment without the presence of illegal timber.

As such, if China insists on its uncritical wood sourcing activity and refuses to clean up its supply chain, it faces the risk of losing its established export markets in environmentally sensitive countries. Such potential loss of market share might be too substantial to be digested by China’s domestic market or other less environmentally sensitive markets such as the Middle East and Africa.

4.3.3. **AN UNDER-RESEARCHED ISSUE**

It thus becomes apparent for China that, if securing a sustainable wood supply in producer countries and preventing its existing export markets in consumer countries from dwindling were its desired outcomes for the long run, it needs to develop responses commensurate with changes in the international trading environment. It is also clear that an essential part of such response mix shall be taking firmer actions to rein in imports of illegally logged timber and to promote more responsible practices in wood procurement, manufacturing, and exports. Therefore, a full diagnosis of the nature, scale, and patterns of global wood flows to China that are tainted by illegal timber is imperative and emergent.

China’s trade in forest products and its trends and implications have been relatively well explored by the existing literature (Sun et al. 2004a, 2004b; Katsigris et al. 2004; White et al. 2006; Zhang et al. 2007; Canby et al. 2008; Sun and Canby 2010; Yang and Zhai 2012). In contrast, the study of China’s illegal timber trade has been limited and
incomprehensive. More specifically, on the one hand, the academic emphasis of most studies by Chinese scholars is often on the description and identification of China’s wood trade patterns, with little attention (probably due to the sensitivity concern) given to investigating the nature and extent of China’s imports of illegal wood. On the other hand, in the English literature, owing to China’s extensive global forest footprint and its far-reaching impact, studies of illegal logging and related trade in many parts of the world will inevitably involve, to a varying extent, discussion of China’s role as an importer or exporter of illegal wood and its impacts on forestry governance and timber markets in the regions or countries under examination. These have thus resulted in a number of assessments over the scale of China’s illegal timber trade. However, such estimates tend to subject to two limitations.

First, many of the published estimates of the share of illegal timber in China’s imports tend to be inconsistent, scientifically unverifiable, and outdated. Borrowing Schloenhardt’s comment on existing statistics about illegal timber trade, most of the published figures are produced “on the basis of seizures, samples or other research and much of the available data tend to be referenced circularly and not linked to an original source” (Schloenhardt 2008, 7). Second, there has been the absence of a comprehensive study of the magnitude of China’s illegal timber imports with a fairly broad coverage in terms of both the major forest products and producer countries with illegal logging problems. The majority of existing studies either only cover a limited number of high-risk supplying countries or only consider an incomplete spectrum of wood-based products and often ignore pulp and paper in their assessments. For example, EIA’s 2012 study on China’s illegal timber trade focused only on China’s imports of illegal logs and sawn wood. Other timber products (e.g., wood chips) and pulp which demand an increasingly greater proportion of China’s trade volume and value were not included in their estimates.

4.4. **China’s Global Trade in Illegal Timber**

To overcome above limitations, this chapter draws upon the import-source analysis that incorporates two sources of baseline data. The first is the latest statistics of China’s

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100 Existing reported estimates of the proportion of China’s annual illegal timber imports to its total imports of forest products include: 32% in 2000 (Seneca Creek 2004, 4); 9.9% in 2003 (Hembery 2007, 28); 28% in 2007 (illegal timber as a percent of China’s total production and imports in that year, Global Timber 2011); 37–66% in 2008 (Dieter 2009, 50% (Global Witness 2009, 98); 20% in 2010 (Lawson and MacFaul 2010, 106); 10% in 2011 (only applied to imports of logs and lumber, EIA 2012, 7).
forest product imports from China General Administration of Customs (GAC). The second is the published estimates of the level of illegal logging or trade in China’s high-risk supplier countries collected from government sources or respected research institutions. By doing so, this chapter elects to present an updated and comprehensive analysis of the extent and commodity composition of China’s illegal wood inflows, to identify the major high-risk suppliers and map out the routes for major tainted wood flows.

4.4.1. Methods and Data Sources

Traditionally, depending on the defining role (producer, consumer, or processor) of the focused countries in global timber trade chain, there have been three methodologies – wood-balance modelling, trade data discrepancies, and import-source analysis – being commonly drawn on to measure the level of illegal logging in producer countries and illegal timber trade in processing and consumer countries (also see Chapter 1). While wood-balance modelling is used to quantify illegal logging in producer countries and trade data discrepancies applied for calculation of the illegal timber content in specific bilateral trade flows, import-source is often the only approach available for estimating imports of illegal timber by consumer and processing countries. Most of the published estimates for illegal timber imports in the literature have been produced in this manner (Lawson 2007a; Lawson and MacFaul 2010, 101).

Import-source analysis calibrates the amount of illegal timber imported by a specific consumer or processing country from a particular producer country through multiplying the total volume of wood imports with the estimated level of illegal logging or trade in that producer country. In the literature, applications of this method include the international environmental NGO “Friends of the Earth” (Matthew 2001), WWF (Hewitt 2005), Oliver (2005), and Hirschberger (2008) using import-source analysis to measure the EU imports and/or exports of illegal wood and related products; Contreras-Hermsilla et al. (2007) to analyse the global imports of illegal timber from high-risk countries and regions; Lawson and MacFaul (2010) to gauge the extent of illegal timber flows from five selected producer countries to seven consumer/processing countries; and EIA (2012) to estimate China’s annual illegal imports of logs and lumber.
While being useful as a means of obtaining the worse-case scenario baseline figures with which to improve attention and motivate action (Lawson and MacFaul 2010: 103), it should be stressed that import-source analysis has several shortcomings and limitations. First, this approach does not account for the portion of timber that has been under-reported and therefore not captured by the customs statistics in consumer or processing countries. Second, this method does not capture illegal timber that has been transhipped through the third-party countries and misdeclared as originating from the third-party countries. Third, this method is unable to allow for measuring changes over time of a particular country’s illegal wood imports. This is because the estimated rates for illegal logging in producer countries that are used to support the import-source analysis are fixed figures. The real illegal logging situations in producer countries tend to be dynamic and vary over time as a result of a number of factors, for example, the improved or decreased effort from governments and private sectors to clean up the supply chain. Fourth, this method posits that the estimated levels of illegal logging or trade in a producer country, unless specified by the provisos accompanying the estimates, are equally applicable to all categories of forest products exported by that country. Clearly, this is unlikely the truth as in reality individual wood flows of specific product groups from a particular producer country may contain a greater proportion of illegal wood than that of other product groups exported from the same country. For example, Seneca Creek (2004) estimates that 35 percent of Malaysia’s wood exports is of suspicious origin. In contrast, Chatham House (Lawson and MacFaul, 2010: 103) reports that the bulk of the wood furniture exported from Peninsular Malaysia is made from plantation-grown rubberwood, which is unlikely to have been logged illegally. Therefore, the 35 percent estimate is obviously inapplicable to Malaysia’s exports of wood furniture.

Nonetheless, when China is the subject of investigation, import-source analysis involves two steps to calculate China’s illegal timber imports.

4.4.1.1. **Step one: calculating China’s total RWE volume of forest product imports**

Import-source approach measures the illegal content in specific wood flows from a particular producer country to China by multiplying the total RWE volume of the wood flows with the estimated level of illegal logging or trade in that country. Therefore,
three sources of data are required: (1) baseline data; (2) RWE conversion factors for the calculation of the RWE volume of China’s wood imports; and (3) estimates of illegal logging or trade for individual producer countries.

This chapter uses CCSY 2012 as the baseline data to calculate the physical volume of China’s 2012 imports of forest products. CCSY is the only official source of Chinese trade statistics and regarded as the best approximation of the actual trade. The 2012 version of CCSY was the latest series available at the time of conducting this analysis.

The term forest products used in this chapter refers to all goods derived from wood through processing of mechanical or chemical decomposition. These mainly include timber products (e.g., industrial roundwood, sawn wood, wood-based panels), pulp, and paper and paperboards, but exclude non-wood forest products such as non-wood plant and animal products (FAO, 2010b). Forest products are grouped and recorded in CCSY in accordance with the Harmonised Commodity Description and Coding System (HS system) under which, forest products mainly distribute in Chapter 44, 47, and 48. The standard cross-reference between the HS six-digit number and individual forest product categories is provided in Table 9.2 in Appendices.

In order to aggregate and compare quantities of different forest products, the physical volume (e.g., cubic metres) or mass (e.g., kilograms) of each product category need to be converted to a consolidated unit, the RWE volume. As noted early in this chapter, RWE is a standard measure of the amount of roundwood required for the manufacture of a unit of specific wood-based products. It is a useful tool for assessing trends in the forest footprint of a given country’s production, import, export, and consumption of wood-based products. Global Timber (2010) suggests that unless credible alternatives are available, attempts to assess timber imports from high-risk countries should be best adopting the conversion factors provided by authoritative organisations such as FAO and International Tropical Timber Organisation (ITTO). Taking this advice, this analysis uses the conversion factors proffered by FAO, ITTO, EU Commission Directorate-General Eurostat, and UN Economic Commission for Europe (UNECE) for most of the forest products (see Table 9.3 in the Appendices). Meanwhile, it also incorporates factors from other credible sources (e.g., Sun et al. 2004a; Zhu et al. 2004) for forest products that are not covered by above organisations and for differentiation among different pulp products as well.
4.4.1.2. **Step Two: Calculating the Illegal Wood Share in China’s Forest Product Import**

After converting, on a country-by-country basis, all wood flows to China into RWE volume, the second step is to calculate the illegal wood content in each flow from the high-risk producer countries to China. For analytical purposes, this analysis assumes that the same amount of illegal timber found in producer countries’ exports would be identically found in China’s imports.\(^{101}\) Thus, the share of illegal wood in China’s forest product imports from a given producer country can be achieved by multiplying the total import RWE volume from that country with the estimated level of illegal production or export for that country.

Illegal logging estimates are available in the literature for most of the world’s important high-risk producer countries such as Indonesia, Mozambique, and the Russian Federation which are often amongst China’s major wood suppliers. As published estimates of the proportion of illegal timber in a country’s exports of wood products are not consistently available in the literature, this analysis assumes that in such cases published estimates of the illegal logging rates for that country are considered as the proxy for the proportion of illegal wood exports to the overall wood exports from that country.\(^{102}\)

In reviewing and culling the estimates from the literature, when previous studies offer for a specific supplier country more than one estimate of the illegal logging rates or offer range estimates (e.g., 30–60 percent), weightings are given to the more recent assessments or the more conservative lower-end figures. For countries where illegal logging are known to take place in varying extent terms but the quantitative data about the share of illegal logging to the overall logging are unavailable in the literature, these countries are excluded from this study’s calculation of China’s illegal wood imports –

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\(^{101}\) China has to date had no proactive arrangements in place allowing for effective elimination of illegal wood from its imports, thus this assumption is applicable for the China side. However, given the large number of high-risk supplying countries involved in China’s timber trade, it is difficult to undertake a country-by-country dissection of the effects of the established measures in each involved supplying country on filtering out illegal timber production and exports. Hence, this analysis supposes that this assumption equally applies to China’s high-risk supplying countries.

\(^{102}\) This might add another limitation to the import-source analysis as not all timber illegally felled in one country is destined for the export. A portion of the illegal wood is apparently being consumed domestically.
despite there have been studies (Seneca Creek 2004; Hirschberger et al. 2008) that adopted regional averages as the illegal logging estimates for those countries. This analysis’s decision of not to introduce the regional averages is based on two considerations. First, with the inclusion only of those countries where the evidence of illegal logging and trade is realistic and concrete, this analysis is able to derive a more conservative yet reliable estimate of the scale of illegality in China’s wood imports. Second, even without drawing upon the regional average approach, this analysis has been able to garner from the literature the estimates of illegal logging or trade for a total of 44 countries, which virtually cover all China’s outstanding high-risk wood supplying countries (see Table 9.4 in Appendices). Countries that are not on the list are often those from which wood flows to China are marginal in quantity and therefore, excluding them from the analysis will unlikely affect the reliability of the final assessment in any significant terms.

4.4.2. AN OVERVIEW OF CHINA’S 2012 IMPORTS OF FOREST PRODUCTS

China plays a pivotal role in the global forest product market, featuring prominently as the world’s largest importer by value and ranking among the top five leading import markets for several major forest product categories. According to the CCSY, in 2012 China imported from more than 228 countries a total of 237.2 million RWE m³ of forest products, including timber products, pulp, paper and paperboards, and wooden furniture, valued at US$36.4 billion. This represents two percent increase in RWE volume and nine percent decrease in value compared to the 2011 imports, or a 287 percent increase in RWE volume and 196 percent increase in value in comparison with China’s 2000 imports.
Table 4.1: China and the world’s leading wood importing markets by import value, 2012

<table>
<thead>
<tr>
<th>Leading importer</th>
<th>Forest products (million US$)</th>
<th>Percent</th>
<th>Leading importer</th>
<th>Wood chips (million US$)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. China</td>
<td>36,440</td>
<td>10.7%</td>
<td>1. Japan</td>
<td>2,519</td>
<td>48.2%</td>
</tr>
<tr>
<td>2. US</td>
<td>33,216</td>
<td>9.7%</td>
<td>2. China</td>
<td>1,334</td>
<td>25.5%</td>
</tr>
<tr>
<td>3. Germany</td>
<td>28,061</td>
<td>8.2%</td>
<td>3. Turkey</td>
<td>303</td>
<td>5.8%</td>
</tr>
<tr>
<td>4. Japan</td>
<td>17,676</td>
<td>5.2%</td>
<td>4. Finland</td>
<td>192</td>
<td>3.7%</td>
</tr>
<tr>
<td>5. France</td>
<td>15,024</td>
<td>4.4%</td>
<td>5. South Korea</td>
<td>91</td>
<td>1.7%</td>
</tr>
<tr>
<td>Global import</td>
<td>341,699</td>
<td>100%</td>
<td>Global import</td>
<td>5,226</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Leading importer</th>
<th>Logs (million US$)</th>
<th>Percent</th>
<th>Leading importer</th>
<th>Sawn wood (million US$)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. China</td>
<td>7,251</td>
<td>43.1%</td>
<td>1. China</td>
<td>5,521</td>
<td>17.4%</td>
</tr>
<tr>
<td>2. India</td>
<td>2,011</td>
<td>12.0%</td>
<td>2. US</td>
<td>4,188</td>
<td>13.2%</td>
</tr>
<tr>
<td>3. Japan</td>
<td>1,030</td>
<td>6.1%</td>
<td>3. Japan</td>
<td>2,527</td>
<td>8.0%</td>
</tr>
<tr>
<td>4. Austria</td>
<td>742</td>
<td>4.4%</td>
<td>4. UK</td>
<td>1,643</td>
<td>5.2%</td>
</tr>
<tr>
<td>5. South Korea</td>
<td>655</td>
<td>3.9%</td>
<td>5. Italy</td>
<td>1,365</td>
<td>4.3%</td>
</tr>
<tr>
<td>Global import</td>
<td>16,818</td>
<td>100%</td>
<td>Global import</td>
<td>31,641</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Leading importer</th>
<th>Veneer sheets (million US$)</th>
<th>Percent</th>
<th>Leading importer</th>
<th>Pulp (million US$)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. US</td>
<td>321</td>
<td>10.9%</td>
<td>1. China</td>
<td>17,057</td>
<td>29.8%</td>
</tr>
<tr>
<td>2. Germany</td>
<td>181</td>
<td>6.2%</td>
<td>2. Germany</td>
<td>4,558</td>
<td>8.0%</td>
</tr>
<tr>
<td>3. Italy</td>
<td>164</td>
<td>5.6%</td>
<td>3. US</td>
<td>3,502</td>
<td>6.1%</td>
</tr>
<tr>
<td>4. Japan</td>
<td>158</td>
<td>5.4%</td>
<td>4. Italy</td>
<td>2,214</td>
<td>3.9%</td>
</tr>
<tr>
<td>5. China</td>
<td>135</td>
<td>4.6%</td>
<td>5. South Korea</td>
<td>1,872</td>
<td>3.3%</td>
</tr>
<tr>
<td>Global import</td>
<td>2,929</td>
<td>100%</td>
<td>Global import</td>
<td>57,194</td>
<td>100%</td>
</tr>
</tbody>
</table>

(Source: CCSY 2012 and UN Comtrade Database 2012)
Figure 4.5: China’s 2012 forest product imports by product sectors

(Source: CCSY 2012)

Figure 4.6: China’s 2012 timber product imports by product category

(Source: CCSY 2012)
As indicated in Figure 4.5 and 4.6, following the import pattern throughout 2000–2011, timber products and pulp continue to be the product segments dominating China’s 2012 imports, together made up 98 percent of the RWE volume and 88 percent of the value of total forest product imports of that year. In timber product sector, industrial roundwood and sawn wood endure as the two leading product categories, with combined import REW volumes and value respectively accounting for 72 percent and 86 percent of China’s 2012 timber product imports. In addition, driven by the fast expansion of China’s pulp industry along with the growing demand for wood fibre, China’s imports of wood chips have demonstrated a faster growth pace and become the third largest product category by both volume (23 percent) and value (nine percent) in China’s timber product imports. In contrast, China’s imports of wood-based panels in 2012, though regained a slight increase in volume compared to the 2011 imports (2.3 million RWE m$^3$), adhere to in general the track of downward trend occurred since 2000.

The Asia-Pacific, Europe, and North America are the three leading supplying regions. Combined exports from the three regions to China accounted for 89 percent by RWE volume and 86 percent by value of China’s 2012 global forest product imports (see Figure 4.7). At the country level, Canada, Indonesia, Japan, Russia, and the US hold the outstanding positions as the top five suppliers, together supplying 55 percent by RWE volume of China’s forest product imports in 2012 (see Table 4.2). Brazil, New Zealand, Thailand, UK, and Vietnam constitute the second tier of major suppliers, together furnishing 21 percent by RWE volume of China’s 2012 wood imports. Detailed major supplier countries for China’s wood imports are provided in Table 4.2.

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Table 4.2: China’s leading suppliers by product category, ranked by the RWE volume of China’s 2012 imports

<table>
<thead>
<tr>
<th>Forest products overall</th>
<th>Wood chips</th>
<th>Industrial roundwood</th>
<th>Sawnwood</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. US (21%)</td>
<td>1. Vietnam (46%)</td>
<td>1. Russia (30%)</td>
<td>1. Canada (31%)</td>
</tr>
<tr>
<td>2. Canada (13%)</td>
<td>2. Thailand (24%)</td>
<td>2. New Zealand (23%)</td>
<td>2. Russia (30%)</td>
</tr>
<tr>
<td>3. Russia (11%)</td>
<td>3. Indonesia (14%)</td>
<td>3. US (10%)</td>
<td>3. US (11%)</td>
</tr>
<tr>
<td>4. Indonesia (5%)</td>
<td>4. Australia (11%)</td>
<td>4. PNG (7%)</td>
<td>4. Thailand (7%)</td>
</tr>
<tr>
<td>5. Japan (5%)</td>
<td>5. South Africa (1%)</td>
<td>5. Canada (6%)</td>
<td>5. Indonesia (3%)</td>
</tr>
<tr>
<td>Sum: 55%</td>
<td>Sum: 96%</td>
<td>Sum: 75%</td>
<td>Sum: 83%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wood-based panels</th>
<th>Pulp</th>
<th>Paper and paperboard</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vietnam (24%)</td>
<td>1. US (30%)</td>
<td>1. Taiwan (31%)</td>
<td>1. Indonesia (39%)</td>
</tr>
<tr>
<td>2. Malaysia (19%)</td>
<td>2. Canada (13%)</td>
<td>2. South Korea (27%)</td>
<td>2. Myanmar (25%)</td>
</tr>
<tr>
<td>3. Thailand (17%)</td>
<td>3. Japan (8%)</td>
<td>3. Japan (18%)</td>
<td>3. Philippines (14%)</td>
</tr>
<tr>
<td>4. Russia (9%)</td>
<td>4. Brazil (7%)</td>
<td>4. Indonesia (15%)</td>
<td>4. Russia (7%)</td>
</tr>
<tr>
<td>5. Indonesia (7%)</td>
<td>5. UK (6%)</td>
<td>5. Thailand (4%)</td>
<td>5. Vietnam (4%)</td>
</tr>
<tr>
<td>Sum: 75%</td>
<td>Sum: 65%</td>
<td>Sum: 95%</td>
<td>Sum: 89%</td>
</tr>
</tbody>
</table>

(Source: CCSY 2012)

Note: Percentages in the parentheses indicate the proportion of RWE volume of China’s 2012 total imports of that product category.
4.4.3. **Illegal Wood Flows in China’s 2012 Forest Product Imports**

In 2012, a total of 234 countries were involved as wood suppliers in China’s global forest product trade. Among them, 44 countries across four regions (Asia-Pacific, Africa, Europe, Latin America) – based on realistic estimates collected from the literature of the levels of illegal logging or illegal wood exports in individual countries – have been identified by this analysis as high-risk supplying countries (see Table 9.4 in Appendices). Collectively, wood exports from these high-risk countries to China amounted to 82.7 million RWE m³ or 35 percent of China’s 2012 total imports of forest products.

By using the import-source approach to assess the content of illegal wood in each of the bilateral wood flows from the identified high-risk countries to China, this analysis estimates that, in conservative terms in 2012 alone, China imported 24.2 million RWE m³ of illegally logged timber or illegally traded wood products from the globe, with an import value of over US$4.3 billion. Such a magnitude of illegal timber imports represents ten percent by RWE volume and 12 percent by value of China’s global forest product imports in that year.

Within the international context, China stands as the world’s singularly largest importer of illegal wood, with the second-highest estimated share of illegal wood imports in relation to the country’s total imports (ten percent, less than Japan at 20 percent). In contrast with other global leading importers, the RWE volume of illegal wood imported into China in 2012 is estimated to be almost double that of Japan, the second-highest importer (13.5 million RWE m³) and, more than triple that of the US, the third-largest importer (7.4 million RWE m³).

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104 China’s wood imports from North America mainly come from America and Canada where illegal logging is not recognised as a serious problem. Although exports from these two countries to China certainly contain a varying proportion of illegal timber, for analytical purposes, wood flows from the third-party countries are not considered in calculation of China’s illegal timber imports.
Figure 4.8: China and other world’s leading importers of illegal wood, 2012 (1,000 RWE m³)

The world's top ten importers of illegal wood, 2012 (1,000 RWE m³)

(Source: CCSY 2012, UN Comtrade Database 2012, and FAOSTAT 2012)

Note: (1) Data on the overall imports of forest products for the world’s leading importing countries in 2012 were extracted from the UN Comtrade and FAOSTAT database, except for China the import data for which were sourced from CCSY 2012. (2) The volume of each country’s illegal wood imports was obtained by multiplying the RWE volume of each country’s total wood imports with the published estimates of illegal imports as percentages of the overall wood imports for that country. Such estimates include Belgium (1.3%), Canada (5%), France (2.5%), Germany (1.4%), Italy (1.7%), Japan (20%), Netherlands (2.4%), UK (7.2%), and US (0.7%). Estimates for Japan and Canada were attributed to Seneca Creek (2004), the remaining others were quoted from Hembery (2007). (3) Given a wide recognition in the literature that pulp in Brazil, Chile, and South Africa is mostly manufactured by legal wood from plantations (e.g., Hirschberger et al. 2008), pulp exports from the three countries to above ten importing countries were excluded from the calculation of illegal wood flows.

4.4.3.1. Asia-Pacific

The Asia-Pacific holds both the largest number (14) of identified high-risk countries and the largest proportion of illegal wood flows to China. In 2012, China’s wood imports from the region totalled 72.6 million RWE m³, with an import value of around US$10.4 billion. It is estimated that 15.7 million RWE m³ or 22 percent of the total exported from the region to China might have come from illegal sources.
Indonesia, PNG, Solomon Islands, Thailand, and Vietnam were the five principal suppliers of illegal tropical hardwood in the region, with each flow from any of the five to China exceeding one million RWE m$^3$. In all, these five countries supplied 84 percent by RWE volume of China’s illegal wood imports from the region, or 55 percent if compared to China’s global imports of illegal wood. In consistent with China’s overall import preference, wood chips, industrial roundwood, sawn wood, and chemical pulp (mainly from Indonesia and Thailand) were the major staples exported from this region to China.
Figure 4.11: China’s 2012 imports of illegal wood from the Asia-Pacific by product categories (RWE m3)

(Source: CCSY 2012)

4.4.3.2. AFRICA

Africa ranks fifth by regions in terms of the RWE volume of wood exports to China. During 2012, 4.6 million RWE m³ or US$1.6 billion worth of forest products were shipped from the region to China. Some nine countries out of thirty-six China’s African suppliers have been identified as high-risk countries. Among them, four countries including Cameroon, Congo Republic, Equatorial Guinea, and Gabon are from the Congo Basin area where contains most of Africa’s remaining primary rainforest and where illegal industrial logging is recognised as an extensive and accelerated problem (Megevand et al. 2013).

The magnitude of illegal wood imported by China from the nine African high-risk countries is quantified to be at 1.5 million RWE m³, corresponding to one-third of China’s wood imports from the continent. The lion’s share of illegal wood exports is exclusively occupied by industrial roundwood and sawn wood, together actually comprising 99 percent of the illegal timber exports from the nine high-risk suppliers to China.
Overall, forest product trade between the continent’s high-risk countries and China indicates a high level of inter-reliance relationship. On the one hand, eight of the nine identified high-risk countries are amongst China’s ten largest supplying countries within the region, with combined wood exports from the eight to China in 2012 virtually made up 60 percent of China’s timber imports from the region. On the other hand, China often represents an exceedingly important consumer market being able to digest a significant, in some cases even dominant proportion of timber products exported from these high-risk countries to the world. As shown in the cases of Mozambique (96 percent), Equatorial Guinea (96 percent), Benin (78 percent), Liberia (78 percent), Congo Republic (70 percent), and Gabon (52 percent), exports to China of logs and lumber from each of the six countries in 2012 were in excess of half of their respective exports to the world (see Figure 4.13).

105 The other two countries which are among Africa’s top ten wood suppliers for China and which have not been identified as the high-risk suppliers are South Africa (No.1) and Gambia (No.9).
Figure 4.13: Comparison of log and lumber exports from African high-risk countries to China and to the rest of the world, by 2012 export value (1,000 US$)

(\textbf{Source}: CCSY 2012 and UN Comtrade Database 2012)

\textbf{Note}: (1) Data on the value of log and lumber exports from the identified African high-risk countries to the rest of the world were sourced from UN Comtrade Database. (2) Due to the fact that many countries in Africa didn’t report data on 2012 forest product trade to the UN Statistics Centre, export value for each African high-risk country was obtained by using an inverse method to calculate the import value reported by their trade partner countries.

\subsection*{4.4.3.3. Europe}

Europe (including the Russian Federation) was the third largest regional supplier by both RWE volume and value in China’s 2012 forest product trade. During 2012, the EU exports of wood-based products to China reached 59.1 million RWE m\textsuperscript{3}, valued at US$9.2 billion. Among the many EU suppliers, Russia was the most outstanding supplier in terms of the quantity of wood exports to China. In 2012, Russia supplied 25.1 million RWE m\textsuperscript{3} or US$3.7 billion worth of forest products to China. Exports from Russia alone to China comprised 42 percent by RWE volume of China’s total imports from the EU or 11 percent of China’s global wood imports.

Some 12 countries from the region have been identified as high-risk suppliers, though two of them (Azerbaijan and Albania) virtually exported no wood to China in 2012 (see Table 4.3). Combined illegal wood from the other ten high-risk countries to China in 2012 is estimated at 6.3 million RWE m\textsuperscript{3}, with a trade value of close to US$948 million. This illegal share accounted for about 11 percent by RWE volume and ten percent by...
value of China’s wood imports from the region.

The overwhelming majority of illegal wood exported from Europe to China, again, came from Russia. In 2012, Russia exported 6.3 million RWE m$^3$ of illegal wood to China, mainly in the forms of logs, lumber, and chemical pulp. This represented a predominant share (99 percent) of the total illegal wood imported into China from the EU. In contrast, illegal wood flows to China from other European countries were fairly insignificant in quantity due to the limited scale of the overall bilateral trade of forest products.

Table 4.3: Illegal timber exported from identified EU high-risk countries to China, 2012

<table>
<thead>
<tr>
<th>EU high-risk suppliers</th>
<th>Export volume (RWE m$^3$)</th>
<th>Export value (US$)</th>
<th>Illegal wood volume (RWE m$^3$)</th>
<th>Illegal timber value (US$)</th>
<th>Illegal timber as percent of the total exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
<td>25,133,055</td>
<td>3,732,592,403</td>
<td>6,283,264</td>
<td>933,148,101</td>
<td>25%</td>
</tr>
<tr>
<td>Latvia</td>
<td>112,758</td>
<td>17,190,898</td>
<td>22,552</td>
<td>3,438,180</td>
<td>20%</td>
</tr>
<tr>
<td>Estonia</td>
<td>39,372</td>
<td>7,021,762</td>
<td>19,686</td>
<td>3,510,881</td>
<td>50%</td>
</tr>
<tr>
<td>Slovakia</td>
<td>96,993</td>
<td>29,273,897</td>
<td>9,699</td>
<td>2,927,390</td>
<td>10%</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>17,566</td>
<td>10,392,310</td>
<td>7,026</td>
<td>4,156,924</td>
<td>40%</td>
</tr>
<tr>
<td>Bosnia-Herzegovina</td>
<td>25,805</td>
<td>9,245,175</td>
<td>516</td>
<td>184,904</td>
<td>2%</td>
</tr>
<tr>
<td>Montenegro</td>
<td>892</td>
<td>244,536</td>
<td>446</td>
<td>122,268</td>
<td>50%</td>
</tr>
<tr>
<td>Macedonia</td>
<td>121</td>
<td>38,930</td>
<td>30</td>
<td>9,733</td>
<td>25%</td>
</tr>
<tr>
<td>Georgia</td>
<td>186</td>
<td>39,046</td>
<td>17</td>
<td>3,514</td>
<td>9%</td>
</tr>
<tr>
<td>Moldova</td>
<td>166</td>
<td>32,417</td>
<td>2</td>
<td>324</td>
<td>1%</td>
</tr>
<tr>
<td>Albania</td>
<td>1</td>
<td>281</td>
<td>0</td>
<td>197</td>
<td>70%</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>24%</td>
</tr>
</tbody>
</table>

(Source: CCSY 2012)

4.4.3.4. **LATIN AMERICA**

Latin America ranked fourth by export volume among the five regional suppliers to China. In 2012, Latin America exported a total of 21 million RWE m$^3$ or US$4 billion worth of forest products to China. The bulk of wood exports were composed of pulp (in particular chemical pulp), which accounted for 92 percent of the region’s wood flows to
China.

Some nine countries including Brazil, Mexico, and Peru have been identified as high-risk supplier countries in the region. During 2012, illegal wood imports from the nine countries to China are assessed to be at around 657,368 RWE m³, valued at US$202 million. Such illegal wood made up 20 percent by RWE volume of China’s wood imports from the region.

Of the total illegal wood that China sourced from the region, 64 percent (419,225 RWE m³) originated from Mexico, 16 percent (103,703 RWE m³) from Brazil, and eight percent (55,757 RWE m³) from Peru. Again, following China’s general import preference, industrial roundwood, sawn wood, and recovered paper and paperboard were the largest product categories, comprising close 90 percent of the illegal wood received by China from the region.

![Figure 4.14: China’s illegal wood imports from Latin America, 2012](Source: CCSY 2012 and UN Comtrade Database 2012)

**Note:** Due to a wide recognition in the literature that pulp and roundwood in Brazil are mostly produced by plantation timber from the southern states where illegality is not considered a major issue (e.g., Hirschberger et al. 2008; Lawson and MacFaul 2010), pulp was therefore excluded from the calculation of China’s illegal wood imports from Brazil though it accounted for 97 percent of China’s total wood imports from the country. For Brazilian logs, only based on China customs statistics, it is unable to distinguish between the logs produced from Brazilian Amazon (where illegal logging is a thorny problem) and those from Brazilian southern states. However, as logs only accounted for less than 1 percent (5,420 RWE m³) of China’s wood imports from Brazil, its inclusion will not affect the final assessment of China’s total imports of illegal wood.
4.5. **Conclusion**

By using the import-source analysis and trade data from the UN Comtrade database, FAOSTAT, and CCSY, this chapter has developed a full diagnosis of the nature and patterns of China’s global imports of illegal forest products. A number of key findings can be encapsulated from this case study:

- In the international/regional transaction chain of illegal timber trade, China sits in the middle by acting as a prominent processing hub, each year importing large volumes of raw wood materials of illegal or suspicious origin from dozens of high-risk producer countries on the one hand, and re-exporting value-added wood-based products manufactured from the imported illegal wood mainly to markets in the developed countries on the other. With the critical absence of a legislative or regulatory establishment that specifically deals with the illegal timber trade, China’s illegal wood imports from high-risk producer countries have grown considerably in parallel with the aggressive expansion of its legal forest product trade.

- By using the import-source approach to assess the content of illegal wood in every bilateral wood flows from the 44 identified high-risk supplying countries to China, this chapter has given a conservative estimate of the extent of China’s global imports of illegal wood. That is, in 2012 alone, China imported 24.2 million RWE m$^3$ of illegally logged timber or illegally traded wood products from the globe, with an import value of over US$4.3 billion. Such a magnitude of illegal timber imports represents ten percent by RWE volume and 12 percent by value of China’s global forest product imports in that year. It’s worth noting that in the existing literature, most of the studies on China’s illegal wood imports only cover a limited number of high-risk supplying countries, and/or only consider an incomplete spectrum of wood-based products. As such, the estimate produced by this analysis is probably at present the most comprehensive one considering its relatively broad coverage in terms of both the major forest products imported by China and the high-risk supplying countries involved in China’s global wood imports.

- Within the international context, China stands as the world’s singularly largest
importer of illegal wood, with the second-highest estimated share of illegal wood imports in relation to the country’s total imports (ten percent, less than Japan at 20 percent). In contrast with other global leading importers, the RWE volume of illegal wood flows to China in 2012 is estimated to be almost double that of Japan, the second-highest importer (13.5 million RWE m$^3$) and, more than triple that of the US, the third-largest importer (7.4 million RWE m$^3$).

- Through the analysis of China-related illegal wood flows, this chapter has identified multiple bilateral chains of transaction networks that connect China as the consumer and high-risk producer countries as the suppliers. These transaction chains represent the upper part of the overall China-oriented transaction chain of illegal wood trade, as China not only imports illegally logged timber, it also re-exports finished wood products made of the imported illegal wood. But cleaning up the upper, supply chain should be the starting point for China to tackle its problem of illegal wood trade.

- This chapter has identified a clear pattern associated with China’s imports of illegal wood. That is, China’s global sourcing of illegal wood tends to concentrate in a limited number of high-risk producer countries. In the Asia-Pacific, Indonesia, PNG, Solomon Islands, Thailand, and Vietnam were the five leading suppliers of illegal tropical hardwood in the region. The combined exports from the five countries to China accounted for 84 percent by RWE volume of China’s illegal wood imports from the region, or 55 percent of China’s global imports of illegal wood. In Africa, eight high-risk countries – including Benin, Cameroon, Congo Republic, Equatorial Guinea, Gabon, Ghana, Liberia, and Mozambique – supplied nearly all of the illegal wood that China sourced from the region, or six percent of the total illegal wood that China sourced from the globe. In Latin America, 64 percent of China’s illegal wood imports from the region originated from Mexico, 16 percent from Brazil, and eight percent from Peru. In Europe, Russia supplied a nearly complete share (99 percent) of the illegal wood that China collected from the region.

