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THE RISE OF ENVIRONMENTAL CRIME

A GROWING THREAT TO NATURAL RESOURCES, PEACE, DEVELOPMENT AND SECURITY

A UNEP-INTERPOL RAPID RESPONSE ASSESSMENT

Nellemann, C. (Editor in Chief); Henriksen, R., Kreilhuber, A., Stewart, D., Kotsovou, M., Raxter, P., Mrema, E., and Barrat, S. (Eds). 2016. ***The Rise of Environmental Crime – A Growing Threat To Natural Resources Peace, Development And Security.*** A UNEP-INTERPOL Rapid Response Assessment. United Nations Environment Programme and RHIPTO Rapid Response–Norwegian Center for Global Analyses, www.rhipto.org

ISBN 978-82-690434-0-2 (print)
ISBN 978-82-690434-1-9 (pdf)

Printed by UNEP

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Editorial Team Christian Nellemann *(Editor in Chief)*
Rune Henriksen
Arnold Kreilhuber
Davyth Stewart
Maria Kotsovou
Patricia Raxter
Elizabeth Mrema
Sam Barrat

Cartography Riccardo Pravettoni
Philippe Rekacewicz (figure 11)
Emmanuelle Bournay (figure 14)

Foreword

The world is being dredged of its natural resources, with much of what we rely on for our livelihoods at risk from a new threat: environmental crime.

The slaughter of elephants and rhinos has raised awareness of the illegal trade in wildlife. We are facing mass extinctions and countries are losing iconic wildlife species. However, the scope and spectrum of this illegal trade has widened. Criminals now include in their trafficking portfolios waste, chemicals, ozone depleting substances, illegally caught seafood, timber and other forest products, as well as conflict minerals, including gold and diamonds.

The growth rate of these crimes is astonishing. The report that follows reveals for the first time that this new area of criminality has diversified and skyrocketed to become the world's fourth largest crime sector in a few decades, growing at 2-3 times the pace of the global economy. INTERPOL and UNEP now estimate that natural resources worth as much as USD 91 billion to USD 258 billion annually are being stolen by criminals, depriving countries of future revenues and development opportunities.

Environmental crime has impacts beyond those posed by regular criminality. It increases the fragility of an already brittle planet. The resulting vast losses to our planet rob future generations of wealth, health and wellbeing on an unprecedented scale. They also compromise our ability to achieve the Sustainable Development Goals.

An additional by-product of environmental crime is that it undermines peace. It is not surprising that the UN Security Council has recognized the serious threat to security posed by environmental crime, with UN reports pointing to armed groups and potentially even terrorists sustained through the spoils of this rising criminal industry.

However, an enhanced law enforcement response can help address this worrying trend. There are significant examples worldwide of cross-sectoral efforts working to crack down on environmental crime and successfully restore wildlife, forests and ecosystems. Such collaboration, sharing and joining of efforts within and across borders, whether formal or informal, is our strongest weapon in fighting environmental crime.

But to meet the scale of this threat, a broad-ranging, targeted effort must be put forward so that peace and sustainable development can prevail.

Mr. Achim Steiner
UN Under-Secretary General and UNEP Executive Director

Mr. Jürgen Stock
INTERPOL Secretary General

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Summary and recommendations

The environment provides the very foundation of sustainable development, our health, food security and our economies. Ecosystems provide clean water supply, clean air and secure food and ultimately both physical and mental wellbeing. Natural resources also provide livelihoods, jobs and revenues to governments that can be used for education, health care, development and sustainable business models. The role of the environment is recognized across the internationally agreed seventeen sustainable development goals adopted in 2015.

However, the environment as the very foundation of sustainable development, peace and security is now at risk. Environmental crime is vastly expanding and increasingly endangering not only wildlife populations but entire ecosystems, sustainable livelihoods and revenue streams to governments. By some estimates, possibly more than a quarter of the world's elephant population has been lost in a decade. However, environmental crimes are no longer restricted to iconic wildlife and rare wood species alone – they have become part and parcel of the larger global network of transnational organized environmental crimes. Environmental crime also include corporate crime in the forestry sector, illegal exploitation and sale of gold and minerals, illegal fisheries/fishing, trafficking in hazardous waste and chemicals and threat finance using wealth generated illegally from natural resources to support non-state armed groups and terrorism.

Although the definition of "environmental crime" is not universally agreed, it is often understood as a collective term to describe illegal activities harming the environment and aimed at benefitting individuals or groups or companies from the exploitation of, damage to, trade or theft of natural resources, including serious crimes and transnational organized crime.

Indeed, the value of the illegal wildlife trade is now dwarfed by the larger crimes against the environment.

- The illegal wildlife trade is by some estimated at 7–23 billion USD per year
- Environmental crime is now estimated to be ca. 91–258 billion USD (2016) annually, a 26% increase from previous estimate in 2014.
- Environmental crimes is rising by 5-7% annually – 2–3 times the rate of the global economy
- Losses of government revenues through lost tax income due to criminal exploitation account for at least 9–26 billion USD annually.
- Forestry crimes including corporate crimes and illegal logging account for an estimated 51–152 billion USD;
- Illegal fisheries an estimated 11–24 billion USD,
- Illegal mining estimated at 12–48 billion USD;
- Waste at 10–12 billion USD.

The wide uncertainty range reflects the lack of criminal statistics in this field, but is based on best sources and criminal intelligence from INTERPOL. The value makes environmental crimes the fourth largest crime in the world after drug trafficking (344 billion USD), counterfeit crimes (288 billion USD) and human trafficking (157 billion USD), by some estimates.

Unlike any other known crime, environmental crimes are aggravated through their additional cost and impact on the environment and cost to future generations. Deforestation, dumping of chemicals and illegal fisheries causes loss of ecosystem services such as clean air and clean water, extreme weather mitigation, food security and even health and wellbeing. They also deprive governments of much-needed revenues and undermine legal businesses.

The possible annual growth rate of environmental crimes is difficult to estimate. Based on some registered trade statistics, seizures and reported incidents including of iconic species and chemicals, the last decade has seen a rise in environmental crimes by an annual growth rate of possibly in the range of at

least 5–7%, with examples as high as 21–28%. This compares to a global GDP growth rate of ca. 2.4%. Hence, the growth rate in environmental crimes, including the illegal wildlife trade, may indeed be 2–3 times that of the global economy, but corresponds to or exceed the growth rate in Asian countries that serve as transit or recipient of many illegal products.

With the rising involvement of transnational organized crime, criminals coordinate, evade or even shift their focus from drugs, human trafficking, counterfeit products and arms to any new opportunity – hazardous waste and chemicals, forest products, pangolins, giant clams, minerals and illegally extracted gold. The pangolin, an ant and insect eating scaly mammal from Asia and Africa, has become one of the world's most trafficked animals for fraudulent medicines and exclusive meals in just a few years, with over a million individual pangolins estimated to have been killed in a decade. Natural resources in terms of gold, minerals, forestry products or waste are easier to smuggle and raise less attention than drugs. Hazardous waste and electronic waste are often customs-code classified as second-hand products by smugglers and thereby bypass customs regulations and international conventions. Criminals shift swiftly between types of contraband or to alternative geographic locations in response to geographically or thematically limited enforcement operations.

Moreover, enforcement efforts have revealed a great increase in the scale of organization of environmental crimes: Prosecuted and convicted individuals in recent years have been convicted for illegal logging and laundering of hundreds of millions of USD in individual cases, dwarfing the resources which are available for enforcement, investigation and prosecution. Individual carbon credit fraud cases have involved sums of transfers and profits also in the hundred million USD scale. A single individual vessel involved in illegally fishing Patagonian toothfish was estimated to have had illegal catches of around 200–300 million USD alone. The UNODC-WCO container control programme has established improved customs controls in some countries, targeted at transnational organized crime. This programme is seeing a rise in a new diversity of contraband far beyond drugs, arms, counterfeit products and ivory – but also ozone depleting chemicals and hazardous waste – such as containers with 37 tons of the ozone-depleting gas in Pakistan in 2014, but also in places like Paraguay in 2015 and in Ghana in 2016, reflecting a global network.

Criminals are becoming more advanced and are shifting from ivory to giant clams and pangolins. They shift from smuggling ozone depleting CFCs to HCFCs smuggling as HCFCs are phased out and become more scarce, shifting from regular

VAT fraud to carbon credit fraud as the carbon credit market emerged, and are shifting to laundering illegal tropical timber through pulp and paper when customs target round logs or furniture. These criminal networks now also engage in "white collar"-crimes, including corporate crimes, use of thousands of shell companies in tax havens, tax fraud, double counting, transfer mispricing, money laundering, internet crimes and hacking, phishing/identity theft, securities fraud, financial crimes, and fraudulent reclaiming of carbon credits, to mention a few, impeding and hindering development goals across sectors at both national and global levels. As transnational organized criminal groups become more established, their abilities to circumvent enforcement efforts increase, diversify and shift to new products.

The root causes of environmental crimes vary greatly, and subsequently the design, identification and implementation of appropriate responses must be carefully planned. Root causes are primarily the low risks and high profits in a permissive environment as a result of poor governance and widespread corruption, minimal budgets to police, prosecution and courts, inadequate institutional support, political interference and low employee morale, minimal benefits to local communities and rising demand in particular in Asia. The situation is especially critical on support to prosecution and courts/the judiciary in many developing countries. Indeed, a regional breakdown between North America and Southern Africa of relative expenditure on the police, prosecution services and courts revealed that in North America 43% of these funds went to prosecution and courts, while only 16% in the countries of southern Africa. Poverty also facilitates recruitments of low-level perpetrators at the frontlines. This means that the issue requires a full range of responses, also beyond enforcement.

The international community is still far behind in combating the rising role of environment-associated crimes for threat finance in conflict and for development and environmental security. Resources allocated to international enforcement efforts against environmental crimes are completely under-dimensioned for containing the growth in environmental crimes. Current global resources specifically allocated to international organisations such as INTERPOL, UNEP, WCO, UNODC and relevant conventions specifically for combating these transnational environmental crimes are likely combined no more than 20–30 million USD globally (dependent on calculation), resulting in continued rising involvement of organized criminal networks due to a permissive environment unless more resources are allocated and capacities shared across agencies.

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RONDA TÁTICA RODO
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Indeed, OECD reported in 2014 that the share of ODA (Official Development Assistance) to governance and peace had been declining by a relative 3% annually since 2009.[1] This has actually led to a weakening of the enforcement and prosecution sector in recent years, especially in the least developing countries.

The sheer financial scale and sophistication of environmental crimes now require an entirely different scale of coordinated responses and international collaboration, working across ministries and jurisdictions at the national level, to international cross-UN and trans-border collaboration. Achieving this level of sophistication will require significant donor support because the sites most affected by environmental crimes are also in the countries with the least resources to address them.

Efforts to curb the wider environmental crimes have become particularly important in response to threats against peace and security, so vital to sustainable development. Across the world, terrorist and non-state armed groups are increasingly benefitting financially from or engaging with organized crime, as recognized by the UN Security Council Resolution S/RES/2195 (2014). In the Trans-Sahara, armed groups like Al Qaeda in Islamic Maghreb (AQIM) and Al Mourabitoun and others are smuggling drugs, cigarettes, migrants and commodities for profit. Da'esh or ISIS is heavily involved in trafficking of oil and antiques, amongst other commodities, showing yet a diversification by targeting antiques. Taliban make their primary incomes from drugs and taxation. Non-state armed groups, terrorist groups and others are increasingly now also engaging in environmental crimes and thrive on the exploitation of natural resources, similar to the incomes derived from other forms of contraband.

This provides them with a low-risk high-profit source of revenue compared to their traditional incomes from other forms of smuggling, human trafficking, drugs or counterfeit products. This, in turn, undermines peacekeeping efforts. Groups like Janjaweed and LRA have, like other groups in the region made incomes from ivory. In Peru and Colombia – which currently have the largest cocaine production in the world, illegal gold mining is becoming a profitable alternative to drugs. Organized criminal groups also use environmental crimes to launder money from drug trafficking. Groups benefitting or have benefitted in the past from illegal or unregulated exploitation of natural resources include Al Shabaab, which prior to the intervention by the AU in Somalia made 38-56 million USD annually on the illicit charcoal trade. Much of this traffic, including by organized crime, continues. In the Amazon, armed groups like FARC are taxing timber, gold and coltan. FARC for instance makes an estimated 12 million USD annually by extorting illegal gold miners. Criminal networks behind the conflict in eastern DRC, a conflict which has killed several million people, have spent around 2% of their proceeds to fund 25–49 different rebel groups. According to some esti-

mates, illegal natural resources exploitation in eastern DRC is valued at 722–862 million USD annually.

In spite of the rising threat to environment, peace, security and development, a number of successes show that coordinated responses can effectively curb the illegal trade and sometimes restore damage to ecosystems:

At the national level, perhaps the biggest single success achieved on combating environmental crime was the Brazilian sector wide Plan for Protection and Combating Deforestation in the Amazon (PPCDAM), reducing deforestation in the Amazon by 76% across only five years. Perhaps the most important key to the Brazilian success was that a single office was given full responsibility for coordination: the Executive Office of the Presidency in close collaboration with the Federal Police, with coordination and implementation with 13 ministries and more partners, and even in the first phase results were substantial: Over 41,000 fines worth USD 3.9 billion were issued, 700 were arrested and many prosecuted, one million cubic meters of tropical timber seized; 11,000 properties, equipment and assets were confiscated or destroyed, and nearly one million hectares of productive land (pastures and soybean) were embargoed.

Correspondingly, the Montreal protocol has an important role also in reducing the illegal trade in ozone-depleting substances like CFCs and HCFCs through initiatives, including the "informal Prior-Informed Consent – iPIC" launched by UNEP in 2006 and the Project Sky Hole Patching with countries participating as members and with both the Regional Intelligence Liaison Office of the World Customs Organization and the UNEP OzonAction Programme under the Montreal Protocol playing a coordinating role. Thanks to the Project Sky Hole Patching I and II, about 800 tons of ozone depleting substances have been seized as of 2010. With regard to iPIC, in 2014 alone, of the reported 141 consultations, over 30% resulted in rejections or cancellations of license requests which prevented unwanted trade in more than 545 tons of ozone depleting substances including HCFCs and halons. UNODC reported in 2013 that the scale of illicit trade in CFCs had dramatically been reduced as a result of the global agreement on the phasing out of ozone-depleting substances, effectively shutting down also criminal markets. However, HCFCs are still widely used with several years to go until the phase out date. This demonstrates how implementing environmental rule of law through global agreements can effectively both obtain environmental goals and also shut down a global illegal trade of commodities by providing no safe havens.

The Stockholm, Rotterdam and Basel conventions are the conventions responsible for helping prevent the illegal trade in chemicals and waste. In 2013, UNODC reported that illegal trade in E-waste to Southeast Asia and the Pacific was estimated at 3.75 billion USD annually or 1.5 times larger than the illegal trade in wildlife in the region, estimated at 2.5 billion. UNEP estimated in 2015 that the trade globally amounted to 12.5-18.8 billion USD annually, however, how much of this e-waste that was subject to the illegal trade or simply dumped, is not known. These conventions provide important platforms for strengthening efforts against the illegal trade in hazardous chemicals and waste.

While some certification schemes on selected minerals are in place, most are still way behind the sheer scale of illegal trade in natural resources, especially in fragile states and regions affected by conflict. In other crime areas, efforts to combat and reduce carbon credit fraud have been implemented such as in the EU, shutting down major parts of the trade especially on carbon credit VAT fraud.

Re-introduction programmes of endangered or lost wildlife can also be done through coordinated efforts. Golden Lion Tamarins are slowly gaining grounds in Brazil's Atlantic forests. In 2015 Nepal celebrated the third year without the loss of a rhino to poaching (also in 2011 and 2013) and their rhino populations are slowly recovering unlike in most other parts of the world. In Europe the large brown bear populations are recovering due to protective legislation, supportive public opinion, and practices making coexistence with people possible. Angola, Botswana, Namibia, Zambia and Zimbabwe have jointly established the Kavango Zambezi Transfrontier Conservation Area to help elephant populations recover.

A concerted action and information and analysis sharing effort to combat and reduce environmental crimes will be required across the world to curb its rise in environmental crimes, and subsequently support sustainable businesses, peaceful development and prosperity and wellbeing across nations. This includes, as reflected also in UN Security Council Resolutions S/Res/2195 (2014) and S/RES/2277 (2016), the need for improved sharing of information and analysis from and across member states and the UN on the role of organized crime in environment, peace, development and security. Protecting the ecosystems and the sustainable use of natural resources against harm from crime will require a cross-sectoral long-term effort. As has been shown, dedicated collaborative efforts can indeed be successful.

Recommendations

1 **Reduce threats to security and peace:** Strengthen the information collection, analysis and sharing, across sectors, in peacekeeping missions, Sanctions Committees and across the UN as a whole on the role of natural resource exploitation in conflicts and security in order to inform holistic responses towards securing peace, security and sustainable development. This includes integrating INTERPOL liaison officers in peacekeeping missions.

2 **Rule of law:** The international community must recognize and address environmental crimes as a serious threat to peace and sustainable development and strengthen the environmental rule of law at all levels to prevent safe havens including disrupting overseas tax havens, improve legislation at international and national levels, implement dissuasive penalties, substantial sanctions and punishments, capacity building and technological support, in order to enhance the enforcement and adjudication capacities in the area of environmental crime.

3 **Leadership:** Governments should establish central coordination and national cross-sectoral plans, with unity of command and unity of efforts, in coordination with the relevant UN entities, INTERPOL, and other relevant international treaty bodies and institutions, as appropriate, to combat the involvement of criminal organized groups in environmental crimes.

4 **Financial support:** Call upon the international development community to recognize and address environmental crime as a serious threat to sustainable development and strengthen the share of ODA to governance and judicial sector reform including to combating and preventing environmental crime. This should be targeted to capacity building and technological support to relevant agencies, national, regional and global law enforcement efforts against environmental crimes, such as information and analysis, inter-agency collaboration, enforcement, prosecution and the judiciary, especially in developing countries and fragile states.

5 **Economic incentives and consumer awareness:** Strengthen economic incentives, relevant institutions and awareness. This requires that plans for alternative livelihoods, economic incentives and consumer awareness also in importing countries are fully integrated and coordinated with enforcement efforts. Identifying best practices in behavioural change should be undertaken to reduce demand, including through a Communications Summit to address all points of this trade.

Introduction

The large-scale killings of up to several hundred thousand elephants in the last decade[2] have probably triggered much of the global attention on the wider wildlife trafficking crisis. This has been reflected in numerous conferences, resolutions and declarations in over 70 significant events since 2012 to support efforts to curb the poaching and illegal trade.[3] The wider illegal trafficking of thousands of species, of birdlife, reptiles, fish, amphibians, mammals and plants has reached unprecedented scales, damaging ecosystems, diversifying transnational organized crime (TOC), and causing losses in revenues from tourism. Forestry crimes, from unregulated or illegal burning of charcoal to large-scale corporate crimes concerning timber, paper and pulp involving large-scale deforestation, have major bearings on global climate emissions, water reserves, desertification schemes and rainfall.[4]

The scale and nature of the challenge of illegal wildlife trade have been well recognized in decisions of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (see decisions and resolutions following COP 16)[5-7], the UN Commission on Crime Prevention and Criminal Justice and UNODC,[8] the Economic and Social Council (ECOSOC), the UN Security Council, UN General Assembly, INTERPOL,[9] the World Customs Organisation (WCO) and others, including many significant nations. High-level political conferences have also addressed the issue, most notably recently convened in Botswana and Paris (December 2013), London (February 2014), and Tanzania (May 2014). This has led to resolutions at the UN Environment Assembly in 2014 and 2016, in the UN General Assembly in 2015 on Tackling illicit trafficking in Wildlife (A/RES/69/314), in Resolution 23/1 of *The Commission on Crime Prevention and Criminal Justice* on strengthening a targeted crime prevention and criminal justice response to combat illicit trafficking in forest products, and by INTERPOL General Assembly (AG-2014-RES-03).

Yet, while these resolutions increase the political momentum, the crisis is still deepening in many regions. In spite of some successes, the responses in terms of impact on the ground are still behind the scale and development of the threat to wildlife and ecosystems, as well as increasingly also development goals, peace and security.

Environmental crimes, including illegal mining of gold, diamonds, illegal unreported and unregulated fisheries and trafficking in hazardous waste also undermines legal commerce and robs developing countries of an estimated USD 91–259 billion every year. Tax revenues from this activity could have been used for schools, infrastructure investments, health care and business development.

The issue of environmental crime, however, has much more far-reaching impacts and threats to human security and sustainable development. Firstly, many people are involuntarily recruited as a result of poverty and lack of alternatives. Secondly, the diversification of organized crime into these sectors as a low-risk, but profitable crime further accelerates corruption and undermines legal business models by deflating prices and even through the use of forced labour.

Finally, environmental crime, beyond destroying the very platform on which our health, food production, economy

and ultimately wellbeing is based,[10-11] is in some instances funding non-state armed groups, terrorism and driving conflicts. Indeed, the UN Security Council has in numerous resolutions, especially since Resolution 2195 (Dec 19th, 2014), called for improved and increased support from member states to enhance the information and analysis capacity regarding the nexus of organized crime and threat finance. Groups such as the Lord's Resistance Army and Janjaweed have been involved in killings of elephants for ivory. Natural resources have become yet another source of income similar to drugs, counterfeit products, oil and antiques which have been funding groups like the Taliban, Al Qaeda and Islamic State.

Hence, environmental crime has now reached far beyond that of wildlife trafficking alone, jeopardising the very foundation of health, development, peace and security. Combating environmental crime, supporting peace and development and ultimately restoring ecosystems and wildlife populations where possible will require a grand scale effort globally.

This report summarizes some of the central resolutions and legal framework available to combat environmental crimes, and points to a way forward for the development of a system-wide strategy.

What is environmental crime?

The term environmental crime covers not only the illegal trade in wildlife, but also forestry and fishery crimes, illegal dumping of waste including chemicals, smuggling of ozone depleting substances and illegal mining. Illegal mining is not limited to illegal extraction of resources, it also has severe environmental impacts, whether from mercury pollution from artisanal gold mining,[12] or destruction of natural flora and fauna, pollution, landscape degradation and radiation hazards, with negative impact on arable land, economic crops and trees.[13] A broad understanding of environmental crime includes threat finance from exploitation of natural resources such as minerals, oil, timber, charcoal, marine resources, financial crimes in natural resources, laundering, tax fraud and illegal trade in hazardous waste and chemicals, as well as the environmental impacts of illegal exploitation and extraction of natural resources.[14] Environmental crime has in recent years received global attention due to its serious and deleterious impact on the environment and ecosystems, as well as on peace, security and development.

Although the definition of "environmental crime" is not universally agreed, it is most commonly understood as a collective term to describe illegal activities harming the environment and aimed at benefitting individuals or groups or companies from the exploitation of, damage to, trade or theft of natural resources, including, but not limited to serious crimes and transnational organized crime.

Environmental crime endangers not only wildlife populations ranging from elephants, rhinos and tigers to pangolins, reptiles, fish and rare birds and plants but also at an ecosystems level through massive deforestation, pollution from unregulated chemical use and disposal, and destruction of livelihoods.[15]

Illegal trade ranges from bush-meat poaching based on food insecurity by impoverished villagers[16] to natural resource exploitation by transnational organized criminals and non-state armed groups with potential links to terrorism. Given the complexity of the history and causal mechanisms involved in the range of environmental crime issues, there is also subsequently substantial confusion with regard to which responses are the most appropriate. In the following, some clarification is given, reflecting developments during 2015.

Illegal exploitation of natural resources, including ITW, has negative consequence on potential revenues from tourism, timber, mining, gold, diamonds, fisheries and even oil and charcoal. These are all natural resources that could have produced revenue for development needs such as for health care, infrastructure, schools and sound and sustainable business development.[17] Indeed, the illegal trade especially in natural resources

like fish, timber and minerals undermine legal and sustainable businesses through unfair competition and non-payment of legitimate taxes for social benefits. Currently, the scale of different forms of environmental crime is likely in the range of USD 91–259 billion or 1–2 times the size of global ODA.[18]

This total amount of 91–259 billion is a loss to society because the commercial activity takes place in a parallel criminal illegitimate economy. It undermines governance, legal tax-influenced price levels, and particularly legitimate business. An unknown proportion will nonetheless be re-introduced into the legitimate economy through laundering, or as consumption for example.

About 10% of the total amount is estimated loss of revenue to governments. The number is based on two assumptions:

1. that the criminal activity generates an average profit of 30%, and
2. that government tax revenues could be 30% of the profits, if the environmental crime activities had been legal and legitimate.

For an approximate comparison the average world total tax rate % of commercial profits was 40.8 in 2015 according to the World Bank.[19]

For the USD 91–259 billion range, with a profit of USD 27–78 billion, the tax income, which is loss for government revenue, would be 8–23 billion, or 8.8 % of the total amount. This is

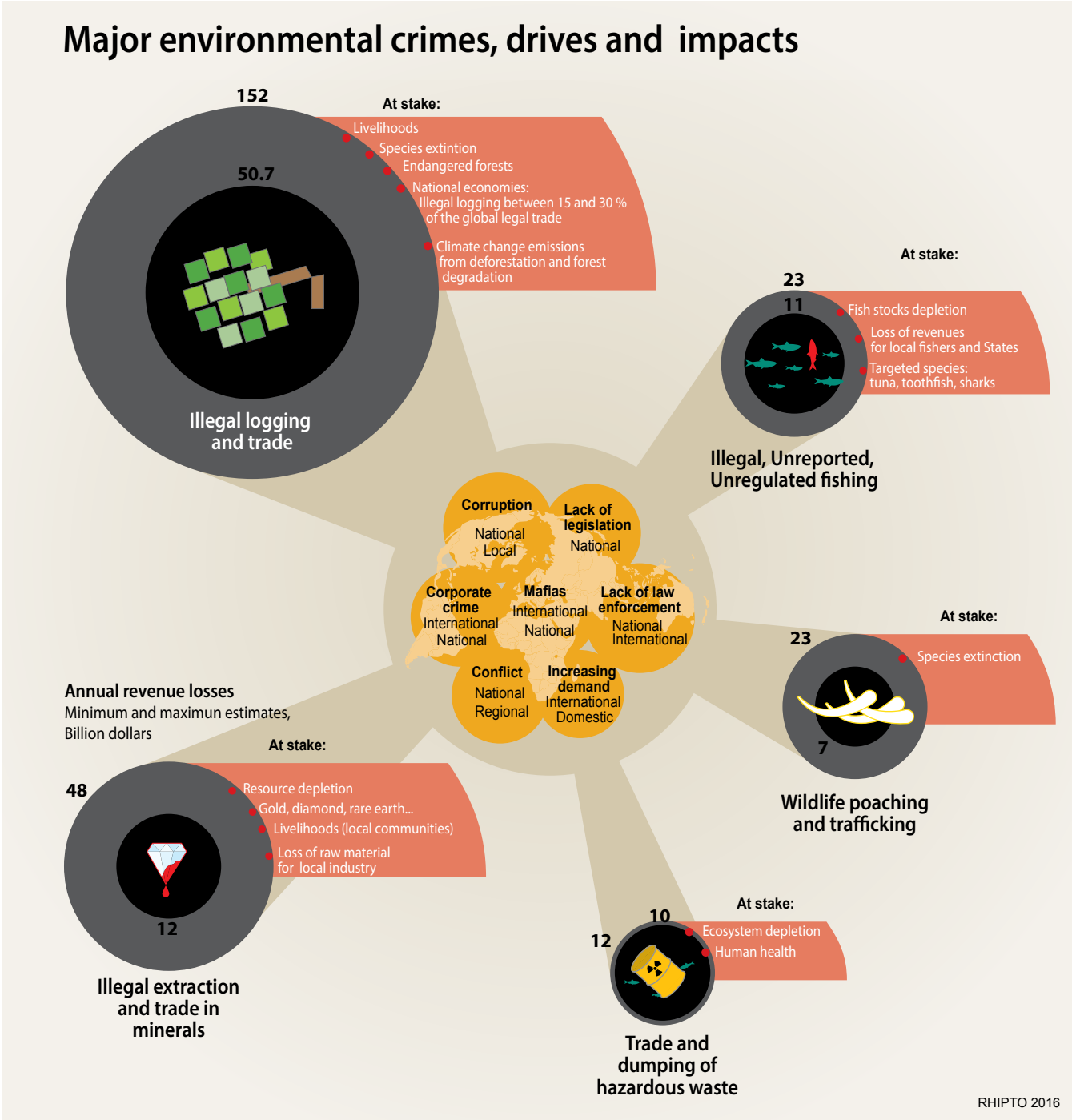

Figure 1: Environmental crimes go far beyond wildlife and includes fish, timber, minerals and even hazardous waste.[20-21]

rounded up to 10% for ease of calculation, giving a loss of government revenue of USD 9–26 billion.

Impacts on environment and ecosystems from environmental crimes

An ecosystem is a dynamic complex of plant, animal and microorganism communities and the non-living environment interacting as a functional unit.[22] Ecosystems provide a range of services and provide the very foundations of our economy, human health, livelihoods and well-being.[23-25] They can include clean air, water supply, extreme weather mitigation and storm protection, food security and pollination, just to mention a few.[26-28] An assessment of the environmental impacts of the illegal trade in Wildlife has just been launched (June 2016) by UNEP, however, no assessment currently exists of the environmental impacts of the wider range of environmental crimes and their full implications for environmental sustainability and development goals. This is urgently needed. Information is available on a number of individual parts of the environmental crimes, though a consolidated overview is needed.

Different forms of environmental crimes and their approximate estimated scale[T1]

Environmental crime	Annual loss of resources pre 2014 estimate (USD)[T2]	Annual loss of resources 2016 estimate (USD)	Source or reviews
Illegal logging and trade	30–100 billion	50.7–152 billion	New Sources: UNEP, 2014 (10–30%), updated by FAOSTAT 2014:[T3] Roundwood including woodfuel: 3.7 billion m^3 x average export unit price of 137 USD/m^3 = global wood trade of USD 507 billion. With 10–30% possibly illegal this accounts for USD 50.7–152 billion.
Illegal, Unreported and Unregulated fisheries	11–30 billion	11–23.5 billion	MRAG and UBC 2008[T4] (10–23 billion) UNODC 2011[T5] and Agnew 2009[T6] (10–23.5 billion) (12–32% of the global trade). No new updates available. However, this does not include illegal open sea discard of approximately one-third of the global catch. Hence discards may account for tens of billions of USD in addition.
Illegal extraction and trade in minerals/ mining	12–48 billion	12–48 billion	Estimated as only 1–4% of by industry of the global trade (GFI, 2011; GA 2012). New source GI 2016[T7] indicates –28–90% of mined gold was illegal in five South America countries, accounting alone for 7 billion USD on gold alone in five countries) suggesting that this is a gross underestimate. However it has been kept as this for now as more research is needed.
Illegal trade and dumping of hazardous waste	10–12 billion	10–12 billion US$	US Department of Justice 2000[T8] (10–20 billion); GA 2012. New source UNEP 2015 (Unaccounted or illegally traded E-waste alone accounted for 12.2–19 Billion USD in 2015).[T9] The ratio between illegal and unregulated is not clear, hence previous estimate is kept.
Illegal trade and poaching of plants and other wildlife	7–23 billion	7–23 billion US$	Wyler and Sheik 2008[T10] (5-20 billion), Haken 2011[T11] (7.8–10 billion). US Government agencies 2000 cited OECD 2012[T12] (USD 6-10 billion excluding wood and fish). New estimates UNODC including mainly endangered species cf. CITES. This estimate is somewhat confounded with forestry data, hence original estimate is kept but needs revision. No new estimate currently available, but see separate section on growth in environmental crimes.
Sum environmental crime	**70–213 billion**	**91– 259 billion US$ (30–22% higher ie. 26% on average)**	All converted to 2016 USD.[T13]

Other non-environmental crimes	Annual loss of resources pre 2014 estimate (USD)	Annual loss of resources 2016 estimate (USD)	Source or reviews
Drugs		344 billion USD	UNODC 2005 (cannabis herb and resin USD 142 billion),[T14] UNODC 2011 (2009 cocaine 85 billion + opiates/heroin 68 billion)[T15]
Human trafficking (excl. recent migrant to Europe)		157.1 billion	International Labour Organisation 2014 (forced labour generates USD 150 billion in illegal profits per year. 2/3 is from sexual exploitation and the rest other economic exploitation) [T16] EUROPOL-INTERPOL 2016 (Recent migration wave Europe USD 5.5 billion)[T17]
Counterfeit crimes		288 billion USD	OECD 2007[T18] and UNODC[T19] (USD 250 billion) does not include domestically produced and consumed products, or non-tangible digital products.
Small arms illegal trafficking		1.5–3 billion USD	10-20% of the licit small arms trade, which is USD 10.3 billion incl. parts and sights per year (Small Arms Survey 2012)[T20] Ammunition USD 4.2 billion per year (Janes Intelligence Review 2013)[T21]

These estimates are derived from published reports, UN statistics on legal trades and estimates from criminal intelligence through INTERPOL on the extent based on reporting from National Central Bureaus in member states. Given that criminals do not report statistics on their activities, considerable uncertainties exist not only regarding the accuracy of the estimates, but also the delineation amongst the different crime groups and the commodity prices applied in the different sectors. For example, some agencies include only CITES registered species, others include fisheries and forestry but not the much larger trade in timber and wood fuel. Hence wide ranges are provided.