- In consistent with its overall timber trade, China’s imports of illegal wood exhibit a strong preference over unprocessed or marginally processed wood products. For example, in the Asia-Pacific, 84 percent of China’s imports of
illegal wood were composed of industrial logs, pulp, sawn wood, and wood chips. In Africa, industrial roundwood and sawn wood together comprised 99 percent of the illegal timber exports from the region to China.
5. CHINA’S GLOBAL TRADE IN ILLEGAL OZONE-DEPLETING SUBSTANCES

This chapter is the third case study of China-related TEC with a specific focus on trade in illegal ozone-depleting substances (ODS). The main objective of this case study is to understand the “transaction networks” involved in China’s global and regional trade in illegal ODS chemicals.

This chapter is organised into three sections. Recognising that the scholarly treatments of many key issues of global trade in illegal ODS have been presented less systematically, Section 5.1 reviews various discourses and lays them out in an organised and coherent fashion. In doing so, it periodises the historical evolution of the international illegal trade in ODS into three phases: origins, proliferation and history repeating itself. In each stage, this section analyses the scale and scope, trading routes, major sources, transiting points, and destinations associated with the illegal trade. Section 5.2 garners treatments from the literature concerning the factors and drivers of illegal ODS trade and categorises them into three broad groups: protocol-related factors, market-related elements, and regulatory and institutional failures.

Section 5.3 firstly uses bilateral trade data collected from the Ozone Secretariat Data Access Centre and the UN Comtrade Database to document China’s historical record and the present state of ODS production, consumption, and trade. Secondly, this section compiles and analyses 85 records of China-related ODS seizures that occurred between January 2000 and April 2014. The main purpose of this analysis is to understand China’s role in the international and regional transaction chain of illegal ODS trade, the scale of China’s black market, the magnitude and diversity of ODS chemicals involved in illicit trade, the major destination markets for Chinese-produced ODS, and the prevalent methods for smuggling and concealment.

5.1. ILLEGAL ODS TRADE: DEFINITIONS, ORIGINS, SCALES, AND TRENDS

In the late 1980s, global concerns over an alarming international environmental crisis – the thinning of the Earth’s protective ozone layer – eventually led to the ratification of the Montreal Protocol on Substances that Deplete the Ozone Layer (also known as the Montreal Protocol). With a view to protecting the ozone layer and sending it back on
the track of recovery, this landmark MEA sets up a phase-out system to gradually eliminate global production and consumption of a family of ozone-depleting substances (ODS) listed in five annexes to the Protocol.\footnote{ODS to be phased out under the Montreal Protocol are listed in four Annexes of Controlled Substances to the Protocol. These include: (1) Annex A, Group I and Annex B, Group I: chlorofluorocarbons (CFCs) used in aerosol, foam applications, refrigeration, and solvents; (2) Annex A, Group II: halons used in fire protection; (3) Annex B, Group II: carbon tetrachloride (CTC) used as a cleaning agent and process agent; (4) Annex B, Group III: 1,1,1-trichloroethane (methyl chloroform, short as “TCA”) used as industrial solvents; (5) Annex C, Group I: Hydrochlorofluorocarbons (HCFC) used as transition substances to the phase-out of CFCs; (6) Annex C, Group II: Hydrobromofluorocarbons (HBFCs) used as solvents, cleaning agents and fire suppressants; (7) Annex E: methyl bromide used as a pesticide for soil fumigation and in post-harvest application. Annex D to the Protocol is a list of products containing CFCs or halons. See UNEP Ozone Secretariat. “The Montreal Protocol on Substances that Deplete the Ozone Layer”. \url{http://ozone.unep.org/en/handbook-montreal-protocol-substances-deplete-ozone-layer/5}.}

More than a quarter of a century has passed since its entering into force in 1989, the treaty has now been hailed by the international community as “perhaps the single most successful international agreement to date”\footnote{The Ozone Hole. “The Montreal Protocol on Substances that Deplete the Ozone Layer”. \url{http://www.theozonehole.com/montreal.htm}.} in terms of its unprecedentedly universal participation by all nations in the world and of its great achievement in ozone layer protection. It has been claimed that the treaty can be a classic example and an inspiring demonstration of how developed and developing countries can unite under an internationally agreed framework to address a global environmental challenge (UNEP 2012, 6).

Despite the tremendous applause that the Protocol has received, there are still important issues, which the Protocol has largely failed to deal with effectively, that continue to possess strong potentials to undercut the concerted international effort to protect the ozone layer.\footnote{The continuation and potential expansion of the black market for ODS, the soaring production of HCFCs for feedstock use, and the emissions of ODS from banks of equipment and other products have been regarded as the three major issues that the Montreal Protocol has thus far failed to tackle in an effective manner (UNEP 2013b).} Among such issues, illegal trade in ODS (including mixtures and equipment containing ODS) remains a palpable manifestation of the Protocol’s vulnerability. As recognised by the Decision XII/10 (2010) adopted at the seventh Meeting of the Parties (MOP) to the Montreal Protocol, illegal trade poses “a threat to the global success of ozone layer protection”.

\section*{5.1.1. DEFINING THE TERM}

As a subset of the broad environmental crime, illegal trade in ODS can be understood as
the “deliberate evasion of environmental laws and regulations by individuals and companies in the pursuit of personal financial benefits” (UNEP Ozone Secretariat 2002, 1). Though the Montreal Protocol itself does not define the term illegal trade, it institutes a set of control measures on the production, consumption, and international trade of ODS chemicals.\textsuperscript{109} It is then the legally bounded obligation of the Parties operating under both Article 2 (developed countries) and Article 5 (developing countries) to translate the control provisions into their domestic legislative and regulatory systems and to further implement them adequately. Therefore, it can be said that the illegality associated with ODS trade is directly tied to national laws and regulations. This is particularly the case after the 1997 Montreal Amendment when many Parties have established and implemented a licensing system that consists of quota control and license management for the production, consumption, import, and export of controlled substances.\textsuperscript{110}

In reality, due to the transnational distribution of consuming and supplying markets and trade globalisation, illegal trade often involves cross-border movements of ODS chemicals from the source countries to consumer countries, sometimes with third-party countries implicated as transit points. Along the chain of custody, illegality takes place in various forms, ranging from production, sale, import, export, or use without a licence, traded volumes in excess of the authorised allowance, to the import or export without payment of royalties or taxes. Accordingly, it follows that ODS chemicals can become a contraband in two different ways. First, when ODS are produced illegally by entities not registered or authorised by the national ODS administration. Second, when legal production of ODS is being diverted into the black market, meaning that although ODS remain legal at the source point, they become illicit during the redirection process as trading activities violate specific national laws on ODS imports and consumption. In both cases, ODS are being produced and circulated in an unregulated and unmonitored

\textsuperscript{109} According to Article 1 of the Montreal Protocol, “production” refers to the amount of controlled substances produced, minus the amount destroyed by technologies to be approved by the Parties and minus the amount entirely used as feedstock in the manufacture of other chemicals. Recycled and reused ODS are not calculated into a Party’s production. “Consumption” refers to production plus imports minus exports of controlled substances. See UNEP Ozone Secretariat. “The Montreal Protocol on Substances that Deplete the Ozone Layer”. \url{http://ozone.unep.org/en/handbook-montreal-protocol-substances-deplete-ozone-layer/5}.

\textsuperscript{110} The Montreal Protocol evolves through the “adjustments” and “amendments” in responding to new developments in the ozone layer domain. Since the signing of the Protocol in 1987, several significant amendments have been made. These include the 1990 London Amendment, the 1992 Copenhagen Amendment, the 1997 Montreal Amendment, and the 1999 Beijing Amendment.
fashion, thus undermining a country’s ability to stay compliant with its obligation under the Protocol.

Hayman et al. (2002, 10) and Clark (2007a, 1) wrote that when controls restrict the supply of an existing environmental commodity or service while the demand for which remains buoyant, the emergence of a black market and associated illegal operations is par for the course. Illegal trade in ODS has just taken root in and grown out of such a historical conjuncture of curtailed supply and unmet demand (e.g., serving cars equipped with chlorofluorocarbons (CFCs) reliant air-conditioning (AC) systems). Apparently, this has hardly been a new or sole phenomenon in the environmental management sector, as we have seen in the previous two case studies, the same kind of mechanism driving and perpetuating illegal trade in wildlife, timber, and wood products.

5.1.2. THE HISTORICAL EVOLUTION OF ILLEGAL TRADE IN ODS

From a historical perspective, illegal ODS trade can be conceived of as evolving in line with the Protocol’s phase-out schedules through three stages: origins, proliferation, and “history reproducing itself”. Each stage is typified by distinct elements including the major traded substances and the directions of illegal flows.

5.1.2.1. STAGE ONE: ORIGINS (1989–LATE 1990s)

Originally, the first cases of illegal ODS trade came to light in the mid-1990s when phase-out schedules for CFCs began to effect in Article 2 countries. Except for exports to meet the basic domestic needs in Article 5 Parties and a handful of essential or critical uses that were exempted from the Protocol’s phase-out embrace, production of CFCs for domestic consumption ceased in Europe in 1995 and one year later in the US. In the meantime, stringent controls were imposed on CFC imports in Article 2 Parties, though again, with limited exemptions given to recycled or reclaimed CFCs and repackaging for onward export to Article 5 countries (EIA 2011, 3).

Spatially, illegal trade at this stage was largely confined to non-Article 5 countries, mainly featured with brokers based in Europe (e.g., Germany, UK) diverting CFCs and halons produced in Central and Southeast Asian countries (notably China and Russia) onto the markets in the EU and US, where legitimate supplies had been curtailed but
steady demand had somehow persisted (Banks et al. 2008, 15–16). During this period, small amounts of illegal CFCs were also reported to be illegally imported into Australia, Canada, and Taiwan (Brack 1996, 110). It was reputed that the Russian Federation had been the most prominent source for the bulk of illegal CFCs transhipped through Europe to the US throughout most of the 1990s (UNEP 2001, 5). Some analysts estimated that the proportion of Russian-manufactured illicit CFCs to those produced worldwide could be as high as 47 percent (TED 1999).

Estimates of the scale of international illegal trade in ODS during this period vary slightly. UNEP (2001, 3) and UNODC (2013, 119) estimated that between 16,000 and 38,000 tonnes of illegal CFCs were traded globally in the mid-1990s, worth up to US$500 million and equivalent to 15–20 percent of the global CFC trade. Chatham House and EIA placed the estimated total volume of illegal ODS traded worldwide at up to 20,000 tonnes per year, with a value of US$150-300 million, amounting to 12 percent of the global ODS production (Brack et al. 2006, 4).

5.1.2.2. STAGE TWO: PROLIFERATION (EARLY 2000S–CIRCA. 2010)

The second stage of the development of illegal ODS trade can be exemplified by its decline in developed countries contemporaneously with growing proliferation in the developing world. It became particularly entrenched in a limited number of developing countries.

By the late-1990s, Europe and the US witnessed a clear decline in the level of CFC smuggling. This was evidenced by the seizure records released by the US Customs, which indicated that during 1992–2001, the volume of confiscated CFCs fell steeply from its peak in 1994 of 403,744 kg down to 14,247 kg in 2001 (UNEP Ozone Secretariat 2002, 3).

This downward trend arose, in the main, from a combination of four factors. First, in 1997 the Montreal Amendment required all Parties to “establish and implement a system for licensing the import and export of new, used, recycled, and reclaimed controlled substances” (Article 4B, Montreal Protocol). Licensing systems have proved to be an effective tool in assisting the Parties in the prevention of illegal traffic of controlled ODS through mutual notification – regular reporting by exporting countries
to importing countries and cross-checking of information between exporting and importing countries (MOP Decision IX/8 1997). Second, during the period, both the major transit region the EU and the leading consumer country the US had developed new responses to stem the influx of illegal CFCs into their territory. In June 2000, the EU ratified the Regulation (EC) NO 2037/2000 on Substances that Deplete the Ozone Layer which introduced a ground-breaking ban on the sale and use of CFCs and halons in all member states since 2000. While in the US, in response to the pervasive ODS smuggling in Florida and Miami, the US authorities established a task squad on CFC smuggling under the aegis of the Justice Department and many other Federal governmental agencies. Such a multi-agency approach, along with the special enforcement operations against ODS smuggling initiated thereafter such as the “Cool Breeze”, had facilitated the flow of information among coordinated agencies and deterred many of those involved in either large-scale marine trafficking or small-scale passenger trafficking along the US-Mexico borders (Ezra and Newman 2002, 6; Andersen et al. 2002, 184–5). Third, thanks to the external donor funding, major producer countries like Russia were able to wind down their domestic CFC production. In 1996, the World Bank, in collaboration with the international financial entity Global Environment Facility (GEF) and individual donor nations, launched the “Special Initiative for Supplementary Funding”. A sum of US$26.2 million was granted to support the Russian government to shut down its internal CFC and halon production capacity (UNEP 2001, 10). By 2000, Russia successfully closed its CFC and halon production facilities and stopped import and export operations of Annex A- and B-controlled ODS (MOP Decision XIII/17 2001). This had helped to reduce the flows of illegal ODS from high-risk countries to the international black market. Fourth, and probably the most important factor, market demand for CFCs dwindled in the EU and US in pace with a growing number of CFC-reliant equipment and appliances (e.g., refrigerators, air-conditioners) that were either being retrofitted to use ODS alternatives, or being eliminated from continuing operation as they reach their end-of-life point, or being smuggled together with other “e-wastes” to the developing countries.111

111 “E-wastes” refer to discarded electronic devices or their scrapped components such as used computer monitors, mobile phones, and TV sets. The issue of smuggling of used ODS-containing equipment converges with another issue known as “e-waste dumping” in cases when the involved ODS-based products are electronic appliances such as refrigerators and air conditioners (also referred to as “household hazardous waste”). Smuggling of such “white goods” poses a serious threat not only to ozone layer and climate change, but also to the environment and public health.
In parallel with the decline of ODS smuggling in developed countries, developing countries started to see illegal ODS trade escalating into a widespread and substantial issue as the 1990s drew to close. Following immediately the commencement of the 1999 consumption freeze in Article 5 countries, evidence derived from seizure records and market surveys had been piling up and signifying a strong shift of ODS smuggling from the developed to developing world.

With only a few years into the 1999 freeze, instances of illegal trade began to take place in a host of developing countries. In particular, the Asia-Pacific region, which constituted more than 80 percent of global production and consumption of CFCs, had quickly emerged to be the new hub for the black market in ODS (Clark 2007a, 2; Elliott 2007b, 505). By 2005, countries in the region with proved records of contraband ODS seizures included Bangladesh, China, India, Indonesia, Malaysia, Thailand, the Philippines, and Vietnam, with China being the main source. Moreover, the problem of ODS smuggling seemed to become more acute and entrenched in a small number of countries in the region. For example, in Vietnam, in the early 2000s, around 80 percent of the CFC-12 imports were estimated illegal (Ezra and Newman 2002, 13). In India, between 1999 and 2000, an estimated 900–1000 metric tonnes of illegal ODS were smuggled into the country (UNEP 2001, 5). In the Philippines, in 2002, about 15–20 percent of the CFCs shipped to the country arrived without permits (Brack et al. 2006, 5); other estimates suggested that illegal trade of CFC-12 in the Philippine might be up to 75 percent of the legitimate consumption (Ezra and Newman 2002, 13).

EIA assessed that during the early 2000s the size of illegal CFCs being smuggled into developing countries each year was likely on the order of 10–20 percent of the legitimate trade. Based on the 2005 figures, smuggling of this magnitude would represent an illegal trade in CFCs of approximately 7,000–14,000 metric tonnes per annum, with a value of US$25–60 million (Clark 2007b, 1).

More recently, ODS seizures resulted from the special operations “Sky-hole Patching Series” provide another string of solid evidence for the widespread nature and substantial magnitude of ODS smuggling in the Asia Pacific. In 2006, at the request of China Customs, UNEP and World Customs Organisation Regional Intelligence Liaison Office for Asia and the Pacific (WCO RILO A/P) coordinated the “Sky-hole Patching Operation I”. This regional enforcement operation incorporated partners from customs
and environmental authorities of 20 Asian countries and international organisations to form a united anti-environmental crime front in the Asia-Pacific to curb the illegal trade in ODS and hazardous wastes. The key approach adopted to support the operation was the establishment of an informal monitoring and notification system for the keeping track of the movement of suspicious shipments when they were imported, re-exported or trans-shipped across the territories of member customs (WCO RILO A/P 2007, 3). In ODS terms, from September 2006 to October 2007, six member Customs in China, Fiji, India, Thailand, and the Philippines reported 27 seizures of a total of 155 metric tonnes of contraband ODS. Of which, Thailand and India made the largest number (9) of seizures, with each confiscating 65 metric tonnes of CFCs and Hydrochlorofluorocarbons (HCFCs) and 31 metric tonnes of HCFCs respectively. This was followed by China with six seizures of 51 metric tonnes of CFCs and HCFCs, the Philippines with one seizure of 5 tonnes of CFCs, and Fiji with one seizure of a small quantity of CFCs. Of the chemicals seized, CFC-12 and HCFC-22 were the most traded items in these clandestine activities (WCO RILO A/P 2007, 11).

After November 2007, the notification mechanism of suspicious shipments was maintained and ODS seizures continued to be reported by the participating countries. Till October 2009, an aggregate of 301 cases of ODS smuggling were documented, contributing to a total confiscation of 728 metric tonnes of illegal ODS, with 99 percent of which being CFCs (UNODC 2013, 117).

Inspired by the successes of the Sky-hole Patching I, in 2010 the WCO RILO A/P and UNEP DTIE OzonAction (Division of Technology, Industry and Economics), together with customs authorities from over 80 countries, launched the project “Sky-hole Patching II”. In this operation, 275 seaports and other strategically selected enforcement locations were identified as high-risk points, at which customs officials were advised to intensify their risk profiling and physical inspection of suspicious outgoing and incoming shipments. Through a six-month action from May to November 2010, the joint enforcement operation resulted in the seizure of over 7,500 cylinders of illegal CFCs, HCFCs and other controlled ODS chemicals, with a total weighing 108 metric tonnes. Although some seizures were reported from Africa, Central Asia, and Europe, the majority took place in the Asia Pacific, with China, India, and Thailand recording the largest hauls of illicit ODS (WCO and UNEP 2010, 1–2). Today, the operation has become an ongoing plan of action being practised each year by customs officials.
Updated information from the 2013 Analysis Report by the WCO RILO A/P and Korea Customs Service (2013, 17) indicated that during 2012, three seizures of 23 metric tonnes of illegal ODS were made in the Asia Pacific.

At the Regional Customs Cooperating Meeting in Sarajevo, Bosnia and Herzegovina in May 2014, customs officers from 19 countries including China were awarded the “2014 Ozone Protection Award” for their commitment to the prevention and combating of unwanted and illegal trade in ODS. Statistics indicated that from September 2012 to April 2014, customs officials from the 19 countries contributed to a total of 133 seizures of 7,370 pieces of equipment and 9,513 refrigerant cylinders containing more than 467 metric tonnes of ODS and mixtures. In addition, during the period, the Informal Prior Informed Consent (iPIC) – a voluntary consultation mechanism designed to prevent illegal and unwanted trade through online information exchange and cross-checking between importing and exporting member countries before the issuance of export/import licenses – reported the avoidance of 67 unwanted or illegal shipments of nearly 846 metric tonnes of ODS chemicals and mixtures (UNEP DTIE OzonAction 2014a).

5.1.2.3. History Repeats Itself (2010–Present)

From January 2010, consumption of CFCs was banned worldwide. The challenge for the member states to the Montreal Protocol has moved to the prevention of illegal trade in methyl bromide and HCFCs, whose consumption is projected to cease in 2015 and 2040 respectively. In fact, as developing countries froze the use of HCFCs in 2013 and developed countries took deeper cuts in line with their commitments under the Protocol, concerns have been raised over the likelihood that the history of illegal trade in CFCs would reproduce itself in the sector of HCFCs (Grabiel et al. 2013, 48). In reality, HCFC smuggling, including both small-quantity smuggling and large-scale smuggling, have been evidenced in a number of HCFC seizures occurred in China, French Estonia, Greece, India, Italy, UK and the US in recent years, suggesting the existence of a pervasive black market for HCFCs with potential to rival that seen with CFCs.

In contrast with the market conditions where illegal CFC trade grew up, the present global trading environment provides a more fertile market ground favourable for the potential development and prosperity of a black market for HCFCs. First, current scale
of global use of HCFCs is much greater than that of CFCs. Since 1998, HCFC consumption in developing countries has grown at an average rate of 15 percent per year. In 2012, combined consumption in Article-5 Parties amounted to 603,550 metric tonnes, 3.2 times more than the peaked consumption of CFCs in 1995 (see Figure 5.1).

Figure 5.1: Comparison of historical consumption of CFCs and HCFCs in Article-5 Parties (metric tonnes)

Second, present use of HCFCs is much more widespread and popular than that of CFCs. Thanks to their low ozone-depleting potential (ODP), HCFCs were initially introduced as transition substances to facilitate the smooth phase-out of CFCs. However, industry research shows that HCFCs have now been used for a wide array of purposes not only including aerosol propellants, foaming blowing agents, refrigerants, and solvents, but also involving feedstock uses and process agents for the manufacturing of other chemicals. Moreover, demand for and use of HCFCs seem to have become rooted in several industrial sectors in a number of developing countries. A comprehensive survey carried out by the United Nations Development Programme (UNDP) in 2005 on the HCFC consumption patterns and trends in nine selected countries revealed a high level of concentration in terms of the substances consumed and the consuming industrial
sectors involved. In 2005, consumption of HCFCs in the nine sample countries totalled 52,140 metric tonnes. HCFC-22 and HCFC-141b were the two most used chemicals, combined constituted 97 percent of the total use. Most of HCFC consumption appeared to pile up in the refrigeration servicing sector and foam manufacturing sector (UNDP 2005, 3, 5–6).

5.2. FACTORS DRIVING ILLEGAL ODS TRADE

In essence, the core mechanism behind illegal trade in ODS is the special market conditions where demand remains unmet due to controlled and curtailed supply. However, a comprehensive literature review suggests that the formation of such market environment can be articulated to three clusters of factors. This section garners and collates treatments in the literature of drivers and factors that are believed to have played a part in engendering such market conditions. For clarity, this section categorises them into three broad groups: Protocol-related factors, market-related elements, and regulatory and institutional failures.

5.2.1. PROTOCOL-RELATED FACTORS

Protocol-related factors are mainly concerned with the design and loopholes associated with the ozone regime established under the Montreal Protocol. These factors are claimed to create considerable potential for illegal trade or present loopholes that have been exploited by black marketers and fraudsters in the trafficking of controlled ODS.

5.2.1.1. DIFFERENTIATED PHASE-OUT SCHEDULES

A common criticism of the ozone regime is that the differentiated phase-out schedules between Article 5 and non-Article 5 Parties lead to substantial price differentials between the international and domestic markets and open the door for large profits to be made by smugglers.

112 These nine surveyed countries were Argentina, Brazil, Colombia, India, Indonesia, Iran, Lebanon, Mexico, and Venezuela.
In consideration of the political, economic, and technical constraints facing the developing countries during the 1980s, the Protocol granted a 10-more-year grace period for countries operating under Article 5 of the Protocol to – with the financial and technical assistance from developed countries – gradually adapt to the international standards. The staggered phase-out schedules legitimately enabled developing countries to continue producing and consuming CFCs and halons for at least 14 years beyond the 1 January 1996 phase-out date for non-Article 5 countries. Such different target dates for the phase-out implementation resulted in significant price differentials between the international markets where the supply was freely available and the prices were low and the national markets where the supply was dwindling and the prices were rising. For example, it is said that in 1997 a kilogram of CFCs bought in China would only cost US$2, but the price rose to US$10–15 per kg when smuggled into the EU (Hayman and Brack 2002, 12). Therefore, the large price margins made smuggling of ODS from developing to developed countries a highly profitable business.

Moreover, global price discontinuities were further accentuated in countries where tax and royalty fees were levied on ODS import or where supply cartels were able to maintain inflated prices for ODS on the domestic market (UNEP Ozone Secretariat 2002, 2). For example, in the US, since 1990 an escalating excise tax was imposed on ODS production and import. It is estimated that during that time, one container load of CFCs (30,0001b) smuggled into the US would bring the smugglers a quick profit of over US$200,000-250,000 due to the price differentials between the low price for CFC purchase on the world market and the high wholesale or retail prices in the US (Hayman and Brack 2002, 12).

5.2.1.2. Recycled substances not subject to the Protocol’s control measures

Compared to virgin ODS, recovered, recycled, and reclaimed ODS are less regulated by the ozone regime. Under the Montreal Protocol, the amounts recycled and reused are

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113 In general, such considerations included: (1) during the 1990s, a number of countries with economies in transition in Eastern Europe and the former Soviet Union experienced political and economic upheavals which made them difficult to ratify and comply with the Montreal Protocol. (2) The then existence of a large number of ODS-reliant equipment in developing countries made an accelerated process of retrofitting or replacing such equipment economically unrealistic. (3) Technical limitations remained on the wide availability of low-cost ODS alternatives in many applications.

114 Decision IV/24 of the 4th Meeting of the Parties to the Montreal Protocol provides detailed definitions for the three terms (MOP Decision IV/24 1992).
not considered as “production” and thus not included in the calculation of a Party’s consumption quotas (Article 1, Montreal Protocol). International trade in non-virgin ODS is only subject to the regulation of Article 4B of the Protocol which urges each Party to institute a licensing system for the validation and approval of import and export of new, used, recycled, and reclaimed controlled substances, as well as the regulation of Article 7(3) which requires each Party to report to the Ozone Secretariat separate statistical data of its annual import and export of controlled substances whether used or not.

The allowance for an ongoing transnational trade of reused and recycled ODS after the phase-out date gives rise to a loophole. Smugglers are able to get around the national monitoring and control systems simply by falsely disguising and declaring new CFCs or halons as recycled, especially when it is difficult to distinguish virgin and used ODS gases. However, market surveys show that very few used ODS are actually found on the world market, due to the usually lower price of virgin ODS compared with the cost for recovering ODS from used machinery or equipment (Grabiel et al. 2013, 51).

5.2.1.3. Transit trade

Under the Montreal Protocol, “transit” or “transit movements” refers specifically to “transhipment” where goods from the country of origin are shipped through a third country (transit point) but destined for another country for final sale or consumption. It is worth noting that the Protocol distinguishes transhipment from another term “import and re-export”. Though both involve the presence of an intermediary country, transhipment refers to goods being moved through a third country while without leaving the port, railway wagon or other temporary storage places on their way from the country of origin to the country of final destination. In contrast, in cases of import and subsequent re-export, goods are firstly imported into the intermediary country, after either being stored for some time or going through certain forms of processing (e.g., repackaging), and then re-exported to the final destination country (Brack et al. 2006, 30–1).

With respect to the responsibility of data report, the Protocol views transit trade as a single transaction and imposes the reporting obligations on the country of origin as the exporter and the country of final destination as the importer. For import and re-export,
the Protocol regards them as two separate transactions and places the reporting obligations on the country of origin that first reports the shipment to the country of intermediary destination, which subsequently reports the export to the country of final destination, and at last the country of final destination reports the import (Article 7, Montreal Protocol). Thus, it can be seen that in the case of transshipment, the intermediary countries are under no bound obligation to record and report goods passing through their territories. While in the case of import and re-export, each of the three parties involved equally take a reporting obligation. Nonetheless, both forms of transiting goods through a third party, especially those trading hubs or free trade zones, can present a serious loophole that smugglers can take advantage of for ODS trafficking.

Typically, illegal traders employ transit points to detour illegal ODS from the source to end-use market for two reasons. First, rigorous checking at the customs point of the destination country makes a direct relay of the contraband risky, especially when the source country has been profiled by the destination country as a hot or high-risk source for illegal ODS, and therefore see its shipments prioritised for scrutiny. Second, monitoring and control of the movement of ODS in the intermediary country are often lax or even largely missing. Being so may be due to either the sheer enormous scale of cargo throughput at the trading hubs’ sea and terrestrial ports, which makes it impossible to police every flow, or else due to the special policies in free trade zones that have looser administrative procedures by design in order to attract international investment and reduce local unemployment and poverty. Whatever the reason behind it, the very lack of stringent monitoring and control of transited goods in intermediary countries implies that they provide a route that illegal dealers can capitalise on to obscure the provenance of the illegal chemicals and confuse the tracks. This creates extra dimensions of difficulty for the detection and interception of ODS contraband by customs officials in the destination countries.

The use of transit scam in transboundary movements of illegal ODS has been a recurring and widespread feature throughout the history of ODS trafficking. During the second half of the 1990s, as discussed earlier, much of the illegal CFCs entering the US originated in Russia but passed through the hands of a set of European companies as brokers. A point worth highlighting here is that these contraband CFCs were managed to be imported into the US, again, under the disguise of transit trade, with the final destination falsely stated on the customs documents as developing countries in Latin
America and the Caribbean. In reality, however, detected cases of CFC smuggling into Florida and Miami at this time showed that the majority of the illicit CFCs never left the US, but ended up in the US domestic markets (Anderson et al. 2002, 184). During 1995 and 1996, it was discovered that a number of American and European offshore territories in the Pacific and Caribbean including Netherlands Antilles and French Saint Martine were being used frequently as transit points in laundering CFCs and thereby blurring the true destination of the chemicals (UNEP 2001, 17–8; Brack et al. 2006, 33). After entering the 2000s, in tandem with the shift of the ODS black market from developed to developing countries, several trading hotspots in the Asia Pacific including Singapore and Dubai in the United Arab Emirates emerged to be the new transit points in transnational illegal ODS trade. EIA’s analysis of seizure data and interviews with illegal dealers revealed that a significant proportion of illegal CFCs imported into India were transited through Dubai and Singapore, while over half of the total CFCs imported into Dubai were re-exported both legally and illegally to Africa, South Asia, and other markets (Clark and Newman 2002, 14).

5.2.2. MARKET-RELATED ELEMENTS

Market-related elements mainly pertain to the factors that either lead to the persistence of a high market demand for controlled ODS after the phase-out dates, or contribute to the wide availability of illegal ODS on the black markets.

5.2.2.1. HIGH MARKET DEMAND

As with other black markets, demand inclines to be the ultimate creator of supply. According to the literature, the continuation beyond the phase-out schedules of a latent market demand for controlled ODS can be attributed to four factors.

First and foremost, the existence of a large number of ODS-containing equipment and appliances in use creates sizeable and dispersed service markets. In the US, for example, it is argued that the millions of vehicles fitted with CFC-dependent AC systems were the largest single source for market demand during the 1990s. It is estimated that over 90 percent of automobiles running in the mid-1990s were equipped with CFC-reliant AC systems; in 1995 this represented around 110 million cars using CFC-12 (Hayman and Brack 2002, 12). Even by the year 2002, according to UNEP’s 2002 refrigeration
assessment report, at the global level, there were still some 600,000 road vehicles equipped with AC systems operating on CFC-12 or R-502, equivalent to half of the total number of the vehicles in use in that year (Kuijpers 2003, 8). Another indicator of the extent of installed ODS-containing equipment is the “ODS banks”, a jargon used to refer to the “total amounts of ODS substances contained in existing equipment, chemical stockpiles, foams and other products” (de Jager et al. 2005, 3). According to UNEP’s 2006 refrigeration assessment report, the global CFC bank accumulated at around 450,000 tonnes, with 70 percent of which estimated to be clumped in Article 5 countries. HCFCs comprised the dominant refrigerant bank in terms of quantity, estimated at more than 1.5 million tonnes, representing 60 percent of the total amount of refrigerants in use. Again, the bulk (two-third) of the global HCFC bank resided in Article 5 countries (Kuijpers 2007, 2).

Second, ODS-containing equipment usually has a long operating life. Early in the first half of the 1990s, major manufacturers initiated the conversion process of new product production from CFCs to the use of ODS-free refrigerants. For example, by the end of 1994, nearly all the major automobiles manufacturers had converted their mobile AC systems to the use of HFC-134a (Kuijpers 1998, 13). However, the typically 15–25-year-long lifespan means that old equipment manufactured using CFC-12 refrigerants still comprises the majority of the installed base (de Jager et al. 2005, 51). Therefore, it is expected that the longer these products linger on the market, the longer the demand for illegal ODS will persist.

Third, for ODS-reliant equipment to be operating on ODS-free chemicals, the equipment often requires retrofitting, such as a change of lubricant or replacement of expansion device or compressor. However, the cost for equipment conversion is usually higher than that of directly acquiring ODS from the black market. Thereby, a kind of “symbiotic” relationship is formed between the continuing use of ODS-reliant equipment and the illegal trade. That is, the “continuing use” creates a demand for cheap ODS, which leads to the emergence of a black market. The black market further allows for plentiful supplies of cheap illicit ODS, which in turn extend the operating life of the equipment being used. This symbiosis explains in part why the demand for CFCs in the service sectors in some developing countries (e.g., India, Indonesia) still remains high despite the import of virgin CFCs has been banned since January 2010. For example, according to UNEP, the average cost of retrofitting a mobile AC system to
enable the use of HFC-134a in Asian developing countries is between US$100–200. In contrast, acquiring a 13.6 kg-weighed cylinder of CFC-12 from the black market would only cost US$50, which would allow the AC systems to be serviced many times (Liu and Bagai 2007, 4). In addition to that, the greater cost of ODS alternatives might also serve as a discouragement to the replacement process. For example, the global average price for HFC-134a in 2010 was recorded at US$17.23 per kg, some US$3.58 higher than that for CFC-12 in that year (Grabiel et al. 2013, 45).

Fourth, the smuggling of used equipment, products, and components (e.g., automobile AC units, domestic or commercial refrigeration and heat pump systems) whose continuing functioning relies on the supply of controlled ODS further complicates the illegal trade problem. This is because the trafficking increases the number of ODS-reliant equipment and ODS banks in the recipient countries. This, in turn, undermines the recipient countries’ ability to reduce demand particularly from the service sector, and thus increases the risk of illegal trade.

Initially, the issue of illegal trade of ODS-reliant equipment was brought to the attention of the Ozone Secretariat at the Thirteenth Meeting of the Parties to the Protocol in 2001. At the meeting, 20 small countries including Argentina were found to be failing to comply with their production or consumption baseline, despite receiving considerable financial assistance from the Multilateral Fund for the Implementation of the Montreal Protocol (MLF). National representatives from these non-complying countries pointed to the issues of cheap and ample supplies of illegal CFCs and the growing imports of used CFC equipment (especially used vehicles and domestic refrigeration equipment operating on CFC-12) as two main culprits for their failure to stay compliant (13th MOP Report 2001, 33). In response, the Ozone Secretariat established a list of countries that do not manufacture controlled substances for domestic use and do not wish to import ODS-containing equipment and products. In addition, a number of Parties outlawed the import of used ODS equipment by introducing import bans or other regulatory restrictions. Even more aggressively, the EU banned the export to all countries of used equipment containing most categories of controlled ODS. Despite all these initiatives, however, due to the high costs associated with the shipping, recycling, and destruction of used ODS-based equipment in developed countries, smugglers have been able to step in and purchase the used equipment at a low price from those holders wishing to get rid of such economic burden. As a result, most of the obsolete ODS-
based goods are smuggled and sold into the developing countries where local people are unable to afford the new products.

Today, the dumping problem is taking place again, only with the subject shifted from the equipment-containing CFCs to that containing HCFCs, mostly involving the equipment designed for HCFC-22 and used in refrigeration and AC sector, as well as, to a lesser extent the foaming equipment (Grabel et al. 2013, 19). Though it remains unknown as to the precise magnitude of the ODS-containing products being smuggled annually from the developed to developing countries, this problem can be significant as corroborated by seizure information. For example, apart from the seizure of 108 tonnes of illicit ODS chemicals, the 2010 Sky-hole Patching II operation also contributed to the interception of over 660 items of ODS-containing equipment (WCO and UNEP 2010, 2). This problem highlights the relevance of the sound management of the nearing-end-of-life products at the exporting side and the regulation of import of used ODS equipment at the importing side to the protection of the ozone layer and mitigation of climate change.

5.2.2.2. The ready availability of illegal ODS

On the supply side, the wide availability of contraband ODS tends to be the major impediment to the timely elimination of the use of controlled ODS. At the Ninth MOP in 1997, the Ozone Secretariat noticed the issue of illegal trade resulting in the continuing availability of fairly significant quantities of CFCs in several non-Article 5 countries after the phase-out of production and consumption of CFCs by January 1996 (MOP Decision IX/23 1997). This had prevented such Parties from complying with their due phase-out obligations and led to greater continued use of CFCs and halons and continued ozone depletion.

In general, such ready availability, though stockpiles and recycling from the installed banks may play a part, is mainly ascribable to the continuation of production of virgin substances in both developed and developing countries. More specifically, as discussed in the earlier part of this chapter, such continued production can further be distinguished between two different sources: either illegal production going on unregulated or, legal production being diverted onto the black market.
a. Illegal Production

For Parties whose freeze or phase-out schedules for a specific controlled substance become applicable, it is the Party’s mandatory obligation to take practicable measures to regulate and manage its domestic production, consumption, and trade of that substance in order to meet the reduction goals under the Protocol. Within this context, what are termed “illegal production” points to the part that exceeds the national production limits as specified for a specific control period by the Protocol. For example, Paragraph 2, Article 2 of the Montreal Protocol requests that, for any non-Article 5 Parties during the control period of 1 January 1994 to 1 January 1996, their annual production of the controlled substances in Group I, Annex A (A-I, five main types of CFCs) shall not exceed 25 percent of their 1986 production baseline. It will be considered as an act of non-compliance if the Party concerned produce more than the maximum allowed, and in a sense, the part surpassing the permitted quantity may be deemed as illegal production. Overproduction at the national level is quite an accumulative result of the ill-regulated industrial activities. At the industry level, illegality may be mirrored in various forms of unregulated production including unlicensed production or production in excess of the quotas specified in a permit issued by the National Ozone Units (NOU).

In history, a typical example for production in excess of the Protocol permits was Russia and other Eastern European countries which, though classified as non-Article 5 countries and scheduled for the 1996 phase-out, experienced hardships in complying with the terms of the Protocol due to the political and economic turmoil during the mid-1990s. As a result, these countries were actually in non-compliance with their obligations under the Protocol by continuing to illegally produce controlled substances that were supposed to be phased out. As discussed previously, it is claimed that much of these overproduced materials were flooded to the black markets in the EU, US and other non-Article 5 countries. Other documented instances of production non-compliance include Argentina, which reported production of 3,065 ODP tonnes of A-I controlled substances during the freeze control period of 1 July 1999 to 1 June 2000, some 319.7 ODP tonnes more than its maximum permitted. This had placed Argentina in non-compliance vis-à-vis its obligations under Article 2A of the Protocol for that control period (MOP Decision XIII/21 2001).

It deserves to note that “production in excess of the Protocol requirements” as reflected in the cases of Russia and Argentina might only represent part of the entirety of illegal
production, that is, the part being calculated into a Party’s production or consumption quotas and being detected and identified as non-compliant. Yet as substantiated in the case of China’s CFC exports after the declared closure of domestic CFC production facilities in 2007 (discussed later), there have been significant amounts of illegal production going on clandestinely which remain undetected and undocumented by Chinese ODS officials.

**b. Legal Production**

On top of illegal production, there has been the existence of several forms of legal production which are thought to provide another source of ODS being directed to illegal commerce and offer a range of opportunities for concealment and disguises.

Under the terms of the Protocol, as mentioned above, a ten-year delay was granted to developing countries whose annual consumption level of Annex A substances is lower than 0.3 kilograms per capita on the date of entry into force of the Protocol for it, or any time thereafter but prior to the 1999 freeze date (Para. 1, Art. 5, Montreal Protocol). The one-decade grace period provides the legal foundation for Article 5 countries to continue producing and consuming new CFCs and halons to meet their basic domestic needs until the 2010 phase-out date, though the amount produced and consumed each year is subject to a gradual reduction control starting from 1 January 1999 (Para. 3, Art. 5, Montreal Protocol). However, it seemed that some Article 5 Parties were taking advantage of this opportunity to produce and consume CFCs and other ODS much more than really needed, which had therefore caused a marked growth in ODS production in Article 5 countries between 1986 and 1997 (see Figure 5.2). In particular, China, India, Brazil and the Republic of Korea were the four largest producers of Annex-A substances among Article 5 Parties through the history.
Figure 5.2: Production of controlled substances in Annex A (CFCs and Halons) in Article 5 Parties during 1986–2012 (ODP tonnes)

(Source: UNEP Ozone Secretariat Data Access Centre 1986–2010)

Note: Historical production of Annex B-I substances (other CFCs) in Article 5 Parties has been insignificant in quantity, with annual fluctuation up and down mainly along the level of 25 ODP tonnes till 2006

Figure 5.3: Production of A-I (CFCs) controlled substances in major producing Article 5 Parties during

(Source: UNEP Ozone Secretariat Data Access Centre 1986–2010)

For non-Article 5 countries, legal production was also permitted to continue after the 1996 phase-out date for several specified purposes and exempted essential or critical uses. First, production of Annex A and B substances for export to meet the basic domestic needs of Article 5 Parties was allowed until the 2010 phase-out date applied to the developing countries, though again, the quantity produced annually was subject to
gradual reduction control. Some analysts claimed that in the mid-1990s, in addition to the flows of the Russian manufactured ODS, considerable amounts of controlled substances produced in Europe under the name of export to meet the basic needs in developing countries were actually being laundered back into European countries’ domestic markets (Andersen et al. 2002, 185). Second, an exemption from the phase-out control was given to certain “essential uses”, which are usages that were considered critical either for health and safety or for the functioning of society, when no other economically, technically, and environmentally acceptable alternatives or substitutes were available (MOP Decision IV/25 1992). Therefore, even after the phase-out date, non-Article 5 Parties can apply for the production and consumption of four mains CFCs (CFC-11, CFC-12, CFC-113, and CFC-114), halon-2402, and methyl chloroform for essential uses including metered-dose inhalers (MDIs), fire protection, torpedo maintenance, aerospace applications, laboratory and analytical critical uses. The production and/or import of controlled ODS for exempted essential uses are not aggregated into a Party’s ODS consumption quotas. Third, there is also a critical-use provision under the Protocol that applies only to methyl bromide. A Party can apply for a critical-use exemption (CUE) for methyl bromide which will allow it to produce or import a specified quantity of that substance in a given calendar year and use it for the specified applications approved by the Parties. Fourth, production and consumption of controlled substances for the use as feedstock in the manufacturing of other chemicals are not controlled by the Protocol. Therefore, the amounts produced and imported for that purpose are not included in the calculation of a Party’s production and consumption quotas (MOP Decision VII/30 1995). However, UNEP and EIA have cautioned that the large volumes of unmonitored HCFC feedstock production accumulated in developing countries might become another source of black market HCFCs, in particular when Article 5 Parties take deeper production cuts pursuant to their commitments under the Protocol (EIA 2011, 22).
5.2.3. REGULATORY AND INSTITUTIONAL FAILURES

Addressing the black market for environmental commodities or services can be challenging due to the many complexities that impair the established international and national control system. Broadly, Hayman and Brack (2002, 10, 15–7) classify such complexities under two rubrics: “regulatory and institutional failures”. In their views, regulatory failures refer to inadequate regulations, regulatory loopholes, or the failure to deter non-compliance attempts. On the other hand, institutional failures include insufficient resources, untrained (or undertrained) staff, or cumbersome administration that might prevent the effective operation of environmental controls.

In the ODS sector, if regulatory failures refer to the loopholes associated with the ozone regime that create the potential for illegal trade (as discussed previously), then institutional failure might specifically embody in several factors that directly cause layers of difficulty in the detection and combating of illegal ODS trade. At the 12th MOP in December 2000, the Parties recognised the relevance of control over trade between Parties of ODS and products containing ODS for the global implementation of the Protocol. However, in the meantime, the Parties also acknowledged that the effective control at national borders can be difficult due to “the problems in ODS identification, the complexity of relevant customs codes, the lack of trained customs officers, and the need to approach the problems by cooperative action by all countries” (MOP Decision XII/10 2000). Moreover, the parallel existence of legal and illegal ODS
on the market implies that the mere presence of a controlled substance cannot be simply deemed as a sign of illegality. Further verification of the accompanying documentation is required before a judgement on the nature of the goods inspected can be made (DeSombre 2000, 63). However, considering the huge numbers of cross-border shipments that take place worldwide each day, the complexity and enormous scale of work that customs and enforcement personnel have to handle, especially in terms of differentiating and triaging between illegal and legal shipments, cannot be understated. For example, global ODS imports reached 336,790 metric tonnes in 2012. Drawing upon the method used by Chatham House and EIA (Brack et al. 2006, 8), this would represent around 22,512 transnational shipments to be monitored by enforcement agencies in importing countries around the globe in that year alone.

5.3. **China’s Global Trade in ODS**

If it is arguable that the Asia-Pacific has become the new hub for a global black market in ODS (Elliott 2007b, 505), then China must be at the centre of the hub, given its dominance in the region in terms of its prominent roles as both the largest producer and consumer of legal ODS as well as the largest source of illegal ODS.

Since the first revelation in 1997 of the involvement of Chinese dealers in the cross-border trade of illegal ODS (Clark 2005, 5), the country has had a recorded history of over 17 years of consistently supplying the world with illicit ODS chemicals. A rich body of evidence—including the growing number of China-related ODS seizures, the prevalence of Chinese-produced counterfeit ODS on the global black market, and the considerable discrepancies in China’s ODS exports and its major trading partners’ imports—has pointed to China’s illegal trade in ODS as being a significant magnitude issue. It demonstrates that China is a major source from which large volumes of illegal CFCs and HCFCs are being smuggled each year to both developed and developing countries around the world.

China’s role in the global and regional trade chain of illegal ODS presents a special challenge to the successful implementation of the Montreal Protocol. As Clark (2007a) observes, the failure of the Chinese government to curb its substantial outflows of

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115 This method for the calculation of the possible numbers of ODS shipments assumes that shipping of ODS occurs in 13.6 kg disposable cylinders packed in standard (20-foot) containers. In case of fully loaded, one container would contain 1,100 cylinders, weighing 14.96 metric tonnes in aggregate.
illegal ODS to the international market has placed an extra burden on customs officers across the Asia Pacific and beyond, and in turn has increased the risk of the recipient countries’ non-compliance with the Protocol. Though this point of view was disapproved by some Chinese officials who insisted that “the emphasis should be on the importer to ensure that the trade is legal and does not put them in non-compliance” (Brack et al. 2006, 28).

This section aims to investigate China’s profile and function in global trade of illegal ODS. To that end, this section will first use data from the Ozone Secretariat Data Access Centre and UN Comtrade Database to review China’s history and present state of production, consumption, and trade of controlled ODS. Second, this section will analyse 85 records of China-related ODS seizures occurred during 2000–2014 to unpack the various aspects of the transaction networks associated with China’s illicit ODS trade. Specifically, it will explore China’s role in the global and regional trade in illegal ODS, the scale and scope of the illegal trade, the major destinations, and the methods for smuggling and concealment.

5.3.1. CHINA’S HISTORY AND PRESENT STATE OF ODS PRODUCTION, CONSUMPTION, AND TRADE


Under the Montreal Protocol, China was classified as a Party operating under paragraph 1 of Article 5 of the Protocol. In January 1993, China formulated its national plan “Country Programme for the Phase-out of Ozone Depleting Substances” (MEP 1999), which was approved by the Executive Committee of the MLF in March 1993. Up to date, China has received an accumulated US$623 million funding in total from the MLF in supporting the fulfilment of its national obligation under the Protocol.

5.3.1.1. CHINA’S PRODUCTION AND CONSUMPTION OF CONTROLLED ODS

China has been historically the world’s leading ODS producer and consumer. With a
rapid economic growth, industrialisation, and urbanisation in the past three decades, China’s demand for ODS-based products – e.g., rigid foams used in domestic refrigerators, refrigerants for servicing AC equipment, aerosols for sprays or paint – grew markedly. This surging demand directly resulted in a substantial increase in China’s production and use of controlled ODS from the mid-1980s through most of the following decade. In 1997, China produced 98,054 ODP tonnes of ODS and consumed 90,511 ODP tonnes, accounting for around 35 percent and 34 percent of the global ODS production (282,481 ODP tonnes) and consumption (270,026 ODP tonnes) in that year (UNEP Ozone Secretariat Data Access Centre 1997). At the point following the 1996 phase-out of ODS production and use in developed countries, this magnitude of production and use made China the world’s largest ODS producer and consumer, more than doubling the production of India which was in the second position in 1997. China’s production and consumption continued to grow into 1998 and reached its historical peaks of 121,042 and 166,991 ODP tonnes respectively, before it started to decline (See Figure 5.5).

Figure 5.5: China’s ODS production and consumption during 1986–2012 (ODP tonnes)

By substance categories, the majority of China’s ODS production and use concentrated in CFC-11, CFC-12, CFC-113, halon-1211, halon-1301, and carbon tetrachloride. In 1997, production and use of these six categories of substances made up 97.3 percent and
95.7 percent of China’s 1997 total ODS production and consumption. By industrial sectors, five major industries including foams, refrigeration and air-conditioning (RAC), fire protection, aerosols, and solvents virtually contributed to all of China’s ODS use. In 1997, the amount consumed by the five industrial sectors accounted for 98.8 percent of China’s total ODS use (MEP 1999). Moreover, these sectors tended to share a number of common characteristics, which included rapid growth, geographic dispersion of enterprises, and growing profitability of ODS production (World Bank 2013, 1, 53). These patterns created extra hardships in managing China’s ODS phase-out.

As operating as an Article 5 Party, starting from 1 July 1999, China is bound to freeze both production and consumption of major ODS chemicals at the average of 1995–1997 baseline levels, then gradually reduce its production and use of CFCs and halons by 50 percent by 2005 and 85 percent by 1 January 2007, before finally completing the phase-out by 1 January 2010 (see Table 9.5 in Appendices). As part of the effort to contain its domestic production, China banned new halon and CFC-aerosol production facilities in 1990 and 1991, and all new CFC production facilities in 1993 (World Bank 2004b, 17).

In 1993, following the approval by MLF of its Country Programme, China entered into a partnership with the World Bank Montreal Protocol Program. Ever since then, with assistance from the implementing agencies (the World Bank and UNDP), China has successively put in place five ODS phase-out projects within the broad framework of its national plan. While the fifth project the “HCFC Phase-out Management Plan (HPMP) (Stage I)” is still going on (UNDP 2011), the fourth phase-out project “CN ODS IV”, completed in 2013, has helped China to reduce significant amounts of ODS production and consumption.

Adapted on the lessons learnt from the previous three projects, the fourth phase-out project ‘CN ODS IV’ devised a distinctive sectoral-level approach. It consisted of nine discreet phase-out sector plans that covered halon production and consumption, mobile air conditioning (MAC), CFC production, polyurethane (PU) foam, industrial and

116 First, it should be noted that China’s production and consumption of carbon tetrachloride were insignificant in quantity, only in the order of zero and 110 ODP tonnes respectively in 1997. However, in 1998 China’s production and consumption of this substance suddenly surged to 35,090 and 85,628 ODP tonnes. Second, the UNEP Ozone Secretariat Data Access Centre only provides data on production and consumption of controlled substances aggregated at the “Annex-group” level. Data on China’s 1997 production and use of specific ODS are quoted from the China Country Programme.
commercial refrigeration (ICR), process agent and carbon tetrachloride (CTC) production, 1,1,1-Trichloroethane (TCA), aerosols, and the accelerated CFC and halon phase-out. Over the life of the project from 1997 to 2013, a total of US$440 million from the MLF had been disbursed yearly to support the project (World Bank 2013). Upon its completion in 2013, the CN ODS IV project brought about a substantial reduction in China’s production (over 100,000 ODP Tonnes) and consumption (over 110,000 ODP Tonnes) of ozone-harming gases and substances, ensuring a timely and cost-effective fulfilment of China’s obligations under the Protocol (World Bank 2014). By 2009, China’s consumption of CFCs, halons, and CTC was down from the 1997 and 1998 peaks to only 370, 986 and 87 ODP tonnes respectively, and a drop of similar extent was also seen in the production sector (see Figure 5.6 and 5.7). Moreover, this project also enabled China, by 1 July 2007, to shut down and dismantle five of the six remaining CFC production facilities in Changshu City (near Shanghai), allowing China to realise its CFC and halon phase-out commitments two and a half years ahead of the 2010 schedule.117 Until 1 January 2010, except for minor quantities approved by the Parties to the Protocol for exempted essential or critical uses, China had, at least on paper, completely eliminated the production and consumption of CFCs, halons, CTC and TCA – five years ahead of the initial schedule.

Figure 5.6: China’s phase-out of CFC, halons and carbon tetrachloride production (ODP tonnes)

(Source: Ozone Secretariat Data Access Centre 1997–2012)

Note: Production and consumption after 2009 were for essential or critical uses approved by the Parties to the Protocol.

Yet alongside the decline in production and consumption of CFCs, halons, and CTC, China’s production and consumption of HCFCs have grown at an average annual rate of 29 and 21 percent respectively since 1998 (see Figure 5.8). In 2012, China produced 34,414 ODP tonnes of HCFCs and ranked the world’s biggest HCFC producer (86 percent), followed by India, Republic of Korea, Mexico, and Argentina. Though the bulk of ODS manufactured in China is traded legally, thanks to the enormous size of its production, China remains a major source for most of the illicit HCFCs traded on the international black market.
Pursuant to the accelerated HCFC phase-out schedule adopted at the 19th MOP in 2007, the proximate and intermediate control targets for China as an Article 5 Party include the freeze on production and consumption of HCFCs at the averaged 2009–2010 baseline level from 1 January 2013 and 10 percent reduction by 1 January 2015. To aid the Chinese government to achieve the freeze and reduction goals, the 64th Meeting of the MLF Executive Committee approved China’s 2011–2015 HCFC Phase-out Management Plan (Stage-I) and appointed UNDP as the implementing agency. Four months later, at the 65th Meeting, the MLF Executive Committee approved China’s HCFC phase-out plan in solvent sector. As such, the stage I of China’s HPMP consisted of HCFC phase-out plans in seven industrial sectors, including the HCFC production, PU foam, extruded polystyrene (XPS) foam, room air conditioning (RAC), industrial and commercial refrigeration (ICR), servicing and solvent sectors, with the overall funding from MLF amounted to US$270 million. In April 2013, the 69th Meeting of the MLF Executive Committee approved another large funding package, which contains an amount up to US$385 million to be allocated over 17 years to help China to achieve the entire elimination of its industrial production of HCFCs by 2030. Upon completion, this will result in the prevention of the emission of over 4.3 million metric tonnes (300,000 ODP tonnes) of HCFCs and eight billion tonnes of carbon dioxide equivalent greenhouse gas emissions.118

5.3.1.2. China’s Exports of Controlled Substances

On top of being the global leading producer and consumer, for the past decade, China has also been the world’s major exporter of a variety of controlled substances including methyl bromide, CFCs, halons, methyl chloroform, and HCFCs. Between 2002 and 2012, China ODS exports grew steadily at an average annual rate of 18.7 percent, from 71,719 metric tonnes in 2002 to 397,718 metric tonnes in 2012. During this period, while exports of CFCs and halons were decreasing gradually along with China’s phase-out schedules, HCFCs and methyl bromide increased constantly and now constitute the two largest stables in China’s ODS exports.

Figure 5.9: China ODS exports by substance categories during 2002–2011 (metric tonnes)

(Source: UN Comtrade Database 2002–2012)

Note: (1) Data on China’s ODS exports for the periods of 2002–2006, 2007–2011 and 2012 were extracted from the UN Comtrade Database by using HS 2002, HS 2007, and HS 2012 respectively. (2) HS 2002 and HS 2007 in the UN Comtrade Database do not distinguish between the sub-category substances under the Annex C to the Protocol, only data aggregated at the Annex-level are available. The cross-reference between the major controlled ODS and HS codes is provided in Table 9.6 in the Appendices. (3) Due to its low ODP index (0.12), methyl bromide is not significant in quantity when converted from metric tonnes to ODP tonnes.

Presently, China is the world’s largest HCFC exporter. In 2012, China supplied the world a total of 213,758 metric tonnes of Annex-C controlled substances, valued at US$438.8 million. Following was the US exporting to the world 13,984 metric tonnes and Netherlands 13,758 metric tonnes. HCFC-22 took up the biggest share (70 percent) in China’s HCFC exports, then followed by HCFC-123 and other HCFCs (see Figure 5.10). Major export markets for Chinese HCFCs clustered in East and South Asia and the Middle East, including Japan, South Korea, Thailand, Saudi Arabia, and Malaysia (see Figure 5.11).
5.3.2. Profiling China’s Role in Global Trade in Illegal ODS

Seizure data are often the most relevant and oft-drawn reference in the study of the black market for environmental goods, including ODS.\(^{119}\) In comparison with the seizure information on illegal wildlife trade, publicly accessible data on illegal ODS

\(^{119}\) Seizure reports, market investigations, and discrepancy analysis of bilateral ODS trade data are often the three most important sources of data for the study of illegal trade in ODS. Other indicators of illegal trade in ODS might include the market prices of illicit chemicals which are presumed to rise as controls come into place and legitimate supplies diminish, and the growth in market share of legal alternatives (EIA 2011, 10).
seizures are lesser in both availability and quantity terms. There are no comprehensive information repositories for ODS seizures that are comparable to TRAFFIC Bulletin Seizures and Prosecutions which compiles all possible anecdotal reports on global seizures of illegal wildlife. ODS seizure information scatters in a number of reports by governmental agencies, environmental NGOs, and international organisations.

Paragraph 7 of the MOP Decision XIV/7 (2002) invites Parties to report verified cases of illegal ODS trade to the Ozone Secretariat in order to facilitate the exchange of information. To encourage Parties to report, the Decision intentionally excludes the illegally traded quantities from counting in a Party’s consumption quotas provided that the Party does not place the said amounts on its own market. However, the results so far have proved to be not so satisfactory. This is not only because only a limited number of countries showed the willingness to report ODS seizures made in their enforcement activities, but also because the seizure data reported were sometimes incomplete, with information on the intended destination of or smuggling methods for the traded ODS often missing. For example, in the case of China-related seizures, this chapter identifies 22 countries around the world that have ever intercepted illegal exports from China of controlled substances in the past years. While only six countries, including Argentina, Japan, Seychelles, Sri Lanka, the Philippines, and Uzbekistan, made their reports to the Ozone Secretariat.

Nevertheless, through an extensive literature review and interviews with Chinese officials working at the ODS administration agencies, this chapter has been able to collect and compile 85 records of China-related ODS seizures which have been made by both Chinese and international enforcement agencies between January 2000 and April 2014 (see Table 9.8 in Appendices). This database may not provide an exhaustive coverage, but it is certainly an as-complete-as-possible collection that this chapter can

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120 Customs Enforcement Network (CEN) database might be a good source for ODS seizure information though it is assessable to only authorised customs officials in its member countries. This WCO-maintained database is claimed to contain more than 150,000 pieces of information on seizures of various illegal commodities, including drugs, weapons, and tobacco. According to Gwang-hyeon Jang, the intelligence analyst of the WCO RILO A/P, seizures of illegal environmental goods actually accounted for only a small proportion of the total seizure records. For example, in 2004, the CEN database compiled 78,233 seizure records. Of which, the two largest seizure categories were drugs (52,313) and tobacco (10,727), seizures of environmental goods only included CITES-protected flora and fauna (6,270 records), hazardous wastes (6 records), timber smuggling cases (6 records) (Jang 2004). Also see CEN webpage: http://www.wcoomd.org/en/topics/enforcement-and-compliance/instruments-and-tools/cen.aspx.
The main objective is, through the analysis of the seizure data, to understand China’s role in the international and regional transaction chain of illegal ODS trade, the scale of China’s black market, the magnitude and diversity of ODS chemicals involved in illegal trade, the major destination markets for Chinese-produced ODS, and the prevalent methods for smuggling and concealment.

In ideal cases, each record of the ODS seizures would contain information on the date of seizure, the substances traded, the country of origin, destination and transit points (when applicable), the quantity of the confiscated, and the methods for smuggling and concealment. Akin to but slightly different from the definition adopted in Chapter 3 (China’s global trade in illegal wildlife), the term “China-related” is here meant to comprise two classes of seizure cases. First, “Class A” includes seizures which occurred within or outside China, with China as the source country for the contraband ODS. Second, “Class B” includes seizures involving China as the transit country through which illegal ODS were intended to be smuggled from the source to the destination country. Note that in contrast with the categorisation of wildlife seizures in Chapter 3, the classification of ODS seizures does not encompass cases where China was involved as the destination or consumer country. Being so is because all the China-related ODS seizures collected by this chapter pertain exclusively to China as either the supplier of the illegal ODS, or the transit point along the trading routes. Moreover, a comparison between the number of Class A (79 records) and Class B (4 records) clearly reveals the overpowering dominance of China’s role as the world’s outstanding supplier of illegal ODS, at least for the past ten more years.121

5.3.2.1. Scale of China’s Black Market for ODS

Excluding cases where the quantities of the seized ODS were not provided or were recorded in non-standard units (e.g., recorded in number of cylinders while the specification of the used cylinders was not available), the 85 record cases of China-related ODS seizures made over the 14-year time span resulted in an aggregate confiscation of 1,967 metric tonnes of contraband ODS. This represents an average annual magnitude of 140 metric tonnes of illicit ODS being manufactured mostly in mainland China and traded to international markets. If we draw on the method used by

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121 Two seizures are not considered for this comparison due to the lack of information on the implied sources, though seizures did take place within China.
UNODC (2013: 119), which suggests that the seized amounts only account for five percent of the entire illegal trade, then those 140 metric tonnes will translate into 2,620 metric tonnes of illegal ODS flowing mainly from China to the international black market on an annual basis.

Table 5.1: Major indicators of China’s illegal trade in ODS

<table>
<thead>
<tr>
<th>Substances traded</th>
<th>Number of seizures</th>
<th>In standard unit (kg)</th>
<th>In non-standard units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFC-11</td>
<td>3</td>
<td>92,200</td>
<td>200 cylinders of various size</td>
</tr>
<tr>
<td>CFC-12</td>
<td>34</td>
<td>618,575</td>
<td>6,293 cylinders of various size</td>
</tr>
<tr>
<td>CFC-112</td>
<td>1</td>
<td>268,200</td>
<td>--</td>
</tr>
<tr>
<td>CFC-113</td>
<td>3</td>
<td>48,210</td>
<td>--</td>
</tr>
<tr>
<td>Unknown kinds of CFCs</td>
<td>6</td>
<td>6,152</td>
<td>36 cylinders of various size</td>
</tr>
<tr>
<td>CFCs containing equipment</td>
<td>6</td>
<td>e.g., fridges, refrigerators, freezers, chillers, compressors</td>
<td>Unable to aggregate due to incompatible measures</td>
</tr>
<tr>
<td>HCFC-22</td>
<td>18</td>
<td>817,097</td>
<td>636 cylinders of various size</td>
</tr>
<tr>
<td>HCFC-123</td>
<td>1</td>
<td>2,500</td>
<td>--</td>
</tr>
<tr>
<td>HCFC-141b</td>
<td>2</td>
<td>7,700</td>
<td>--</td>
</tr>
<tr>
<td>Unknown kinds of HCFCs</td>
<td>1</td>
<td>25,850</td>
<td>--</td>
</tr>
<tr>
<td>HCFCs containing equipment</td>
<td>7</td>
<td>e.g., AC units, refrigerators, fridges</td>
<td>Unable to aggregate due to incompatible measures</td>
</tr>
<tr>
<td>Halon-1211</td>
<td>2</td>
<td>51,467</td>
<td>--</td>
</tr>
<tr>
<td>Methyl bromide</td>
<td>1</td>
<td>27,472</td>
<td>--</td>
</tr>
<tr>
<td>Unknown kinds of ODS</td>
<td>12</td>
<td>1,328</td>
<td>--</td>
</tr>
<tr>
<td>Total</td>
<td>--</td>
<td><strong>1,966,751</strong></td>
<td>--</td>
</tr>
</tbody>
</table>

Note: Table 5.1 is based on an analysis of China-related ODS seizures made worldwide between January 2000 and April 2014.

CFCs and HCFCs were the two main groups of ODS found in seizures. Of the total seized, 1,033 metric tonnes or 54 percent were contraband CFCs, recovered from 53 seizures. 853 metric tonnes or 44 percent were illegal HCFCs, derived from 29 seizures.
There were also small amounts of methyl bromide (27 metric tonnes), halon-1211 (0.5 metric tonnes), and some 1.3 metric tonnes of unspecified kinds of ODS.

Within the CFC family, CFC-12 was the most favoured CFC chemical in illicit trade. Some 619 metric tonnes of seized CFC-12 made up 60 percent of the total seized CFCs. This was followed by CFC-112 and CFC-11, respectively accounting for 26 and 9 percent of the total CFCs busted. The popularity of CFC-12 on China’s ODS black market is also supported by its markedly higher seizure number: 34 seizures involved the interception of illicit CFC-12, substantially higher than the number of the seizures of any other controlled chemicals. On the other hand, among the HCFC substances, HCFC-22 remained the most traded item, with 18 seizures resulting in 817 metric tonnes of contraband HCFC-22 (see Table 5.1).

Figure 5.12 visualises the annual variation of the volume of seized ODS. One puzzling aspect that can be drawn from this chart is the continuing presence of enormous quantities of Chinese-produced CFCs on the international black market even after the Chinese government shut down nearly all CFC manufacturing plants by July 2007. From 2008 to 2010, for example, Russian authorities intercepted, from three separate smuggling attempts, a total of 560 metric tonnes of illegal CFCs produced in China. Russia seized 268 metric tonnes of Chinese CFC-112 in 2008 and 266 metric tonnes of Chinese CFC-12 in 2009 (EIA 2011, 26–7). In 2010, some 26 metric tonnes of Chinese
CFC-12 were seized again by Russian customs (INTERPOL and UNEP 2013, 29–30). In all three cases, the virgin chemicals were mislabelled and misdeclared as recycled substances even though the Chinese government itself had admitted that it did not have the capacity to recycle such a large amount of CFCs (UNEP DTIE OzonAction 2012, 5).

Substantial amounts of illegal Chinese CFCs also appeared on the black markets in Hong Kong, Taiwan, Kenya and Uzbekistan. Possible explanations for the stubborn persistence of illegal Chinese CFCs on the global black market include the diversion for illegal use of established stockpiling prior to the 2007 production halt, as well as the continuing operation of unregulated production facilities (UNODC 2013, 118). Furthermore, for the scenario of possible ongoing illicit production, interviews with Indonesian ODS traders revealed more specific details (Clark 2005, 16). Some large Chinese ODS producers, which had previously been paid by the MLF to shut down their CFC production lines, had actually turned themselves into key brokers linking other illicit ODS producers and their overseas customers. That is, they acquired CFCs from other smaller, illicit domestic plants and capitalised on their established transnational client networks to supply overseas markets with illicit CFCs.

5.3.2.2. MAJOR DESTINATION MARKETS

Analysis of seizure data provides important information on the major destinations for Chinese-produced illegal CFCs and HCFCs. In total, seizure data identified 23 countries and territories as recipients of Chinese illegal ODS. Based on the size of the seized chemicals, Russia, the US, India, Japan, and Spain comprised the top five destination markets (see Figure 5.13), although the types of chemicals most favoured in the markets vary among localities.
Russia is the largest recipient of Chinese illegal ODS. From 2007 to the first half of 2014, Russian enforcement made nine seizures of illegal CFCs and HCFCs sourced in China, weighing in an aggregate of 679 metric tonnes. The average volume for each seizure was 85 metric tonnes. CFC-12, CFC-112 CFC-113, and HCFC-22 were the most prevalent chemicals traded to Russia. An intimidating aspect of this line of trafficking was the large-scale nature of individual shipments, which suggests the involvement of well-financed enterprises in both countries. Except for one seizure involving the movement of 130 illicit ODS-containing AC split systems, all of the remaining eight seizures had implication in each case of smuggling from China to Russia of vast amounts of illegal ODS, ranging from the lowest four metric tonnes to the highest 268 metric tonnes (see Table 9.8 in Appendices). The latest haul occurred in January 2014 when the Russian Ministry of the Interior carried out a major operation for the detention and arrest of organisers and perpetrators suspected of responsible for a transnational ODS smuggling scheme. The operation raided more than 20 hideouts and ended with the arrest of four suspects as well as the seizure of 34,440 kg of illegal CFCs and HCFCs contained in 1,500 refrigerant cylinders. Illegal substances were decanted from the original cylinders into ones mislabelled as containing ozone-safe refrigerants like ethylene-glycol and HFC-134a. Shipment paper indicated that these chemicals were sourced in mainland China and destined for Moscow by rail and road transportation (UNEP DTIE OzonAction 2014b, 7).
Although the US ranked second in terms of the volume of the seized ODS, the bulk of the seizures were the result of a series trafficking by a Florida-based company from March 2007 to April 2009. Within that two-year period, this company managed a succession of 11 shipments of a total of 418 metric tonnes of HCFCs, with a market value estimated at around US$4 million. Instead of a direct course of delivery from China to Florida, the shipments were transhipped via Caribbean islands to evade inspection (EIA 2011, 26–7).

Between 2004 and 2013, Indian authorities made seven seizures of Chinese HCFCs, amounting to 221 metric tonnes. Among the seven seizures, five unusually concentrated in a short five-month period from March to July 2013 and all involved containerised shipments of large volumes of Chinese HCFC-22. In March 2013, the Indian Directorate of Revenue Intelligence intercepted the largest-ever recorded smuggling of Chinese HCFCs: 183 metric tonnes of HCFC-22 contained in five bulk isotanks. The goods were ascertained as originating in China and bounded for a factory in Gujarat State, India. Despite the shipment papers alleged the imports were operating under an Export-Oriented-Unit (EOU) scheme, it was determined that the EOU license was being misused and that the refrigerants were believed to be illicitly diverted for domestic uses (UNEP DTIE OzonAction 2014, 5).

Japan’s seizures of illicit Chinese ODS took place mainly in 2001 and 2002, during which the Japanese authorities made eight seizures of a total of 192 metric tonnes of Chinese-produced CFC-12. The only recorded seizure by Spain, of 150 metric tonnes Chinese HCFCs, was made in a grand operation coded “Refreshco”, initiated by the Spanish Guardia Civil in February 2012. The seven-month-long operation culminated in December 2012 with confiscation of more than 150 metric tonnes of Chinese HCFC-22 and the detention of 97 people purportedly to be involved in the illegal trade.122 Two Spanish companies were on suspicion of illicit diversion onto the EU markets of several hundred tonnes of Chinese HCFCs which were imported for re-export purposes during 2010–2012.123 Most of the chemicals were said to be sold to serve refrigeration systems on fishing vessels with Russian and Lithuanian flags.

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123 According to the “EU Regulation 1005/2009”, the use of virgin HCFCs has been prohibited since 1 January 2010 and the use of recycled or reclaimed HCFCs for the maintenance or serving of refrigeration, air-conditioning and heat pump equipment will also be prohibited after 31 December 2014. However,
Taiwan’s role as a consuming market seems not significant. From the Epaper “Ozone Layer Protection in Taiwan 2003–2013”, this chapter collected only two records of illegal ODS imports to Taiwan. Of them, one reported that during 1999–2004, Taiwan Customs intercepted a total of 51 metric tonnes of halon-1211 containing extinguishers from six separate illicit imports. Taiwan banned the import of virgin halons in 1994 and the import of halon-containing equipment in 2000. The other one reported that between January and July 2007, Taiwan Customs and Costal Guards successfully foiled five attempts of ODS smuggling to Taiwan. Some 33 metric tonnes of CFC-12 were confiscated under the terms of the 1996 CFCs import ban and eight metric tonnes of HCFC-22 were impounded due to the lack of import permits.