T1 "Transnational Crime in the Developing World," (Global Financial Integrity).
T2 "The Environmental Crime Crisis."
T3 "Global Forest Resources Assessment 2015," www.fao.org/3/a-i4808e.pdf.
T4 "The Global Extent of Illegal Fishing," (Fisheries Ecosystems Restoration Research, Fisheries Centre, University of British Coloumbia; MRAG).
T5 "Transnational Organized Crime in the Fishing Industry: Focus on Trafficking in Persons, Smuggling of Migrants, Illicit Drugs Trafficking," in Focus on: Trafficking in Persons, Smuggling of Migrants, Illicit Drugs Trafficking (Vienna).
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The legal framework on environmental crimes

Criminals exploit the lack of international consensus and the divergence of approaches taken by countries. What may constitute a crime in one country, is not in another. This effectively enables criminals to go "forum shopping" and use for example one country to conduct poaching, another to prepare merchandise, and export via a third transit country. According to UNODC, corruption is the most important enabling factor behind illegal wildlife and timber trade.[29] Identifying the optimal legal framework for preventing, combating and prosecuting environmental crimes requires careful consideration.

Firstly, with the extent of the crises, many have called for designating any violation of wildlife or environmental laws and regulations to be designated as "serious crimes". Another proposal is to designate illicit trafficking in protected species of wild fauna and flora involving organized criminal groups" as serious crimes. While the latter may serve a purpose, careful consideration must be made to ensure such an approach does not undermine principles of proportionality between offense and punishment. A hunter taking the wrong deer should for obvious reasons not be punished to the same extent as an organized criminal involved in large-scale illegal deforestation, the killing and trafficking of hundreds of rhinos or thousands of elephants, or someone funding large-scales atrocities from gold or diamond smuggling revenues, by supporting terrorism or armed violent groups.

Secondly, the type of definition and designation of the offense may lead to the wrong laws or regulations being applied in prosecution. Many emerging definitions for environmental crime have actually constrained the term by limiting it to crimes associated with breaches of environmental legislation only[30] or endangered species only. This seriously reduces opportunities for prosecution and punishment, since environmental crime is typically only seen to refer to infractions (fines) or misdemeanours (fines or shorter term imprisonment), rather than felonies.

An important point is the fact that an offence is a crime only if the state decides to punish a certain behaviour through criminal law. Criminalizing an environmental offence can, in certain cases, be an effective and dissuasive way to achieve proper implementation of environmental law. However, there are large differences between the criminal sanctions provided for environmental offences across the globe and often existing criminal sanctions are not sufficiently stringent to ensure a high level of environmental protection. Similarly, the capacity of governments to enforce criminal law greatly varies. This is particularly true in many of the least developed countries,

where very little development support has gone to strengthen the enforcement and judicial sector. Indeed, one of the biggest differences between many industrialized countries and the least developed, is the much larger proportion of police compared to the prosecuting or judicial sector. For example, in North America, 44% is spent on courts and prosecution and 56% on police, while in the countries in southern Africa only 16% is spent on prosecution/courts and 84% on police.[31]

The necessity of a wider approach is intrinsically recognized by the UN Convention on Transnational Organized Crime (UNTOC), that intentionally does not define transnational organized crime or list the kinds of crimes that might constitute it, simply to enable a broader applicability of the convention on new and emerging forms of crime. It does, however, define organized criminal groups.[32-33]

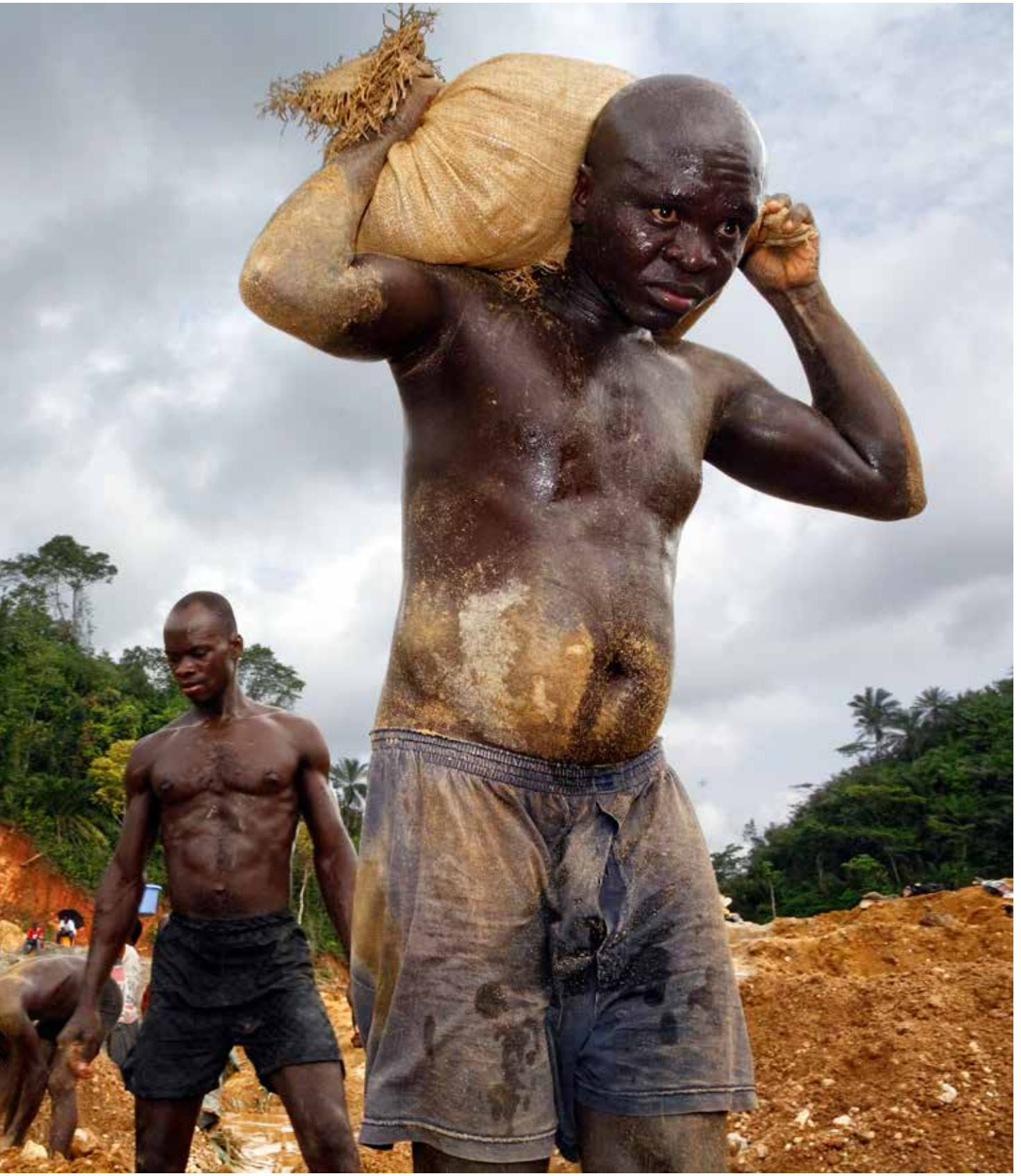
Legislation

In 2014, the INTERPOL General Assembly passed a Resolution on INTERPOL's response to emerging threats in Environmental Security (Resolution AG-2014-RES-03).[34] In that Resolution, instead of defining environmental crime, INTERPOL instead focused on "environmental security" by recognizing the impact that environmental crime and violations can have on a nation's political stability, environmental quality, its natural resources, biodiversity, economy and human life. INTERPOL also recognizes that criminal networks engaged in financial crime, fraud, corruption, illicit trade and human trafficking are also engaged in or facilitating environmental crime.

Both INTERPOL and the Commission on Crime Prevention and Criminal Justice (CCPCJ) have taken this approach. By regarding environmental crimes more as a collective term, they can fall under already established laws on serious crimes, including, but not limited to, serious financial crimes, corporate crimes, forgery, fraud including tax fraud, organized crime and threat or terrorist finance, where the damage to the environment or use of natural resources is a means to this goal and an aggravating condition. Given the complexity and the severity of the threat to the environment, such an approach provides prosecutors with far more powerful tools for prosecution and prevention and importantly – proportionality between offense, intent and punishment.

Importantly, as pointed out by the EU, in Directive 2008/99/EC of The European Parliament and of the Council of 19 November 2008 on the protection of the environment through criminal law: Common rules on criminal offences make it possible to use effective methods of investigation also on environmental crimes. In order to achieve effective protection of the environment, dissuasive penalties for environmentally harmful activities must be in place. Indeed, in the EU, a *"failure to comply with a legal duty to act can have the same effect as active behaviour and should therefore also be subject to corresponding penalties. Therefore, such conduct should be considered a criminal offence throughout the Community when committed intentionally or with serious negligence."*[35]

Natural resources are increasingly driving conflicts, and the nexus of organized crime and threat finance provide a particularly challenging framework for intervention and early prevention. This was recognized in UN Security Council Resolution S/RES/2195 (2014), which strongly called upon and encouraged the wider UN, as appropriate, and member states to "to collect, analyse and exchange information, including law enforcement and intelligence information" to "prevent terrorism benefiting from transnational organized crime" and to share, as appropriate, between Special Representatives of the Secretary-General, the Department of Peacekeeping Operations, the Department of Political Affairs, the Counter-Terrorism Executive Directorate, the UN Office on



Drugs and Crime, the Counter-Terrorism Implementation Task Force and the United Nations Development Programme, within existing mandates and resources.

The importance of gaining improved information on the role of environmental crimes and natural resources in conflict was also recognized directly for the first time in the operational mandate in S/RES/2277 (2016) to MONUSCO, the largest UN peacekeeping mission, in Eastern DRC. In eastern DRC looting of natural resources is a primary driver of the near 20 year long conflict.

In terms of the different features of environmental crime, there is a degree of division of labour in terms of providing legislation and set the parameters for implementation. On the illegal wildlife trade, CITES (The Convention on International Trade in Endangered Species of Wild Fauna and Flora) is the legally binding international instrument that imposes obligations on source, transit and destination states. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. And it makes it easier to gain cooperative action across the illegal supply chain regarding listed species.[36]

Three conventions control the international trade and movement of hazardous waste and dangerous chemical substances by setting procedures and standards for import and export. Both the environment and human health are exposed to hazardous waste and chemicals through the cycle these products go through from production, transport, use and to disposal. The interlinked conventions are:

1) The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, which primarily covers wastes trade.

2) The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade and

3) The Stockholm Convention on Persistent Organic Pollutants which primarily covers chemicals, including restrictions on production.[37]

The consensus based Montreal Protocol of 1987, which controls ozone depleting gasses (ODS), has been ratified by 197 parties, making it universally ratified. Projects worth USD

3.2 billion have been approved by its Executive Committee to phase out over 450,000 tonnes of substances with ozone depletion potential (ODP), including the implementation of Project Sky Hole Patching by the Regional Intelligence Liaison Office of the World Customs Organization in the 2000s. UNEP, UNIDO, UNDP and the World Bank are the implementing agencies of the protocol.[38]

UNEP has an important role as well in terms of maintaining an overview of legislative efforts, to avoid excessive compartmentalisation in upholding the rule of environmental law. UNEP Governing Council's (GC) Decision 27/9 is the first internationally negotiated document to establish the term "environmental rule of law".[39] The decision emphasised the role of organized criminal groups in trafficking hazardous waste, wildlife and illegal timber. The Council recognised that environmental crime undermines sustainable development, the successful implementation of environmental goals and objectives, the rule of law, and effective governance. The council also noted that these issues have been recognized in UN General Assembly resolution A/RES/67/1 (2012) and A/RES/67/97 (2013) which urged member states to address transnational organized crime's impact on the environment.[40] This language closely matches the language used in S/RES/2195 (2014) mentioned above.

GC Decision 27/9 requested UNEP's Executive Director to improve coherence, coordination and collaboration between UNEP agencies as well as other entities, including, but not limited to, information sharing, capacity building and the strengthening of national environmental governance and expertise for prosecutors, judges, and law enforcement.[41]

In 2014 UNEP hosted the very first United Nations Environment Assembly. Resolution 1/3 on illegal trade in wildlife from the Assembly was deeply concerned about the increasing scale of illegal trade in wildlife products, including timber and marine species. It recognized the illegal trade's damage to ecosystems and rural livelihoods, and that it undermines good governance, rule of law and threatens national security.[42]

UNEA further reaffirmed both the Economic and Social Council (ECOSOC) resolution 2013/40 and UN Commission on Crime Prevention and Criminal Justice's resolution 23/1's calls for making illicit trafficking in protected species and forest products into a serious crime as defined by UNTOC.

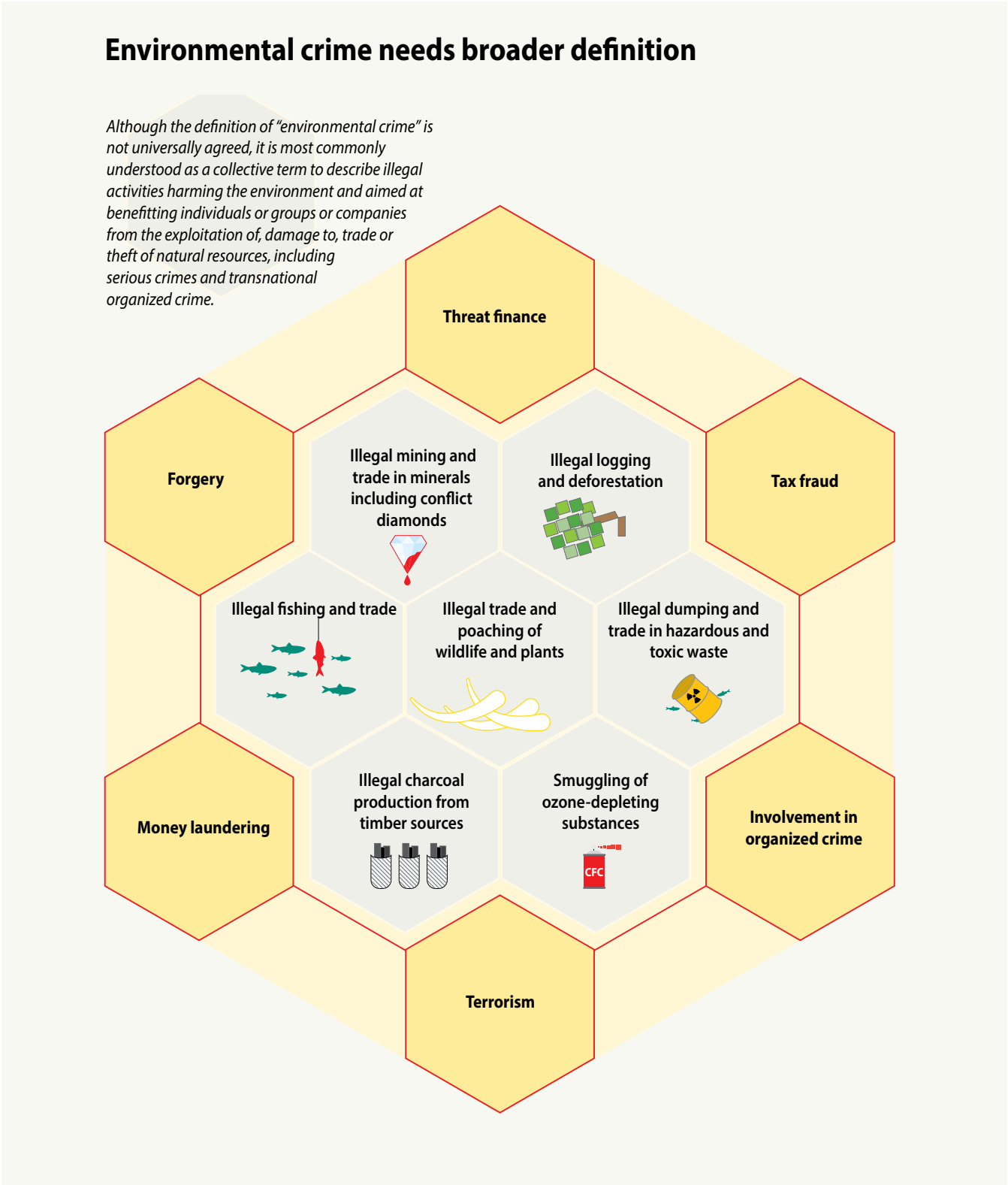


Figure 2: Although the definition of "environmental crime" is not universally agreed, it is most commonly understood as a collective term to describe illegal activities harming the environment and aimed at benefitting individuals or groups or companies from the exploitation of, damage to, trade or theft of natural resources, including serious crimes and transnational organized crime.