Hong Kong’s role as a transit point, as seen in the case of China’s illegal wildlife trade, is not evident based on the available seizure data. Only two Hong Kong-related ODS seizures were collected by this chapter. One was made in September 2009, when the Hong Kong authorities seized 1,600 kg of CFC-12 contained in 100 cylinders. The other one was made in November 2011, when the Hong Kong Customs intercepted a consignment of 6,800 kg of CFC-12 believed to be destined for Thailand. In both cases, the possible sources for the illegal ODS were not provided (see Table 9.8 in Appendices).

5.3.2.3. METHODS FOR SMUGGLING AND CONCEALMENT

ODS trafficking is fluid and transitional in nature, and seasoned smugglers tend to adapt to changing circumstances to develop innovative and sophisticated techniques to circumvent the established regulatory systems. Existing literature sums up a range of methods that have been employed in the ODS trafficking. In general, such methods fall into the following six broad sets: front door smuggling, false labelling, misdeclaration, fake recycled or reclaimed, concealment, and transhipment fraud (see Table 5.2).
Excluding 22 cases where the information on smuggling methods was not provided or where the illicit ODS were simply transiting via a third country due to geographical proximity, this chapter has filtered out 63 cases with disclosed information on the methods for smuggling and concealment (see Table 9.8 in the Appendices).

Table 5.2: Summary of commonly used smuggling methods

<table>
<thead>
<tr>
<th>Smuggling methods</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front door smuggling</td>
<td>Front door smuggling describes situations where enforcement is not in place or ineffective, and smugglers do not even attempt to disguise the illegal shipments, but instead simply rely on the fact that the authorities won’t pay special attention to the movements.</td>
</tr>
<tr>
<td>False labelling</td>
<td>False labelling refers to illegal ODS being smuggled in cylinders or packaging being labelled as non-regulated chemicals or other legal merchandise, for example, canisters containing CFC-12 are sometimes labelled as containing HFC-134a instead.</td>
</tr>
<tr>
<td>Misdeclaration</td>
<td>Misdeclaration often occurs at the border checkpoints where illegal ODS are disguised using labels on the shipping documents or invoices that falsely identify the goods contained within as other similar, legal chemicals. In practice, this method may involve variations depending on the illegal purposes the perpetrators intend to achieve, such as “under-invoicing” where the real value or quantities of the declared goods are being understated to avoid tax or save the use of import or export quotas.</td>
</tr>
<tr>
<td>Fake recycled/reclaimed</td>
<td>Fake recycled/reclaimed involves virgin ODS being mislabelled or misdeclared as recovered, recycled or reclaimed chemicals. In some cases, illegal traders may deliberately add contaminants to make the virgin one look like used. This might create an extra source of danger for the equipment or personnel handling or inspecting the equipment due to the unstable and explosive nature of some of the contaminated gases.</td>
</tr>
<tr>
<td>Concealment</td>
<td>Concealment involves many variations. Some might be simple, involving hiding illegal ODS in mix with legal products like furniture, plastics, or garments and transporting via cars or ships. Other variations might be complex and sophisticated, such as ‘double layering’ where containers of illegal ODS are hidden within a larger, specially-designed container or compartment, or hidden behind a layer of legal merchandise while cursory inspection won’t be able to uncover.</td>
</tr>
<tr>
<td>Transshipment fraud</td>
<td>Transshipment fraud involves shipments of legal ODS ostensibly destined for legal end-use markets that are diverted at transit points onto the black market.</td>
</tr>
</tbody>
</table>

(Source: UNEP 2001, 16–7; Grabiel et al. 2013, 50–7; UNODC 2013, 117. Revised by the author)
Analysis of seizure data shows that “misdeclaration” is the most commonly used method. Commonly seen practices include CFC-12 being misdeclared as non-regulated substances such as HFC-134a or HCFC-22 (when HCFC-22 was not subject to control), or misdeclared as legal merchandise such as aluminium, plastic racks, garments, mist lamps and cartons, or bathtubs and handicrafts. HCFC-22 was misdeclared as HFC-134a or ethylene-glycol and methyl bromide was misdeclared as foaming agents. Incentives for misdeclaration vary by cases. In some cases, licensed traders misreport the nature or understate the quantities of the declared goods to avoid the use export or import quotas. In other cases, traders understate the real value of the declared goods to avoid tax payments and/or possibly to avoid drawing attention and additional inspection from customs.

“Concealment” is the second most common method and in practice it may vary in its degrees of sophistication. Some may be simple, involving hiding CFC-12 with legal merchandise such as furniture, plywood and glass products or in personal luggage or car boots as in cases of passenger trafficking of small amounts. Others are complex and sophisticated, involving “double layering” where CFC-12 is hidden behind a layer of non-regulated substances such as HFC-134a or HCFC-22, or concealed in larger custom-designed containers like metal oil drums, or secret spaces like coach luggage compartments or secluded cabins in fishing boats.

In addition, the methods of “false labelling” and “fake recycled or reclaimed” are also used by illegal dealers. In false labelling, logos of branded products such as “Honeywell” were appropriated to disguise counterfeit CFCs. Canisters containing CFC-12 and HCFC-22 were mislabelled as containing non-regulated substances, and equipment containing HCFC-22 was falsely labelled as HFC-410a units. Fake recycled or reclaimed mainly involved virgin CFCs being mislabelled as recycled substances.

5.4. CONCLUSION

In this case study, based on the analysis of 85 China-related ODS seizures, I have analysed China’s global trade in illegal ODS with respect to its scale, the magnitude and diversity of ODS chemicals involved in illegal trade, the major exporting markets for Chinese-produced illegal ODS, and the prevailing methods for smuggling and concealment. A number of key findings concerning China’s role and function in
global/regional trade in illicit ODS can be summarised as follows:

- In the international and regional transaction chain of illegal ODS trade, China has been functioning as the world’s leading source of illegal ODS. Between 2002 and 2014, China supplied the international black market with at least 1,840 metric tonnes of illegal ODS, with an average annual outflow of 131 metric tonnes (the figure of 1,840 does not include the amounts of ODS recovered from four seizures where the implied source country was either not China or not provided).

- CFCs and HCFCs were the two groups of ODS that dominated the illegal trade from China to the world. Of the total ODS recovered from 85 seizures, 54 percent (1,033 metric tonnes) were contraband CFCs, 44 percent (853 metric tonnes) were illegal HCFCs. Further, within the CFC family, CFC-12 was the most traded CFC chemical in illicit trade, accounting for 60 percent of the total seized CFCs. Among the HCFC substances, HCFC-22 remained the most favoured item in illegal trade, comprising nearly 96 percent of the total seized HCFCs.

- Some 23 countries and territories have been identified by this study as the recipients of Chinese illegal ODS. Based on the size of the seized chemicals, Russia, the US, India, Japan, and Spain comprised the top five destination markets, although the types of chemicals most favoured vary among localities. Illegal exports to these five countries constituted 90 percent of China’s total outflows of illegal ODS to the world.

- Based on the available seizure data, Hong Kong’s role as a transit point, as seen in the case of China’s illegal wildlife trade, is not evident in China’s illegal ODS trade.

- Misdeclaration and concealment are the two most frequently used methods in moving illegal ODS out of China. Often seen practices in ODS trafficking include CFC-12 being misdeclared as non-regulated substances (e.g., HFC-134a or HCFC-22), or misdeclared as legal merchandise (e.g., aluminium, plastic racks, garments, mist lamps and cartons, or bathtubs and handicrafts). HCFC-22
was misdeclared as HFC-134a or ethylene-glycol, and methyl bromide was misdeclared as foaming agents. In the case of concealment, illegal ODS may be hidden in mix with legal merchandise (e.g., furniture, plywood, glass products), hidden in personal luggage or car boots, concealed behind a layer of non-regulated substances, or concealed in larger custom-designed containers, such as metal oil drums, secretive spaces like coach luggage compartments, or secluded cabins on fishing boats.
6. CHINA’S RESPONSE TO TEC

National-level control of environmental crime relies primarily on individual states’ effort to transfer ratified multilateral environmental agreements into national legislation, to impose regulations on domestic trade, to criminalise serious environmental offences, to set administrative or criminal penalties to deter illegal trade, and to allocate sufficient resources to investigate, prosecute, and adjudicate such offences.

In the three case studies, this thesis has identified that the part played by China in the international/regional illegal trade of environmental goods changes by cases. In the wildlife sector, China acts as the world’s dominant consumer for illegal wildlife. In the timber sector, China remains the world’s largest importer of illegally felled and traded timber and the leading exporter of value-added wood products made of the imported illegal wood. In the ODS sector, China emerges as the world’s leading supplier of illegal ODS in the international black market. Overall, there are two common features that cut across the three environmental sectors: the sheer massive scale of China-related illegal trade and the deep embeddedness of China in the international/regional illegal transaction chain. These two features, on the one hand, pose a significant challenge to the Chinese government in tackling its TEC problems. On the other hand, they have also determined that Chinese effort and progress made toward addressing its illegal internal trade will likely have a substantive, positive overflowing effect on the whole of the international and regional illegal trade. The unique contextual features place China in a distinctive position where the Chinese government should seize the opportunity and take on a more important or even leading role in the international and regional effort to fight against the illegal trade in environmental goods.

It is encouraging to see that the Chinese government has invested great effort in recent years in addressing illegal trade and combating environmental offences. Therefore, noticeable progress has been made in improving China’s legal framework and in strengthening its internal and transnational enforcement cooperation. However, there still are crucial limitations that stymie the effective containment of China’s illegal trade in each of the three TEC sectors. This chapter examines China’s legal frameworks on and enforcement responses to the illegal trade of the three categories of environmental goods. In particular, this chapter will identify the key challenges that China faces in tackling the illegal trade in each of the three environmental sectors. In the concluding
chapter (Ch7), I will weave together the three strands of understandings developed by this thesis – the accounts of networked threats and responses produced in Chapter 2, the empirical findings of transaction networks in China’s illegal trade made by the three case studies, and the regulatory or enforcement challenges identified in this Chapter – in order to pinpoint the critical points where China’s wildlife authorities can step in to build their networked responses to TEC.

6.1. CHINA’S RESPONSE TO ILLEGAL TRADE IN WILDLIFE

6.1.1. CHINA’S LEGAL FRAMEWORK FOR WILDLIFE

In wildlife sector, China has established a relatively sound legislative and regulatory mix for the protection and administration of wildlife resources as well as for the prevention and detection of wildlife offences. Overall, China’s legal framework of wildlife can be seen as composed of four levels: (1) major wildlife-related national laws promulgated by the National People’s Congress (NPC); (2) national regulations by the State Council; (3) administrative normative documents (e.g., Announcements, Circulars, Directives, and Orders) by the primary wildlife administration authorities at the ministerial level (e.g., State Forestry Administration (SFA)); and (4) criminal judiciary interpretations and opinions by the Supreme People’s Court and the Superior People's Procuratorate. The administrative normative documents and judiciary interpretations and opinions mainly serve as an instrument to guide the enforcement of national wildlife laws and wildlife-related provisions in the Criminal Law. Although the departments of wildlife protection and administration at provincial and municipal levels do make and adopt regulations and measures by themselves to govern local wildlife-related activities, they largely follow the guidance of their ministerial superiors and focus on implementation.

Among the major national wildlife laws and regulations, there are Wildlife Protection Law (1988), Criminal Law (1997), Regulations on the Implementation of Terrestrial Wildlife Protection (1992), and the Regulations on the Management of Import and Export of Endangered Wild Fauna and Flora (2006) (see Table 9.10 in Appendices). Apart from major national wildlife laws and regulations, there are several national laws,

127 SFA is the principal national agency for wildlife protection and administration in China. Over the past two decades, SFA has, independently or in conjunction with other ministerial agencies, released tens of wildlife-related administrative normative documents in the forms of Order, Announcement, Circular, Measures, and Directives.
including *Fishery Law* (1986), *Customs Law* (1987), *Environmental Protection Law* (1989) and *Forestry Law* (1985), which are less directly related to wildlife, but contain provisions concerning certain aspects of the protection and administration of wildlife resources. In addition to the domestic legislative and regulatory establishments, China has been a party to several wildlife-related international treaties, which include acceding to CITES in 1991, to the Convention on Wetlands of International Importance especially as Waterfowl Habitats in 1992, and to the Convention on Biological Diversity in 1992.

The 1988 *Wildlife Protection Law* (thereafter *WPL 1988*), as China’s first national legislation on wildlife protection, has been the centrepiece in China’s wildlife legal framework. Other national or local wildlife regulations were enacted in pursuance of the *WPL 1988* and exist to enforce the relevant provisions therein. Since 2015, a number of Chinese laws relating to ecosystems and the environment have been placed under the NPC’s scrutiny to ensure that they are compatible with the ideology of “ecological civilisation” promoted by the Xi Jinping Administration. As part of this general overhaul, in December 2015, the *WPL 1988* underwent its first major revision in twenty-six years since it came into force in 1989. After two rounds of revision and public submissions, the amended WPL will be officially taking effect on 1 January 2017 (thereafter *WPL 2017*). In general, more than what is suggested by its name, this law not only protects wildlife, it also legalises the domestication, captive breeding, and utilisation of wildlife, as well as enabling the development of a wildlife industry in China.

### 6.1.1.1. Three-level Protection on Wildlife

According to Article 2 of the *WPL 2017*, wildlife protected by the law includes two types of wild animals: (1) terrestrial and aquatic wildlife species that are rare and valuable or in danger of extinction; and (2) terrestrial wildlife species that are beneficial or of important ecological, scientific or social value. Based on the grading and categorisation of wildlife species, China adopts a three-level protection framework (Art.10, *WPL 2017*).

For wildlife species classified as rare and valuable or endangered, the State affords the highest level of protection called “special state protection” (SSP), which is further
differentiated between two sub-tiers: the first class SSP (Class-I SSP) and the second class SSP (Class-II SSP). In January 1989, the SFA and the Ministry of Agriculture jointly released the *List of Wildlife under Special State Protection* to specify the detailed range of wildlife species under SSP (SFA and Ministry of Agriculture Order 1999 No.1). In 2003, the SFA levelled up the protection status for all specimens of musk deer (*Moschus spp.*) from Class-II to Class-I SSP (SFA Order 2003 No.7). As such, currently, the list of Class-I SSP covers a total of 97 species which include, for example, Tibetan antelope (*Pantholops hodysoni*), snow leopard (*Nefelis nculosa*), clouded leopard (*Panthera pardu*), tiger (*Panthera tigris*), and Asian elephant (*Elephas maximus*) which are often seen in the illegal trade. The list of Class-II SSP contains 160 species including pangolins (*Manis pentadactyla*), black bear (*Selenaretos thibetanus*), brown bear (*Ursus arctos*) and other species. In April 1993, the List was expanded to include species that are not native to China, but covered by the CITES Appendix I and II (e.g., rhino, crab-eating macaque, and African elephant). The protection status allocated for the CITES-listed species follows the CITES’s classification, with species in CITES Appendix I being granted the Class-I SSP and, species in CITES Appendix II being given the Class-II SSP (SFA *Circular* 1993 No.48).

The second level of protection encompasses species that are not covered by the List of SSP, but are valued by local governments and are thus put under the local special protection. Governments at the provincial, municipal, and autonomous region levels are responsible for the drafting, issuance, and amendment of the list of wildlife under local special protection. At last, the third level of protection is given to species with important ecological, scientific or social values. In 2000, the SFA released the *List of State Protected Terrestrial Wildlife of Beneficial or of Important Economic or Scientific Value*, which contains 1,591 species from five orders including Mammalia, Aves, Amphibia, Reptilia, and Insecta (SFA *Order* 2000 No.7).128

Each of the three levels corresponds to a varying degree of protection, as reflected in the differences in the administration agencies in charge of issuing the permits or drafting the protection lists as well as in the differences in the administrative or criminal

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128 It’s worth noting that in the *WPL 2016*, the third level of protection is given to wildlife with “important ecological, scientific and social value”. In contrast, the counterpart clause in the *WPL 1988* was written as “wildlife that is beneficial, or having important economic or scientific value”. To some extent, the change of the wording from “economic, beneficial” to “ecological, social value” might reflect an emphasis shift of the legislature to the ecological and social benefits brought by wildlife, not merely on their economic values.
liabilities and penalties assigned to relevant offences. For example, according to Article 21 of the *WPL 2017*, the issuance of permits for hunting of wildlife under Class-I SSP is within the remit of the departments of wildlife administration under the State Council. In contrast, the issuance of permits for hunting of wildlife under Class-II SSP is deferred to the departments of wildlife protection at the provincial and municipal levels.

### 6.1.1.2. Captive Breeding of Wildlife under SSP

China takes an encouraging and supportive stance on wildlife captive breeding, but it puts the breeding operations of wildlife under SSP for commercial purposes under a licensing control. Article 3 of the *WPL 2017* lays down the guiding principle that:

> Art. 3. The State protects the lawful rights and interests of units and individuals engaged in scientific research and captive breeding of wildlife.

Furthermore, Article 25 of the *WPL 2017* states that:

> Art. 25. The State supports relevant scientific research institutions in captive breeding of wildlife under SSP for the purpose of protection of the species concerned. For captive breeding of wildlife under SSP *for purposes other than protection* (emphasis mine), the State implements a licensing scheme. Individuals or organisations intending to captive breed wildlife under SSP shall obtain the approval of the department of wildlife administration under the government at the levels of province, autonomous region or municipality, and shall obtain a captive-breeding permit.

Article 25 of the *WPL 2017* has been the most important legal basis for China’s domestic “farming” of wildlife under SSP for commercial trade and utilisation, although there are other administrative regulations and edicts that further regulate how the breeding operations and commercial utilisation of captive-bred wildlife shall proceed.

In January 1991, the SFA released the *Measures for the Management of Licensing for Domestication and Captive Breeding of Wildlife under Special State Protection (1991)* (thereafter referred to as the “*Measures (1991)*” for brevity) to assist the enforcement of the licensing scheme. The *Measures (1991)* defines wildlife allowed for captive
breeding as “terrestrial wildlife under SSP”, and delineates the licensable scope of purposes for domestication and breeding as including “protection, research, scientific experiments, exhibitions or other economic purposes” (Art. 2, Measure (1991)). It is notable that the licensable scope under the Measures (1991) is much wider than that defined in the WPL (1988 and 2017). More importantly, captive breeding of wildlife under SSP for “economic purposes” has been plainly written into the licensable scope. It is this provision which gives the national and provincial forestry authorities the green light to issue licences to those domesticating and breeding nationally protected wildlife such as Siberian tiger, moon bear, and clouded leopard for commercial exploitation.

According to the Measures (1991), any individuals and entities can apply for the captive-breeding licence so long as they meet the requirements on having fixed sites, proper equipment, sufficient funding, necessary technologies and personnel, and secured sources of food for the scale and type of the breeding operations (Art. 3). As to the application procedures, the Measures (1991) states that:

Art. 5. Individuals and entities intending to captive breed wildlife shall apply to local wildlife administration under the government at the county level and shall submit the “Application Form for Domestication and Captive Breeding of Wildlife under SSP”. Domestication and captive breeding of wildlife under Class-I SSP shall report to and obtain the approval of the State Forestry Administration; domestication and captive breeding of wildlife under Class-II SSP shall report to and obtain the approval of wildlife administration under the government at the levels of province, municipality or autonomous region.

Note that under the WPL 1988 and the Measures (1991), the SFA is the authorised agency in charge of the evaluation of applications and issuance of licences for captive breeding of wildlife under class-I SSP. However, under the WPL 2017, the licensing authority for captive breeding of wildlife under both Class-I and Class-II SSP has been vested to wildlife administrations at the levels of province, municipality, and autonomous region. International environmental NGOs such as EIA have expressed their concerns over such a policy change, claiming that deferring responsibility for managing breeding operations to the provinces would decrease the level of oversight at
the central level of the government. Nonetheless, as a subordinate regulation to the WPL, relevant provisions in the Measures (1991) are expected to be amended in the near future in order to be in concert with the WPL 2017.

In June 2003, the SFA and other eleven ministerial authorities together published the Circular on the Need to Adapt to New Situations and Strengthen the Work on Prohibiting Illegal Hunting, Catching and Trade of Terrestrial Wildlife (2003). This Circular identified three major challenges in the domestic wildlife conservation and utilisation. First, considerable levels of illegal hunting and catching activities have resulted in a sharp decline in the population of many species. Second, illegal trade has been rampant, with cases of illegal buying, transport, processing, and sale of terrestrial wildlife recurred in many parts of China. Third, the number of the severe cases and wildlife offences has increased markedly in recent years. In addition, the Circular, for the first time, proposed to allow captive breeding for commercial trade and utilisation of those terrestrial species for which there already exist successful breeding technologies. Compared to the 1991 Measure’s wording of “[integrating] other economic purposes” in the licensable scope for captive breeding of wildlife under SSP, this Circular’s proposal, by specifically using the terms “commercial trade and utilisation”, represents another major leap toward even greater commercialisation of China’s captive breeding industry.

Pursuant to this proposal, two months later, the SFA issued the Circular on the Release of the List of 54 Terrestrial Wildlife Species....that Are Allowed for Domestication and Captive Breeding for Commercial Trade and Utilisation (2003) (see Table 9.10 in Appendices). As such, from 4 August 2003 onwards, all 54 terrestrial species named on the list – including one species under Class-I SSP (sika deer), five species under Class-II SSP (red deer (Cervus elaphus) and other four species under the Psittacidae family) – are officially open to domestication and farming for commercial purposes.130

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130 Article 28 of the WPL 2016 gives SFA the authority to revoke protection status from species under SSP in light of the fact that for those species, there have been well-proven knowledge and technologies for captive breeding. In fact, at the 20th meeting of the twelve session of the NPC Standing Committee on 25 April 2016, attendants already discussed the possibility of removing sika deer (Cervus nippon) from the list of Class-I SSP based on arguments that the technology and knowledge for captive breeding of sika deer have been well-established and the population of captive-bred sika deer across China has reached several millions. See NPC People News. “The Revision of the WPL Enters the Second Round.” April 25, 2016. http://npc.people.com.cn/n1/2016/0425/c14576-28302692.html.
6.1.1.3. Trade and utilisation of wildlife under SSP

In China’s wildlife legal framework, trade and utilisation have been expressed as Jingying Liyong in Chinese. This Chinese phrase’s literal translation is “management and utilisation”; but in Chinese wildlife legal parlance, the term management (Jingying) refers to sale and purchase in the business setting, while utilisation (Liyong) refers to the use of wildlife and their parts and products, for purposes such as scientific research and experiments, public exhibitions and performances, and the manufacture of a variety of products (e.g., healthcare products, medicines, arts and crafts, and pelt products). China’s wildlife laws and regulations legalise trade and utilisation of wildlife under SSP for an authorised range of purposes, but they outlaw the trade and utilisation for other purposes. Therefore, it is important to have a clear notion that under China’s wildlife legal framework, what forms of trade and utilisation of wildlife under SPP are legal and what are illegal.

In general, the WPL 2017 prohibits the sale, purchase, and utilisation of wildlife under SSP and their products, but gives exemptions to the trade and utilisation for a specified range of purposes and requires these exemptions to be subject to control by government approvals and the “special marking” scheme. The WPL 2017 states that:

Art. 27. Sale, purchase, and utilisation of wildlife under SSP or products thereof shall be prohibited. Where the sale, purchase or utilisation of wildlife under SSP or products thereof is necessary for scientific research, captive breeding, public exhibition or performance, heritage conservation or other special purposes (emphasis mine), the units concerned shall obtain the approval of the department of wildlife administration under the government at the level of province, municipality or autonomous region, and shall obtain the special markings in accordance with relevant regulations to ensure the traceability of the wildlife products.

Art. 29. Production and utilisation of wildlife and products thereof as medicines shall comply with laws and regulations relating to pharmaceutical management.

Art. 30. Production and trade of food made of wildlife under SSP or products thereof … shall be prohibited. Purchase of wildlife under SSP or products thereof for use as food shall be prohibited.
In the *WPL 1988*, it was originally its Article 22 that banned the sale, purchase, and utilisation of wildlife under SSP and granted virtually the same range of exemptions. But it was also the same Article 22 that included the following paragraph – which has been deleted from the *WPL 2017* – that stated:

Second Para., Art. 22. Units and individuals that domesticate and breed wildlife under SSP may, by presenting their domestication and captive-breeding licences, sell wildlife under SSP or products thereof, in accordance with relevant regulations, to the purchasing units designated by the government.

Although this paragraph from the *WPL 1988* has already been removed in revised drafts for the *WPL 2017*, during the intervening 28 years, it has already been fully translated into the many subordinate regulations drafted in pursuance of the *WPL 1988*. For example, Article 9 of the *Measures (1991)* dictates that licensees must obtain the approval of SFA before they sell or utilise captive-bred wildlife under Class-I SSP and their products, and must obtain the approval of the department of wildlife administration at the provincial level before they sell or utilise captive-bred wildlife under Class-II SSP. As for the designated purchasing units, the *Regulations on the Implementation of Terrestrial Wildlife Protection (1992)* states that:

Art. 25. The list of designated purchasing units for captive-bred wildlife under SSP and products thereof shall be drawn up by the department of wildlife administration under the government at the level of province, autonomous region or municipality, and shall be approved by the government at the same level. Designated purchasing units must register, by presenting the approval documents, at the local department of administration for industry and commerce.

Art. 27. Sale or purchase of wildlife under SSP or products thereof at pedlars’ market is prohibited

Two clear points emerge from a reading of these provisions. First, sale, purchase, or utilisation of state protected wildlife is normally prohibited in China, but a few violations of the WPL face administrative penalties including confiscation of wildlife products and illegal proceeds, license revocation or monetary fines. Acts causing “serious harm” are considered criminal offences under Provisions 151, 340 and 341 of the Criminal Law of China, incurring criminal penalties ranging from fines, to fixed-term imprisonment or even life sentences.
exemptions exist. Second, trade and utilisation of captive-bred wildlife under SSP and their products are legal, but such trade and utilisation are only allowed to occur among entities or enterprises that are licensed or designated by the government, and prior to sale or utilisation, the units concerned shall obtain the approval of the competent wildlife administration.

It is understood that Article 27 of the WPL 2017 is a general and principled prohibitive clause applied to trade or utilisation of wildlife under SSP. Wildlife referred in this article shall be read as including both wild and captive-bred population, and including both the species covered by the List of Wildlife under SSP and the species not native to China but listed in CITES Appendix I and II. Following the general prohibition, exemptions come in to legalise certain forms of trade and utilisation of wildlife under SSP. That is, if trade or utilisation is necessary for the purposes specified in Article 27 of the WPL 2017, they are allowed to carry on with prior approval from relevant wildlife administration and are subject to the special marking scheme.

Note that under Article 27 of the WPL 2017 and its counterpart clause (Arc. 22) of the WPL 1988, there contains, among the exempted purposes, an extra licensable category written as “other special purposes”. Although both the WPL 1998 and 2017 have not explicitly ruled out the “commercial purposes” from the licensable scope, considering that the legislative intentions behind these exempted purposes in Article 27 of the WPL 2017 and Article 22 of the WPL 1988, we have good reasons to believe that both WPL do not intend to include trade or utilisation for commercial purposes in the category of “other special purposes”. This is because all the specified exemptions in the WPL are related to scientific research, species and heritage conservation, and public education, while the commercial trade or utilisation of wildlife under SSP is surely of little avail to the wildlife conservation and education.

However, by inscribing economic purposes into the licensable scope, the Measures (1991) made an illegal “opening” out of the confines of the WPL 1988. As a sectoral regulation subordinate to the national law of the WPL, the Measures (1991) has illegally expanded the category of “other special purposes” to include “economic purposes” as a cause for exemption for commercial farming. Following this, it is not surprising that the Measures (1991) has further authorised and legalised the commercial trade and utilisation of captive-bred wildlife under SSP. This is surely a breach in which
a basic national law (WPL 1988) has been ill-interpreted and manipulated by a subordinate regulation (Measure (1991)) to open a backdoor for commercial trade and utilisation of wildlife under SSP.

In addition to the above general provisions on wildlife trade and utilisation, the State Council, SFA, and other ministerial authorities have issued a number of administrative regulations that legalise or prohibit certain forms of trade and utilisation of certain state protected species. In May 1993, in reaction to an initiative by the US to threaten trade sanctions against China on account of China’s domestic trade in rhino horns and tiger parts (WWF 2012, 3), China’s State Council issued the Circular on the Ban of Trade of Rhino Horns and Tiger Bones (1993). This Circular is still in force today. Included in the Circular is an outright ban on the import, export, sale, purchase, transport, carrying or posting of rhino horns and tiger bones, including any identifiable body parts, arts and crafts made of or TCM containing ingredients of such body parts. Moreover, rhino horn and tiger bone are erased from traditional medicine pharmacopoeia, and the use of rhino horns and tiger bones for the making of medicines is forbidden thereafter the ban. Products containing rhino horn or tiger bone that were produced before the ban are required to be sealed and banned from trade.

Note that this Circular does not ban trade in tiger pelts and pelt products. It is this Circular that has been, over the past ten years, giving the international community an illusion, that China has fully prohibited domestic trade in parts and derivatives of tiger (including captive-bred). However, at a CITES standing committee meeting held in Geneva 2014, a Chinese delegate admitted in public for the first time that China permits trade in pelts from captive-bred tigers, but bans trade in tiger bones (Khadka 2014). Even so, as we will see in the following sections, under China’s special marking scheme, not only the trade of tiger pelts products, but also the trade of tiger bone products such as tiger bone wine and tiger bone pain-killing paster, are all enabled and legalised by the SFA’s special marking scheme and are going on at a commercial scale.

To enforce the State Council 1993 Ban, in November 1993, the Ministry of Health released the Circular on Changing the Ingredients and Names of Traditional Chinese Medicines Containing Rhino Horn or Tiger Bone (1993). On top of reiterating the ban on the production and trade of TCM containing ingredients of rhino horn or tiger bone, the Circular authorised the use of leopard bones as a substitute to tiger bones for the
making of internally applied medicines. Also, it mandated a change of the names of products that contain the words “rhino horn” and “tiger bone”, with the TCM and healthcare products containing the words “tiger bone” required to be changed into “bone strengthening” and the word “rhino” to be replaced by “west”. This explains why this study has only been able to detect the “bone strengthening” products under the SFA’s special marking scheme, while unable to spot tiger bone products.

In June 2005, the SFA, Ministry of Health, State Administration for Industry and Commerce (SAIC), State Food and Drug Administration (SFDA), and the State Administration of Traditional Chinese Medicine (SATCM) together released an internal document: the *Circular on the Launching of a Pilot Project for the Use of Captive-bred Tiger Bones in Medicines and the Gradual Reduction in the Use of Leopard Bones (2005)*. Unlike other SFA documents which are accessible to the public, the full content of this *Circular* has been unavailable on SFA’s websites, though its name has appeared in several normative documents issued by the provincial forestry authorities as a supplementary implementation guideline to the *Circular*. As indicated by its title, this *Circular* seems to authorise the re-use in medicines of bones harvested from farmed tigers. At a time when the State Council 1993 Ban is still effective, issuing such a *Circular* is no doubt in violation with the 1993 Ban. If it is the case, this is the second point of breach that this chapter has identified in China’s wildlife legal system where a subordinate normative overly defies a regulation of a superior legislative order.

In January 2003, the SFA and SAIC released the *Circular on Straightening out Manufacturing and Processing Businesses Utilising Wildlife and Their Products and Launching the Pilot Marking Scheme (2003)*. This *Circular* introduced a pilot marking scheme called *Special Marking for Trade and Utilisation of Wildlife and Products Thereof*. Such markings have been given to commercial entities and their wildlife

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132 In Chinese phonetic system, the words “rhino” and “west” share the same pronunciation.

133 In the literature on wildlife value orientation (WVO, or beliefs about the relationships between human and wildlife), it is suggested that currently the predominant WVO in China is materialism (Zinn and Shen 2007; Teel etc. 2007). Materialists regard wildlife as exploitable resources for human use. Based on a review of China’s wildlife legal frameworks in this chapter, we clearly see the influences of materialism on wildlife legislation, for example, the use of wording like “wildlife with important economic value” in the *WPL 1988*, as well as on policy implementation, for example, the two identified points of breach in which Chinese wildlife administration manipulated or even overly defied superior laws or regulations to give way to commercial farming and utilisation of endangered wildlife. Research on the cultural embeddedness in the content of national and sub-national laws and regulations or the implementation of such laws and regulations is indeed important if such influences were to be reversed, however, it is beyond the scope of this thesis.
products. Wildlife products registered with a special marking can then be transported and sold legally.

Table 6.1: Key junctures in the expansion of the list of pilot entities covered by the special marking scheme

<table>
<thead>
<tr>
<th>Key junctures</th>
<th>Expansion of the list of pilot entities under the scheme</th>
</tr>
</thead>
</table>
| **From 1 May 2004** | • Applying marking scheme to ivory carving factories and retail outlets. Only licensed ivory carving factories and retail outlets can legally operate. Ivory products in sale or exhibition are mandated to be accompanied by a unique identity card issued by the SFA, and an extra photograph of the ivory product is required for items weighing more than 50g. The number of licensed ivory carving factories and retail outlets increased from 9 and 31 in 2004 to 34 and 130 in 2015 respectively.  
  
  • Applying marking scheme to business entities manufacturing or selling Erhu made of Python skins. The combined number of licensed manufacturers and sellers increased from 17 in 2004 to 105 in 2015. |
| **From 1 Jan. 2005** | • Applying marking scheme to production, trade and individual possession of wildlife specimens.  
  
  • Applying marking scheme to companies producing and selling healthcare products and food. The fresh & frozen meat of Siamese crocodile (Crocodylus siamensis, CITES Appendix-I) by Heilongjiang Longyin Import & Export Company Ltd as well as the “Xiongsen bone strengthening wine” and “bear gall bladder wine” by Guangxi Xiongsen Wine Company Ltd were granted by the SFA a special marking for commercial production and trade. Later in 2008 and 2015 respectively, five products of bone strengthening wine products from another two companies were given the markings. Of them, three bone strengthening wine products from Heilongjiang Siberian Tiger Park have been reported by media of using bones from captive tiger for ingredients of these three wine products.134 |
| **From 1 Jul. 2005** | • Applying marking scheme to production and trade of TCM containing authentic musk or bear bile.  
  
  • Applying marking scheme to the processing and trade of pelt products made of wildlife under SSP. |
| **From 1 Jan. 2006** | • Applying marking scheme to production and trade of TCM containing leopard bones.  
  
  • Applying marking scheme to businesses that captive breed wildlife under SSP including tigers, leopards, lions, elephants, giant panda, bears, snub-nosed monkey and so on. |
| **From 1 Jan. 2008** | • Applying marking scheme to production and trade of TCM containing Saiga horns, pangolin scales, or rare snake species.  
  
  • Applying marking scheme to production and trade of tiger and leopard pelts and their products |

Between May 2003 and April 2015, the SFA and other ministerial authorities have issued eighteen regulations and announcements, expanding the list of pilot entities covered by the special marking scheme from the initial two to over 500.135 Wildlife


135 This figure only counts the marked business entities that produce or sell wildlife products. It does not consider the hospitals designated for clinic use of TCM containing ingredients of wildlife under SSP.
products marked for commercial production and trade range over healthcare products and food, TCM, arts and crafts, Chinese traditional instrument, animal specimens, and pelt products. Gradually, over the past 12 years, the ivory carving factories and retail outlets, the production and trade of tiger and leopard pelt products and their products, the production and trade of TCM containing Saiga horn, pangolin scale, rare snake species, musk, and bear bile, the production and trade of healthcare products such as tiger bone wine and bear bile wine as well as of exotic wildlife meat such as Asian Bullfrog (Class-II SSP) and Siamese crocodile (*Crocodylus siamensis*, CITES Appendix-I), all have been added to the embrace of the marking schemes, legalising the commercial production, utilisation, and trade of such products.

Table 6.2: Statistics of the number of business entities covered by special marking scheme (by Jul. 2016)

<table>
<thead>
<tr>
<th>Products made of wildlife under SSP</th>
<th>Number of authorised business entities</th>
<th>Source*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ivory</strong></td>
<td>• Licensed entities for carving or processing ivory tasks: <strong>34</strong>  &lt;br&gt; • Licensed retail outlets: <strong>130</strong></td>
<td>SFA Announcement: 2015 No.9</td>
</tr>
<tr>
<td><strong>Erhu involving the use of python skins</strong></td>
<td>Licensed manufacturing and selling entities: <strong>105</strong></td>
<td>SFA Announcement: 2004 No.1; 2004 No.6; 2005 No.3, No.5</td>
</tr>
<tr>
<td><strong>TCM containing ingredients of authentic musk or bear bile</strong></td>
<td>• Licensed manufacturing and selling entities: <strong>9</strong>  &lt;br&gt; • Designated hospitals for clinical use: <strong>64</strong></td>
<td>SFA Announcement: 2005. No.3, No.5; 2008 No.15; 2014 No.1; 2015 No.8</td>
</tr>
<tr>
<td><strong>TCM containing ingredients of Saiga horn, pangolin scale, or rare snake species (only apply to species classified as special state protection or included in CITES Appendices)</strong>^</td>
<td>• Designated hospitals for clinical use of TCM containing Saiga horn: <strong>492</strong>  &lt;br&gt; • Designated hospitals for clinical use of TCM containing pangolin scale: <strong>711</strong>  &lt;br&gt; • Designated hospitals for clinical use of TCM containing rare snake species: <strong>702</strong></td>
<td>SFA Announcement: 2008 No.15; 2015 No.8</td>
</tr>
<tr>
<td><strong>Products made of the pelts of wildlife under SSP</strong></td>
<td>Licensed entities manufacturing or selling pelt products made of pelts of wildlife under SSP: <strong>66</strong></td>
<td>SFA Announcement: 2005 No.3, No.5; 2007 No.8; 2009 No.6; 2011 No.4; 2012 No.1; 2013 No.6; 2014 No.1; 2015 No.8</td>
</tr>
<tr>
<td><strong>Healthcare products, food and cosmetics containing ingredients of wildlife (not limited to species under SSP)</strong></td>
<td>Licensed entities processing and selling such products: <strong>97</strong></td>
<td>SFA Announcement: 2003 No.3; 2005 No.5</td>
</tr>
</tbody>
</table>

* All SFA Announcements can be found at the SFA Home Website: [http://www.forestry.gov.cn/](http://www.forestry.gov.cn/).

^ Overlaps exist among the designated hospitals for the clinic use of the three categories of TCM.
6.1.2. CHINA’S ENFORCEMENT RESPONSE TO ILLEGAL WILDLIFE TRADE

In recent years, China has taken a number of important steps toward wildlife conservation and tackling illegal trade. In July 2011, the SFA announced the launch of China’s Tiger Recovery Program, a national plan that aims to recover the endangered Amur, Bengal and Indo-China tiger species through measures including increasing and improving tiger habits, establishing monitoring and patrolling system, and cracking down on poaching, smuggling and illegal trade of tiger products.136 In May 2013, China, along with other seven countries, submitted its National Ivory Action Plan to the CITES Secretariat.137 This action plan was a rejoinder to the CITES Secretariat’s request on China – which was identified in a previous report by TRAFFIC (Milliken 2013, 14) as the premier end-use market in the international illegal ivory trade – to outline its concrete activities that are to be taken in the areas of legislation and regulation and of national and international enforcement to curtail domestic illegal ivory trade.138

Following the action plan, China took a series of high-profile moves to signal its firm stance against the illegal ivory trade. In July 2014, 6.15 tonnes of confiscated ivory accumulated through enforcement activities were publicly destroyed in Dongguan, Guangdong Province.139 In May 2015, another batch of 662 kg of illegal ivory and carvings seized since 2014 was publicly crushed again in Beijing. On the destruction ceremony, the head of the SFA, Zhao Shucong, announced a ten-point action plan on combating China’s illegal wildlife trade, with part of the plan being China’s first ever commitment to phase out legal, domestic commercial processing and sale of ivory and products.140 During a state visit to Washington in September 2015, Chinese President Xi Jinping and the US President Barack Obama both committed to enact “nearly complete bans” on ivory import and export (including putting restrictions on the import of ivory as hunting trophies), and to take significant and timely steps to halt the domestic

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137 The full context of this national action plan has been unavailable.
commercial trade of ivory. Following this, in October 2015, the SFA announced a one-year interim ban on the import of African ivory hunting trophy and a suspension of ivory-related administrative licensing service (SFA Announcement 2015 No.17). In March 2016, the SFA renewed the import ban by extending its lifespan until 31 December 2019 and widening its scope of application not only to the import of African elephant ivory acquired as hunting trophies, but also to the import of African elephant ivory tusks and carvings (SFA Announcement 2016 No.3). In the latest announcement released by the SFA in March 2017, it mandated the gradual shut down of a total of 173 ivory processing and selling entities, with 67 of them scheduled to close down before 31 March 2017 and the remaining 105 by the end of 2017 (SFA Announcement 2017 No.8).

In enforcement arena, Chinese law enforcement has a consistent record of, and a good reputation for, its interception of illegal wildlife trade. In the “Wildlife Crime Scorecard” by WWF (Nowell 2012, 29), China scored 0.58 and ranked ninth among 42 countries under the category of “law enforcement effort ratio” (LEER), which is an indicator used to analyse how effective the national enforcement agencies are in interdicting illicit wildlife trade. The score was obtained by dividing the number of in-country wildlife seizures by the total number of seizures linked to that country during 1999–2010. Applying the LEER method to the China-related wildlife seizure data collated in Chapter 3 of this thesis, with some 258 seizures made by enforcement authorities in mainland China, Taiwan and Hong Kong as compared to some 105 China-related seizures made in other countries, China would have a much higher enforcement ratio of 0.71 for its law enforcement achievement during the period from 1996 to 2013.

Forest police and customs remain the two major wildlife enforcement units in China. During 2004–2013, Chinese customs officials nationwide dealt with a total of 930 wildlife-related criminal cases, leading to the apprehension and prosecution of some 1,395 criminal suspects. Between 1984 and 2014, it is reported that China’s forest police throughout the country handled an aggregate of 4.56 million forest and wildlife-

142 Although these 105 wildlife seizures were made by enforcement agencies in other countries, China was involved as either a destination or source for the seized wildlife products.
related cases, with 6.67 million offenders being brought to justice.\textsuperscript{144} According to the SFA, in 2015 alone, forest police countrywide dealt with some 31,746 forest and wildlife-related criminal cases and 202,418 administrative cases. Some 601,508 offenders were imposed penalties of various terms; some 358,465 cm\(^3\) of wood products and 476,776 wild animals were seized.\textsuperscript{145}

In December 2011, China established the National Inter-agencies CITES Enforcement Coordination Group (NICECG) to serve as a liaison office to facilitate the collection and exchange of intelligence, enhance capacity building, and orchestrate joint enforcement activities. The NICECG consists of representatives from the SFA, SAIC, Ministry of Public Security (MPC), General Administration of Customs (GAC), and the Ministry of Agriculture. The CITES Management Authority (MA) of China, hosted by the SFA, is the coordinating body of the NICECG. According to the SFA, by March 2016, some 37 provinces (including municipal cities and autonomous regions) have copied the NICECG and instituted their own inter-agencies CITES enforcement coordinating offices.\textsuperscript{146} In May 2012, the NICECG was awarded the Certificate of Commendation by the CITES Secretary-General for two nationwide wildlife law enforcement operations – “Forest Police Operation” and “Shield of Country Gate Operation” (see Table 9.9 in Appendices) – carried out under the auspices of NICECG in early 2012.\textsuperscript{147}

Based on the data the author collected for this chapter, it is estimated that between 1999 and the first half of 2016, Chinese wildlife enforcement agencies have organised and initiated at least 12 large-scale nationwide enforcement operations against wildlife offences. The latest two operations were launched and deployed by the SFA, including the “Spring Operation” in April 2016 aimed at clamping down on the illegal catching, hunting, and eating of nationally protected bird species,\textsuperscript{148} and the “Thunder Operation”


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in September 2015 focusing on suppressing the illegal killing, sale, purchase, and transport of endangered wildlife and their products.\textsuperscript{149} As it can be seen in Table 6.3, in many of these operations, there involved in each the participation of tens of thousands of enforcement personnel, the putting on record of hundreds or thousands of wildlife-related criminal and administrative cases, the detainment and arrest of hundreds of wildlife offenders, the inspection of a vast number of local niche markets, wildlife stalls, shops, hotels, and restaurants, and the seizure of a substantial volume of wild animals and products.

Internationally, China has purposefully elevated its cross-border enforcement coordination by actively engaging in transnational enforcement operations against wildlife smuggling and illegal trade. Since 2010, China wildlife enforcement units, including customs and forest police, have participated in a series of regional and international wildlife enforcement operations and, have made significant seizures of illicit wildlife products and detained hundreds of wildlife criminals. These included the INTERPOL-led “Operation RAMP” that targeted illegal trade in reptiles and amphibians,\textsuperscript{150} the World Customs Organisation-coordinated “Operation GAPIN” designed to combat illegal cross-border trade in great apes,\textsuperscript{151} and the Chinese-organised “Operation Cobra Series I, II, and III” that aimed at dismantling transnational wildlife crime syndicates.\textsuperscript{152} In the Cobra series, China played a leading role in proposing and co-organising the global crackdowns, managing the sharing of intelligence, and conducting the follow-up investigation and prosecution. The Cobra-II conducted in January 2014 also witnessed the first-ever joint China-Africa undercover sting operation

that resulted in the dismantling of a major ivory trafficking syndicate and the extradition of a Chinese national implicated in the syndicate from Kenya to China.¹⁵³

These are all encouraging progress and achievements made by Chinese wildlife authorities. However, the control of illegal wildlife trade in China still faces significant challenges. In many cases, the most prominent challenge tends to be the absence of sustained and consistent enforcement by local wildlife enforcement agencies to ensure an adequate implementation of China’s control measures on wildlife trade and utilisation. As discussed early in this Chapter, China’s wildlife legal framework legalises and enables the captive breeding of rare and endangered wildlife and the commercial trade and utilisation of such captive-bred wildlife and their products on the one hand, while set up a complex licensing system – e.g., hunting permits, captive-breeding permits, ivory registration and identification scheme, and the special marking scheme – with a view to regulating legal trade and preventing illegal trade on the other. These control measures, if properly enforced, will certainly have a positive impact on containing China’s illegal internal trade. However, reliable evidence collected by this study shows that such a licensing system has often been poorly enforced or even unenforced by local wildlife administration and enforcement authorities. As revealed in several field surveys and undercover investigations conducted by researchers and environmental NGOs (e.g., EIA, Elephant Family) in many parts of China, widespread non-compliance exists in local niche marketplaces that openly sell protected wildlife and in local restaurants that secretly or semi-openly serve wildlife as exotic meals (Meng et al. 2009; EIA 2009). It exists in government-accredited ivory carving factories that manufacture on smuggled ivory tusks, in retail outlets that sell illicit ivory products (EIA 2011; Martin and Vigne 2011; Gabriel et al. 2012; Vigne and Martin 2014). It exists in officially-licensed pharmacies that sell illegal TCM containing ingredients of nationally protected wildlife (Li et al. 2007).

In a way, it can be said that the existence of a legal market for wildlife from sources such as captive breeding and international auctions (in the case of ivory)¹⁵⁴, and the


¹⁵⁴ After banning all international commercial ivory trade in 1989, CITES agreed in 1997 to allow Botswana, Namibia and Zimbabwe to make an experimental sale from their existing legal stocks of raw ivory in order to raise funds to support elephant conservation activities. In 2008, four Chinese companies including the National Arts & Crafts Group Corporation, Beijing Ivory Carving Factory, Guangzhou
weak enforcement of the licensing schemes have been the two most significant culprits for China’s raging illegal trade. This is because, on the one hand, the presence of a legal market aids in the creation and continuation of the market desirability and acceptability for wildlife products and further entrench the culture of commodifying and consuming endangered wildlife products such as ivory, tiger pelts, and TCM containing bear bile. In turn, this will likely draw more people into the consumer market and drive up the total demand for wildlife products. In a way, as the aggregate market demand increases while the legal supply (e.g., captive-bred sources or international auctions) remains the same, it is unsurprising that the new and unmet demand will encourage the development of greater illegal sources of supply, as manifested in more illegal poaching in source countries and more cross-border smuggling of such commodities to China. On the other hand, the ineffective enforcement of the licensing schemes provides a conduit for illegal dealers to launder the illicit wildlife products into the legal market.

6.2. **China’s Response to Illegal Trade in Forest Products**

In the past few years, China has taken a number of important steps to curtail its illegal trade in forest products. These include efforts to improve China’s domestic forestry governance, promote its timber legality verification schemes (TLVS), develop guidelines on investment and logging operations for companies operating overseas, and strengthen international cooperation through establishing bilateral forums and agreements with the major producer and consumer countries. Despite the progress above, key challenges remain. Compared to the lack of consistent enforcement on the ground in the wildlife sector, the biggest challenge facing China in tackling its illegal trade in forest products is the absence of a national legislative or regulatory establishment that explicitly demarcates timber legality and thus provides a practical instrument for enforcement authorities to determine the legal timber and prevent the illegal import and export.

6.2.1. **China’s Legal Framework for Forest Product Trade**

Currently, China has established a relatively solid legal framework for the protection of domestic forest resources and administration of internal forest product trade.

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Daxin Ivory Factory, and Beijing Mammoth Art Co., Ltd. purchased about 62 tonnes of elephant tusks from a one-off ivory auction in Southern Africa (Gao and Clark 2014, 24).
Symbolised first and foremost by the Forestry Law (1985, amended in 1998) and the Regulations on the Implementation of the Forestry Law (2000), this legal framework institutes a system of detailed rules and procedures for the ownership of forest resources, tree planting and afforestation, annual quota control on timber felling, and a chain of licensing schemes for timber logging, processing, and transport. These laws and regulations provide for the basic definitions on the legality for timber logging, transport, manufacturing or processing, and sale within China’s territory. For example, according to the Forestry Law (1985), logging companies must obtain a valid logging permit to harvest timber and must comply with the requirements (e.g., quotas) specified by the logging permit (Art. 32). In addition, logging companies must also comply with the 1998 logging that prohibits all forms of logging within State-owned forests. Timber transporters and carriers who transport timber not belonging to the State management sources must have a valid timber transportation certificate (Art. 37). Under the Regulations (2000), it is required that timber processing enterprises must be legally registered and hold a valid timber processing certificate when processing wood in forest areas (Art. 34).

Driven by concerns for the deterioration of the forest environment and flooding, in 2000 the Chinese government initiated the Natural Forest Protection Program (NFPP) to mediate deforestation and restore protective watersheds. This program comprised two policies: prohibiting commercial logging in state-owned forests upstream of the Yangtze River as well as upstream and midstream of the Yellow River; and reducing logging in key state-owned natural forests in Heilong Jiang, Jilin, and Inner Mongolia (Sun et al. 2016, 2). In 2010 China decided to implement “NFPP Phase II” which put the natural forest areas around the Danjiangkou Reservoir under the coverage of the logging ban. In April 2014 the SFA adjusted its logging policy in Heilongjiang from “reducing logging” to a full ban. In its “13th Five-Year Plan for the Protection of Ecological Environment”, China State Council claimed that by the end of 2016 commercial logging of natural forests has been completely ceased in all key state-owned forest areas. In March 2017 the SFA made another big move, announcing that by the

end of 2017 China will gradually stop commercial logging in natural forests under all kinds of ownership. This means not only the state-owned natural forests, but also the collectively- and private-owned natural forests will also be banned from commercial logging.\(^\text{158}\)


Depending on the classification of the forest products traded, China implements two different import/export control mechanisms. First, China implements a special national licensing scheme for the import and export of rare and endangered plant species and products thereof, whose import and export for commercial purposes are prohibited or restricted by CITES, or whose export is restricted by the State. China CITES MA and the GAC are responsible for the making and adjustment of the *HS Commodity Appendix of Import and Export on Wild Fauna and Flora*, which defines the range of animal and plant species, the import and export of which are subject to licensing control. According to the *2014 HS Commodity Appendix*, currently, a total of 4,413 plant species from the CITES Appendices and/or the List of Wild Flora under SSP are being placed under the national import/export licensing control.\(^\text{159}\) Under the licensing scheme, entities intending to import or export forest products enumerated in the *HS Commodity Appendix* must apply to the China CITES MA for an import/export license, which consists of a certificate/permit for import/export/re-export and a species certificate.\(^\text{160}\)


\(^{160}\) Note that the “certificate for import/export/re-export” and the “permit for export” have different ranges of application. The certificates apply to plant species that are covered by both the *HS Commodity Appendix* and the CITES Appendices and that are required by CITES to be subject to control measures in international commercial trade. In contrast, the permits apply to plant species that are covered by the *HS Commodity Appendix* and for which China has a full sovereignty in the administration of their import and export. In the case of importing/exporting plant species whose import and export for commercial trade are prohibited or restricted by CITES, the entities concerned shall, in addition to obtaining the “certificate for
One import/export license can only be used for one-time import/export and repeated use is illegal.

Second, for the majority of forest products whose import and export are not prohibited or restricted by CITES or by China – which comprises the bulk of China’s forest product import – China enforces a general licensing scheme. In addition to having a business registration certificate, entities engaged in import and export of such forest products shall hold an import/export operation license issued by the competent commerce authorities. For customs clearance, the Customs Law (1987) mandates that the consignee for import goods, or the consignor for export goods, shall make an accurate declaration and submit the import/export operation license and other relevant documents to the Customs for examination (Art. 4). May vary by cases, common documents needed for customs clearance for the imported or exported forest products include: the import/export license, packing list, bill of lading, purchase or sale contracts, shipping/delivery order, timber quarantine certificate, certificate of origin, certificate for non-regulated species listed in the HS Commodity Appendix, receipts for payment of appropriate tariffs and others.

In China’s legal framework for forest product trade, there are only a few provisions that involve a mention of requiring entities concerned to verify the origin of the imported timber, or of advising the trading companies to avoid purchasing forest products of suspicious origin. For example, Article 14 of the Regulations on the Origin of Import and Export Goods (2004) states that when conducting an examination to determine the origin of the import goods, the customs may request the consignee to provide the certificate of origin issued by the exporting country or region. Where necessary, the Customs may request the authorities concerned of the exporting country to verify the certificate of origin. Article 34 of the Regulations on the Implementation of the Forestry Law (2000) requests the purchasing units not to procure timber without a legal logging permit or other lawful documents testifying its legal origin. Overall, in China’s legal framework for timber trade, there have been no explicit treatments to the legality verification for the imported forest products, and this tends to be the biggest obstacle for China to curb its illegal timber trade. However, it is encouraging that this weakness has

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import/export™, also acquire the official certificate for export/import issued by the CITES MA in exporting/importing country or region.
been partially overcome by China’s recent effort in developing its own timber legality verification schemes (TLVS).

6.2.2. CHINA’S TIMBER LEGALITY VERIFICATION SCHEMES

From October 2009, the Research Institute of Forestry Policy and Information under the Chinese Academy of Forestry (CAF) worked in collaboration with the non-profit group ProForest on developing China national TLVS. By late 2011, three reports were produced under this collaboration. The first two reports reviewed changes in market requirements for legal and sustainable timber in China’s major exporting markets and existing TLVS in selected consumer countries (Proforest 2010a, 2010b). The third report proposed a draft China national TLVS, which suggested two mechanisms for the verification of the legality of imported timber. The first is the Chinese Government-guided Timber Verification Scheme (CGTVS), under which bilateral agreements between China and timber-producing countries would be established to define the timber legality, management processes, and valid legality documentation. The second is the Chinese Association-guided Timber Verification Scheme (CATVS), which is a voluntary mechanism designed to be used when trading with countries with which China has not yet established a CGTVS agreement. Under the CATVS, mutual recognition of a particular timber legality verification system is expected to be achieved between industrial associations in China and their counterparts in timber-producing countries (Oberndorf 2013, 14–5; Wellesley 2014, 11; Chen 2014).

At the time of drafting this chapter, little progress has been made in promoting CGTVS, though China National Forest Products Industry Association (CNFPIA) has taken several steps towards developing CATVS. In 2009, with the SFA’s commission, the CNFPIA initiated the programme on the development of standards, procedures, licensing, product markings, and management processes for CATVS. As so far, four Association standards and regulations have been released (Zhang 2014). These include *China Timber Legality Verification Standard (2012 Trial)*, *Detailed Measures for the Implementation of China Timber Legality Verification Standard (2012 Trial)*, *Wood Processing Industry Self-disciplinary Pledge to Procure Wood of Legal Origin (2012 Trial)*, and the *Measures for the Administration of the Verification Procedures, Markings and Certificates for China Timber Legality (2012 Trial)* (CNFPIA 2012). Under *China Timber Legality Verification Standard (2012 Trial)*, the term “timber
legality” is defined as “harvesting, transport, processing, and sale of timber in compliance with relevant national laws and regulations and relevant international agreements that China has signed” (Art. 2.2). Wood processing enterprises are advised to take a due diligence to avoid purchasing wood products which are linked with the risk of coming from illegal origin or “destructive harvest” (Art. 2.5). Moreover, trading enterprises are instructed to implement a chain-of-custody system that tracks and records the whole process from timber logging, transport to final sale. In enforcement terms, for imported wood products to be deemed as legal, the Standard stipulates that the importing enterprises need to present the certificate of origin and customs documentation issued by both exporting and importing countries.

In November 2012, at the second Forest Products International Trade Forum held in Nanning, Guangxi, CNFPIA launched its pilot TLVS program. Eight of CNFPIA’s member companies were chosen to be the first batch of volunteers to implement the program. Overall, the verification process begins with CNFPIA members applying for the membership of the CNFPIA TLVS and signing a self-disciplinary pledge to confirm their commitment to be compliant with the TLVS. Then the enterprises that have proven fully conformable with the legality standards will be issued a “Legal Timber Verification Certificate” and allowed to use the logo of “Legal Timber” on their wood products. To facilitate the program’s implementation, a legality verification management office and an online timber-tracking system were established under the auspice of CNFPIA (Zhang 2014).

6.2.3. INTERNATIONAL ENGAGEMENT

Internationally, China has established several regular dialogue mechanisms and concluded a series of bilateral agreements with a number of key producer and consumer countries. In December 2007, China and the US signed a Memorandum of Understanding (MoU) on combating illegal logging and associated trade on the occasion of the Third Meeting of their Strategic Economic Dialogue. Under the MoU, the two sides decided to establish a bilateral forum that will be attended by representatives from multiple agencies on both sides, and that will identify key priority activities for cooperation to combat illegal logging and promote trade in forest products.
from legal and sustainable sources. As so far, the forum has met six times. At the sixth meeting of the bilateral forum in March 2015, both sides agreed to continue the regular exchange and information sharing through the bilateral forum, to strengthen dialogue and engagement under regional and multilateral fora such as the APEC Experts Group on Illegal Logging and Associated Trade, and to establish partnerships with civil society and private sector to increase effort to tackle illegal logging and related trade.

In January 2009, China and the EU established a Bilateral Coordination Mechanism (BCM) under the China-EU Dialogue on Forest Law Enforcement and Governance (FLEG). The BCM is intended to serve as a forum for policy dialogue, and a mechanism for sharing information on policies and legal frameworks as well as for coordinating initiatives stopping illegal logging and associated trade. It meets annually and develops a multi-annual workplan and operating modalities. According to its 2016 workplan, current planned activities under the BCM include developing trilateral cooperation between China, Indonesia, and the EU on promoting trade of legally sourced timber and timber products, and holding talks to explore the options of including FLEGT licensed timber under the Chinese timber legality verification system.

In 1984, Australia and China signed the Australia-China Agricultural Cooperation Agreement (ACACA) to promote their cooperation on forestry matters and enhance trade opportunities. In 1988, the China-Australia Joint Working Group on Forestry (JWGF) was established under the ACACA. Further in September 2009, the two sides concluded a MoU on combating illegal logging and associated trade in support of sustainable forest management. Under the China-Australia JWGF, the Illegal Logging Working Group was created to host meetings and carry out the priority areas for cooperation identified by the MoU, which include, for example, encouraging trade in

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timber and wood products from verified legal sources, enhancing forest law
enforcement, and sharing information on forest certification schemes.\textsuperscript{165}

In December 2002, China and Indonesia signed a MoU concerning cooperation in
combating illegal trade of forest products. Under the MoU, the two sides consented to
improve forest enforcement for controlling illegal logging and related trade and
promoting adaptive forest practices toward sustainable forest management. Identified
areas for cooperation included the study of illegally logged forest products and illegal
trade, joint development of systems for the timely collection and exchange of data and
information on timber trade, forest laws and regulations and so forth.\textsuperscript{166} In August 2002,
China and Japan concluded a similar MoU on illegal logging and related trade and
sustainable management. In this document, the two countries agreed to develop a
legality verification system for forest products traded between them, although there
have been no media reports on the updates of the development of such a system (Momii
2014, 10–1).

In May 2006, following the exposure by the environmental NGO, Global Witness, of
the large-scale timber trafficking between Kachin State in Burma and Yunnan Province
in China, Burma and China signed the Interim Measures to Manage Timber and
Mineral Cooperation between Burma and Yunnan Province. This agreement contained
a Burmese pledge to ban logging and timber transport in Kachin State as well as a
Yunnan Provincial Government (of China) pledge to henceforth require all Chinese
importers to obtain both an import license from the Yunnan Provincial Bureau of
Commerce and a certificate issued by Burmese officials demonstrating the legal origin
of the timber (Global Witness 2009, 4). By 2010, these measures had helped reduce the
illegal timber imports across the Sino-Burmese border by 70 per cent (Lawson and
MacFaul 2010, 46). However, the illicit trade in logs via the land border between
Kachin State and Yunnan re-bounded back to 900,000 cubic metres in 2014 (EIA 2015,
5). In September 2015, the Yunnan Provincial Government issued a notice that enforced

\textsuperscript{165} Australian Government Department of Agriculture and Water Resources. “Australia’s bilateral
relationships on forestry.” \url{http://www.agriculture.gov.au/forestry/international/regional#australia-and-
china}.

\textsuperscript{166} Indonesia Ministry of Forestry and China SFA. “Memorandum of Understanding between the
Government of the Republic of India and the Government of the People’s Republic of China Concerning
Cooperation in Combating Illegal Trade of Forest Products.” December 18, 2012.
\url{http://www.unecefaoiufro.lsu.edu/responsible_trade/documents/2003-2006/rt03_010.pdf}.
a four-month interim suspension on the import of Burmese wood products.\textsuperscript{167} Follow-up monitoring of the main crossing points along the China-Burma border by the EIA confirmed a sharp downturn in the volume of illegal timber being smuggled between Kachin State and Yunnan Province.\textsuperscript{168} In addition, the Global Environmental Institute, a Beijing-based NGO, reported that in 2015, it organised several informal dialogues and exchange visits for representatives from China SFA, Burmese Ministry of Forestry, research institutions, and NGOs. It is said that a MoU on forestry cooperation and sustainable timber trade was an important topic in the informal discussions (Ren and Ji 2015).

6.3. CHINA’S RESPONSE TO ILLEGAL TRADE IN ODS

Similar to the dilemma that this chapter has identified in China’s illegal wildlife trade, in the ODS sector, China has also implemented a series of national phase-out projects and instituted a relatively robust regulatory mix for the production, use, and trade of controlled ODS. However, the issue of illegal production and export of controlled ODS continues, again as a result of the ineffective enforcement by local authorities.

6.3.1. CHINA’S CONTROL TARGETS AND MEASURES ON ODS PRODUCTION AND USE

Let’s begin with a brief recap on China’s control targets on ODS production and use, which have been discussed to some extent in Chapter 5. China acceded to the Montreal Protocol in 1991 and was classified as a Party operating under Article 5 of the Protocol. In 1993, China formulated its national plan the \textit{Country Programme for the Phase-out of Ozone Depleting Substances}, in which the country’s control missions were set to completely phase out the production and consumption of CFCs, halons and carbon tetrachlorides (CTCs) by 1 January 2010 and 1,1,1-trichloroethane by 1 January 2015. In early 2004, China signed an agreement with the MLF Executive Committee for the CFCs/CTC/halon accelerated phase-out plan, under which China committed to bring forward the end date for its CFCs production from 1 January 2010 to 1 July 2007 (MLF Secretariat 2010a, 185). In 2007, at the 19th Meeting of the Parties to the Montreal Protocol, China adopted another accelerated HCFCs phase-out process agreed to by the Parties with the proximate goal setting for Article 5 Parties as a freeze on production.


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and use of HCFCs at the average 2009–2010 baseline level by 1 January 2013, and further 10 per cent reduction by 1 January 2015.

Between 1993 and 2013, with financial support from MLF and technical support from the World Bank as the implementing agency, China put in place four national phase-out projects (“CN ODS Series”) to reduce its domestic production and use of controlled ODS in different industrial sectors. Upon the completion of the fourth projects “CN ODS IV” in 2013, China had successfully eliminated more than 100,000 ODP tonnes of production and 110,000 ODP tonnes of consumption of CFCs, halons, CTC and TCA (World Bank 2014). On 21 June 2007, China Ministry of Environmental Protection (MEP) released the Circular on the Nationwide Ban of the Production of CFCs, stipulating that, except for essential or critical uses exempted by the Montreal Protocol, CFC production would be completely banned from 1 July 2007 onwards. Ten days later, the MEP signed a contract with the last six remaining CFC and halon-producing firms for the final closure of their production lines, marking the successful conclusion of its CFCs/CTC/halon accelerated phaseout plan (MEP 2007).

In July 2011, the 64th Meeting of the MLF Executive Committee approved China’s 2011–2015 HCFC Phase-out Management Plan (HPMP, Stage-I) and UNDP as the implementing agency. This HPMP was an integral part to achieve China’s 2013 and 2015 control targets for HCFC production and consumption. Four months later, at the 65th Meeting, the MLF Executive Committee approved China’s HCFC phase-out plan in the solvent sector. As such, the stage I of China’s HPMP consisted of HCFC phase-out plans in seven industrial sectors which included the HCFC production, polyurethane (PU) foam, extruded polystyrene (XPS) foam, room air conditioning (RAC), industrial and commercial refrigeration (ICR), servicing and solvent sectors, with the overall funding from MLF amounted to US$270 million (MLF Secretariat 2010b). In December 2011, a launching meeting was held in Shanghai, marking the formal start-up of China’s accelerated HPMP (UNDP 2013, 2). In September 2014, China announced the closure of five HCFCs production lines, resulting in the phase-out of 58,864 tonnes of HCFC production, amounting to 16 per cent of the total HCFC production that China has agreed to close by 2030.169

6.3.2. CHINA’S ENFORCEMENT RESPONSE TO ILLEGAL ODS TRADE

Since 1995, the MEP and other ministerial authorities enacted tens of administrative edicts and regulations concerning ODS administration (see Table 9.12 in Appendices). These include, for example, the Circular on the Ban of New Production Facilities for CFCs and CFC-reliant Equipment (1997), Circular on the Implementation of Quota and Licensing Control on CFC Production (1999), and the Measures for the Administration of ODS Import and Export (1999). Through these edicts and regulations, China established its ODS legal framework which imposes rigorous control on the new ODS production facilities on the one hand, and adopts the quota control and a licensing scheme for the production, consumption, import, and export of controlled ODS on the other. In 2000, the MEP, GAC and the Ministry of Commerce together released the Regulations on Further Strengthening the Management of ODS Import and Export. This document approved the three ministerial departments to institute and maintain, in a collective manner, the National Management Office for ODS Import and Export (ODS Management Office) as the designated apparatus in charge of the administration of import and export of controlled ODS.

Under China’s quota and licensing scheme, enterprises wishing to produce, consume or trade CFCs, halons and other controlled ODS must apply to the MEP or the ODS Management Office for the corresponding production/use/import/export quotas and permits, and conform to relevant quota limits and data reporting requirements. The MEP decides on the allocation of the annual quotas among the registered eligible enterprises, based on the calculation of China’s total production and use quotas allowed under the Montreal Protocol and China’s country programme. Local environmental protection and commercial authorities and customs officials are responsible for the daily enforcement of ODS regulations in their respective remit areas via on-site supervision, annual audits or customs inspections. In 2010 and 2014 respectively, China updated its ODS legislative framework through the enactment of two new regulations – the Regulations on the Administration of ODS (2010) and the Measures for the Administration of the Import and Export of Controlled ODS (2014). According to the two regulations, production, consumption, import, or export without a permit, or with a permit but in violation of relevant requirements on quota limits or the use of permits, are all considered illegal. Offences can attract administrative penalties that range from

the maximum fines of CNY1 million, confiscation of illegal proceeds, dismantlement of production facilities, to the license revocation and future application disqualification.

In 2007, China joined the Informal Prior-informed Consent Mechanism (iPIC), a voluntary and informal mechanism run by the UNEP DTIE OzonAction that is intended for the exchange of information on bilateral trade of controlled ODS among iPIC member countries and prevention of unauthorised ODS imports and exports (UNEP DTIE OzonAction 2016). Since its entry, China has been one of the most active users of this mechanism, which has helped China to prevent a number of unauthorised exports of ODS. A recent case occurred in September 2014 when China ODS Management Office, with iPIC consultation with the EU Commission, successfully prevented an unlicensed export of 60 metric tonnes of HCFC-22 to an EU company.

Between 2006 and 2010, China Customs participated in the transnational enforcement operations Sky-hole Patching Operation Series I and II, which aimed at combating illegal trade of ODS and hazardous wastes. In the Series I of the Operation, the Chinese enforcement effort resulted in six seizures of 51 metric tonnes of CFCs and HCFCs. In the Series II, China, India, and Thailand recorded the largest hauls of illegal ODS (WCO and UNEP 2010, 1–2). In addition, between 2009 and 2013 China also engaged in a series of WCO-coordinated global customs initiatives coded Earth Goddess Operations Phase-I, II, and III. The series operations targeted the illegal transfer of hazardous wastes from the EU and North America to the Asia-Pacific, and enabled Chinese customs to intercept tens of illegal shipments of waste batteries, waste slag, tires and a small number of ODS-containing equipment.

What we outlined above are all positive developments made so far by China. However, a similar dilemma experienced in China’s wildlife sector seems to be replicating itself in the ODS sector: the ineffective enforcement by local enforcement authorities tend to be, again, the main cause for China’s role as the major source of illegal ODS in the

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170 As of 2016, there are 113 countries that have participated in the iPIC, see UNEP DTIE OzonAction 2016.


international black market. If China’s relevant ODS laws and regulations were enforced adequately and effectively at each enforcement point from the license distribution, production surveillance to export control, there would not have been a coterie of ODS dealers based in Zhejiang engaging in annual illegal shipping of more than 8,000 ODP tonnes of CFCs out of China (Clark 2005, 3). Adequate and effective enforcement of the 2007 CFC production ban would also have helped to contain not only the kinds of ODS seizures that have been described in chapter 5 but also, given that the quantity of contraband often accounts for only a fraction (e.g., five percent, see UNODC 2013, 119) of the entire illegal business, the production of chemicals that have almost certainly been successfully smuggled.

6.4. CONCLUSION

This chapter has examined China’s legal framework and enforcement responses in the wildlife, forest and ODS sectors, as well as identified a number of key regulatory and enforcement challenges that prevent China from effectively dealing with environmental crime. These challenges are surely informative as they tell us where should China’s authorities step in so as to improve their efficacy in addressing the illegal trade problem.