It also reaffirmed UN General Assembly A/RES/68/193's emphasis on the centrality of coordinated action to eliminate corruption and disrupt illicit networks.[43] UNEA welcomed the creation of ICCWC[44] and promoted further cross-agency cooperation, regional and international cooperation. The Assembly specifically called upon countries to actively engage in on-the ground activities, such as under the auspices of ICCWC and urged further analysis of environmental impacts from the illegal trade in wildlife products.[45]

In April 2016 the first IUCN World Environmental Law Congress convened in Rio de Janeiro. The event is part of a series designed to strengthen the work of judiciaries in implementing the rule of law. The participants in Rio offered a definition of 'environmental rule of law' as "the application of the rule of law at local, national, regional and international levels in the environmental context."[46] They further declared that:

- Strengthening the rule of law in the environmental arena is critical to the achievement of environmental sustainability and sustainable development.
- Without the rule of law and enforcement of legal rights and obligations, environmental governance, conservation and protection may be arbitrary, subjective and unpredictable.[47]

The Chief Justices, Heads of Jurisdictions, Attorneys Generals, Auditors General, Chief Prosecutors and other high-ranking representatives gathered in Rio agreed on a list of seven core principles to strengthen the environmental rule of law.

Implementation and enforcement

Despite the arrival of the environmental rule of law paradigm, implementation and compliance remain critical. Hundreds of treaties and nonbinding legal instruments and documents containing international goals and objectives exist. UNEP notes that among the 90 most important environmental goals and objectives, only four have had significant progress.[48]

In the follow up to the United Nations Environment Assembly (UNEA) resolution 1/3 on illegal wildlife, UNEP is working on a regional project under GEF-6 to combat illegal wildlife trade in Asia with local stakeholders and Interpol. Another initiative is UNEP's collaboration with 25 countries under the Regional Enforcement Network to build capacity in enforcement, including customs officials.[49]

In order to advance the rule of law in Africa, for example, implementation of the development priorities and strategies in the region rely on vehicles such as Agenda 2063: The Africa We Want and the 2030 Agenda for Sustainable Development. In addition, the UNEP Bali Guidelines Implementation Guide and the Rio Principle 10 provide guidance for cooperation in implementation at the regional and sub regional levels. Key ingredients include information disclosure, implementable and enforceable laws, implementation and accountability mechanisms, coordination of roles, and treating environmental crimes as serious crimes.[50]

Similar language came out of the World Environmental Law Congress in Rio in April 2016, where participants made specific recommendations for implementation mechanisms. They included, but were not limited to, monitoring and reporting systems; anti-corruption measures; environmental assessments; coordination mechanisms such as regional enforcement networks, intelligence sharing and judicial cooperation; linking environmental crimes to other crimes such as money laundering, and strengthening courts' capacity as guarantors of the environmental rule of law.[51]

Progress is being made. Courts the world over now address environmental issues, with more than 50 states having established specialized environmental courts and tribunals.[52]

CITES (see especially decisions and resolutions following COP 16),[53] WCO, INTERPOL[54] and UNODC (such as on capacity building and judiciary training and support),[55] are the mandated institutions to address the Illegal Trade in Wildlife, but represent only a part of the wider environmental crimes. UNODC has with the help of other partners in ICCWC produced a Wildlife and Forest Crime Toolkit, which provides enforcement indicators.[56]

Other institutions with relevant tools and mandates are the UN Security Council, including Subsidiary Organs Branch and the Sanctions committees, World Bank, UNFCCC, UNDP, FAO, DPKO, UNESCO, CCPJC, UNOCC, DSS, OCHA and OECD.

On customs, the 2004 established UNODC-WCO Container Control Programme (CCP) has been successful in targeting sea and dry port container shipments in an increasing number of countries. The cornerstone of the Programme is the creation of inter-agency Port Control Units (PCUs) in which capability is developed and maintained to carry out risk assessments and targeted control and examinations of containers. The CCP is essentially a long-term capacity building programme that develops effective and sustainable port controls through the establishment of Port Control Units. These provide a coordinated approach to container and air freight profiling, targeting and examination, are located in secure environments (usually inside ports and airports) and are staffed by front line officers who are provided with structured training to ensure effective targeting and examination of containers.

The WCO web-based ContainerCOMM information exchange system, developed and continuously enhanced by the WCO, represents the core of the encrypted multi-language (in Dari, English, French, German, Portuguese, Russian, Spanish, Urdu and soon in Vietnamese) information

sharing and is the vital communication component of the CCP. The Programme grants the system for free to all the PCUs, CCP trainers and experts, relevant agencies and organizations and WCO members, both in the developed and developing world. This communication platform has the potential to be the pathway for port- to-port communication on illicit trade at global level.

Seizures include not only counterfeits and drugs, but also wildlife and timber products, and ozone depleting substances. On 23 and 29 January 2014 for example, two containers were seized in Lome, Togo. They contained 3.8 tonnes of ivory and 266 teak logs. The seizures also led to arrests. INTERPOL with support from various bilateral partners and UNODC and WCO, were able to alert authorities in Malaysia, Vietnam and China of this and other shipments in transit. Seizures have included a variety of environmental contraband: containers with shark fins in Ecuador (2012); containers with protected timber in Panama and Ecuador (2012); containers with stuffed animals (lioness, zebra, different deer) in Senegal (2012); sea cucumbers, sea horses and *Teca rolliza* in Ecuador; 5 containers with Guayacan wood, rosewood *Dalbergia retusa* and *Madera tecas* in Panama (2012); six tons of ivory in Malaysia and Togo (2013); 5 containers of rosewood *Dalbergia retusa* (2013) in Panama; 10 containers of rosewood *Dalbergia retusa* in Panama (2014); 3815 kg ivory, 55 kg pangolin and 266 teak logs in Togo (2014); container with 37,298 kg AKMA Refrigerant Gas R-22 (Chloro-difuoromethane) ozone depleting substances in Pakistan in 2014; 5 containers with sea cucumbers, *Balsamo* sp. and *Cocobolo* in Panama (2015); 1 container with R22 in Paraguay (2015); 1,023 kg ivory and 4 tons of pangolin scales in Vietnam (2015); 3 containers with ozone depleting substances in Ghana (2016) and 3 containers with Red Sandalwood in Malaysia (2016).[57]

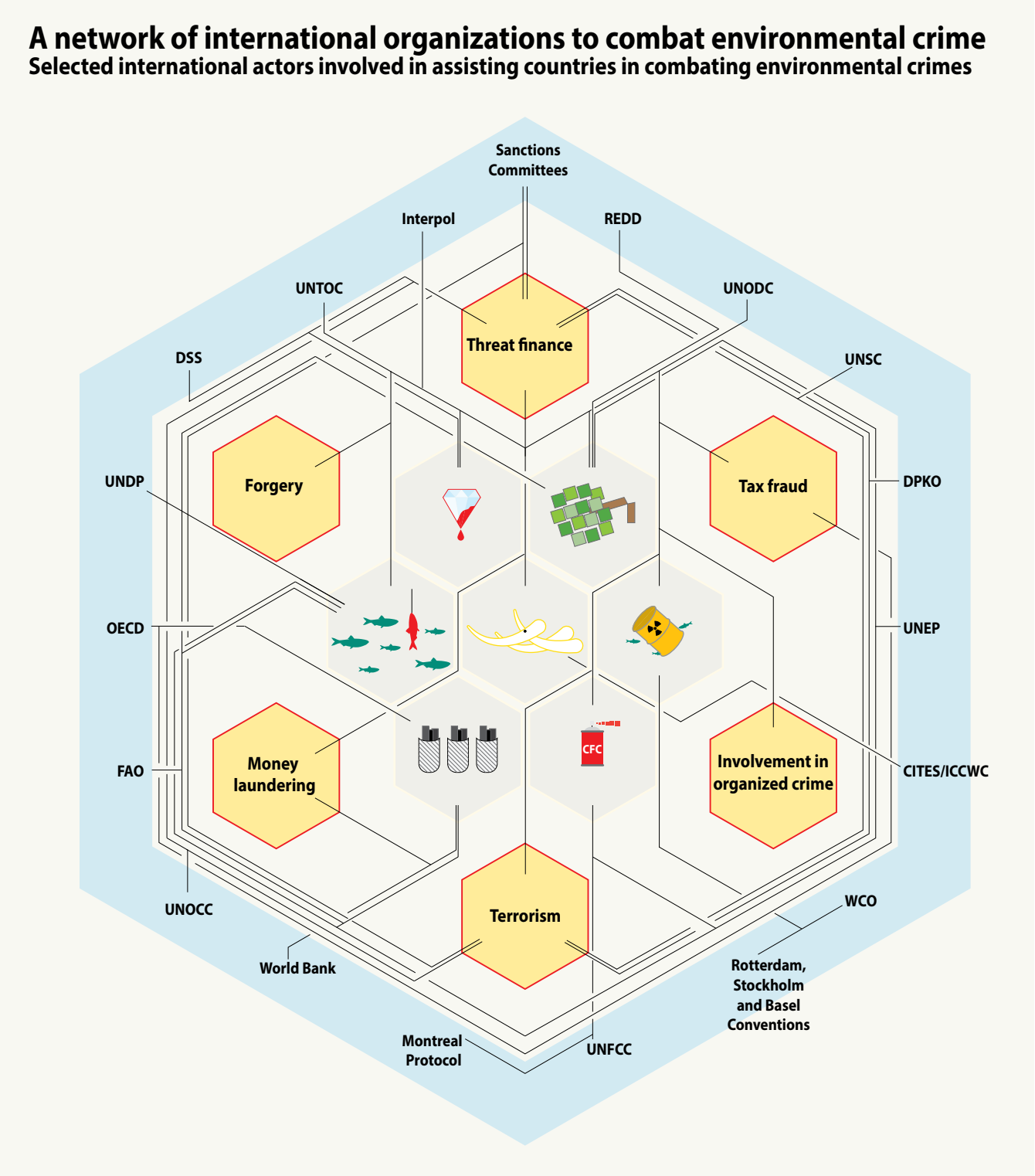


Figure 3: The need for coordination and collaboration on information and analysis: The informal framework of UN agencies, IGO's and INTERPOL influenced by environmental crimes. CITES has a specific role for the illegal wildlife trade, however, far more agencies are influenced by wider environmental crime. The illustration is in no way a formal presentation of mandates, merely an illustration of the range of some of the UN entities, protocols and conventions engaged and significantly affected by environmental crime and with ability to influence.

The rising transnational environmental crime smuggling networks

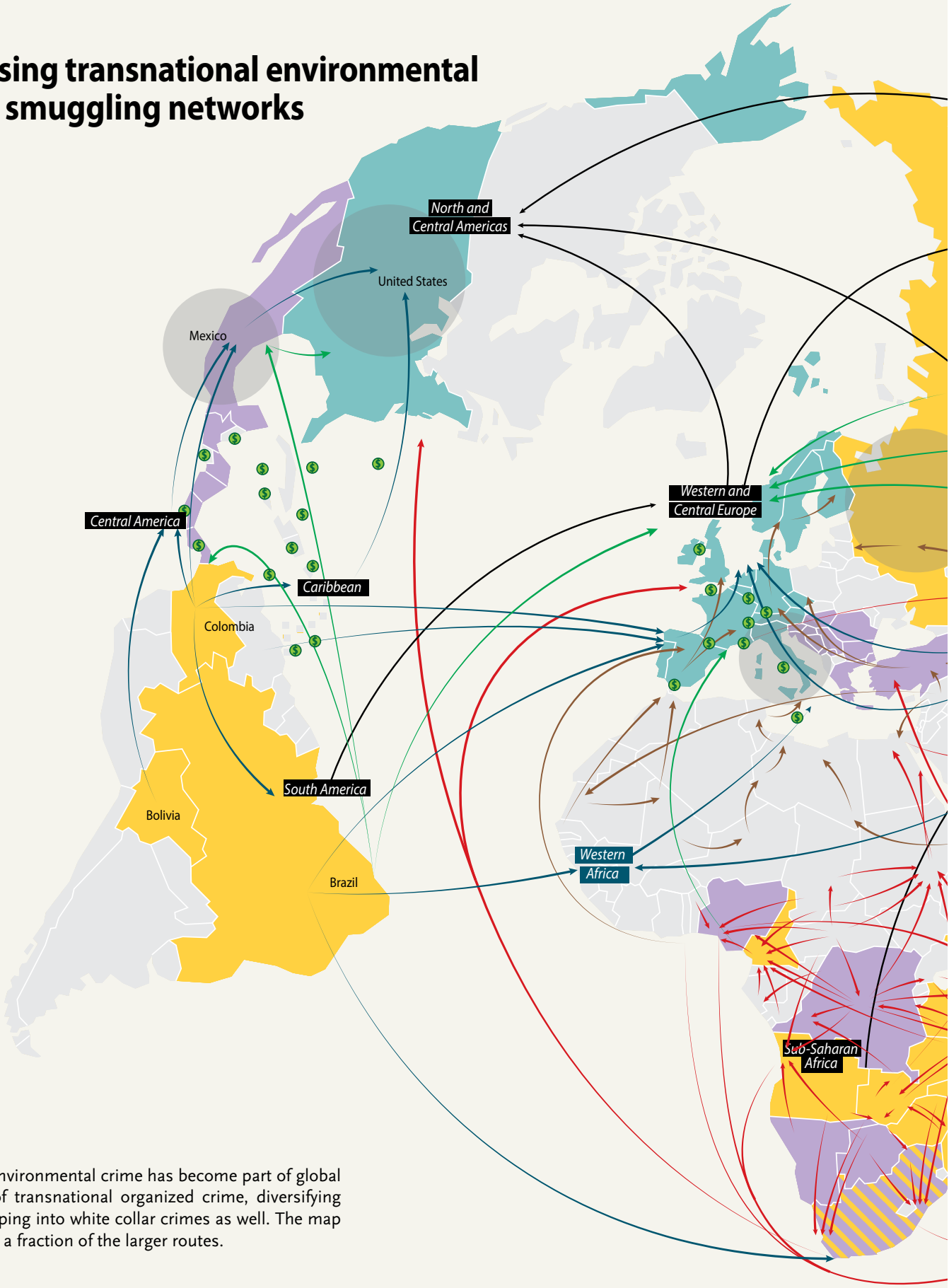


Figure 4: Environmental crime has become part of global networks of transnational organized crime, diversifying and developing into white collar crimes as well. The map shows only a fraction of the larger routes.

East Asia
China
Hong Kong
South East Asia
Thailand
Malaysia
Oceania
Indonesia
Middle East
South Asia
International organized crime network
Ivory and Rhino horns
Wood and wood products
Heroin and cocaine
Migrant trafficking
Human traffiking
Main players
Region
Regional origin or destination
Country of origin
Transit country
Country of destination/market
Tax heaven
Internationally active criminal organization

Growth in environmental crime

Assessing the growth rate of a form of crime can be extremely difficult, given that criminals do not hand over statistics of their illegal activities. Other measures such as number of seizures is also influenced by customs attention, coverage and efficiency. Another factor is the scope of ever changing scams, as well as changing smuggling routes. Homicides and financial crimes are to some extent reported or can be found in some countries' public conviction databases. Many environmental crimes, by contrast, remain unregistered in spite of the massive scale. This has been a primary cause of low awareness of both the scale and the different *modi operandi* of effective laundering methods in the enforcement sector.

However, looking at different statistics across the last 5–10 years there are some indications:

CITES maintain statistics over registered and reported incidents, over 79,000 in 2014. The number of reported incidents have varied substantially, stable in the last five years but increased substantially in the last decade, rising by a growth rate of 5–15% annually.[58] CITES also notes that there is increasing attention on illegal trade in wildlife.[59]

The number of rhinos killed has risen dramatically in the last decade from 13 reported in 2007 to 1,338 in 2015. Nonetheless, the increase in poaching has slowed down due to intensified law enforcement efforts and expenditure.[60] PIKE (proportion of illegally killed elephants from the CITES-MIKE monitoring programme showed a steady growth 2003–2011, but slightly declining and levelling off in recent years, but with levels unchanged and unacceptably high in 2015 compared with 2013 and 2014.[61] This corresponds with the dramatic 62% decline in the forest elephant population 2002–2011, and a 30% loss of geographical range[62] with particularly Central and West Africa and specific sites in Eastern (Ruaha-Rungwa and Chewore) and Southern Africa (Kruger) hit hard recently.[63]

On other products such as forests, previous reports have pointed to dramatic rise in alleged plantation fronts for laundering wild tropical timber in Indonesia during the mid 2000s. Here, the official records of the percentage of illegally logged timber dropped dramatically from 2004–2008, and the area of plantations remained nearly constant. However, the amount of logs sold through plantations increased by 300% or by an annual growth rate of ca. 25% in just five years.[64] Plantations were used to launder "wild" wood, most of them of the alleged "plantations" were only fronts with no actual land area.

E-waste has been reported estimated to increase from an estimated 41.8 million metric tonnes (Mt) of e-waste in 2014 to 50 Mt already by 2018.[65-66] with substantial involvement of a billion USD illegal trade as reported by UNEP, INTERPOL and UNODC, accounting for 3.75 billion USD in Southeast Asia and Pacific alone in 2013.[67] If the share of criminal activities remains constant in the projected increase, this would still account for a minimum growth rate of 4.5%. However, as for other factors, much more intelligence, information and analysis is urgently required.

If some of the numbers are used above, the last decades have seen a rise in environmental crimes by an annual growth rate of possibly in the range of at least 5–7%, with examples as high as 21–28% in some species and items. This compares to a global population growth rate of ca. 1.18%[68] percent and a global GDP growth rate of ca. 2.4%.[69]

Interestingly, the growth rate of environmental crime closely corresponds with the GDP growth rate in many Asian states (5.1–7.5%)[70-71] that are primary recipients of illegal wildlife products, ozone-depleting substances or substitutes such as CFCs and HCFCs, chemicals and waste. Hence, the growth rate in environmental crimes may indeed by 2–3 times that of the global economy. Such estimates have very considerable uncertainty. However, they can be compared to the interest from the UN Security Council on organized crime:

The attention has increased in the highest level of the UN over the wider role of organized crime for peace and security: While the mention of organized crime in statements from the UNSC has hardly changed since 2008 – the number of resolutions including organized crime has increased annually by a "growth rate" 26%, reflecting rising concern.

Hence, while there is progress in combating environmental crimes in individual and significant cases, the rise in environmental crimes is rapid – and a significant threat to development, peace and security.

OLICE

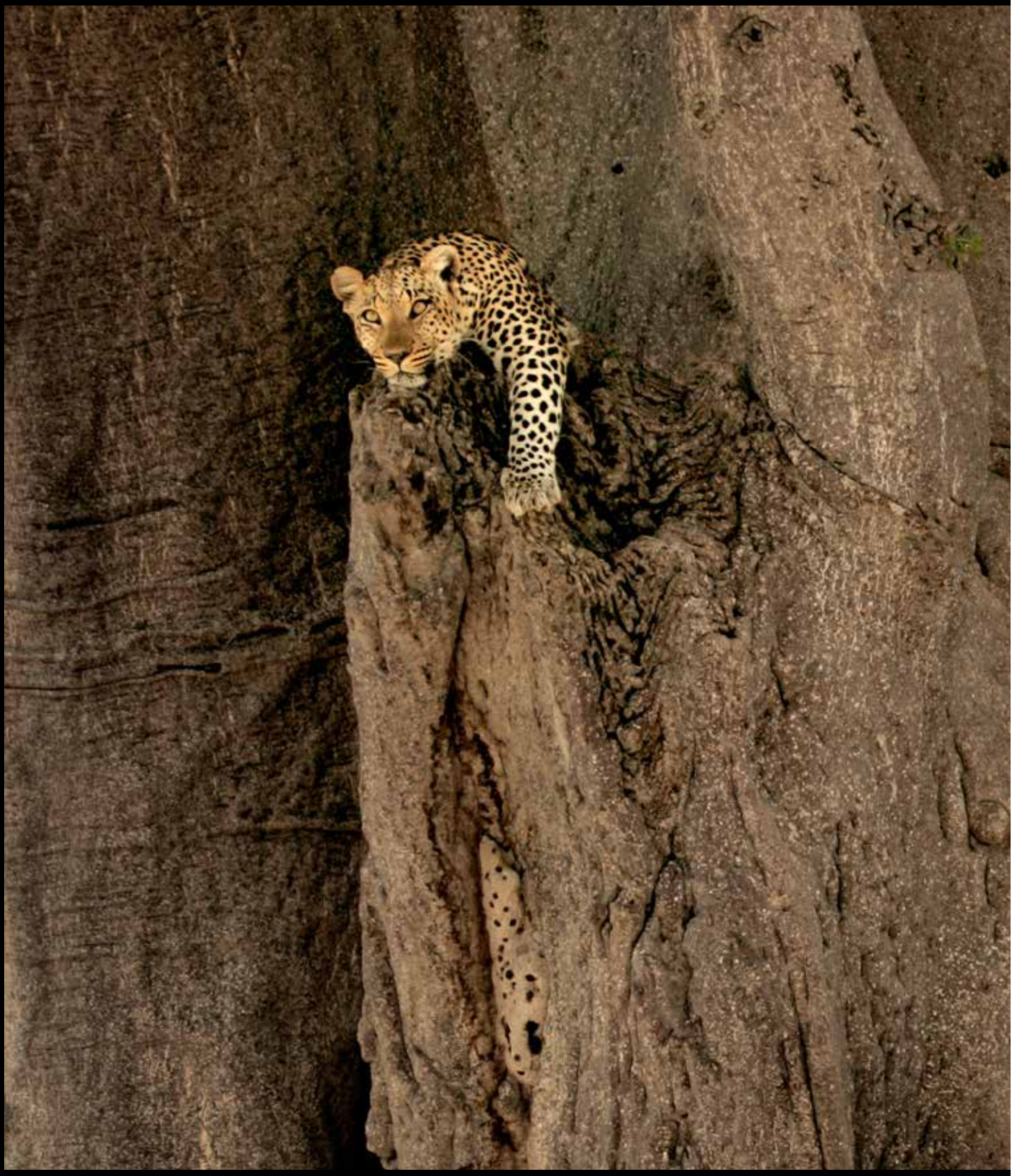
Illegal wildlife trade

Estimates of the illegal trade in wildlife are generally around 7–23 billion dollars annually,[72-75] including anything from insects, reptiles, amphibians to mammals. It concerns both live and dead specimens or even products made from wildlife or plants. The specimens and products are used for pharmaceutical, ornamental or traditional medicinal purposes. Illegal harvest and trade includes a range of species from iconic ones like gorillas, orangutans, elephants, tigers, rhinos, Tibetan antelopes and pangolins to corals, birds, reptiles and sturgeon for caviar. These species often constitute significant financial transactions, both for national economies as well as to black markets. Due to lack of clear definitions, the boundaries between different types of environmental crimes is sometimes unclear.

Organized environmental criminal networks increasingly operate like global multinational businesses, connecting local resources to global markets through complex and interlinked networks often embedded in the business community and in government, sometimes including those tasked with protecting wildlife. Crime groups coordinate through harvesting, trading, and transporting networks to subvert national and international laws and move wildlife products to market.[76] A financier who can supply weapons and material to poaching parties often directs harvesting networks. Harvesting networks can include poor villagers, park rangers, professional hunters, conservation authorities as well as large poaching gangs such as rebel groups or insurgents working under the direction of a financier.[77] Involvement by the political elite in poaching syndicates greatly increases the number of illegal kills and can directly contributes to high rates of poaching.[78]

In the long term organized wildlife crime, enabled by corruption, contributes to the erosion of the state across the continent, challenging countries to control their own borders, resources, and government policies. As illicit economies grow and political power is looted by transnational criminal organizations states will weaken further in a vicious cycle of state degradation accompanied by increased foreign illicit trade. Corruption is one of the most effective and pernicious weapons of organized crime.[79] Organized crime, non-state armed actors, and to some extent armed groups affiliated with the state, benefit when the state is weakened by corruption.[80] Government complicity in organized crime undermines the confidence of local populations in their government.[81] Rule of law is undermined through corruption of law enforcement and the judiciary. Government officials, when implicated in transnational crime, are rarely prosecuted, further undermining government legitimacy.[82]

Transnational crime robs governments of the funds required to perform primary functions related to fighting corruption, controlling borders, and developing the economy, among other things. At the same time criminal groups inject resources into communities, undermining efforts at local government capacity building and legitimacy creation,[83] undermining of the connection between states and societies. In the worst impacted communities individuals look elsewhere for economic and physical security.[84-85] Illicit economies and traffics provide a source of employment and represent a large part of developing economies' income and can sometimes be the most accessible means to accumulation for impoverished communities.[86] Allowed to flourish, organized crime groups can develop local institutions and exploit grievances against government policies and resentment towards lack of development and lack of opportunity.[87-88]



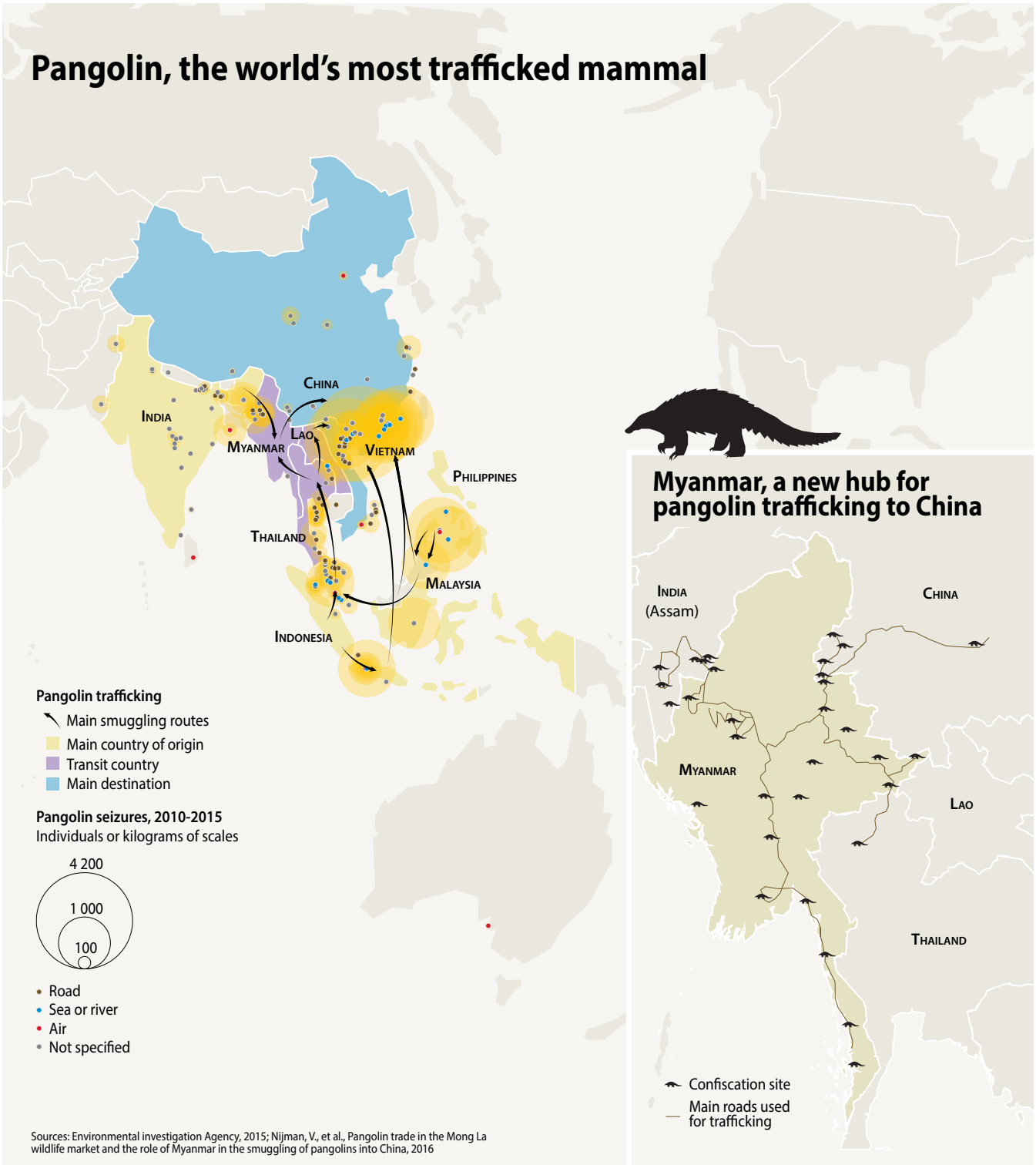


Figure 5: Far over a million pangolins have been killed and trafficked in the last decade, making it one of the World's most targeted animals for the illegal wildlife trade. In 2015, Vietnamese customs officers trained by the UNODC-WCO CCP (Container Control Programme) seized 1,023 kg elephant ivory and around 4,000 kg of pangolin scales.

The rise in the illegal pangolin trade

Pangolins, commonly called scaly ant-eaters, come in eight different species, four located in Africa,[89] and four in Asia.[90] All Pangolins are listed in CITES Appendix II, but the Asian ones are listed with a zero annual export quota.[91] Two Asian pangolin species are IUCN listed as critically endangered,[92] and two as endangered.[93] The Asian species have been hardest hit by illegal trade, with shipments in tens of tons going from southeast Asian range states into China. The illegal trade is primarily in live pangolins, pangolin meat and scales. Demand in scales for traditional medicine and meat associated with luxury consumption primarily in China, and secondarily in Vietnam, drives the trade.[94]

The scale of illegal, illicit and unregulated trade in pangolin parts is under-documented, making it difficult to precisely ascertain the size of the trade, particularly between Africa and Asia. Estimates have been made of seizures at 10,000 per year.[95] which if representing only 10% of the actual exploitation, makes IUCN's SSC Pangolin Specialist Group's estimate of 1 million individuals taken from the wild in the last decade, realistic.[96]

These numbers lack resolution to distinguish between exploitation of the animal's skin (zero quota imposed on Asian pangolins since 2000), scales (used for traditional medicine) or meat (equivalent of 55,000 pangolins worth of meat seized 2007-2015) , which belong to distinct markets. About 20 metric tons of scales have been seized between 2007 and 2015.[97]

The pangolins are potentially commercially extinct in China, which has made the regional trade take off since the 1990s.[98] Given recent seizures, it is safe to conclude that the trade is increasing in scope.