- **In the wildlife sector**, this chapter argues that the existence of a legal market enabled by China’s legal framework, especially the SFA’s special marking scheme, as well as the poorly enforced, or even unforced, licensing schemes by local wildlife authorities, have been the two most prominent factors for China’s raging and spreading illegal wildlife trade. This is because, on the one hand, the presence of a legal market aids in the creation and continuation of the market desirability and acceptability for wildlife products and further entrenches the culture of commodifying and consuming endangered wildlife. In turn, this will likely draw more people into the consumer market and drive up total demand for wildlife products. In a way, as the aggregate market demand increases while the legal supply (e.g., captive-bred sources or international auctions) remains the same, it is unsurprising that the new and unmet demand will encourage the development of greater illegal sources of supply, as manifested in more illegal poaching in source countries and more cross-border smuggling of such commodities to China. On the other hand, the ineffective enforcement of the
licensing schemes also provides a conduit for illegal dealers to launder the illicit wildlife products into the legal market.

- **In the timber sector**, this study argues that the issue of China’s illegal trade in forest products is concentrated in the import of illegally logged or traded timber on the one hand, and the export of wood products made of the imported illegal wood on the other. In order to address China’s illegal timber trade as a whole, this study stresses that China should start by cleaning up the upper, supply chain, namely the wood import. In this regard, after assessing China’s legal framework and responses, this chapter has identified that, the biggest challenge to China’s containment of its illegal wood import has been the lack of a national legislative or regulatory framework. Such a framework would explicitly demarcate the timber legality and thus provide a practical instrument for enforcement authorities, especially the customs officials, to determine the legal timber and prevent the illegal import and export. In the meantime, this study understands that the definitions of timber legality are totally contingent on each timber-producing country’s legislation and regulations, and therefore they tend to vary substantially among countries. For these reasons, this chapter recognises that China’s unilateral effort to address its illegal import problem, however competent, will not be enough. The upshot of this understanding is that China and timber producing countries need to work together to establish a mutually-accepted verification system that sets up an enforceable definition of timber legality, as well as a concomitant of sets of procedures, standards, and certificates for the correct implementation of the timber legality. Only through this, will China be able to curb its illegal wood import.

- **In the ODS sector**, this chapter has identified that, although China has implemented a series of national phase-out projects and instituted a relatively robust regulatory mix for the production, use, and trade of controlled ODS, the ineffective enforcement by local authorities has remained to be the major obstacle for China to address its issues of illegal ODS production and export. This chapter argues that if China’s relevant ODS laws and regulations were enforced adequately and effectively at each enforcement point from the license distribution, production surveillance to export control, there would not have been a coterie of ODS dealers based in Zhejiang engaging in annual illegal
shipping of more than 8,000 ODP tonnes of CFCs out of China. Likewise, adequate and effective enforcement of the 2007 CFC production ban would also have helped to contain not only the kinds of ODS seizures that have been described in chapter 5 but also, given that the quantity of contraband often accounts for a fraction of the entire illegal business, the production of chemicals that have almost certainly been successfully smuggled.
7. **CONCLUSION**

As outlined in Chapter 1, the central goal of this study has been to produce an in-depth understanding of the nature and dynamics of China-related TEC. To that end, this study took the Greater China – which includes mainland China, Hong Kong, Macau, and Taiwan – as the specific geographic focus for its investigation into three key TEC sectors (illegal trade in wildlife, forest products, and ODS). In doing so, this study also adopted an interdisciplinary approach that drew the conceptual insights from multiple strands of literature to explore and understand the utility and relevance of network models in both facilitating TEC (for illegal operators) and addressing TEC challenges (for regulatory and enforcement agencies).

Overall, this study has sought to achieve the central goal in a four-step sequence. Firstly, it built in Chapter 2 a network-centric conceptual framework based on the idea of “networked threats require networked responses”. Secondly, it applied the concept of networked threats to the study of China’s global trade in illegal wildlife, forest products, and ODS (Ch3–5). Thirdly, it examined in Chapter 6 China’s legal frameworks and enforcement responses and identified the key challenges facing China in each of the three selected TEC sectors.

In the fourth step, this concluding chapter weaves together three lines of understandings derived from this study – the accounts of networked threats and responses produced in Chapter 2, the empirical findings of transaction networks in China’s illegal trade made by the three case studies (Ch3–5), and the regulatory and enforcement challenges identified in Chapter 6. The purpose of doing so is to generate practicable prescriptions on how Chinese regulatory and enforcement agencies might apply the notion of networked responses to the formulation of regulatory or enforcement strategies for addressing the key challenges facing them.

7.1. **CONCEPTUAL FRAMEWORK: NETWORK THREATS AND NETWORKED RESPONSES**

In Chapter 2, this study has developed a network-centric conceptual framework based on the idea of “networked threats require networked responses”. This framework focused on addressing two key questions: what essentially constitutes a networked threat, and what forms a networked response.
7.1.1. NETWORKED THREATS

In Section 2.2 of Chapter 2, with a detailed discussion of networks as an organisational form for illegal actors with respect to their definition, typology, structures, and defensive and offensive strengths, this study argued that networked threats can be understood as containing two-fold meanings.

First, networked threats, for the purpose of this dissertation, refer to transaction networks, in which specific illegal commodities are moved along a series of dispersed independent individuals and/or groups who act around the black markets for illicit proceeds. The notion of transaction networks describes the basic dynamics of smuggling or trafficking activities and portrays a specific black market or illegal industry as a whole.

When applied to TEC settings, this study argued that transaction networks represent the transnational chain of the black markets for specific environmental goods. In this way, transaction networks take the shape of a commodity chain that intersects the countries of source, transit, and consumer; they are composed of a wealth of illegal operators – ranging from opportunist offenders, professional poachers, brokers, organised groups, laundering financial entities, and corrupt officials. Through the transaction chain, illegal environmental goods are being produced, taken or harvested, processed, transported, exported, imported, distributed, sold, and consumed. The transnational dimension warrants transaction networks a challenge that can hardly be successfully addressed solely by a state’s own effort and resources.

The analytical focus of transaction networks is on the black markets in its entirety. Points of investigation on transaction networks include among others the defining role (source, transit, or consumer) of a particular country involved in the international and regional illegal trade chain, the scale and scope of the black markets, the magnitude and diversity of environmental contraband involved in trafficking or trade, the methods used in conveyance and concealment of illegal goods, the established smuggling routes, and the affected countries.
Second, this study argued that networked threats can also be used to refer to directed networks. Directed networks are the covert and illegal organisations that adopt networks as the organisational structure to deploy their members and align their relationships, or as a strategy or tactic to design their illegal operations. When employed in this manner, networks afford illegal operators a host of organisational and operational advantages, including adaptability and resilience, over their legal foes the hierarchically organised state actors. When applied to TEC settings, directed networks refer to the organised criminal groups involved in trading and smuggling of environmental goods. This study argued that the interrelationship between transaction networks and directed networks lies in that transaction networks are made up of a web of dispersed directed networks and individual offenders whose self-interests-driven activities articulate with one another along the chain of custody and work as a whole in sustaining the smooth functioning of the overall black markets.

While both terms – transaction networks and directed networks – can be of analytical utility, for three reasons clarified in Chapter 1 – the lack of a robust literature that identifies and analyses China’s role and utility in the international and regional illicit trade, the requirement on different approaches and data sources – this study decided to only apply the concept of transaction networks to the three case studies. In each of the three case studies, by using the identified points of investigation as the guidance and through the analysis of seizure and trade data collected from public sources, this study has provided a deep map of transaction networks involved in China’s illegal trade.

7.1.2. NETWORKED RESPONSES

In Section 2.3 of Chapter 2, taking the proposition of “taking networks to fight networks” as the starting point, this study has sought to enrich this idea by drawing on the work of several influential scholars to develop a nascent yet coherent chain of conceptual logic that accounts for the proliferation of global networks and the notion of networked responses.

At the first juncture of the logical chain, this study observed that the convergence of social organisational evolution and information revolution lays down the organisational and material basis for the rise of networks. This is because the combination of the network form and new ICT allows for the co-existence in a network arrangement of
both centralised decision-making and a decentralised organisational and operational layout among geographically distant and, functionally or managerially autonomous components of the network.

At the second logical juncture, this study noted that the pervasive expansion of networks throughout the entire social structure induces a process of power diffusion on the bottom layer, or the layer of nonstate actors and transnational issues, of the three-dimensional international system. On one side of the power diffusion, illicit or “dark-side” actors such as terrorism and transnational crime groups are adopting networks in designing their organisational structures and operational tactics. The unique defensive and offensive strengths that networks afford their carriers transform dark-side actors into a transnationalised and networked threat for state actors.

On the other side of the power diffusion, in the face of the rise of transnational actors and issues, hierarchically based state actors experience increasing faults and inefficiencies in dealing with the growing complexity of such issues. This directly leads to the inability of the nation-states to govern effectively by acting alone. In a hope to enhance their ability to cope with transnational issues, unitary states are adapting by disaggregating themselves into the component government institutions, such as regulatory and enforcement agencies. These government units are interacting independently in specific issue areas not only with their foreign counterparts under the framework of government networks, but also with the private and civic non-state actors under various forms of public-private partnership. The landscape of the government networks and public-private partnerships is an analogue of what may be called a “Lego World”, a world in which the government institutions as the building blocks of sovereign states can be taken apart, put together with one another and with a wide range of NGOs, civic and corporate actors.

In this emerging Lego World, this study argued that the nature and source of power – defined in terms of the capacity to address transnational issues – have changed in a way that resource-based power is losing strength to relational power and hard power is increasingly outperformed by soft power (at least relatively). A core element of power in the Lego World consists in the ability to mobilise relevant entities and connect them toward a common purpose. Against this backdrop, this study identified two critical abilities as the key sources of network-related power that are most relevant for the
addressing of transnational issues. The first is “network-making power” (connectivity-based power), which stresses the ability to create networks or networks of networks. The second is “networked power” (favourable network position-based power), which focuses on the ability to obtain and retain advantageous positions within an influential network.

In the chapter conclusion, this study argued that networked responses are not a standard, formatted mode of regulatory or enforcement responses. Instead, network responses should be understood as a special way of thinking and acting: a way that sees a bright-side actor (e.g., enforcement agencies) as operating in an environment occupied by various networks and entities, which simultaneously present challenges in terms of amplified (networked) threats, as well as opportunities in terms of power amplifiers for the bright-side actor, in the sense that they could potentially be leveraged for tackling these threats. In other words, in addition to the traditional logic of increasing resource power, network thinking emphasises cultivating connections or relational resources rather than cultivating physical or hard resources.

On the other hand, network thinking analyses an actor first by looking at whether or not it is a participant of an influential network, and whether it is placed in an advantageous or disadvantageous, a favourable or less favourable position in that network. Then, network thinking will consider strategies to move that actor from a less favourable position to a favourable one. This study argued that the overall logic underlying networked way of thinking and action is that, in an increasingly networked, horizontal world, power comes from connections with and the positioning within influential networks and, that power is critical for dealing with transnational issues (including TEC).

7.2. CHINA’S GLOBAL TRADE IN ILLEGAL WILDLIFE

In Chapter 3, based on the analysis of 363 seizure reports coupled with other sources of information, this study has scrutinised China-oriented transaction chain of illegal wildlife trade with respect to its scale, high-profile wildlife commodities, methods for conveyance and concealment, and the smuggling routes and hot spots. This study argued that in the international and regional transaction chain of illegal wildlife, China sits at the core by acting as a dominant consumer. China’s immense internal market
demand for wildlife products for a variety of uses has tended to be the most relevant driver for China-related transnational illicit trade and smuggling of endangered wildlife.

In Chapter 6, after a close examination of China’s legal framework on and enforcement response to illegal wildlife trade, this study has identified two most significant factors for China’s raging and spreading illegal trade. These are the existence of a legal market enabled by China’s legal framework, especially the SFA’s special marking scheme, as well as the poorly enforced licensing schemes by local wildlife authorities. This is because, on the one hand, the presence of a legal market aids in the creation and continuation of market desirability and acceptability for wildlife products and further entrenches the culture of commodifying and consuming endangered wildlife. In turn, this will likely draw more people into the consumer market and drive up total demand for wildlife products. In a way, as the aggregate market demand increases while the legal supply (e.g., captive-bred sources or international auctions) remains the same, it is unsurprising that the new and unmet demand will encourage the development of greater illegal sources of supply, as manifested in more illegal poaching in source countries and more cross-border smuggling of such commodities to China. On the other hand, the weak enforcement of the licensing schemes provides a conduit for illegal dealers to launder the illicit wildlife products into the legal market.

Based on the two challenges identified above, this study argues that China can step in to address its illegal wildlife trade in the following ways.

First, against the presence of the legal market, the Chinese government and its agencies may respond in two ways. On the one hand, they may wish to establish a one-district-rule that prohibits the entire internal trade in captive-bred wildlife, just like what the Chinese government has pledged to do to its domestic trade of ivory products. On the other hand, if such a complete ban is economically unfeasible at present – given China’s enormous industry for wildlife farming as well as the large numbers of wildlife processing and selling businesses\(^\text{173}\) – the Chinese government may consider measures to alleviate its burgeoning internal market demand for endangered wildlife. For sure, crafting such measures requires an understanding of China’s wildlife consumer market,

\(^\text{173}\) For example, it is estimated that there are currently 5,000 to 6,000 tigers being farmed in China. See Yale Environment 360. “How Tiger Farming in China Threatens World’s Wild Tigers.” January 20, 2015. http://e360.yale.edu/feature/how_tiger_farming_in_china_threatens_worlds_wild_tigers/2839/.
such as the profiles and motivations of wildlife users. This necessitates another research project, which is also one of the directions for future study identified by this thesis.

Second, against the enforcement failures, this study argues that China’s wildlife enforcement agencies should scale up their efforts to ensure an adequate implementation of the licensing schemes and to prevent the illegal wildlife products from entering the legal market. This study proposes that China can do so through strengthening its domestic and transnational enforcement networking.

On the one hand, this study noted that the localities where illegal wildlife trade takes place are often “fixed”, mostly occurring in places such as local niche marketplaces for birds, pets, flowers, and antiques, restaurants, street stalls, registered or unregistered processing sites and retail outlets, pharmacies, and online shopping stores. The presence of these network “nodes” which amplifies the threat by housing a significant amount of such illicit activities on location as well as facilitating or encouraging illicit activities elsewhere (by fanning expectation of lower transaction costs of doing such illicit businesses), also provides an opportunity. It enables wildlife enforcement units to have a close monitoring on such trading localities, making it possible for a timely detection and punishment of wildlife offenders, and thus sending a strong message to the public about their zero tolerance stance against the illegal trade. This will help deter potential offenders and prevent illegal trade.

Moreover, as discussed in Chapter 2, the overall jurisdiction of the administration of legal trade and the detection and prevention of illegal trade falls into a chain of regulatory and enforcement authorities, which include customs, forest police, industry and commercial bureau, food and drug administration, environmental protection bureau, and other government agencies. The cross-agency nature entails the need for a coordinating body to orchestrate the dispersed efforts from various government agencies that are under the leadership of different government ministers. On this point, as noted in Chapter 6, China has established the Inter-agencies CITES Enforcement Coordination Group (ICECG) at both the central and provincial levels in order to facilitate the collection and exchange of intelligence, enhance capacity building, and coordinate joint enforcement activities. While this is a positive move, this study argues that the national and provincial ICECGs should not only focus on organising the campaign-mode inter-agency enforcement operations, but more importantly, it should
play a bigger role in supervising and exhorting the local wildlife authorities to sustain consistent enforcement of wild laws in their routine work.

On the other hand, at the international and regional levels, in Chapter 3, this study has identified a number of leading suppliers of illegal wildlife for China. These include Indonesia, Malaysia, Myanmar, Thailand, and Vietnam in Southeast Asia, DR Congo, Kenya, South Africa, and Tanzania in Africa, and India and the Russian Far East. Moreover, by analysis of the cross-border trafficking around China’s border areas, this study has identified multiple transaction chains that connect nodes in China as the consumer, and specific neighbouring countries as the sources or transit points. Each of these transaction chains is typified by the trafficking or trade in a specific range of wild animals. Knowledge about the China-oriented transaction chains will be instrumental in not only assisting China’s border enforcement units in developing a more targeted interception strategy, but also informing China on how to tailor its regulatory and enforcement cooperation with particular parties and which parties to prioritise.

7.3. China’s Global Trade in Illegal Forest Products

In Chapter 4, based on the import-source analysis and bilateral trade data from the UN Comtrade Database, FAOSTAT, and CCSY, this study has presented a full diagnosis of the nature, scale, and patterns of China’s global imports of illegal forest products, as well as identified multiple major transaction chains of illegal wood between the high-risk supplying countries and China.

In particular, this chapter has revealed a clear pattern associated with China’s illegal wood import. That is, China’s global sourcing of illegal wood has tended to concentrate in a limited number of high-risk producer countries. In the Asia-Pacific, Indonesia, Papua New Guinea (PNG), Solomon Islands, Thailand, and Vietnam were identified as five leading suppliers of illegal tropical hardwood in the region. The combined exports from the five countries to China accounted for 84 percent by RWE volume of China’s illegal wood imports from the region, or 55 percent of China’s global imports of illegal wood. In Africa, eight high-risk countries – including Benin, Cameroon, Congo Republic, Equatorial Guinea, Gabon, Ghana, Liberia, and Mozambique – supplied nearly all of the illegal wood that China imported from the region, or six percent of the total illegal wood that China sourced globally. In Latin America, 64 percent of China’s
illegal wood import from the region came from Mexico, 16 percent from Brazil, and eight percent from Peru. In Europe, Russia supplied a nearly complete share (99 percent) of the illegal wood that China collected from the region.

In Chapter 6, this study argued that the issue of China’s illegal wood trade resides in the import of illegally logged or traded timber on the one hand, the export of wood-based products made of the imported illegal timber on the other. In order to address China’s illegal wood trade as a whole, this study stressed that China should start by cleaning up the supply chain. In this regard, after assessing China’s existing legal framework and responses, this study identified that the biggest challenge to China’s containment of its illegal wood import has been the lack of a national legislative or regulatory framework. Such a framework would explicitly demarcate the timber legality and thus provide a practical instrument for enforcement authorities to determine the legal timber and prevent the illegal import and export.

However, in the meantime, this study understood that the definitions of timber legality are totally contingent on each timber-producing country’s legislation and regulations, and therefore they tend to vary substantially among countries. For these reasons, this study recognised that China’s unilateral effort to address its illegal import problem within its borders, however competent, will not be enough. The upshot of this understanding is that China and timber producing countries need to work together to establish a mutually-accepted verification system that sets up an enforceable definition of timber legality, as well as a concomitant of sets of procedures, standards, and certificates for the correct implementation of timber legality. Only through this, will China be able to curb its illegal wood import.

As discussed in Chapter 6, this study noted that since 2009, the Chinese Academy of Forestry (CAF) worked in collaboration with the ProForest on developing China national timber legality verification schemes (TLVS). In 2010, a draft China national TLVS was proposed under this collaboration, which suggested two mechanisms for the verification of the legality of imported timber: Chinese Government-guided Timber Verification Scheme (CGTVS) and Chinese Association-guided Timber Verification Scheme (CATVS). Currently, though little progress has been made in promoting CGTVS, China National Forest Products Industry Association (CNFPIA) has taken several steps towards developing CATVS. These include the launch of a pilot CATVS
program in 2012 in which eight timber processing companies were chosen as the first batch of volunteers for the program.

This study argues that the draft China national TLVS represents a prospect policy framework which, if fully and adequately implemented, promises to play a significant role in combating illegal logging and associated trade, promoting the sustainable development of China’s international wood trade, and improving China’s international image. However, this study argues that there still remains plenty of work to be done before the framework can operate as expected.\(^{174}\)

Under the CGTVS, progress towards developing bilateral agreements with timber-exporting countries need to be accelerated, particularly with those high-risk supplying countries in the Asia-Pacific and Africa as identified in Chapter 4. While under the CATVS, present CNFPIA definition of timber legality is merely China’s unilateral explanation, and lacks feasibility in enforcement terms in international forest products trade. Thus, closer coordination and deeper communication between the CNFPIA and its counterparts in timber supplying countries are essential in order to arrive at a shared understanding of the timber legality and a set of procedures, standards, and certificates necessary for the implementation of timber legality. Moreover, a regular electronic platform for the real-time exchange of information between China and timber-producing countries may be needed to enable the exporting countries to respond to, in a timely fashion, Chinese requests for verification of timber legality certificates.

This study noted that China has begun to explore the possibility of including PNG – which has been identified by Chapter 4 as China’s largest supplier of illegal wood in the

\(^{174}\) Since China’s national TLVS is still in its infancy and expected to take a long period for it to grow up to its full potential, it is therefore an option that China may turn to the certificates issued by the world’s leading timber certifiers like the Forest Stewardship Council (FSC) to verify the legality of imported forest products. However, two problems might undermine the efficacy of the FSC certificates in facilitating the policing of illegal timber flows. Firstly, it cannot take for granted that all FSC-certified companies will refrain from abusing the certificates and always trade legally. An example for this is that a FSC-certified timber trading company the “Dalhoff Larsen and Horneinan” was exposed to have purchased US$304,870 worth of illegally logged timber from two Liberian companies in 2012 and re-exported such illegal timber to Bangladesh, China and France (Global Witness 2014). Secondly, forest owners/managers or producers and traders of forest products in many of China’s high-risk supplying countries have not joined the Forest Stewardship. For example, according to the FSC statistics, there have been so far only three FSC-certified companies in Papua New Guinea and seven in Solomon Islands (data on the number of the FSC certificate holders in above two countries were collected from the FSC online certificate database which can be found at [https://info.fsc.org/certificate.php](https://info.fsc.org/certificate.php) (assessed 14 July 2017)). For more information about the Forest Stewardship, please refer to footnote No.92 on page 133 or visit the FSC webpage ([https://ic.fsc.org/en/what-is-fsc](https://ic.fsc.org/en/what-is-fsc)).
Asia-Pacific – into its CATVS. This study suggests that China should take into account the following two points when it expands its CATVS.

First, China should take PNG as an opportunity to accumulate experiences and expertise, or more ambitiously, to work out a streamlined mechanism for augmenting the coverage of its CATVS to a supplying country. This mechanism may then be able to provide two potential benefits. On the one hand, it may act as a best practice example that can be generalised to incorporating other high-risk supplying countries into China’s CATVS. On the other hand, it may pave the way for the potential signing of a bilateral agreement, which is necessary for the development of China’s CGTVS.

Second, as noted above, China’s global sourcing of forest products tends to concentrate in a limited number of timber producing countries. The concentration indicates that if China is able to curtail its illegal imports from such hot-spot countries, it will help China reduce significantly its imports of illegal timber at the international level. Thus, this study suggests that these hot-spot countries should be high on China’s list of priorities when it pounders on which supplier countries should be incorporated first into its CATVS.

7.4. CHINA’S GLOBAL TRADE IN ILLEGAL ODS

In Chapter 5, based on the analysis of 85 records of China-related ODS seizures, this study has dissected China-oriented transaction chain of illegal ODS, with respect to the scale of China’s black market, the magnitude and diversity of ODS chemicals involved in illicit trade, the major destination markets for Chinese-produced ODS, and the prevalent methods for smuggling and concealment.

In Chapter 6, this study has identified a similar dilemma experienced in China’s wildlife sector replicating itself in the ODS sector. That is, the ineffective enforcement by local authorities has again tended to be the major obstacle for China to address its issues of illegal ODS production and export, despite China has implemented a series of national phase-out projects and instituted a relatively robust regulatory mix for the production, use, and trade of controlled ODS.
This study noted that controlling the outflows of illegal ODS across borders is relatively easier than preventing and intercepting the transnational inflows. This is because illegal ODS producers and dealers are often themselves the unregistered, or even registered, ODS producing or trading companies, which tend to spatially cluster in a few localities in China, such as Hangzhou, Ningbo, and Shenzhen, as revealed by seizure data in Chapter 5. The two features imply that the intelligence gathered from seizures or other sources are more directional and thus likely to lead the enforcement agencies to trace back to the original producers or distributors of the illegal ODS detected.

Therefore, this study argues that China can enhance its ODS regulation and enforcement in two ways. On the one hand, the ODS administration and enforcement agencies should act in a more dutiful manner by incorporating regular inspection and surveillance of local ODS producing and trading companies into their daily work. The aim is to control the ODS supply chain by ensuring that ODS producing and trading companies remain fully compliant with the production quota limits and reporting obligations. Additionally, the enforcement agencies may impose severe penalties as prescribed under China’s ODS legal framework, such as revoking licenses, maximum fines, and dismantling production facilities, on firms who are proven to have involved in illegal production or trading of controlled ODS. Since the annual number of ODS seizures made by enforcement authorities tends to be far smaller than that of wildlife seizures, ODS enforcement authorities shall take advantage of every ODS seizure and dig out the intelligence that would be useful in guiding them to identify the original producers.

On the other hand, in Chapter 5, this study has identified the prevailing methods used in smuggling and concealing ODS, as well as multiple bilateral transaction chains that connect to China as the source, and to India, Russia, the US and other countries as the major recipients of Chinese-produced illegal ODS. These tips are informative not only for making a more tailored and targeted enforcement interception strategy; they also inform China of the priority countries with which it should strengthen its regulatory and enforcement cooperation. Thus, this study suggests that prior to the issuance of an export license, China’s National ODS Management Office should enhance information exchange and verification with its counterparts in the identified hot importing countries through the UNEP’s Informal Prior-informed Consent Mechanism.
7.5. **Learn to Develop and Harness Network-related Power**

In the closing part of this thesis, let’s reflect again on the question that what enlightening policy implications can the concept of networked responses offer for China’s environmental authorities in terms of addressing the TEC problems? To recap briefly, this thesis argues that against the backdrops where environmental crime has already turned into a transnational issue that requires concerted coordination among all affected countries on the one hand, and networks has increasingly become the major organisational carrier for such coordination on the other, China’s environmental authorities need to make changes to attune themselves to the new situations. In many cases, such adjustments involve thinking and acting in a way that promotes networked coordination.

To do so, China needs firstly recognise its undeniable part in sustaining the international illegal trade (through either supplying with or consuming illegal environmental goods), and acknowledge its unavoidable shared responsibility in curtailing the problems. Secondly, to maximise its efforts against environmental crime, China shall craft a networked response, for which the key to success lies in fostering two important network-related power: networked power and network-making power.

To formulate and implement this networked response, China’s environmental agencies may in the first place assess if there is already a proper network arrangement that has been operating effectively in the concerned issue area. If the answer is yes, China needs then to consider joining the network instead of insisting on working along. If this is not case, China may wish to create a network of appropriate form in order to connect the dispersed efforts toward the shared environmental issues. But before doing so, China shall identify the key actors who have a stake in, or who have valuable resources that are crucial for, the addressing of such issues. Following that, China shall invest into building relationships with the identified players and creating infrastructures to foster and host those networks.

Depending on the major functions anticipated, China may wish to create enforcement networks in the wildlife and ODS sector to overcome its weak enforcement problem; to create harmonisation networks in the forest sector to standardise laws and regulations on timber legality between China and its high-risk trading partners; and to continue to make good use of existing information networks in the ODS sector such as the Informal
Prior-informed Consent Mechanism for the prevention of unauthorised ODS trades. This thesis argues that networked coordination is not only a solution to shared environmental challenges, but also a way through which China can extend its regulatory reach and increase its soft power and influence over other countries.

7.6. DIRECTIONS FOR FUTURE RESEARCH

This study suggests three directions for future research. First, within the network-centric conceptual framework, this study argued that networked threats can be interpreted along two dimensions: transaction networks and directed networks. This study has only applied the concept of transaction networks to the study of China’s global trade in environmental goods. Thus, the first future direction to extend this PhD thesis is to explore whether or not the organised crime groups involved in China-related TEC are structured in directed networks, shaped in hub or all-channel network models, or in some kinds of mutation that combine both archetypal structures and/or hierarchical elements.

In Chapter 1, this study suggested that before engaging in a costly and time-consuming research on the aspects of directed networks in China-related TEC, it makes more sense if we can accrue reliable evidence that supports the existence of organised criminal groups in China’s illegal trade. In Chapter 3, this study argued that seizures of large-scale and cross-border shipments of illegal environmental goods are often a good measure of the presence of organised criminality. This is because the trafficking of large quantities of environmental contraband across a long distance from source countries to the end-use markets involves a complicated process that can only be handled with a competent level of expertise, financial resources, and the managing, organising, and marketing capabilities.

In the wildlife and ODS sectors, this study has identified several trafficking routes and illegal environmental goods that most likely involve organised crime groups. For example, in illegal trade in ivory, this study collected 20 China-related large-scale ivory seizures during 1997–2013. The average weight of ivory derived from each of these seizures exceeded 500 kg, which strongly indicates the devastating role played by professional and well-organised criminal networks in trafficking ivory from the source countries to China. In illegal ODS trade, this study has identified that one intimidating
aspect of ODS trafficking between China and Russia was the large-scale nature of individual shipments. This study collected nine seizures that involved smuggling of vast amounts of illegal ODS from China to Russia during 2007–2014, with the volumes of ODS in each seizure case ranging from the lowest four metric tonnes to the highest 268 metric tonnes. This also suggests the involvement of well-financed enterprises in the Sino-Russian trade of illegal ODS.

Second, in Section 7.2 of this chapter, this study suggested that China shall seek to curtail its burgeoning domestic demand for endangered wildlife products, if it is unable to adopt a complete ban on domestic trade in captive-bred wildlife. This study recognises that doing so requires a comprehensive understanding of China’s wildlife consumer market, such as the profile and motivations of wildlife users, in order to reverse the consumer attitudes on wildlife and promote behavioural change.

Third and finally, in Section 7.3, this study recognised that China’s attempt to include PNG in its CATVS is a positive move, and suggested that China should take PNG as an opportunity to accumulate experiences and expertise, or more ambitiously, to work out a streamlined mechanism for augmenting the coverage of its CATVS to a supplier country. Therefore, a study on how the CNFPIA can work together with the wood associations and other stakeholders in PNG to streamline the process may be imperative.
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## 9. APPENDICES

Table 9.1: Illegal forest practices at different custodian points

<table>
<thead>
<tr>
<th>Custodial point</th>
<th>Various ways in which timber can become contraband</th>
</tr>
</thead>
</table>
| Harvesting or extracting | (1) Logging in protected area  
(2) Logging in unprotected areas without authorised permits or with falsified or re-used permits  
(3) Obtaining permits through bribes  
(4) Harvesting of protected tree species  
(5) Extracting from protected forest areas or outside authorised concessions  
(6) Logging in excess of permit or concession quotas  
(7) Underreporting harvest volume and tax payable  
(8) Ignoring selective cutting guideline  
(9) Clear-cutting the natural forest without replantation afterwards, or replantation fails to meet the specified requirement (including the extent of replantation fails to meet the required rate; replanting with low-quality species or at low density)  
(10) Harvesting technologies in use violate mandatory environmental safeguards relating to minimising damage to the soil and environment |
| Transportation | (1) Falsifying log transportation documents  
(2) Accepting fraudulent log transport documents  
(3) Unauthorised or unreported movement across state boundaries |
| Processing | (1) Processing timber at unlicensed facilities  
(2) Expanding capacity without authorisation  
(3) Operating in violation of environmental, social and labour laws |
| Import & export | (1) Logging import & export in defiance of trade restrictions and/or national control measures  
(2) Misdeclaration of the size, quality, place-of-origin or species of timber at the point of import or export to avoid trade restrictions or higher taxes  
(3) Transfer pricing, such as nil profit accounting and manipulating revenue flows for services to avoid revenue |
| Other associated illegal activities | (1) Logging in breach of contractual obligations such as without an environmental impact assessment  
(2) Obtaining harvesting concessions via unlawful means such as corruption  
(3) Laundering illegal timber through a concession |

(Source: Brack et al. 2002, 53; Contreras-Hermosilla et al. 2007, 16, 36; Bricknell 2010, 95; UNODC 2010, 162;)

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Table 9.2: Cross reference between major forest products and the HS six digital codes

<table>
<thead>
<tr>
<th>Wood-based products</th>
<th>Corresponding HS six digital codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel wood etc.</td>
<td>440110</td>
</tr>
<tr>
<td>Wood chips and particles</td>
<td>440121, 440122</td>
</tr>
<tr>
<td>Wood residues</td>
<td>440130</td>
</tr>
<tr>
<td>Wood charcoal</td>
<td>4402</td>
</tr>
<tr>
<td>Industrial roundwood</td>
<td>4403</td>
</tr>
<tr>
<td>Hoop wood</td>
<td>4404</td>
</tr>
<tr>
<td>Wood wool or flour</td>
<td>4405</td>
</tr>
<tr>
<td>Railway or tramway sleepers</td>
<td>4406</td>
</tr>
<tr>
<td>Sawn wood</td>
<td>4407</td>
</tr>
<tr>
<td>Veneer sheet</td>
<td>4408</td>
</tr>
<tr>
<td>Continuously shaped wood</td>
<td>4409</td>
</tr>
<tr>
<td>Particleboard</td>
<td>4410</td>
</tr>
<tr>
<td>Fibreboard</td>
<td>4411</td>
</tr>
<tr>
<td>Plywood</td>
<td>4412</td>
</tr>
<tr>
<td>Densified wood</td>
<td>4413</td>
</tr>
<tr>
<td>Wooden works</td>
<td>4414-4421</td>
</tr>
<tr>
<td>Wood pulp</td>
<td>4701-4705</td>
</tr>
<tr>
<td>Other fibre pulp</td>
<td>4706</td>
</tr>
<tr>
<td>Recovered paper</td>
<td>4707</td>
</tr>
<tr>
<td>Paper &amp; paperboard</td>
<td>Chapter 48</td>
</tr>
<tr>
<td>Timber products</td>
<td>Chapter 44</td>
</tr>
<tr>
<td>Pulp</td>
<td>Chapter 47</td>
</tr>
</tbody>
</table>
Table 9.3: Conversion factors

<table>
<thead>
<tr>
<th>Product</th>
<th>HS codes</th>
<th>Units used in CCSY</th>
<th>Density factor (m³/MT)</th>
<th>Physical volume to RWE volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel wood etc.</td>
<td>440110</td>
<td>kg</td>
<td>1.38</td>
<td>1</td>
</tr>
<tr>
<td>Wood chips and particles</td>
<td>440121, 440122</td>
<td>kg</td>
<td>1.6</td>
<td>1.8</td>
</tr>
<tr>
<td>Wood residues</td>
<td>440130</td>
<td>kg</td>
<td>1.5</td>
<td>1</td>
</tr>
<tr>
<td>Wood charcoal</td>
<td>4402</td>
<td>kg</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Industrial roundwood</td>
<td>4403</td>
<td>m³</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>Hoop wood</td>
<td>4404</td>
<td>kg</td>
<td>1.4</td>
<td>2</td>
</tr>
<tr>
<td>Wood wool/flour</td>
<td>4405</td>
<td>kg</td>
<td>1.4</td>
<td>1</td>
</tr>
<tr>
<td>Railway or tramway sleepers</td>
<td>4406</td>
<td>m³</td>
<td>--</td>
<td>2</td>
</tr>
<tr>
<td>Sawn wood</td>
<td>4407</td>
<td>m³</td>
<td>--</td>
<td>1.43</td>
</tr>
<tr>
<td>Veneer sheet</td>
<td>4408</td>
<td>kg</td>
<td>1.33</td>
<td>2.5</td>
</tr>
<tr>
<td>Continuously shaped wood</td>
<td>4409</td>
<td>kg</td>
<td>1.4</td>
<td>1.9</td>
</tr>
<tr>
<td>Particleboard</td>
<td>4410</td>
<td>kg</td>
<td>1.54</td>
<td>1.5</td>
</tr>
<tr>
<td>Fibreboard</td>
<td>4411</td>
<td>kg</td>
<td>1.42</td>
<td>1.8</td>
</tr>
<tr>
<td>Plywood</td>
<td>4412</td>
<td>kg &amp; m³</td>
<td>1.33 or --</td>
<td>2.5</td>
</tr>
<tr>
<td>Densified wood</td>
<td>4413</td>
<td>kg</td>
<td>1.4</td>
<td>2</td>
</tr>
<tr>
<td>Wooden works</td>
<td>4414–4421</td>
<td>kg</td>
<td>--</td>
<td>1.25</td>
</tr>
<tr>
<td>Wood pulp</td>
<td>4701–4705</td>
<td>kg</td>
<td>--</td>
<td>Mechanical pulp (4701): 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Chemical pulp (4702–04): 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Semi-chemi. pulp (4705): 3.3</td>
</tr>
<tr>
<td>Other fibre pulp</td>
<td>4706</td>
<td>kg</td>
<td>--</td>
<td>2.6</td>
</tr>
<tr>
<td>Recovered paper</td>
<td>4707</td>
<td>kg</td>
<td>--</td>
<td>2.6</td>
</tr>
<tr>
<td>Paper &amp; paperboard</td>
<td>48</td>
<td>kg</td>
<td>--</td>
<td>2.8</td>
</tr>
<tr>
<td>Furniture</td>
<td>940161, --69,</td>
<td>kg</td>
<td>1.4</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>940330–60</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Note:** Conversion factors in the table were mainly sourced from: (1) EU Commission Directorate-General Eurostat, FAO, ITTO, and UNECE, Joint Forest Sector Questionnaire; (2) UNECE and FAO 2010; (3) Sun et al. 2004a; Zhu et al. 2004. Supplementary references include Contreras-Hermosilla 2007, 41–2; Katsigris et al. 2004, 241.
Table 9.4: China’s high-risk supplying countries