Myanmar has emerged as a main transit and source country, because of its geographic location, size and weak government. 52 seizures were made between 2010 and 2014 in Myanmar and neighbouring countries with a retail value of over USD 3 million.[99]

All four pangolin species in Africa are listed as vulnerable, but the hitherto legal exploitation (given national legality) here is increasing, reflecting a shift of the centre of gravity of the trade from Asia, and this particularly applies to scales. Seizures of pangolin parts in Zimbabwe during the first half of 2015 totalled almost 8 tonnes. The seized parts originated in Uganda, Republic of Congo, Kenya and Nigeria. These quantities can be compared with seizures prior to 2013, which did not exceed half a tonne.[100]

Elephants

The African elephant population was estimated to number 473,000 (definite and probable) elephants as of the end of 2013, down from about 1.3 million in 1972.[101-102] In the three years up to the end of 2012 an estimated 100,000 elephants were illegally poached in Africa, with annual estimates ranging from 30,000[103] to 40,000,[104] generating an average of 211 metric tonnes of illegal ivory per year.[105] The African elephant is currently IUCN listed as vulnerable,[106] and CITES listed in Appendix I, except for populations in Botswana, Namibia, Zimbabwe, which are Appendix II.[107]

The proportion of elephants illegally killed in Africa was peaking in 2011, but has declined slightly after 2013. Nonetheless, poaching rates are higher than normal growth rates for elephants. Three quarters of poaching takes place in Central

and South Africa, with one quarter in East Africa. Poaching hotspots include Pendjari (Benin); Garamba (DRC); Niassa (Mozambique); Katavi-Rukva, Ruaha-Rungwa and Selous-Mikumi (all Republic of Tanzania).[108]

An estimated 39,500–43,500 wild Asian Elephants exist across 13 range states, with at least half living in India.[109] The Asian elephant is IUCN red listed as endangered,[110] and CITES listed as Appendix I.[111] No reliable estimate exists on the level of illegal killing of Asian elephants. However one recent study from southern India found poaching to be responsible for 40% of elephant deaths, and 82% of male elephants.[112] Unlike the African elephant, where both males and females have tusks, only Asian elephant males have larger tusks, making them heavily targeted, which can skew populations.[113]

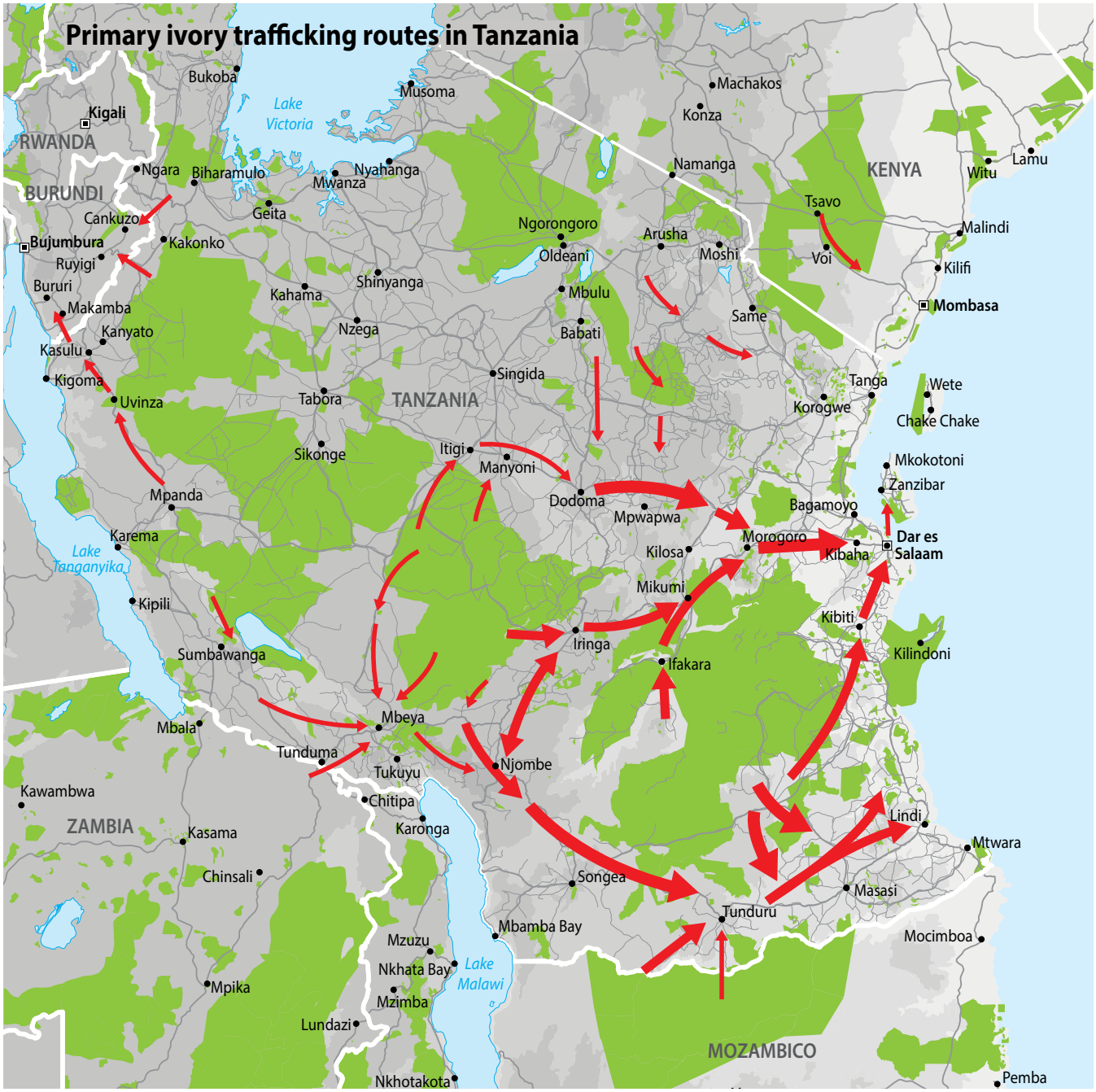


Figure 6: Ivory trafficking routes in Tanzania. South-eastern Tanzania and Northern Mozambique represent one of the hardest hit areas of elephant poaching in the World, illegally exported through Burundi and Tanzania and Malawi to Southeast Asia and China.[114]

Rhinos

There are two species of African rhinos, black rhino and white rhino. The 5,042–5,455[115] critically endangered[116] and CITES Appendix I listed,[117] black rhinos are concentrated in South Africa, Namibia, Swaziland and Zimbabwe. The 19,682–21,077[118] white rhinos, IUCN listed as near threatened,[119] and CITES listed in Appendix I and II.[120] live mainly in South Africa but some have been introduced to Kenya, Zambia and Cote d'Ivoire.[121]

In 2015, poachers killed at least 1,338 rhinos in Africa, the highest number in decades.[122] South Africa, the country that holds the vast majority of the world's rhinos, lost at least 1,175 rhinos in 2015, down slightly from the record high in 2014, when 1,215 rhinos were killed.[123] As of 08 May 2016 363[124] rhinos had been killed in South Africa, which if the rate continues out 2016 will lead to 1037 rhinos killed. Kruger National Park was home to 8001–9290 white rhinos in 2014.[125] It has been the epicentre of the rhino poaching, with

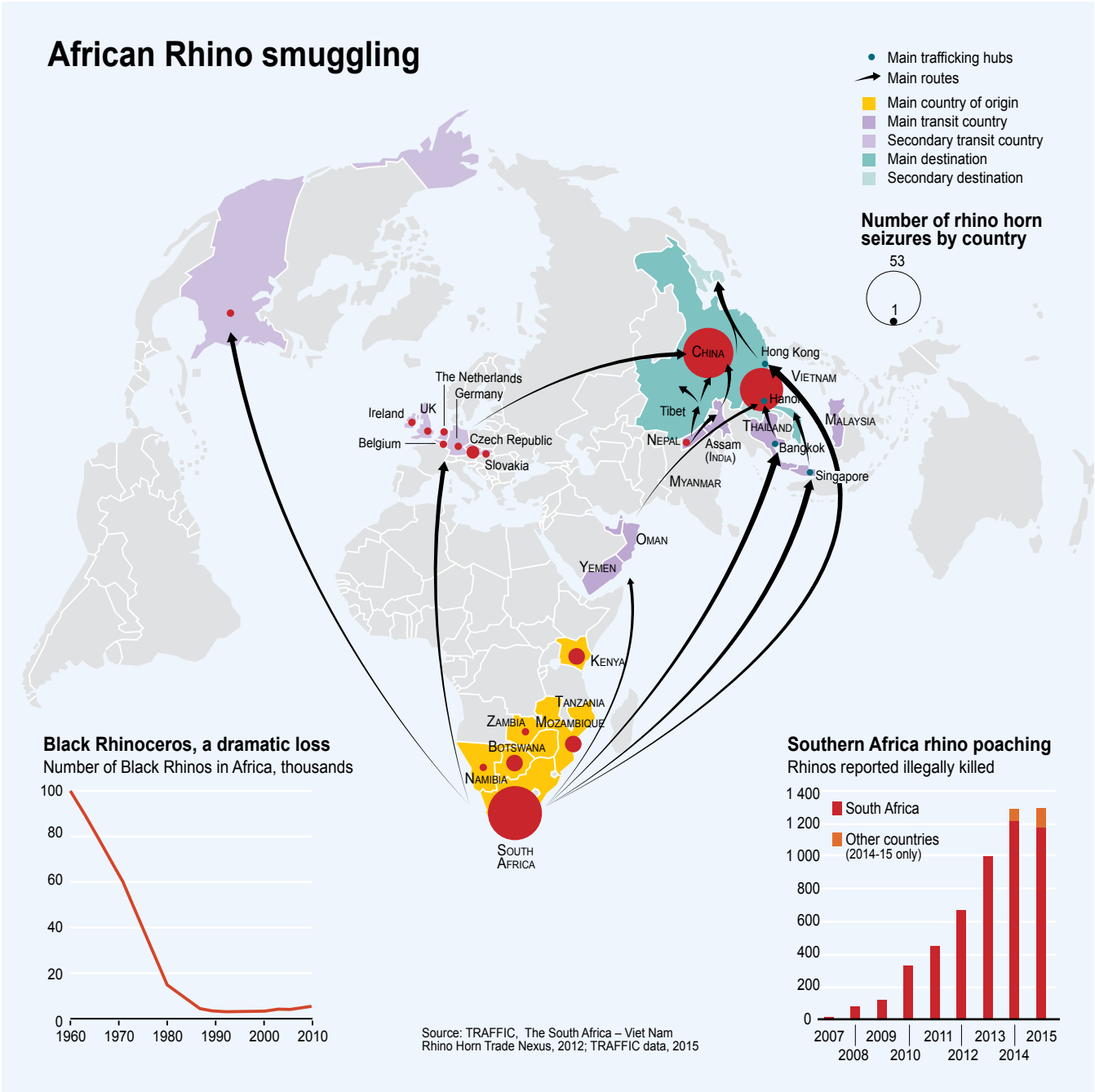


Figure 7: Illegal trafficking in wildlife and smuggling and poaching of rhinos.

55% of South Africa's killed rhinos in 2011 and 2014, and 70% in 2015.[126] About two thirds of all rhino horn seized between 2006 and 2015 was destined for China or Viet Nam.[127]

Asian rhinos come in three species. They are the greater one horned, with a population of 3,500 in mid-2015, the Javan rhino with 63, and the Sumatran with less than 100 individuals in existence.[128] The greater one horned rhino is IUCN listed as vulnerable,[129] while the other two are critically endangered.[130]

Poaching is also a threat to Asian rhinos. Over 70% of Indian Greater One-horned rhinos were in Kaziranga National Park by 2008.[131] with an estimated 2,401 rhinos in 2015.[132] Poaching is currently a threat in Kaziringa with 123 rhinos killed between 2006 and 2015. The killing has increased strongly with 71 (58%) of these killed in 2013–2015.[133] The other major concentration of Asian rhinos are in Chitwan National Park, with 605 of Nepal's 645 rhinos.[134] The Nepal population has been under threat from poaching.[135] However, the population in-country has increased by 111 from 2011 to 2016.[136] But Chitwan has seen no poaching for the full year until mid 2015.[137]

Rhino poachers in Africa have increased considerably in sophistication. Poachers tended to be a mixture of poorly equipped locals and assault-rifle equipped former military, police officials or game scouts with tracking and bush skills.

Now, however, poachers are even more sophisticated using high-powered .375 or .458 rifles or even cross-bows, and increasing use of helicopters and dart guns using immobilization drugs. Such methods and equipment require professional skills and access to expensive equipment.[138] This level of equipment and professionalism among poachers is not yet prevalent among elephant poachers. Highly professional poaching is sometimes called khaki-coloured crime, referring to the likelihood of it being conducted by industry insiders with veterinarians.[139]

Forestry crimes

The involvement of transnational organized crime and advanced laundering is becoming more and more evident, even in forest crimes such as rosewood smuggling, illegal logging, or laundering of illegal tropical timber through "fraud" plantations, laundering the timber through paper mills and palmoil plantation front companies.[140] In some countries as much as 90% of forest are leased as logging concessions.[141-142] It is estimated that 62–86% of all suspected illegal tropical wood entering the EU and US arrives in the form of paper, pulp or wood chips, not as roundwood or sawnwood or furniture products, which have received the most attention in the past (see UNEP-INTERPOL, 2014).[143] In 2015, WWF-Germany conducted a follow-up fibre- laboratory investigation of paper to verify possible presence of tropical wood in a total of 144 different paper products.[144] Tropical timber was found in almost 20 percent, despite most of the companies having ruled out this possibility, further confirming the patterns reported by UNEP-INTERPOL in 2014.

Indeed, corporate crimes have become a key component of forestry crimes. Most crimes involve not the obvious direct illegal logging, but a system of fraud, tax fraud, forged permits or permits acquired through bribes, laundering of illegally procured wood and extensive smuggling operations involving even small fleets of timber vessels operating in Southeast Asia from logging sites to pulp and paper mills abroad. Shell companies, often palmoil or agricultural plantations or grazing (that rarely produce any primary products), are used through multiple temporary shell companies based in tax havens to acquire or lease land for agricultural purposes, but in reality only clearing forests for timber and pulp supply.

UNEP and INTERPOL listed in 2014 some 30 different ways of conducting illegal logging and laundering illegal wood, including 1) Logging in protected areas: 2) Logging without permits in unprotected areas; 3) Illegal logging in conflict zones; 4) Logging in excess of permit or concession quotas; 5) Logging with forged or re-used permits; 6) Obtaining logging permits illegally through bribery; 7) Establishing or expanding palm oil, bio-fuel or other plantations; 8) Cattle ranching and soy production; 9) Widening road corridors, mining or other felling without a permit.

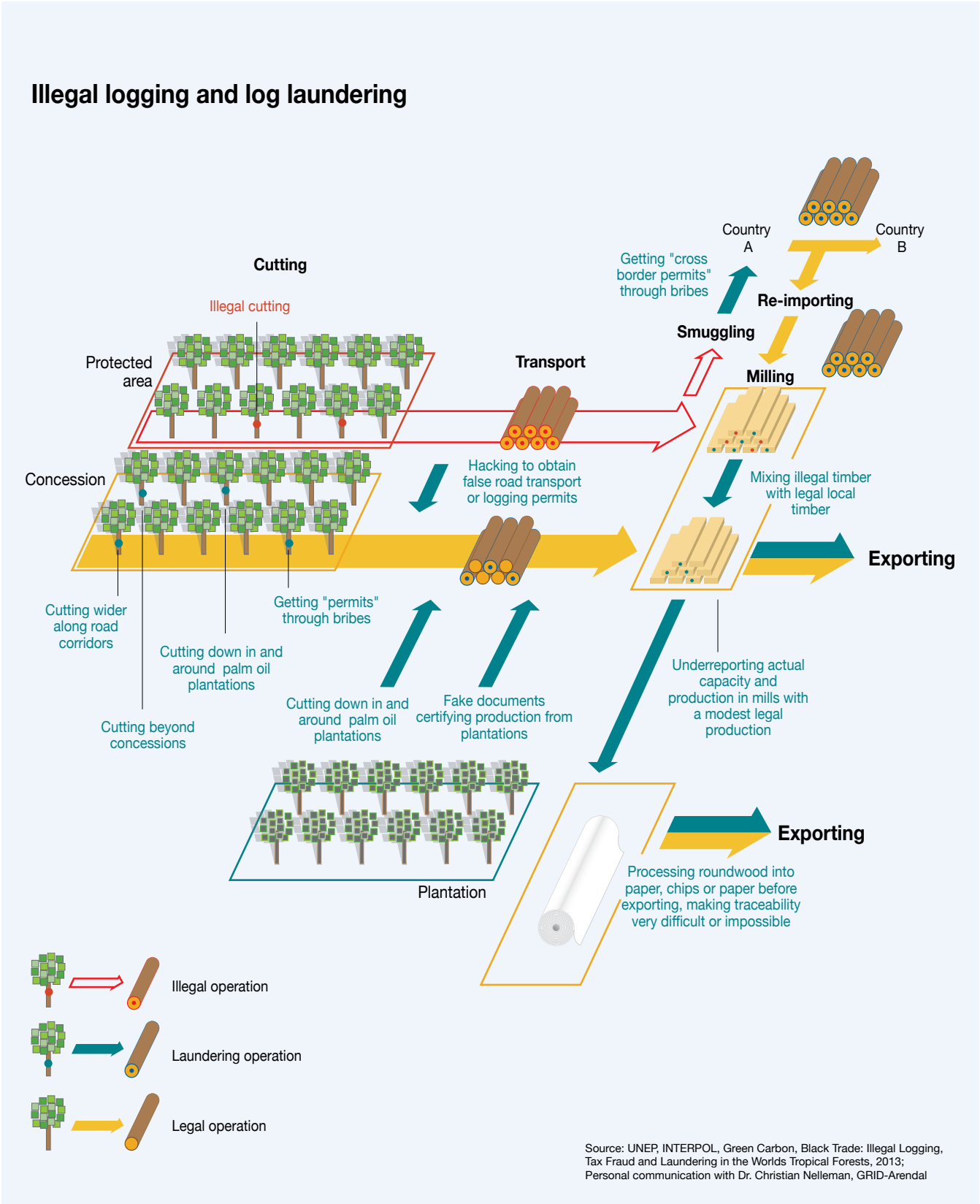


Figure 8: Over 30 different illegal logging and illicit wood laundering methods have been identified by UNEP and INTERPOL.

Illegally harvested rosewood from West Africa

Rosewood is highly sought after worldwide for its pink or red-coloured wood, and therefore commands extremely high prices on the international market. Rosewood is a hard wood used to produce furniture, flooring and ornaments; some species also have an extraordinary acoustic quality and are often used in manufacturing musical instruments. Asia represents the main destination for illegally harvested rosewood driven by the high demand for rosewood furniture (known in China as the "Hongmu" industry).

There are currently estimated to be 3,000 Hongmu factories across 25 areas in China. State owned banks have made loans worth USD 75 million to Hongmu industry. For example, in just one town, Pingxiang, there are 2000 Hongmu businesses alone. As a result, the extremely high levels of demand for this timber species have led to the unsustainable depletion of rosewood trees, and a thriving illicit market for the trade of their timber.

INTERPOL coordinated Operation Log, an operation to address the illicit trade of timber and forest products sourced in West Africa, including the West African Rosewood (*Pterocarpus Erinaceus* Spp). Nine countries participated in this operation; Benin, Burkina Faso, Cote d'Ivoire, Gambia, Ghana, Mali, Mauritania, Senegal and Togo.

This operation resulted in the seizure of illegally harvested rosewood with a value of USD 216 million (*information regarding the quantity of rosewood seized has been updated since the INTERPOL press release in November 2015*)[145] and the arrest of 44 individuals. Investigations are ongoing in the countries and information is being exchanged to dismantle the criminal networks involved in this trade.

The results of the operation raised political awareness about the quantity of illegal trade of rosewood sourced from the region, resulting in Senegal requesting the inclusion of *Pterocarpus Erinaceus* spp in CITES Appendix II.[146] This proposal has been co-sponsored by seven countries namely Benin, Burkina Faso, Guinea, Guinea Bissau, Mali, Nigeria, Togo and Chad.

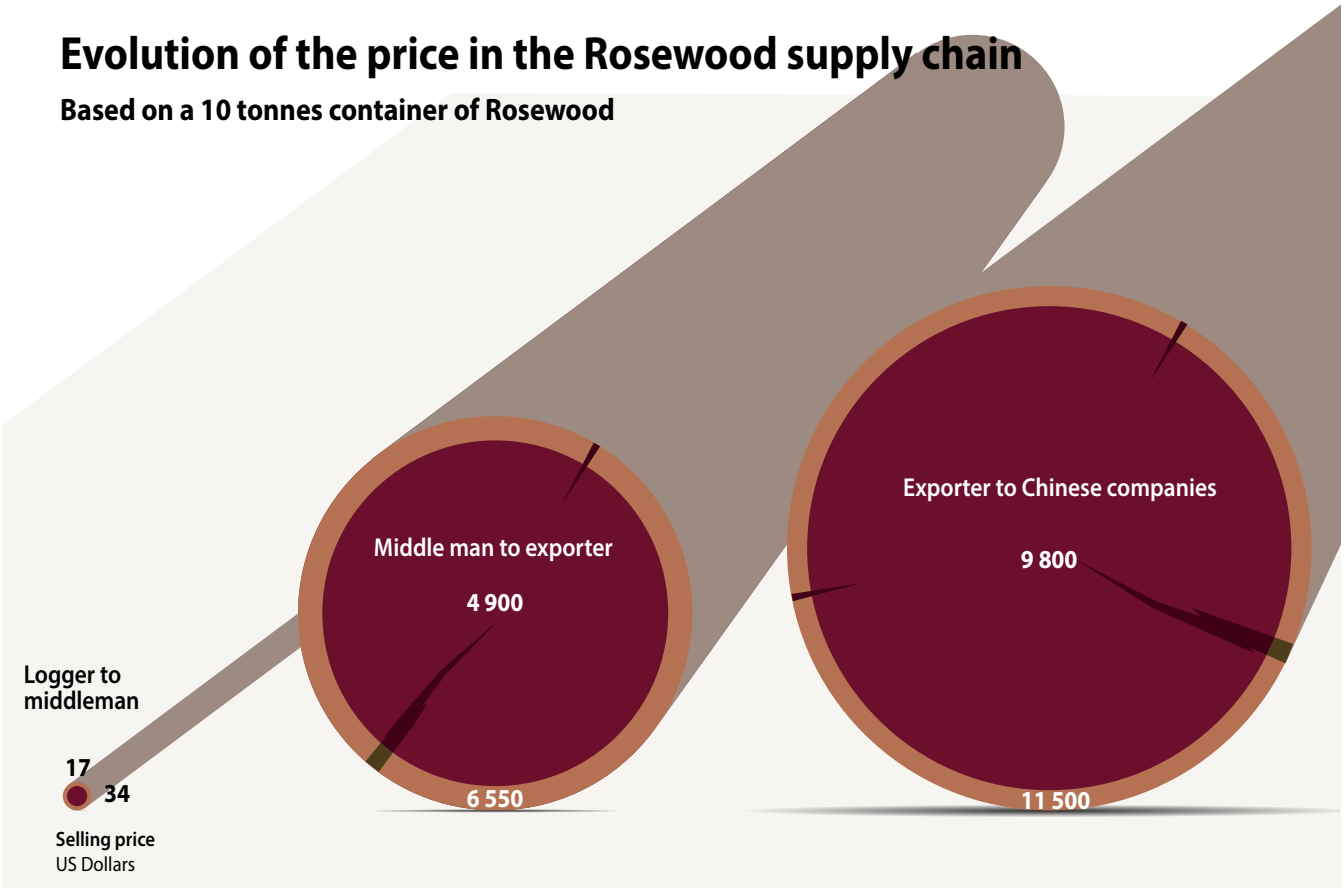


Figure 9: The economic impact of the criminal behaviour relating to illegal logging and the export of West African rosewood can be reflected by the huge differences between the price at the logging stage compared to the export price (as identified in the framework of INTERPOL Operation Log)

Fisheries crimes

According to the Food and Agriculture Organization, 29% of global fish stocks were overfished or extinct in 2011 and well over half of global fish stocks are fully exploited.[147] At the same time, fish and fish-products are 20% of the source of animal protein for 3 billion people around the world and the fish and fish-farming industry secures the livelihoods of between 10 and 12 per cent of the global population, most of these in developing countries.[148]

It is estimated that on average 18% (geographically ranging 3–37%) of the global catch, or as much as 11–26 million tons of fish, is caught illegally each year.[149] Illegal fishing undermines food security, livelihoods, fisheries management and biodiversity.[150] Illegal fishing threatens the subsistence existence of coastal communities worldwide, but particularly in developed countries with weak governance structures. The UN General Assembly has therefore repeatedly called for more knowledge about the links between illegal fishing and organised crime.[151]

There are several inherent factors that make the fisheries sector particularly susceptible to crime.[152] The industry is a truly global enterprise, with fish caught both in areas within and outside national jurisdiction, and in remote areas beyond the scrutiny of ordinary law enforcement agencies. There is great mobility of actors, infrastructure (vessels) and commodities. Added to this is a vague international legal framework governing the law of the sea, which fails in many respects to fully take on board the implication of transnational organised crime taking place at sea and particularly in the fisheries sector. An example of this is that, despite the well-documented harmful consequences of allowing anonymous ownership of vessels in states that are unable or unwilling to exercise their law enforcement jurisdiction over the vessels on their flag, this practice continues unabated. Since the turn of the millennium this trend has but increased. Of particular concern is that private companies can, and do, buy the right to register vessels in vulnerable flag states in order to offer vessel owners the opportunity to register their vessels in countries unable or unwilling to enforce their laws over them. These companies sell impunity to criminals at sea.

In 2013 INTERPOL established a focus project to assist its member states investigate criminal offences committed within the fisheries sector.[153] Fisheries crime offences typically range from fraud and forgery, to breaches of regulations and associated crimes, such as human trafficking and trafficking in illicit goods.[154] It involves criminal organisations organised as mafia-style hierarchies such as the Vidal family[155] and looser network configurations, to state corporate criminals operating with the implicit support of their governments.[156]

In one recent case a fishing vessel was arrested on suspicion of being stateless, which was later confirmed. The documents on board the vessel pertaining to vessel identity and safety certification were confirmed to be forgeries. There was strong suspicion that the crew had not been paid, fraudulent commercial invoices had been issued, and income was most likely never declared to the revenue services. Over a more than ten-year period this one vessel had probably caught an estimated 10.000 tons of Patagonian toothfish with a market value (in today's terms) of USD 200–300 million. Of equal concern was the fact that the vessel engaged in an extremely harmful fishing method using gillnets, which involves the setting of nets of up to 150 km of length. There are a worrying number of reports that these gillnets are left behind in the Southern Ocean when they snag and break off or if the vessel flees to avoid detection, killing entangled fish.

There is moreover mounting evidence that the vulnerabilities of the fisheries sector (their geographical reach, coupled with vague legal regulation) make the industry susceptible to cross-

over crimes, such as drug and weapon trafficking, murder and trafficking. In March 2016 both Australian and French navies have detected fishing dhows filled with weapons headed for Somalia.[157] Recently a youtube video depicts the ramming of smaller fishing vessels and the execution of a number of men clinging to a sinking raft in what appears to be an organised attack by persons on board a fleet of tuna long-liners. There are also concerns about connections between illegal dynamite or blast fishing and explosives used for terrorist activities in Tanzania and rebel groups in DRC.

A common denominator of all of these cases is that the criminal activities are difficult to detect and the offenders are difficult to investigate and prosecute. The jurisdictional limitation to pursue these vessels and the persons on board them, coupled with the difficulty of identifying vessels, vessel movement and ownership, seriously undermine law enforcement action.

By contrast to IUU fishing, "Fisheries Crime" is a term applied to the enabling crimes or associated criminal activity conducted by national or transnational organised crime business models in fisheries value chains. It includes crime in the whole fisheries sector from harvest to processing, to logistics, transport, trade in the products, branding (including food fraud) and the traditional fraudulent criminal activities of nationals committed in multiple jurisdictions such as conspiracy, extortion and bribery. At every stage in the fisheries sector value chain criminal abuses of registries, customs regulations, government documentation, tax frauds, forced labour, labelling fraud, and secrecy jurisdictions are regularly exploited to maximise the criminal profits from IUU fishing.

Waste, pollution

The global waste sector, valued at at least USD 410 billion a year,[158] takes several forms – firstly a legal industry sustaining business and environmental protection, secondly an unregulated sometimes even informal business, that is important for recycling and job creation as well, but with health risks and challenges of monitoring the safety and sound management.[159] Thirdly, trafficking in hazardous waste and chemicals by organized crime.

The Basel, Rotterdam and Stockholm Conventions are the primary instruments for tracking and managing hazardous waste and chemicals, along with other initiatives such as the UN Solving the E-waste Problem (StEP) Initiative on electronic waste. Waste is often deliberately classified as other items to bypass or deceive law enforcement authorities. This is often done by using non-hazardous waste codes for hazardous wastes or using product codes for hazardous wastes or disguised as second hand goods. Key destinations for large-scale shipments of hazardous wastes, such as electrical and electronic equipment, include Africa and Asia, and lack of resources for monitoring or control of an emerging market makes it a low-risk business also for organized crime. This, in turn undermines both the reputation and competitive situation for both legal businesses and informal businesses alike, where the legal businesses have the by far highest costs due to environmental guidelines and health protection of employees and of handling and tracking toxic material.