<table>
<thead>
<tr>
<th>High-risk supplier countries</th>
<th>Estimated illegal logging/trade rate</th>
<th>Source</th>
<th>Annual forest change during 2005–10 (%)</th>
<th>Corruption perception index (score &amp; ranking)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asia-Pacific</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cambodia</td>
<td>90%</td>
<td>Seneca Creek 2004, 5</td>
<td>−1.22</td>
<td>20 (160)</td>
</tr>
<tr>
<td>Indonesia</td>
<td>40–61%</td>
<td>Lawson and MacFaul 2010, 6</td>
<td>−0.71</td>
<td>32 (114)</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>7%</td>
<td>SAVCOR 2005, 8</td>
<td>+1.87</td>
<td>24 (150)</td>
</tr>
<tr>
<td>Laos</td>
<td>45%;</td>
<td>Seneca Creek 2004, 5</td>
<td>−0.49</td>
<td>26 (140)</td>
</tr>
<tr>
<td>Malaysia</td>
<td>14–25%</td>
<td>Lawson and MacFaul 2010, 6</td>
<td>−0.42</td>
<td>50 (53)</td>
</tr>
<tr>
<td>Myanmar</td>
<td>50%</td>
<td>Seneca Creek 2004, 5</td>
<td>−0.42</td>
<td>21 (157)</td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>70%</td>
<td>Seneca Creek 2004, 5</td>
<td>−0.49</td>
<td>25 (144)</td>
</tr>
<tr>
<td>Philippines</td>
<td>46%</td>
<td>Hirschberger 2008, 39</td>
<td>+0.73</td>
<td>36 (94)</td>
</tr>
<tr>
<td>Solomon Islands</td>
<td>50%</td>
<td>Global Timber 2007</td>
<td>−0.25</td>
<td>--</td>
</tr>
<tr>
<td>South Korea</td>
<td>30%</td>
<td>Hirschberger 2008, 39</td>
<td>−0.11</td>
<td>55 (46)</td>
</tr>
<tr>
<td>Taiwan (China)</td>
<td>45%</td>
<td>Hirschberger 2008, 39</td>
<td>--</td>
<td>61 (36)</td>
</tr>
<tr>
<td>Thailand</td>
<td>40%</td>
<td>World Bank 2006, 9</td>
<td>+0.08</td>
<td>35 (102)</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>17–23%</td>
<td>SAVCOR 2005, 8</td>
<td>0</td>
<td>22 (154)</td>
</tr>
<tr>
<td>Vietnam</td>
<td>20–40%</td>
<td>Seneca Creek 2004, 5</td>
<td>+1.08</td>
<td>31 (116)</td>
</tr>
<tr>
<td><strong>Africa</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benin</td>
<td>80%</td>
<td>Contreras-Hermosilla et al. 2007, 17</td>
<td>−1.06</td>
<td>36 (96)</td>
</tr>
<tr>
<td>Cameroon</td>
<td>22–35%</td>
<td>Lawson and MacFaul 2010, 6</td>
<td>−1.07</td>
<td>25 (144)</td>
</tr>
<tr>
<td>Congo Republic</td>
<td>40%</td>
<td>Global Timber, 2007</td>
<td>−0.05</td>
<td>22 (154)</td>
</tr>
<tr>
<td>Equatorial Guinea</td>
<td>80%</td>
<td>Global Timber, 2007</td>
<td>−0.71</td>
<td>19 (163)</td>
</tr>
<tr>
<td>Gabon</td>
<td>50–70%</td>
<td>Seneca Creek 2004, 4</td>
<td>0</td>
<td>34 (106)</td>
</tr>
<tr>
<td>Ghana</td>
<td>59–65%</td>
<td>Lawson and MacFaul 2010, 6</td>
<td>−2.19</td>
<td>46 (63)</td>
</tr>
<tr>
<td>Liberia</td>
<td>80%</td>
<td>Seneca Creek 2004, 4</td>
<td>−0.68</td>
<td>38 (83)</td>
</tr>
<tr>
<td>Mozambique</td>
<td>50–70%</td>
<td>Contreras-Hermosilla et al. 2007, 17</td>
<td>−0.53</td>
<td>30 (119)</td>
</tr>
<tr>
<td>Nigeria</td>
<td>90%</td>
<td>Hirschberger 2008, 39</td>
<td>−4</td>
<td>25 (144)</td>
</tr>
<tr>
<td>High-risk supplying countries</td>
<td>Estimated illegal logging/trade rate</td>
<td>Source</td>
<td>Forest annual change during 2005–10 (%)</td>
<td>Corruption perception index (score &amp; ranking)</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------------------------------</td>
<td>--------</td>
<td>----------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td><strong>Europe</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albania</td>
<td>9%</td>
<td>Markus-Johansson 2010, 92</td>
<td>–0.15</td>
<td>31 (116)</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>24%</td>
<td>SAVCOR 2005, 8</td>
<td>0</td>
<td>28 (127)</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>2%</td>
<td>SAVCOR 2005, 8</td>
<td>0</td>
<td>42 (72)</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>40%</td>
<td>Hirschberger 2008, 39</td>
<td>+1.47</td>
<td>41 (77)</td>
</tr>
<tr>
<td>Estonia</td>
<td>50%</td>
<td>Hewitt 2005, 33</td>
<td>–0.31</td>
<td>68 (28)</td>
</tr>
<tr>
<td>Georgia</td>
<td>9%</td>
<td>SAVCOR 2005, 8</td>
<td>–0.09</td>
<td>49 (55)</td>
</tr>
<tr>
<td>Latvia</td>
<td>20%</td>
<td>Hewitt 2005, 33</td>
<td>+0.34</td>
<td>53 (49)</td>
</tr>
<tr>
<td>Macedonia</td>
<td>25-30%</td>
<td>Hirschberger 2008, 39</td>
<td>+0.47</td>
<td>44 (67)</td>
</tr>
<tr>
<td>Moldova</td>
<td>1%</td>
<td>SAVCOR 2005, 8</td>
<td>+1.24</td>
<td>36 (102)</td>
</tr>
<tr>
<td>Montenegro</td>
<td>50%</td>
<td>Hirschberger, 2008</td>
<td>0</td>
<td>44 (67)</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>25%</td>
<td>World Bank, 2006: 9</td>
<td>+0.01</td>
<td>28 (127)</td>
</tr>
<tr>
<td>Slovakia</td>
<td>10%</td>
<td>Marusak et al. 2005, 43</td>
<td>+0.01</td>
<td>47 (61)</td>
</tr>
<tr>
<td><strong>Latin America</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bolivia</td>
<td>80%</td>
<td>Seneca Creek 2004, 5</td>
<td>–0.53</td>
<td>34 (106)</td>
</tr>
<tr>
<td>Brazil</td>
<td>35-72%</td>
<td>Lawson and MacFaul 2010, 6</td>
<td>–0.42</td>
<td>42 (72)</td>
</tr>
<tr>
<td>Colombia</td>
<td>42%</td>
<td>Seneca Creek 2004, 5</td>
<td>–0.17</td>
<td>36 (94)</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>25%</td>
<td>Contreras-Hermosilla et al. 2007, 17</td>
<td>+0.9</td>
<td>53 (49)</td>
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<tr>
<td>Ecuador</td>
<td>70%</td>
<td>Hembery et al. 2007</td>
<td>–1.98</td>
<td>35 (102)</td>
</tr>
<tr>
<td>Honduras</td>
<td>30-50%</td>
<td>Contreras-Hermosilla et al. 2007, 17</td>
<td>–2.16</td>
<td>26 (140)</td>
</tr>
<tr>
<td>Mexico</td>
<td>70%</td>
<td>Hirschberger 2008, 40</td>
<td>–0.24</td>
<td>34 (106)</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>50%</td>
<td>Contreras-Hermosilla et al. 2007, 17</td>
<td>–2.11</td>
<td>28 (127)</td>
</tr>
<tr>
<td>Peru</td>
<td>80%-90%</td>
<td>Seneca Creek 2004, 5</td>
<td>–0.22</td>
<td>38 (83)</td>
</tr>
</tbody>
</table>

Note: (1) Annual forest change rates indicate the annual forest gain (+) or loss (-) in percent of the remaining forest area during 2005–2010. Data on annual forest change were sourced from “Global Forest Resources Assessment 2010” by FAO (2010). (2) Figures in the column of “Corruption perception index (score & ranking)” indicate: figures at the left side represent the perceived level of corruption, with “0” denoting highly corrupt and 100 as very clean; figures in the parentheses indicate the ranking of the country’s level of corruption among 177 countries and territories around the world. Data on corruption perception indexes were sourced from “Corruption Perception Index 2013” by Transparency International (2014).
Table 9.5: Control measures and phase-out schedules under the Montreal Protocol

**Annex A – Group I: Five main CFCs (CFC-11, -12, -113, -114, and -115)**

*Applicable to both production and consumption*

<table>
<thead>
<tr>
<th>Non-Article 5(1) Parties</th>
<th>Article 5(1) Parties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base level</td>
<td>Base level</td>
</tr>
<tr>
<td>1986</td>
<td>Average of 1995-97</td>
</tr>
<tr>
<td>Freeze</td>
<td>Freeze</td>
</tr>
<tr>
<td>July 1, 1989</td>
<td>July 1, 1999</td>
</tr>
<tr>
<td>75% reduction</td>
<td>50% reduction</td>
</tr>
<tr>
<td>January 1, 1994</td>
<td>January 1, 2005</td>
</tr>
<tr>
<td>100% reduction</td>
<td>85% reduction</td>
</tr>
<tr>
<td>January 1, 1996 (with possible essential use exemptions)</td>
<td>January 1, 2007</td>
</tr>
<tr>
<td></td>
<td>100% reduction</td>
</tr>
<tr>
<td></td>
<td>January 1, 2010 (with possible essential use exemptions)</td>
</tr>
</tbody>
</table>

**Annex A – Group II: Halons (halon-1211, -1301, and -2402)**

*Applicable to both production and consumption*

<table>
<thead>
<tr>
<th>Non-Article 5(1) Parties</th>
<th>Article 5(1) Parties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base level</td>
<td>Base level</td>
</tr>
<tr>
<td>1986</td>
<td>Average of 1995-97</td>
</tr>
<tr>
<td>Freeze</td>
<td>Freeze</td>
</tr>
<tr>
<td>January 1, 1992</td>
<td>January 1, 2002</td>
</tr>
<tr>
<td>100% reduction</td>
<td>50% reduction</td>
</tr>
<tr>
<td>January 1, 1994 (with possible essential use exemptions)</td>
<td>January 1, 2005</td>
</tr>
<tr>
<td></td>
<td>100% reduction</td>
</tr>
<tr>
<td></td>
<td>January 1, 2010 (with possible essential use exemptions)</td>
</tr>
</tbody>
</table>

**Annex B – Group I: Other fully halogenated CFCs**

*Applicable to both production and consumption*

<table>
<thead>
<tr>
<th>Non-Article 5(1) Parties</th>
<th>Article 5(1) Parties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base level</td>
<td>Base level</td>
</tr>
<tr>
<td>20% reduction</td>
<td>20% reduction</td>
</tr>
<tr>
<td>January 1, 1993</td>
<td>January 1, 2003</td>
</tr>
<tr>
<td>75% reduction</td>
<td>85% reduction</td>
</tr>
<tr>
<td>January 1, 1994</td>
<td>January 1, 2007</td>
</tr>
<tr>
<td>100% reduction</td>
<td>100% reduction</td>
</tr>
<tr>
<td>January 1, 1996 (with possible essential use exemptions)</td>
<td>January 1, 2010 (with possible essential use exemptions)</td>
</tr>
</tbody>
</table>
Annex B – Group II: Carbon tetrachloride (CTC)

Applicable to both production and consumption

<table>
<thead>
<tr>
<th></th>
<th>Non-Article 5(1) Parties</th>
<th>Article 5(1) Parties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base level</td>
<td>1989</td>
<td>Base level</td>
</tr>
<tr>
<td>85% reduction</td>
<td>January 1, 1995</td>
<td>85% reduction</td>
</tr>
<tr>
<td></td>
<td>January 1, 1996 (with possible essential use exemptions)</td>
<td>January 1, 2005 (with possible essential use exemptions)</td>
</tr>
<tr>
<td>100% reduction</td>
<td></td>
<td>100% reduction</td>
</tr>
</tbody>
</table>

Annex B – Group III: 1,1,1-trichloroethane (methyl chloroform, or TCA)

Applicable to both production and consumption

<table>
<thead>
<tr>
<th></th>
<th>Non-Article 5(1) Parties</th>
<th>Article 5(1) Parties</th>
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</thead>
<tbody>
<tr>
<td>Base level</td>
<td>1989</td>
<td>Base level</td>
</tr>
<tr>
<td>Freeze</td>
<td>January 1, 1993</td>
<td>Freeze</td>
</tr>
<tr>
<td>50% reduction</td>
<td>January 1, 1994</td>
<td>30% reduction</td>
</tr>
<tr>
<td></td>
<td>January 1, 1996 (with possible essential use exemptions)</td>
<td>70% reduction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100% reduction</td>
</tr>
<tr>
<td></td>
<td>January 1, 2010</td>
<td>January 1, 2010</td>
</tr>
<tr>
<td>100% reduction</td>
<td></td>
<td>January 1, 2015 (with possible essential use exemptions)</td>
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</table>

Annex C – Group I: HCFCs (consumption)

Applicable to consumption

<table>
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<tr>
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<th>Non-Article 5(1) Parties</th>
<th>Article 5(1) Parties</th>
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</thead>
<tbody>
<tr>
<td>Base level</td>
<td>1989 HCFC consumption + 2.8% of 1989 CFC consumption</td>
<td>Base level</td>
</tr>
<tr>
<td>Freeze</td>
<td>1996</td>
<td>Freeze</td>
</tr>
<tr>
<td>35% reduction</td>
<td>January 1, 2004</td>
<td>10% reduction</td>
</tr>
<tr>
<td></td>
<td>January 1, 2010</td>
<td>35% reduction</td>
</tr>
<tr>
<td>75% reduction</td>
<td>January 1, 2015</td>
<td>67.5% reduction</td>
</tr>
<tr>
<td>90% reduction</td>
<td>January 1, 2020, and thereafter use restricted to the servicing of RAC equipment existing at the date</td>
<td>January 1, 2025</td>
</tr>
<tr>
<td>99.5% reduction</td>
<td>January 1, 2030, and thereafter use restricted to the servicing of RAC equipment existing at the date</td>
<td>January 1, 2030, and thereafter use restricted to the servicing of RAC equipment existing at the date</td>
</tr>
<tr>
<td>100% reduction</td>
<td>January 1, 2040</td>
<td>100% reduction</td>
</tr>
</tbody>
</table>

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### Annex C – Group I: HCFCs (production)

**Applicable to production**

<table>
<thead>
<tr>
<th><strong>Non-Article 5(1) Parties</strong></th>
<th><strong>Article 5(1) Parties</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>Base level</strong></td>
<td>Base level</td>
</tr>
<tr>
<td>Average of 1989 HCFC production + 2.8% of 1989 CFC consumption</td>
<td>Average of 2009-10 CFC consumption</td>
</tr>
<tr>
<td><strong>Freeze</strong></td>
<td>Freeze</td>
</tr>
<tr>
<td>January 1, 2004</td>
<td>January 1, 2013</td>
</tr>
<tr>
<td><strong>75% reduction</strong></td>
<td>10% reduction</td>
</tr>
<tr>
<td>January 1, 2010</td>
<td>January 1, 2015</td>
</tr>
<tr>
<td><strong>90% reduction</strong></td>
<td>35% reduction</td>
</tr>
<tr>
<td>January 1, 2015</td>
<td>January 1, 2020</td>
</tr>
<tr>
<td><strong>99.5% reduction</strong></td>
<td>67.5% reduction</td>
</tr>
<tr>
<td>January 1, 2020, and thereafter use restricted to the servicing of RAC equipment existing at the date</td>
<td>January 1, 2025</td>
</tr>
<tr>
<td><strong>100% reduction</strong></td>
<td>97.5% reduction (averaged over ten years 2030-40)</td>
</tr>
<tr>
<td>January 1, 2030</td>
<td>January 1, 2030, and thereafter use restricted to the servicing of RAC equipment existing at the date</td>
</tr>
<tr>
<td></td>
<td>100% reduction</td>
</tr>
<tr>
<td></td>
<td>January 1, 2040</td>
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### Annex C – Group II: HBFCs

**Applicable to both production and consumption**

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<th><strong>Non-Article 5(1) Parties</strong></th>
<th><strong>Article 5(1) Parties</strong></th>
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<tbody>
<tr>
<td>100% reduction</td>
<td>100% reduction</td>
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<tr>
<td>January 1, 1996 (with possible essential use exemptions)</td>
<td>January 1, 1996 (with possible essential use exemptions)</td>
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### Annex C – Group III: Bromochloromethane

**Applicable to both production and consumption**

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<th><strong>Non-Article 5(1) Parties</strong></th>
<th><strong>Article 5(1) Parties</strong></th>
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<tbody>
<tr>
<td>100% reduction</td>
<td>100% reduction</td>
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<tr>
<td>January 1, 2002 (with possible essential use exemptions)</td>
<td>January 1, 2002 (with possible essential use exemptions)</td>
</tr>
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Annex E – Group I: Methyl bromide

Applicable to both production and consumption

<table>
<thead>
<tr>
<th>Non-Article 5(1) Parties</th>
<th>Article 5(1) Parties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base level</td>
<td>Base level</td>
</tr>
<tr>
<td>Freeze</td>
<td>Freeze</td>
</tr>
<tr>
<td>January 1, 1995</td>
<td>January 1, 2002</td>
</tr>
<tr>
<td>25% reduction</td>
<td>20% reduction</td>
</tr>
<tr>
<td>January 1, 1999</td>
<td>January 1, 2005</td>
</tr>
<tr>
<td>50% reduction</td>
<td>100% reduction</td>
</tr>
<tr>
<td>January 1, 2001</td>
<td>January 1, 2015 (with possible critical use exemptions)</td>
</tr>
<tr>
<td>70% reduction</td>
<td></td>
</tr>
<tr>
<td>January 1, 2003</td>
<td></td>
</tr>
<tr>
<td>100% reduction</td>
<td></td>
</tr>
<tr>
<td>January 1, 2005 (with possible critical use exemptions)</td>
<td></td>
</tr>
<tr>
<td>Controlled ODS under the Montreal Protocol</td>
<td>2002 HS</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>---------</td>
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<tr>
<td><strong>Annex A, Group I (CFCs)</strong></td>
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</tr>
<tr>
<td>CFC-11</td>
<td>2903.41.00</td>
</tr>
<tr>
<td>CFC-12</td>
<td>2903.42.00</td>
</tr>
<tr>
<td>CFC-113</td>
<td>2903.43.00</td>
</tr>
<tr>
<td>CFC-114</td>
<td>2903.44.00</td>
</tr>
<tr>
<td>CFC-115</td>
<td>2903.44.90</td>
</tr>
<tr>
<td><strong>Annex A, Group II (Halons)</strong></td>
<td></td>
</tr>
<tr>
<td>Halon-1211</td>
<td>2903.46.10</td>
</tr>
<tr>
<td>Halon-1301</td>
<td>2903.46.20</td>
</tr>
<tr>
<td>Halon-2402</td>
<td>2903.46.90</td>
</tr>
<tr>
<td><strong>Annex B, Group I (Other CFCs)</strong></td>
<td></td>
</tr>
<tr>
<td>CFC-13</td>
<td>2903.45.10</td>
</tr>
<tr>
<td>CFC-111</td>
<td>2903.45.15</td>
</tr>
<tr>
<td>CFC-112</td>
<td>2903.45.20</td>
</tr>
<tr>
<td>CFC-211, -212, -213, -214, -215, -216, -217</td>
<td>2903.45</td>
</tr>
<tr>
<td><strong>Annex B, Group II (CTC)</strong></td>
<td></td>
</tr>
<tr>
<td>Carbon tetrachloride</td>
<td>2903.14.00</td>
</tr>
<tr>
<td><strong>Annex B, Group III</strong></td>
<td></td>
</tr>
<tr>
<td>1,1,1-trichloroethane (methyl chloroform)</td>
<td>2903.19.10</td>
</tr>
<tr>
<td><strong>Annex C, Group I (HCFCs)</strong></td>
<td></td>
</tr>
<tr>
<td>HCFC-22</td>
<td>2903.49.10</td>
</tr>
<tr>
<td>HCFC-123</td>
<td>2903.49.10</td>
</tr>
<tr>
<td>HCFC-141, 141b</td>
<td>2903.49.10</td>
</tr>
<tr>
<td>HCFC-142, 142b</td>
<td>2903.49.10</td>
</tr>
<tr>
<td>HCFC-225, 225ca, 225cb</td>
<td>2903.49.10</td>
</tr>
<tr>
<td><strong>Annex C, Group II (HBFCs)</strong></td>
<td></td>
</tr>
<tr>
<td>All Hydrobromofluorocarbons</td>
<td>2903.49.30</td>
</tr>
<tr>
<td><strong>Annex C, Group III</strong></td>
<td></td>
</tr>
<tr>
<td>Bromochloromethane</td>
<td>2903.49.80</td>
</tr>
<tr>
<td><strong>Annex E, Group I</strong></td>
<td></td>
</tr>
<tr>
<td>Methyl bromide</td>
<td>2903.30.33</td>
</tr>
<tr>
<td>Smuggling methods</td>
<td>Number of seizures</td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Front door smuggling</td>
<td>15</td>
</tr>
<tr>
<td>False labelling</td>
<td>7</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Misdeclaration</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Fake recycled or reclaimed</td>
<td>4</td>
</tr>
<tr>
<td>Concealment</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Transhipment fraud</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
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Table 9.8: Compilation of China-related seizures of illegal ODS

<table>
<thead>
<tr>
<th>Order</th>
<th>Reporting country</th>
<th>Date of seizure</th>
<th>Substance traded*</th>
<th>Volume (kg)</th>
<th>Volume (in non-standard units)</th>
<th>Implied source</th>
<th>Implied destination</th>
<th>Smuggling methods</th>
<th>Information source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Malaysia</td>
<td>2000</td>
<td>CFC-12</td>
<td>Not indic.</td>
<td>4,600 cylinders</td>
<td>China</td>
<td>Malaysia</td>
<td>Mislabelling</td>
<td>Clark, 2007a: 2</td>
</tr>
<tr>
<td>2</td>
<td>Japan</td>
<td>Jul/2001</td>
<td>CFC-12</td>
<td>11,745</td>
<td>39,150 cans (300g/each)</td>
<td>China</td>
<td>Japan</td>
<td>Misdeclared as HFC-134a</td>
<td>UNEP/OzL.Pro.15/INF/6 2003, 2</td>
</tr>
<tr>
<td>3</td>
<td>Japan</td>
<td>Jul/2001</td>
<td>CFC-12</td>
<td>123,300</td>
<td>411,000 cans (300g/each)</td>
<td>China</td>
<td>Japan</td>
<td>Misdeclared as HFC-134a</td>
<td>UNEP/OzL.Pro.15/INF/6 2003, 2</td>
</tr>
<tr>
<td>4</td>
<td>Japan</td>
<td>Jul/2001</td>
<td>CFC-12</td>
<td>11,160</td>
<td>35,999 cans (310g/each)</td>
<td>China</td>
<td>Japan</td>
<td>Misdeclared as HFC-134a</td>
<td>UNEP/OzL.Pro.15/INF/6 2003, 2</td>
</tr>
<tr>
<td>5</td>
<td>Japan</td>
<td>Jul/2001</td>
<td>CFC-12</td>
<td>31,112</td>
<td>103,705 cans (300g/each)</td>
<td>China</td>
<td>Japan</td>
<td>Not indicated</td>
<td>UNEP/OzL.Pro.16/7, 2004, 2</td>
</tr>
<tr>
<td>6</td>
<td>Japan</td>
<td>3/Oct/2002</td>
<td>CFC-12</td>
<td>4,536</td>
<td>18,142 cylinders (250g/each)</td>
<td>China</td>
<td>Japan</td>
<td>Double layering; misdeclared as antifreeze</td>
<td>UNEP/OzL.Pro.16/7 2004, 2; UNEP 2013b, 53</td>
</tr>
<tr>
<td>7</td>
<td>Japan</td>
<td>Jun/2002</td>
<td>CFC-12</td>
<td>2,871</td>
<td>11,483 cans (250g/each)</td>
<td>HK</td>
<td>Japan</td>
<td>Misdeclared as HFC-134a</td>
<td>UNEP/OzL.Pro.15/INF/6 2003, 2</td>
</tr>
<tr>
<td>8</td>
<td>Japan</td>
<td>Jun/2002</td>
<td>CFC-12</td>
<td>2,708</td>
<td>10,830 cans (250g/each)</td>
<td>HK</td>
<td>Japan</td>
<td>Misdeclared as HFC-134a</td>
<td>UNEP/OzL.Pro.15/INF/6 2003, 2</td>
</tr>
<tr>
<td>9</td>
<td>Japan</td>
<td>Oct/2002</td>
<td>CFC-12</td>
<td>4,536</td>
<td>18,142 cans (250g/each)</td>
<td>China</td>
<td>Japan</td>
<td>Misdeclared as ethylene glycol</td>
<td>UNEP/OzL.Pro.16/7 2004, 2</td>
</tr>
<tr>
<td>10</td>
<td>Philippines</td>
<td>May/2003</td>
<td>CFC-12</td>
<td>539</td>
<td>454 cylinders (13.6kg/each)</td>
<td>China</td>
<td>Philippines</td>
<td>Misdeclared as HFC-134a</td>
<td>UNEP/OzL.Pro.16/7 2004, 2</td>
</tr>
<tr>
<td>11</td>
<td>Philippines</td>
<td>May/2003</td>
<td>CFC-12</td>
<td>15,504</td>
<td>1,140 cylinders (13.5kg/each)</td>
<td>China</td>
<td>Philippines</td>
<td>Mislabelled as HFC-134a</td>
<td>UNEP/OzL.Pro.15/INF/6 2003, 3</td>
</tr>
<tr>
<td>12</td>
<td>Philippines</td>
<td>Jun/2003</td>
<td>CFC-12</td>
<td>28,000</td>
<td>2,076 cylinders (13.6kg/each)</td>
<td>China</td>
<td>Philippines</td>
<td>Double layering</td>
<td>UNEP/OzL.Pro.16/7 2004, 2</td>
</tr>
<tr>
<td>13</td>
<td>Sri Lanka</td>
<td>Apr/2003</td>
<td>CFC-12</td>
<td>Not indic.</td>
<td>200 cylinders</td>
<td>China</td>
<td>Sri Lanka</td>
<td>Misdeclared as HFC-134a</td>
<td>UNEP/OzL.Pro.16/INF/7 2004, 2</td>
</tr>
<tr>
<td>Order</td>
<td>Reporting country</td>
<td>Date of seizure</td>
<td>Substance traded</td>
<td>Volume (kg)</td>
<td>Volume (in non-standard units)</td>
<td>Implied source</td>
<td>Implied destination</td>
<td>Smuggling methods</td>
<td>Information source</td>
</tr>
<tr>
<td>-------</td>
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<td>----------------</td>
<td>-------------------</td>
<td>------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>14</td>
<td>Indonesia</td>
<td>2004</td>
<td>CFCs</td>
<td>Not indic.</td>
<td>2 containers</td>
<td>China</td>
<td>Indonesia</td>
<td>Not indicated</td>
<td>Clark 2007a, 3</td>
</tr>
<tr>
<td>15</td>
<td>India</td>
<td>2004</td>
<td>CFC-12</td>
<td>Not indic.</td>
<td>160 cylinders</td>
<td>China</td>
<td>India</td>
<td>Hidden beneath plywood</td>
<td>Clark 2007a, 3</td>
</tr>
<tr>
<td>16</td>
<td>China</td>
<td>Jan/2005</td>
<td>HCFC-123</td>
<td>2,500</td>
<td>Not indicated</td>
<td>China</td>
<td>Not indicated</td>
<td>Misdeclaration</td>
<td>Liu and Bagai 2007, 16</td>
</tr>
<tr>
<td>17</td>
<td>China</td>
<td>Jun/2005</td>
<td>Methyl bromide</td>
<td>27,472</td>
<td>2,020 cylinders (13.6kg/each)</td>
<td>China</td>
<td>Not indicated</td>
<td>Misdeclaration</td>
<td>Liu and Bagai 2007, 17</td>
</tr>
<tr>
<td>18</td>
<td>China</td>
<td>15/Mar/2006</td>
<td>CFC-12</td>
<td>14,416</td>
<td>1,060 cylinders (13.6kg/each)</td>
<td>China</td>
<td>Not indicated</td>
<td>Misdeclared as aluminium</td>
<td>Liu and Bagai 2007, 17</td>
</tr>
<tr>
<td>19</td>
<td>Argentina</td>
<td>Mar/2006</td>
<td>HCFC-22</td>
<td>500</td>
<td>Not indicated</td>
<td>China</td>
<td>Argentina</td>
<td>Misdeclared as HFCs</td>
<td>UNEP/OzL.Pro.18/INF/6 2006, 2; EIA 2011, 26–7</td>
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<tr>
<td>20</td>
<td>China</td>
<td>15/Apr/2006</td>
<td>CFC-12</td>
<td>1,840</td>
<td>200 cylinders (9.2kg/each)</td>
<td>China</td>
<td>Not indicated</td>
<td>Misdeclared as plastic racks, mail trousers</td>
<td>Liu and Bagai 2007, 17</td>
</tr>
<tr>
<td>21</td>
<td>China</td>
<td>8/Jun/2006</td>
<td>CFC-11</td>
<td>Not indic.</td>
<td>200 cylinders</td>
<td>China</td>
<td>Not indicated</td>
<td>Misdeclared as &quot;mist lamps, cartons&quot;</td>
<td>Liu and Bagai 2007, 17</td>
</tr>
<tr>
<td>22</td>
<td>China</td>
<td>13/Sep/2006</td>
<td>CFC-12</td>
<td>752</td>
<td>Not indicated</td>
<td>China</td>
<td>Not indicated</td>
<td>Mixed with glass products</td>
<td>Liu and Bagai 2007, 17</td>
</tr>
<tr>
<td>23</td>
<td>China</td>
<td>27/Nov/2006</td>
<td>CFC-12</td>
<td>7,480</td>
<td>Not indicated</td>
<td>China</td>
<td>Not indicated</td>
<td>Not indicated</td>
<td>Liu and Bagai 2007, 37</td>
</tr>
<tr>
<td>24</td>
<td>Kyrgyzstan</td>
<td>2007</td>
<td>Halon-1211</td>
<td>467</td>
<td>2,400 car fire extinguishers</td>
<td>South Korea</td>
<td>Kyrgyzstan</td>
<td>Transiting China</td>
<td>Miller and Batchelor 2009, 48</td>
</tr>
<tr>
<td>25</td>
<td>Kyrgyzstan</td>
<td>2007</td>
<td>R12, R22 CE</td>
<td>Not indic.</td>
<td>27 fridges; 6 showcase refrigerator</td>
<td>South Korea</td>
<td>Kyrgyzstan</td>
<td>Transiting China</td>
<td>Miller and Batchelor 2009, 48</td>
</tr>
<tr>
<td>26</td>
<td>Kyrgyzstan</td>
<td>2007</td>
<td>CFC CE</td>
<td>Not indic.</td>
<td>110 freezers</td>
<td>China</td>
<td>Kyrgyzstan</td>
<td>Not indicated</td>
<td>Miller and Batchelor 2009, 48</td>
</tr>
<tr>
<td>27</td>
<td>Uzbekistan</td>
<td>2007</td>
<td>CFCs</td>
<td>Not indic.</td>
<td>72 litres</td>
<td>China</td>
<td>Uzbekistan</td>
<td>Not indicated</td>
<td>Miller and Batchelor 2009, 49</td>
</tr>
<tr>
<td>28</td>
<td>Uzbekistan</td>
<td>2007</td>
<td>CFCs</td>
<td>Not indic.</td>
<td>24 cylinders</td>
<td>China</td>
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<td>Miller and Batchelor 2009, 49</td>
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<td>Order</td>
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<td>Volume (kg)</td>
<td>Volume (in non-standard units)</td>
<td>Implied source</td>
<td>Implied destination</td>
<td>Smuggling methods</td>
<td>Information source</td>
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</tr>
<tr>
<td>29</td>
<td>Uzbekistan</td>
<td>2007</td>
<td>Unknown ODS</td>
<td>408</td>
<td>Not indic.</td>
<td>Unknown number of ODS containers</td>
<td>China</td>
<td>Uzbekistan</td>
<td>Hidden in vehicle</td>
</tr>
<tr>
<td>30</td>
<td>Russia</td>
<td>2007</td>
<td>CFCs</td>
<td>4,080</td>
<td>Not indic.</td>
<td>300 cylinders (13.6kg/each)</td>
<td>China</td>
<td>Russia</td>
<td>Not indicated</td>
</tr>
<tr>
<td>31</td>
<td>Russia</td>
<td>2007</td>
<td>CFC-113</td>
<td>43,680</td>
<td>Not indic.</td>
<td>160 barrels</td>
<td>China</td>
<td>Russia</td>
<td>False declaration</td>
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<tr>
<td>32</td>
<td>Seychelles</td>
<td>2007</td>
<td>R11, R12 CE</td>
<td>268,200</td>
<td>Not indic.</td>
<td>88 refrigerators and chillers</td>
<td>China</td>
<td>Seychelles</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>South Korea</td>
<td>2008</td>
<td>CFC-11</td>
<td>73,400</td>
<td>Not indicated</td>
<td>South Korea</td>
<td>Russia</td>
<td>Transiting China; virgin mislabelled as recycled</td>
<td>UNEP DTIE OzonAction 2012, 6</td>
</tr>
<tr>
<td>34</td>
<td>Russia</td>
<td>2008</td>
<td>CFC-112</td>
<td>268,200</td>
<td>Not indicated</td>
<td>Not indicated</td>
<td>China</td>
<td>Russia</td>
<td>Virgin mislabelled as recycled</td>
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<td>35</td>
<td>Kyrgyzstan</td>
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<td>CFC CE</td>
<td>8</td>
<td>Not indic.</td>
<td>8 refrigerators</td>
<td>South Korea</td>
<td>Kyrgyzstan</td>
<td>Transiting China</td>
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<td>36</td>
<td>Uzbekistan</td>
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<td>408</td>
<td>Not indic.</td>
<td>30 cylinders (13.6kg/each)</td>
<td>China</td>
<td>Uzbekistan</td>
<td>Transiting Kyrgyzstan; hidden in coach luggage compartment</td>
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<td>37</td>
<td>Uzbekistan</td>
<td>2008</td>
<td>Unknown ODS</td>
<td>54</td>
<td>Not indic.</td>
<td>4 cylinders (13.6kg/each)</td>
<td>China</td>
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</tr>
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<td>38</td>
<td>Uzbekistan</td>
<td>2008</td>
<td>Unknown ODS</td>
<td>27</td>
<td>Not indic.</td>
<td>1 piece of AC unit</td>
<td>China</td>
<td>Uzbekistan</td>
<td>Not indicated</td>
</tr>
<tr>
<td>39</td>
<td>Uzbekistan</td>
<td>2008</td>
<td>Unknown ODS</td>
<td>27</td>
<td>Not indic.</td>
<td>2 cylinders (13.6kg/each)</td>
<td>China</td>
<td>Uzbekistan</td>
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<tr>
<td>40</td>
<td>Uzbekistan</td>
<td>2008</td>
<td>Unknown ODS</td>
<td>12</td>
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<td>12 cylinders</td>
<td>China</td>
<td>Uzbekistan</td>
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<td>41</td>
<td>Uzbekistan</td>
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<td>91</td>
<td>Not indic.</td>
<td>25 refrigerators plus 4 cylinders</td>
<td>China</td>
<td>Tajikistan</td>
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<td>48</td>
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<td>48 cylinders</td>
<td>China</td>
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<td>Date of seizure</td>
<td>Substance traded</td>
<td>Volume (kg)</td>
<td>Volume (in non-standard units)</td>
<td>Implied source</td>
<td>Implied destination</td>
<td>Smuggling methods</td>
<td>Information source</td>
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<td>Uzbekistan</td>
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<td>Unknown ODS</td>
<td>163</td>
<td>12 cylinders (13.6kg/each)</td>
<td>China</td>
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<td>14</td>
<td>Not indicated</td>
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<td>Uzbekistan</td>
<td>Transiting Kyrgyzstan</td>
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<td>45</td>
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<td>2008</td>
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<td>122</td>
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<td>China</td>
<td>Uzbekistan</td>
<td>Transiting Kyrgyzstan</td>
<td>Miller and Batchelor 2009, 50</td>
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<td>6 cylinders (13.6kg/each)</td>
<td>China</td>
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<td>Miller and Batchelor 2009, 50</td>
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<td>27 cylinders (13.6kg/each)</td>
<td>China</td>
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<td>Transiting Kyrgyzstan</td>
<td>Miller and Batchelor 2009, 50</td>
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<td>49</td>
<td>Russia</td>
<td>2009</td>
<td>CFC-12</td>
<td>266,100</td>
<td>Not indicated</td>
<td>China</td>
<td>Russia</td>
<td>Virgin mislabelled as recycled</td>
<td>EIA 2011, 26–27</td>
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<td>50</td>
<td>HK</td>
<td>2/Sep/2009</td>
<td>CFC-12</td>
<td>1,600</td>
<td>100 cylinders</td>
<td>Unknown</td>
<td>Not indicated</td>
<td>Not indicated</td>
<td>Koeppen 2011</td>
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<td>51</td>
<td>Uzbekistan</td>
<td>2010</td>
<td>CFC-12; HCFC-22</td>
<td>120</td>
<td>36 cylinders</td>
<td>China</td>
<td>Uzbekistan</td>
<td>Not indicated</td>
<td>EIA 2011, 26–27</td>
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<td>Uzbekistan</td>
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<td>CFC-12; HCFC-22</td>
<td>1,150</td>
<td>1,150 cylinders (13.6kg/each)</td>
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<td>India</td>
<td>Mislabeled as R-134a</td>
<td>INTERPOL and UNEP 2013, 25</td>
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<td>53</td>
<td>India</td>
<td>2010</td>
<td>CFC-12; HCFC-22</td>
<td>13 refrigerators</td>
<td>2 AC units; 22 freezers, 2 refrigerators</td>
<td>China</td>
<td>Uzbekistan</td>
<td>Not indicated</td>
<td>EIA 2011, 28</td>
</tr>
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<td>Uzbekistan</td>
<td>2010</td>
<td>CFCs</td>
<td>7 cylinders R12; 50 cylinders R600</td>
<td>China</td>
<td>Uzbekistan</td>
<td>Not indicated</td>
<td>UNEP/OzL.Pro.22/INF/4 2010, 2</td>
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<td>Uzbekistan</td>
<td>28/Jan/2010</td>
<td>CFC-12</td>
<td>7 cylinders R12; 50 cylinders R600</td>
<td>China</td>
<td>Uzbekistan</td>
<td>Not indicated</td>
<td>UNEP/OzL.Pro.22/INF/4 2010, 2</td>
<td></td>
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<tr>
<td>Order</td>
<td>Reporting country</td>
<td>Date of seizure</td>
<td>Substance traded</td>
<td>Volume (kg)</td>
<td>Volume (in non-standard units)</td>
<td>Implied source</td>
<td>Implied destination</td>
<td>Smuggling methods</td>
<td>Information source</td>
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<tr>
<td>57</td>
<td>Uzbekistan</td>
<td>Jan/2010</td>
<td>CFC-12</td>
<td>Not indic.</td>
<td>70 cylinders</td>
<td>China</td>
<td>Uzbekistan</td>
<td>Not indicated</td>
<td>UNEP DTIE OzonAction 2012, 6</td>
</tr>
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<td>58</td>
<td>Uzbekistan</td>
<td>10/Jan/2010</td>
<td>HCFC-22</td>
<td>Not indic.</td>
<td>2 refri.; 2 AC units</td>
<td>China</td>
<td>Uzbekistan</td>
<td>Not indicated</td>
<td>UNEP/OzL.Pro.22/INF/4 2010, 2</td>
</tr>
<tr>
<td>59</td>
<td>Uzbekistan</td>
<td>6/Jul/2010</td>
<td>R134a, R12</td>
<td>36</td>
<td>Not indicated</td>
<td>China</td>
<td>Uzbekistan</td>
<td>Hidden in the car boot</td>
<td>UNEP/OzL.Pro.22/INF/4 2010, 2</td>
</tr>
<tr>
<td>60</td>
<td>Kazakhstan</td>
<td>Apr/2010</td>
<td>CFC-12</td>
<td>Not indic.</td>
<td>1 compressor; 10 refrigerant cylinders</td>
<td>China</td>
<td>Kazakhstan</td>
<td>Hidden in personal luggage</td>
<td>UNEP DTIE OzonAction 2012, 5</td>
</tr>
<tr>
<td>61</td>
<td>Russia</td>
<td>Jun-Nov/2010</td>
<td>CFC-12</td>
<td>26,000</td>
<td>26 containers (1 metric tonnes/each)</td>
<td>China</td>
<td>Poland</td>
<td>Misdeclared as recycled</td>
<td>INTERPOL and UNEP 2013, 29–30; UNEP DTIE OzonAction 2012, 6</td>
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<tr>
<td>62</td>
<td>Kenya</td>
<td>May/2010</td>
<td>CFCs</td>
<td>2,000</td>
<td>Not indicated</td>
<td>China</td>
<td>Kenya</td>
<td>Not indicated</td>
<td>Grabiel et al. 2013, 14</td>
</tr>
<tr>
<td>63</td>
<td>China</td>
<td>25/June/2010</td>
<td>CFC-12</td>
<td>15,000</td>
<td>1,140 cylinders (13.6 kg/each)</td>
<td>China</td>
<td>Not indicated</td>
<td>Not indicated</td>
<td>Koeppen, 2011</td>
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<tr>
<td>64</td>
<td>Taiwan</td>
<td>Jan-Aug/2010</td>
<td>CFC-12; HCFC-22</td>
<td>41,476</td>
<td>Not indicated</td>
<td>China</td>
<td>Taiwan</td>
<td>Hidden in secret cabins; misdeclaring as R-134a</td>
<td>Ozone Layer Protection in Taiwan Epaper. Vol.19, Aug. 18, 2010.</td>
</tr>
<tr>
<td>65</td>
<td>Kyrgyzstan</td>
<td>11/June/2011</td>
<td>CFC-12; HCFC-22</td>
<td>50</td>
<td>Not indicated</td>
<td>China</td>
<td>Uzbekistan</td>
<td>Transiting Kyrgyzstan; hidden in luggage</td>
<td>INTERPOL and UNEP 2013, 31; UNEP DTIE OzonAction 2012, 7</td>
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<td>68</td>
<td>Kyrgyzstan</td>
<td>6/Aug/2011</td>
<td>HCFC-22 CE</td>
<td>Not indic.</td>
<td>71 refrigerators</td>
<td>China</td>
<td>Uzbekistan</td>
<td>Transiting Kyrgyzstan; without import permission</td>
<td>UNEP DTIE OzonAction 2012, 7</td>
</tr>
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<td>69</td>
<td>HK</td>
<td>15/Nov/2011</td>
<td>CFC-12</td>
<td>6,800</td>
<td>Not indicated</td>
<td>China</td>
<td>Thailand</td>
<td>Misdeclared as ‘bathtub and handicrafts’</td>
<td>Dorji 2013; Koeppen 2011</td>
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<tr>
<td>Order</td>
<td>Reporting country</td>
<td>Date of seizure</td>
<td>Substance traded</td>
<td>Volume (kg)</td>
<td>Volume (in non-standard units)</td>
<td>Implied source</td>
<td>Implied destination</td>
<td>Smuggling methods</td>
<td>Information source</td>
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<td>70</td>
<td>Canada</td>
<td>Feb/2011</td>
<td>HCFC-22</td>
<td>Not indic.</td>
<td>600 cylinders</td>
<td>China</td>
<td>Canada</td>
<td>Misdeclared as R-134a</td>
<td>INTERPOL and UNEP 2013, 29; UNEP DTIE OzonAction 2012, 6</td>
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<td>71</td>
<td>Spain</td>
<td>Feb-Dec/2012</td>
<td>HCFC-22</td>
<td>150,000</td>
<td>Not indicated</td>
<td>China</td>
<td>Spain</td>
<td>Not indicated</td>
<td>ARC News Dec. 17, 2012; UNEP DTIE OzonAction, 2014b, 9–10</td>
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<tr>
<td>72</td>
<td>Russia</td>
<td>Feb/2012</td>
<td>R12; R113; R141b</td>
<td>19,090</td>
<td>1,150 cylinders</td>
<td>China</td>
<td>Russia</td>
<td>Misdeclared as R134a</td>
<td>INTERPOL and UNEP 2013, 29; Hong et al. 2013, 22</td>
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<td>73</td>
<td>China</td>
<td>16/Nov/2012</td>
<td>HCFC-22</td>
<td>11,560</td>
<td>850 cylinders (13.6kg/each)</td>
<td>China</td>
<td>Netherlands</td>
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<tr>
<td>74</td>
<td>Russia</td>
<td>Aug/2013</td>
<td>R22 CE</td>
<td>Not indic.</td>
<td>130 AC R22 split systems</td>
<td>China</td>
<td>Russia</td>
<td>Mislabeled as R410a units</td>
<td>EIA 2013, 12</td>
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<td>75</td>
<td>Cyprus</td>
<td>11/Oct/2013</td>
<td>R22 CE</td>
<td>Not indic.</td>
<td>2 AC units containing R22</td>
<td>China</td>
<td>Cyprus</td>
<td>Mislabeled as R410</td>
<td>UNEP DTIE OzonAction 2014b, 11</td>
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<td>76</td>
<td>India</td>
<td>1/Mar/2013</td>
<td>HCFC-22</td>
<td>182,902</td>
<td>5 ISO tanks</td>
<td>China</td>
<td>India</td>
<td>Re-export tricks</td>
<td>UNEP DTIE OzonAction 2014b, 5</td>
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<td>77</td>
<td>India</td>
<td>25/Jul/2013</td>
<td>HCFC-22</td>
<td>14,960</td>
<td>1,100 cylinders (13.6kg/each)</td>
<td>China</td>
<td>India</td>
<td>Hidden between furniture works</td>
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<td>78</td>
<td>India</td>
<td>23/May/2013</td>
<td>HCFC-22</td>
<td>9,547</td>
<td>702 cylinders (13.6kg/each)</td>
<td>China</td>
<td>India</td>
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<td>India</td>
<td>6/Jun/2013</td>
<td>HCFC-22</td>
<td>8,106</td>
<td>596 cylinders (13.6kg/each)</td>
<td>China</td>
<td>India</td>
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<td>India</td>
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<td>5,494</td>
<td>404 cylinders (13.6kg/each)</td>
<td>China</td>
<td>India</td>
<td>Hidden between declared goods</td>
<td>UNEP DTIE OzonAction 2014b, 6</td>
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<td>81</td>
<td>China</td>
<td>2013</td>
<td>CFC-12</td>
<td>2,079</td>
<td>184 cylinders (11.3kg/each)</td>
<td>China</td>
<td>South Africa</td>
<td>Mislabeled and misdeclared as R410a</td>
<td>UNEP DTIE OzonAction 2014b, 8</td>
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<td>Tajikistan</td>
<td>17/Jan/2013</td>
<td>HCFC-22</td>
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<td>7 cylinders (13.6kg/each)</td>
<td>China</td>
<td>Tajikistan</td>
<td>Hidden in sealed ivory</td>
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<td>83</td>
<td>Russia</td>
<td>Jan/2014</td>
<td>R11, R12, R22, R141b</td>
<td>34,440</td>
<td>1,500 cylinders</td>
<td>China</td>
<td>Russia</td>
<td>Misdec. as ethylene-glycol and R134a</td>
<td>UNEP DTIE OzonAction 2014b, 7</td>
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<tr>
<td>Order</td>
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<td>Date of seizure</td>
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<td>Volume (kg)</td>
<td>Volume (in non-standard units)</td>
<td>Implied source</td>
<td>Implied destination</td>
<td>Smuggling methods</td>
<td>Information source</td>
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<td>84</td>
<td>Russia</td>
<td>Apr./2014</td>
<td>R22, R141b</td>
<td>25,850</td>
<td>1,660 cylinders</td>
<td>China</td>
<td>Russia</td>
<td>Misdeclared as R134a and R404a</td>
<td>UNEP DTIE OzonAction 2014b, 7–8</td>
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<td>Taiwan</td>
<td>1999-2004</td>
<td>Halon-1211 CE</td>
<td>51</td>
<td>not indicated</td>
<td>Not indicated</td>
<td>Taiwan</td>
<td>Illegal import; from 6 independent seizures</td>
<td>Ozone Layer Protection in Taiwan Epaper Vol.5, Jan.1, 2004</td>
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</table>

* “CE” is the abbreviation for “containing equipment”. “CFC-12 CE” denotes CFC-12 containing equipment.
Table 9.9: China’s nationwide wildlife law enforcement special operations during 1999–2016

<table>
<thead>
<tr>
<th>Time frame</th>
<th>Operation codename</th>
<th>Main results</th>
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<tr>
<td>10–30 Apr. 1999</td>
<td>Kekexili No.1 Operation</td>
<td>17 poaching networks dismantled; 66 arrests; seizures included 1,658 Tibetan antelope pelts, 545 antelopes, 28 heads and 4 pelts of wild yak</td>
</tr>
<tr>
<td>15–29 Jan. 2000</td>
<td>Southern No.2 Operation</td>
<td>Over 500,000 enforcement officers mobilised; 264 criminal cases cleaned up, 8,370 marketplaces inspected; seizures included over 40,000 wild animals, 28,000 kg of wildlife products, 1,652 wildlife pelts</td>
</tr>
<tr>
<td>21 Nov.–24 Dec. 2001</td>
<td>Eagle Hunting Operation</td>
<td>27,000 hotels and restaurants and 6,000 wildlife marketplaces inspected; 4,147 criminal cases uncovered; seizures included 620,000 live wild animals and 65,205 kg of wildlife products</td>
</tr>
<tr>
<td>17–26 Dec. 2002</td>
<td>Migratory Birds Operation</td>
<td>16,385 hotels and restaurants and 3,374 marketplaces inspected; 1,829 wildlife administrative cases dealt with; 52 wildlife criminal cases uncovered; 318 arrests; seizures included 10,000 live birds and 9,403 kg of bird products</td>
</tr>
<tr>
<td>10–19 Apr. 2003</td>
<td>Spring Thunder Operation</td>
<td>170,000 enforcement officers mobilised; 80,000 hotels, restaurants and peddlars market inspected; 9,179 wildlife cases solved; 9,521 fined, detained or arrested; seizures included 938,501 wild animals (including 45,515 wild animals under SSP) and 30,000 kg of wildlife products</td>
</tr>
<tr>
<td>21 May–17 Sept. 2007</td>
<td>Green-Shield No.2 Operation</td>
<td>970,000 enforcement officers mobilised; 1,316 nature reserves, 1,244 forest parks, 4,147 State-owned forest stations and 48,625 wood processing workshops inspected; 110,000 cm³ wood products seized; 65,165 cases dealt with, involving 67,363 persons, including a large-scale seizure in Yangjiang Guangdong that involved 5,371 Asian water monitor (Varanus salvator, Class-I SSP), 30 pangolins, 21 bear paws, and 3,283 tortoises and turtles</td>
</tr>
<tr>
<td>Early 2012</td>
<td>Forest Police Operation</td>
<td>Over 700 wildlife cases uncovered, involving 1,031 offenders; 13 wildlife criminal networks dismantled; 7,155 illegal wildlife stalls and 628 illegal online wildlife shops being shut down; 520 websites involved in selling illegal wildlife closely monitored; seizures included 130,000 wild animals, 2,000 wildlife products and 147 wild animal skins</td>
</tr>
<tr>
<td>Early 2012</td>
<td>Shield of Country Gate Operation</td>
<td>13 arrests; 21 smuggling networks dismantled; seizures included 337,400 kg of red sandal wood, 30,000 kg of yew timber, 1,367 kg of ivory and 876 horns of Saiga antelope</td>
</tr>
<tr>
<td>1–30 Apr. 2013</td>
<td>2013 Skynet Operation</td>
<td>80,000 enforcement officers mobilised; 6,020 antique and flower-bird marketplaces inspected, 186 websites believed to involve in illegal trade requested to be rectified; 5,784 illegal wildlife stalls being shut down, 328 licensed trading sites being suspended; 679 wildlife cases dealt with; 100,000 wild animals seized, valued at CN¥7.9 million</td>
</tr>
<tr>
<td>1 Apr.–30 Jun. 2014</td>
<td>2014 Skynet Operation</td>
<td>55,900 forest police mobilised; 3,498 antique and flower-bird marketplaces inspected; 280 licensed business entities producing or selling wildlife products being suspended; 3,571 illegal wildlife stalls being shut down; 137 websites implicated in illegal sale being closely monitored; 93,400 wild animals seized, valued at over CN¥5.3 million</td>
</tr>
<tr>
<td>Time frame</td>
<td>Operation codename</td>
<td>Main results</td>
</tr>
<tr>
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</tr>
<tr>
<td>1 Sept.–30 Nov. 2015</td>
<td>Thunder Operation</td>
<td>250,000 forest police mobilized; 35,000 wildlife cases uncovered, involving 39,000 offenders; 78 wildlife-related criminal networks being dismantled; seizures included 56,000 m³ of illegal wood, 130,000 wild animals, total value amounted to CN¥130 million</td>
</tr>
<tr>
<td>20 Apr.–20 May 2016</td>
<td>Spring Operation</td>
<td>342 wildlife criminal cases dealt with, 507 arrests; seizures include 85,000 wild animals and 2,268 wildlife products, valued at around CN¥47 million</td>
</tr>
</tbody>
</table>

**Source:**
<table>
<thead>
<tr>
<th>Year of EIF</th>
<th>Authority of issuance</th>
<th>Title</th>
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<tbody>
<tr>
<td><strong>National laws</strong></td>
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<td></td>
</tr>
<tr>
<td>1997</td>
<td>NPC</td>
<td>Criminal Law</td>
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<tr>
<td><strong>Major regulations</strong></td>
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<tr>
<td>1989</td>
<td>MOA and SFA</td>
<td>List of Wildlife under Special state protection (MOA and SFA 1989 Order No.1)</td>
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<tr>
<td>1991</td>
<td>SFA</td>
<td>Measures for the Management of Licensing for Domestication and Captive Breeding of Wildlife under Special state protection</td>
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<tr>
<td>1993</td>
<td>State Council</td>
<td>Circular on the Ban of Trade in Rhino Horn and Tiger Bone (State Council [1993] 39)</td>
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<tr>
<td>1993</td>
<td>SFA</td>
<td>Circular on the Approval of Incorporating Portion of the CITES-listed Wild Faunas into the ‘List of Wildlife under Special state protection (SFA [1993] 48)</td>
</tr>
<tr>
<td>1993</td>
<td>Ministry of Health</td>
<td>Circular on Changing the Ingredients and Names of Traditional Chinese Medicines containing Rhino Horn or Tiger Bone (Ministry of Health [1993] 59)</td>
</tr>
<tr>
<td>2003</td>
<td>SFA</td>
<td>Adjustment to the List of Wildlife under Special state protection (SFA Order 2003 No.7)</td>
</tr>
<tr>
<td>2003</td>
<td>SFA and SAIC</td>
<td>Circular on Straightening out the Manufacturing and Processing Businesses Utilising Wildlife and Their Products and Launching the Pilot Marking Scheme (SFA [2003] 3)</td>
</tr>
<tr>
<td>2003</td>
<td>SFA</td>
<td>Emergent Circular on Imposing Stringent Control over Trade, Utilisation, Domestication and Captive Breeding of Wildlife (SARS) (SFA [2003] 34)</td>
</tr>
<tr>
<td>2003</td>
<td>SFA and other 11 ministerial authorities</td>
<td>Circular on the Need to Adapt to New Situations and Strengthen the Work on Prohibiting Illegal Hunting, Catching and Trade of Terrestrial Wildlife (SFA [2003] 99)</td>
</tr>
<tr>
<td>2004</td>
<td>SFA, Ministry of Health, SAIC, SFDA, and SATCM</td>
<td>Circular on Further Strengthening the Conservation of Musk Deer and Bear Resources and Management of Medicines Containing Ingredients of Musk or Bear Body Parts (SFA [2004] 252)</td>
</tr>
<tr>
<td>2005</td>
<td>SFA, SAIC, Ministry of Health, SFDA, and SATCM</td>
<td>Circular on the Pilot Project for the Use of Captive-bred Tiger Bones and Gradual Reduction of the Use of Leopard Bones (SFA [2005] 139)</td>
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### Major regulations

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<tr>
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<th>Authority</th>
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<tr>
<td>2005</td>
<td>SFDA</td>
<td>Regulations on Report and Evaluation of Healthcare Products and Food</td>
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<tr>
<td>2006</td>
<td>SFDA</td>
<td>Circular on Matters concerning the Use of Leopard Bones (SFDA [2006] 118)</td>
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<tr>
<td>2007</td>
<td>SFA, Ministry of Health, SAIC, SFDA, and SATCM</td>
<td>Circular on Strengthening the Conservation of Saiga, Pangolins and Rare Snake Species and Regulation on the Management of Medicines Containing Ingredients of Saiga, Pangolins, or Rare Snake Species (SFA [2007] 242)</td>
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<tr>
<td>2008</td>
<td>SFA</td>
<td>Circular on Further Strengthening the Administration of Ivory Tusks and Products (SFA [2008] 258)</td>
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<tr>
<td>2009</td>
<td>SFA</td>
<td>Circular on Strengthening the Protection and Management of Wild Tigers and stringently Cracking Down on Smuggling and Illegal Trade of Tiger Parts and Products (SFA [2009] 298)</td>
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<tr>
<td>2010</td>
<td>MOHURD</td>
<td>Circular on Opinions on Strengthening Zoo Management (MOHURD [2010] 72)</td>
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<tr>
<td>2012</td>
<td>CAA</td>
<td>Emergent Circular on Prohibition of Illegal Auction of Rhino Horns, Tiger Bones and Elephant Ivory</td>
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<tr>
<td>2016</td>
<td>SFA</td>
<td>Circular on the Abrogation of Some Normative Documents (SFA [2016] 54)</td>
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### Judicial interpretations and opinions

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<tr>
<th>Year</th>
<th>Authority</th>
<th>Interpretation Title</th>
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<tr>
<td>2000</td>
<td>The Supreme People’s Court</td>
<td>Interpretation on the Application of Law for Criminal Cases of Wildlife Resources Destruction</td>
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<tr>
<td>2000</td>
<td>The Supreme People’s Court</td>
<td>Interpretation on the Application of Law for Smuggling Cases</td>
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<td>2001</td>
<td>SFA, Ministry of Public Security</td>
<td>Jurisdiction and Standards for Prosecution of Forestry and Terrestrial Wildlife-related Criminal Cases</td>
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<tr>
<td>2008</td>
<td>The Supreme People’s Prosecurorate</td>
<td>Stipulation on the Standards for Criminal Case Prosecution under the Jurisdiction of Public Security Organs</td>
</tr>
</tbody>
</table>

**Note:** CAA (China Association of Auctioneers); MOA (Ministry of Agriculture); MOHURD (Ministry of Housing and Urban-Rural Development); SAIC (State Administration for Industry and Commerce); SATCM (State Administration of Traditional Chinese Medicine); SFA (State Forestry Administration); SFDA (State Food and Drug Administration); Year of EIF (Year of Entry into Force)
<table>
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<tr>
<th>Year of EIF</th>
<th>Authority of issuance</th>
<th>Title</th>
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<tr>
<td><strong>National Laws</strong></td>
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<tr>
<td>1985</td>
<td>NPC</td>
<td>Forestry Law (amended in 1998)</td>
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<td>1987</td>
<td>NPC</td>
<td>Customs Law (amended in 2013)</td>
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<td>1992</td>
<td>NPC</td>
<td>Law on the Quarantine of Entry and Exit Animal Plant</td>
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<tr>
<td>2002</td>
<td>NPC</td>
<td>Law on the Import and Export Goods Inspection</td>
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<td>2004</td>
<td>NPC</td>
<td>Foreign Trade Law</td>
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<td><strong>Major regulations</strong></td>
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<tr>
<td>2000</td>
<td>State Council</td>
<td>Regulations on the Implementation of the Forestry Law</td>
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<tr>
<td>2002</td>
<td>Ministry of Commerce</td>
<td>Regulations on the Import and Export of Commodity</td>
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<td>2005</td>
<td>State Council</td>
<td>Regulations on the Origin of Import and Export Goods</td>
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<tr>
<td>2005</td>
<td>Ministry of Commerce</td>
<td>Measures for the Administration of Licenses for the Import of Goods</td>
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<td>2006</td>
<td>State Council</td>
<td>Regulations on the Administration of Import and Export of Endangered Wild Fauna and Flora</td>
</tr>
<tr>
<td>2014</td>
<td>SFA and GAC</td>
<td>Measures for the Administration of Import and Export License of Wild Fauna and Flora</td>
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<tr>
<td><strong>Regulations under China Association-guided Timber Verification Scheme (CATVS)</strong></td>
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<td>2012</td>
<td>CNFPIA</td>
<td>China Timber Legality Verification Standard (2012 Trial)</td>
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<td>2012</td>
<td>CNFPIA</td>
<td>Wood Processing Industry Self-disciplinary Pledge to Procure Wood of Legal Origin</td>
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<td>2012</td>
<td>CNFPIA</td>
<td>Detailed Measures for the Implementation of China Timber Legality Verification Standard</td>
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<td>2012</td>
<td>CNFPIA</td>
<td>Measures for the Administration of the Verification Procedures, Markings and Certificates for China Timber Legality (2012 Trial)</td>
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</tbody>
</table>

**Note:** NPC (National People’s Congress); SFA (State Forestry Administration); GAC (General Administration of Customs); CNFPIA (China National Forest Products Industry Association); Year of EIF (Year of Entry into Force)
Table 9.12: List of China’s ODS laws and regulations

<table>
<thead>
<tr>
<th>Year of EIF</th>
<th>Authority of issuance</th>
<th>Title</th>
</tr>
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<tbody>
<tr>
<td></td>
<td><strong>National Laws, Country Programme, and List of controlled ODS</strong></td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>State Council</td>
<td>Country Programme for the Phase-out of Ozone Depleting Substances</td>
</tr>
<tr>
<td>2000</td>
<td>NPC</td>
<td>Air Pollution Prevention and Control Law (amended in 2015) (only Art. 85 has a reference to ODS)</td>
</tr>
<tr>
<td>2010</td>
<td>State Council</td>
<td>Measures for the Administration of Ozone-depleting Substances</td>
</tr>
<tr>
<td>2010</td>
<td>MEP, NDRC, MIIT</td>
<td>Announcement on the List of Controlled ODS (MEP [2010] 72)</td>
</tr>
<tr>
<td></td>
<td><strong>Regulations on the administration of the introduction/expansion of new ODS production facilities</strong></td>
<td></td>
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<tr>
<td>1995</td>
<td>SBPCI</td>
<td>Circular on Strengthening the Administration of the Expansion of CFC Production lines (SBPCI [1995] 340)</td>
</tr>
<tr>
<td>2003</td>
<td>MEP</td>
<td>Circular on the Strict Control of New or the Expansion of CTC Production Facilities (MEP [2003] 28)</td>
</tr>
<tr>
<td>2003</td>
<td>MEP</td>
<td>Circular on the Strict Control of New/Expansion of/Rebuilding of the Production Facilities for 1,1,1-trichloroethane and Methyl Bromide (MEP [2003] 60)</td>
</tr>
<tr>
<td>2006</td>
<td>MEP</td>
<td>Supplementary Circular on the Strict Control of the Introduction or Expansion of New Production Facilities that Consumes Carbon Tetrachloride (MEP [2006] 15)</td>
</tr>
<tr>
<td></td>
<td><strong>Regulations on the quota and licensing control of the production and use of controlled ODS</strong></td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>MEP</td>
<td>Detailed Measures for the Implementation of Quota and Licensing Control of the Production of Halon-based Fire Extinguishers</td>
</tr>
<tr>
<td>1999</td>
<td>MEP</td>
<td>Detailed Measures for the Implementation of Quota and Licensing Control on CFC Production</td>
</tr>
<tr>
<td>2006</td>
<td>MEP</td>
<td>Circular on the Promulgation of the “Measures for the Administration of Licenses for the Production and Consumption of Methyl Chloroform and the Registration of the Sale Methyl Chloroform” (MEP [2006] 21)</td>
</tr>
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</table>
### Regulations on the import and export of controlled ODS

<table>
<thead>
<tr>
<th>Year</th>
<th>Authors</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>1999</td>
<td>MEP, MOC, GAC</td>
<td>Measures for the Administration of ODS Import and Export <em>(repealed in 2014)</em></td>
</tr>
<tr>
<td>2000</td>
<td>MEP, MOC, GAC</td>
<td>Circular on the Release of the “List of Controlled ODS in Import and Export (First Batch)” <em>(MEP [2000] 10)</em></td>
</tr>
<tr>
<td>2000</td>
<td>MEP</td>
<td>Regulations on Strengthening the Administration of the Import and Export of Controlled ODS <em>(repealed in 2014)</em></td>
</tr>
<tr>
<td>2001</td>
<td>MEP, MOC, GAC</td>
<td>Circular on the Release of the “List of Controlled ODS in Import and Export (Second Batch)” <em>(MEP [2001] 6)</em></td>
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<tr>
<td>2001</td>
<td>MEP etc.</td>
<td>Matters Concerning the Control of the Import of Automobiles that are Equipped with CFC-12 Reliant Air Conditioning Systems or Compressors <em>(MEP [2001] 207)</em></td>
</tr>
<tr>
<td>2006</td>
<td>MEP</td>
<td>Circular on the Release of the “List of Controlled ODS in Import and Export (Fourth Batch)” <em>(MEP [2006] 25)</em></td>
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<tr>
<td>2009</td>
<td>MEP, MOC, GAC</td>
<td>Circular on the Release of the “List of Controlled ODS in Import and Export (Fifth Batch)” <em>(MEP [2009] 161)</em></td>
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<tr>
<td>2012</td>
<td>MEP, MOC, GAC</td>
<td>Circular on the Release of the “List of Controlled ODS in Import and Export (Sixth Batch)” <em>(MEP [2012] 78)</em></td>
</tr>
<tr>
<td>2014</td>
<td>MEP, MOC, GAC</td>
<td>Regulations on the Administration of the Import and Export of Controlled ODS</td>
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</table>

### Prohibitive regulations on the production and consumption of controlled ODS

<table>
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<tr>
<th>Year</th>
<th>Authors</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>CMIF</td>
<td>Circular on the Ban of the Use of CFCs in the Manufacturing of New Automobiles <em>(CMIF [1997] 99)</em></td>
</tr>
<tr>
<td>1998</td>
<td>MPS</td>
<td>Circular on the Ban of the Use of Halon-1202 as the Fire Extinguishing Agents <em>(MPS [1998] 30)</em></td>
</tr>
<tr>
<td>1999</td>
<td>MEP and CMIF</td>
<td>Circular on the Ban of the Equipment of CFC-12 Reliant Air Conditioning Units in Newly Produced Automobiles <em>(MEP [1999] 267)</em></td>
</tr>
<tr>
<td>2003</td>
<td>MEP</td>
<td>Announcement on the Ban of the Use of Carbon Tetrachloride as the Cleaning Agents <em>(MEP [2003] 69)</em></td>
</tr>
<tr>
<td>2004</td>
<td>MEP</td>
<td>Announcement on the Ban of the Use of CFC-113 as the Cleaning Agents <em>(MEP [2004] 449)</em></td>
</tr>
<tr>
<td>2004</td>
<td>MEP</td>
<td>Announcement on the Ban of the Production and Sale of Industrial and Commercial Refrigeration Compressor and Related Products that Consume CFCs <em>(MEP [2004] 452)</em></td>
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<tr>
<td>2005</td>
<td>MEP</td>
<td>Announcement on the Ban of the Production and Consumption of CFC-113 <em>(MEP [2005] 60)</em></td>
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<tr>
<td>2006</td>
<td>SAG and MEP</td>
<td>Announcement on the Ban of the Use of Methyl Bromide in Grain Storage Industry <em>(SAG [2006] 4)</em></td>
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<td>Year</td>
<td>Author/Department</td>
<td>Prohibitive regulations on the production and consumption of controlled ODS</td>
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<td>2006</td>
<td>STMD and MEP</td>
<td>Announcement on the Ban of the Use of CFC-11 as the Tobacco Swelling Agents (STMD [2006] 2)</td>
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<tr>
<td>2007</td>
<td>MEP</td>
<td>Announcement on the Nationwide Ban of the Production of CFCs (MEP [2007] 43)</td>
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<td>2007</td>
<td>MEP</td>
<td>Announcement on the Ban of the Use of CFCs as the Foaming Agents (MEP [2007] 45)</td>
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<td>2007</td>
<td>MEP et al.</td>
<td>Announcement on the Ban of the Production, Sale, Import, and Export of Household Appliances that Consume CFCs as the Refrigerants or Foaming Agents (MEP [2007] 200)</td>
</tr>
<tr>
<td>2009</td>
<td>MEP</td>
<td>Announcement on the Ban of the Production and Consumption of TCA (MEP [2009] 39)</td>
</tr>
</tbody>
</table>

**Note:** CMIF (China Machinery Industry Federation); MOC (Ministry of Commerce); MEP (Ministry of Environment Protection); MIIT (Ministry of Industry and Information Technology); MPS (Ministry of Public Security); NDRC (National Development and Reform Commission); SAG (State Administration of Grain); SBPCI (State Bureau of Petroleum and Chemical Industry); STMD (State Tobacco Monopoly Administration); Year of EIF (Year of Entry into Force)