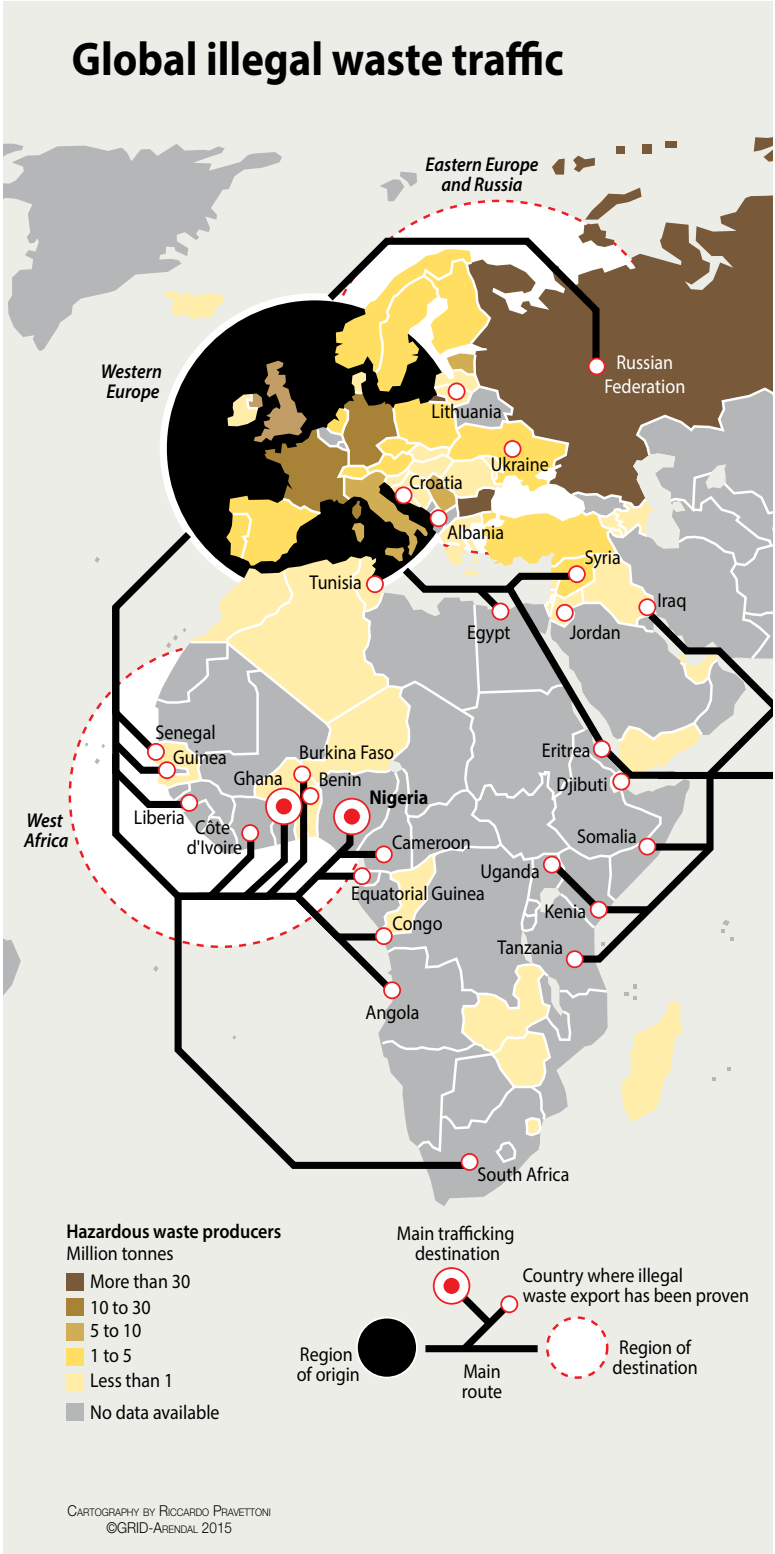
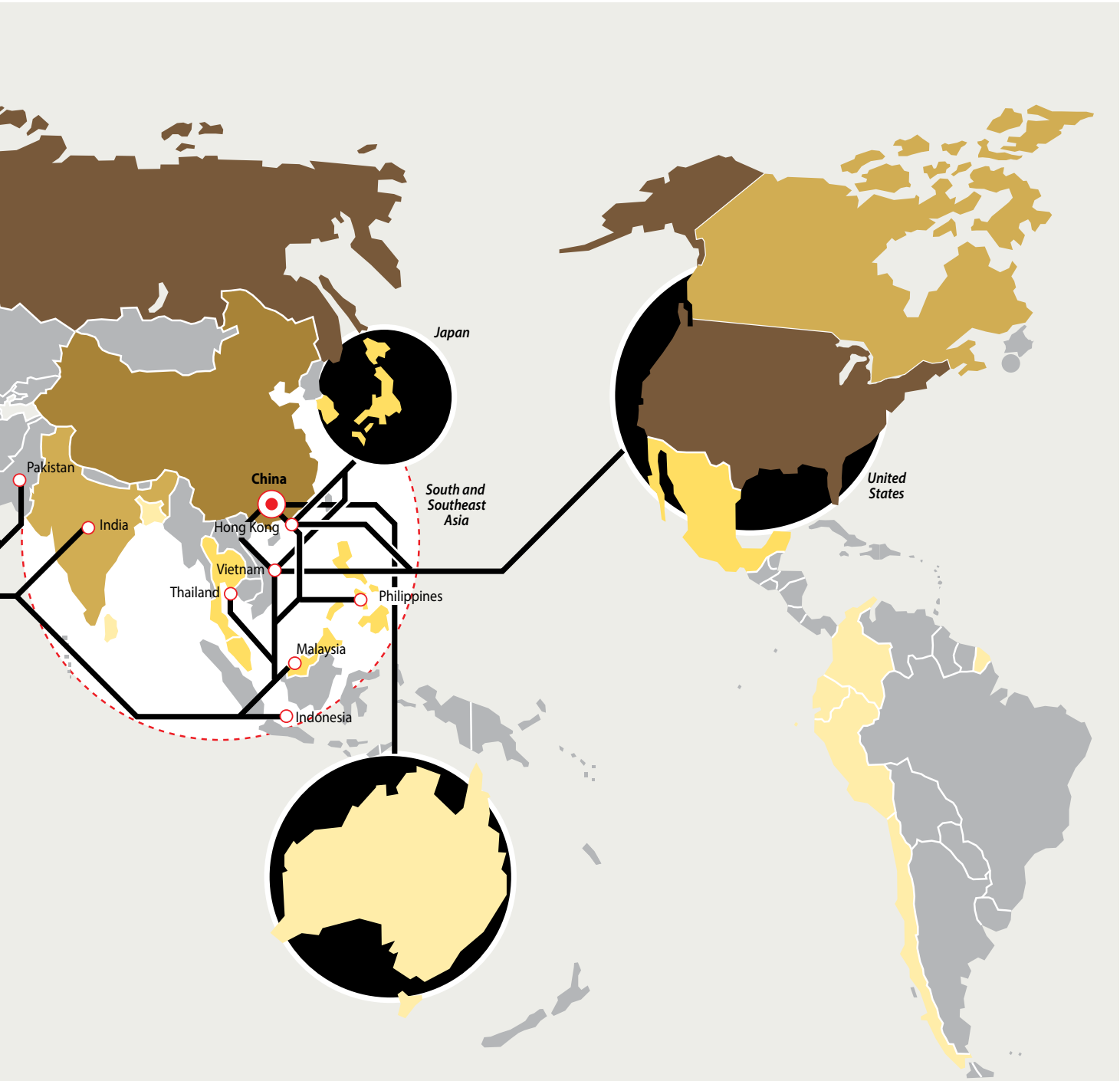


Figure 10: Illegal trafficking routes of hazardous waste.



Sources: United Nations Statistical Division, 2011; UNODC, Transnational Organized Crime in East Asia and the Pacific, 2013; Impel-TFS, 2006, Threat Assessment Project, and WorldCustoms Organization (2009) Operation Demeter final report, supplemented with data from the Dutch national audit, appeared in the Coordinated audit on the enforcement of the European Waste Shipment Regulation

White collar environmental crimes

The links of environmental crimes to money laundering, hacking, fraud and tax evasion by transnational organized criminal networks

The heavier transnational organized criminal networks, experienced in white collar crimes also – have embraced environmental crimes as an emerging black market with low risks and high profits. The crimes related to natural resources, waste and wildlife include tax fraud, double counting, transfer mispricing, money laundering, internet crimes and hacking, phishing/identity theft, securities fraud, financial crimes, and fraudulently reclaim carbon credits, as shown by some of the many examples investigated by INTERPOL and EUROPOL in recent years.

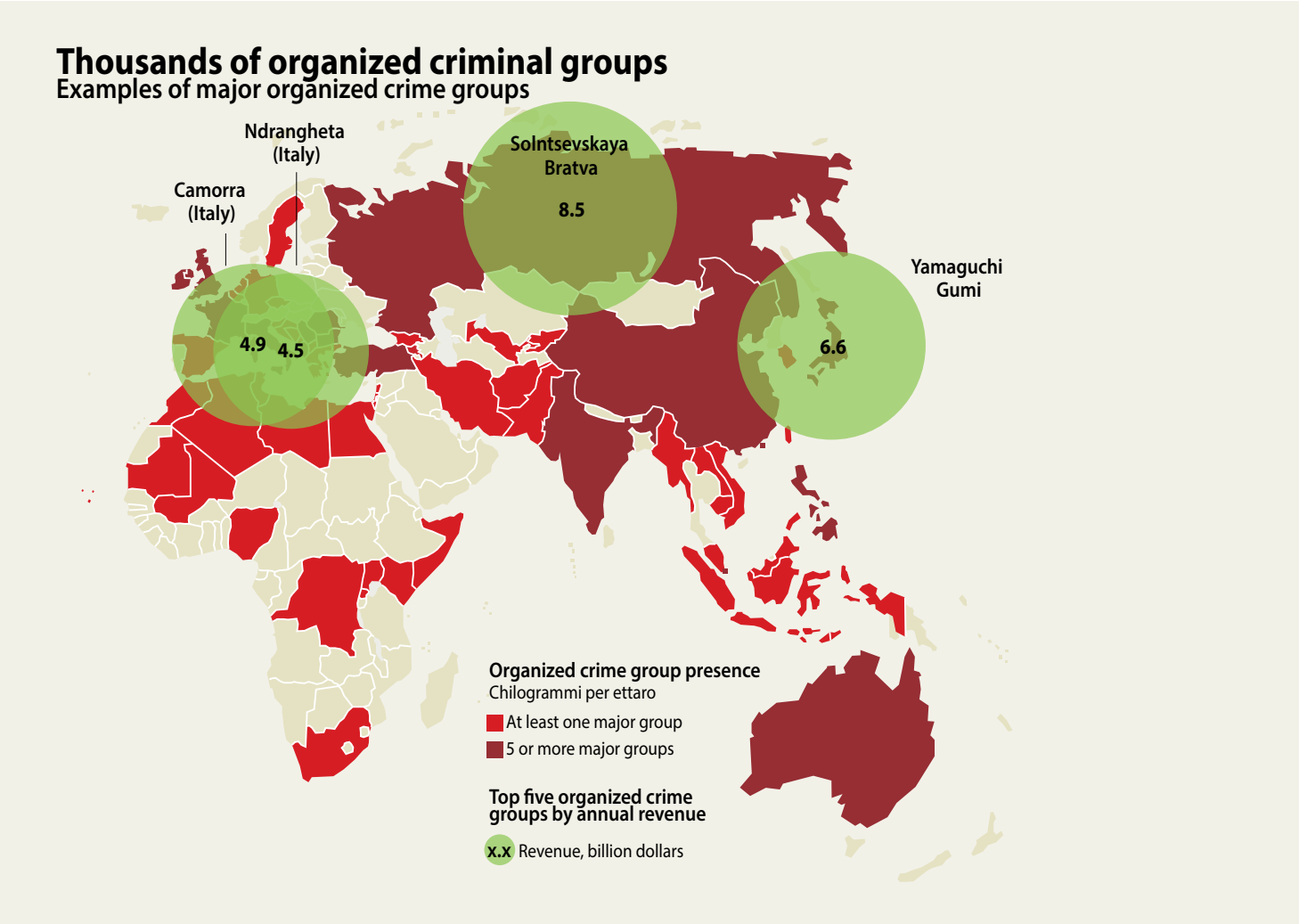
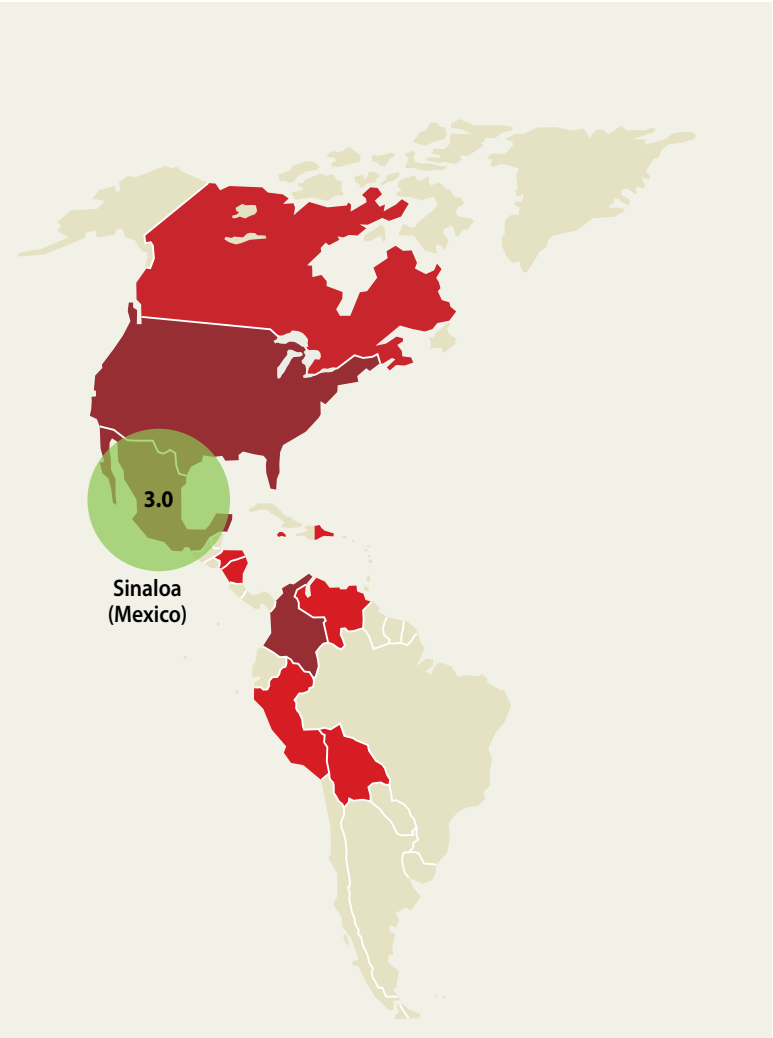


Figure 11: Examples of organized crime groups.

These white collar crimes, including corporate crimes through a wide network of shell companies based in tax havens, involve serious crimes and vast sums of money that not only rob governments and developing countries of hard-needed revenues, but also undermine legal markets and businesses, even impacting stock markets. Organized crime also uses environmental crimes to launder money from drug trafficking. In Peru and Colombia – which currently have the largest cocaine production in the world – illegal mining is by some claimed to be a viable alternative to drugs and the easiest and most profitable way to launder money from the illegal drug trade in the history of Colombian drug trafficking.[160]

Carbon trading is the world's fastest growing commodities market.[161] The combined value of carbon pricing instruments were in 2015 just under USD 50 billion. Carbon taxes and emission system trade sales generated over USD 15 billion in government revenues across the world.[162] The vulnerability to crime of this trade derives from the market's immaturity and the intangible nature of the product, which is based on "the lack of delivery of an invisible substance to no one."[163]



Another market is the trade in forest certificates (CRAs), that essentially enables landowners to offset their restoration obligations by paying for maintaining native vegetation elsewhere. The potential market for this in Brazil alone is trading 4.2 Mha of CRAs with a gross value of USD 9.2 +/– 2.4 billion, possibly becoming the largest market for trading forests in the world.[164] Also this has vast risks for organized crime and fraud and it is imperative as these trading systems evolve that substantial resources are given to the national and international police community, including INTERPOL and UNODC to help develop systems for prevention of the misuse and monitoring. Individual cases have revealed scams on carbon credits from tens to hundreds of millions of USD in individual cases.[165-166]

In 2009 a Brazilian federal prosecutor, Bruno Valente Soares, conducted an investigation into charges that illegal timber from the state of Pará was being laundered as "eco-certified" wood, and subsequently exported to markets in the United States, Europe, and Asia. International buyers often pay an extra tariff or premium for eco-certified timber, while the alleged operations also involved forgery and fraud. The scheme allegedly involved up to 3,000 companies across Pará's timber sector. Laundering illegally logged wood through real plantations or illicit companies has sky-rocketed in Asia.

In Indonesia, the amount of logs allegedly produced through plantations increased from an official 3.7 million m^3 in 2000 to 22.3 million m^3 in 2008,[167] although it is widely known that only a portion of these plantations were actually established.[168] At the same the number of illegal logging cases in Indonesian courts dropped from a high of 1,714 in 2006 to only 107 in 2009.[169] In 2011, UNODC quoted officials in Indonesia that the number of plantation estates actually producing timber may be less than half of the officially quoted figures.[170] World Bank analysts in Jakarta are even more sceptical and suggest the area of productive HTI plantations may be no more than one-third of the officially quoted numbers.[171]

"White collar" environmental crimes include, like any other "white collar" crime, crimes such as corporate crimes, use of shell companies in tax havens, tax fraud, double counting, transfer mispricing, money laundering, internet crimes and hacking, phishing/identity theft, securities fraud, financial crimes, and fraudulently reclaim carbon credits, along with threat finance to terrorist and armed groups, to mention a few.

Environmental crime and threat finance to terrorism and conflicts

Both non-state armed groups, terrorist groups and other networks thrive on the exploitation of natural resources to fund their activities. Examples include Taliban funded by drugs,[172] Janjaweed operating from Darfur into CAR and DRC, and LRA in DRC poaching elephants.[173] At least 40 percent of internal conflicts in the last 60 years have a link to natural resources.[174]

Prior to African Union's intervention in Somalia made 38–56 million USD annually on the illicit charcoal trade, in circumvention of sanctions and ban by the UN Security Council. In the Amazon, armed groups are taxing both timber and coltan, similar to what is done by non-state armed groups in DRC. FARC generate incomes by taxing coltan and an estimated 12 million USD annually by extorting illegal gold miners.[175] In the Trans-Sahara, armed groups are smuggling drugs, cigarettes,

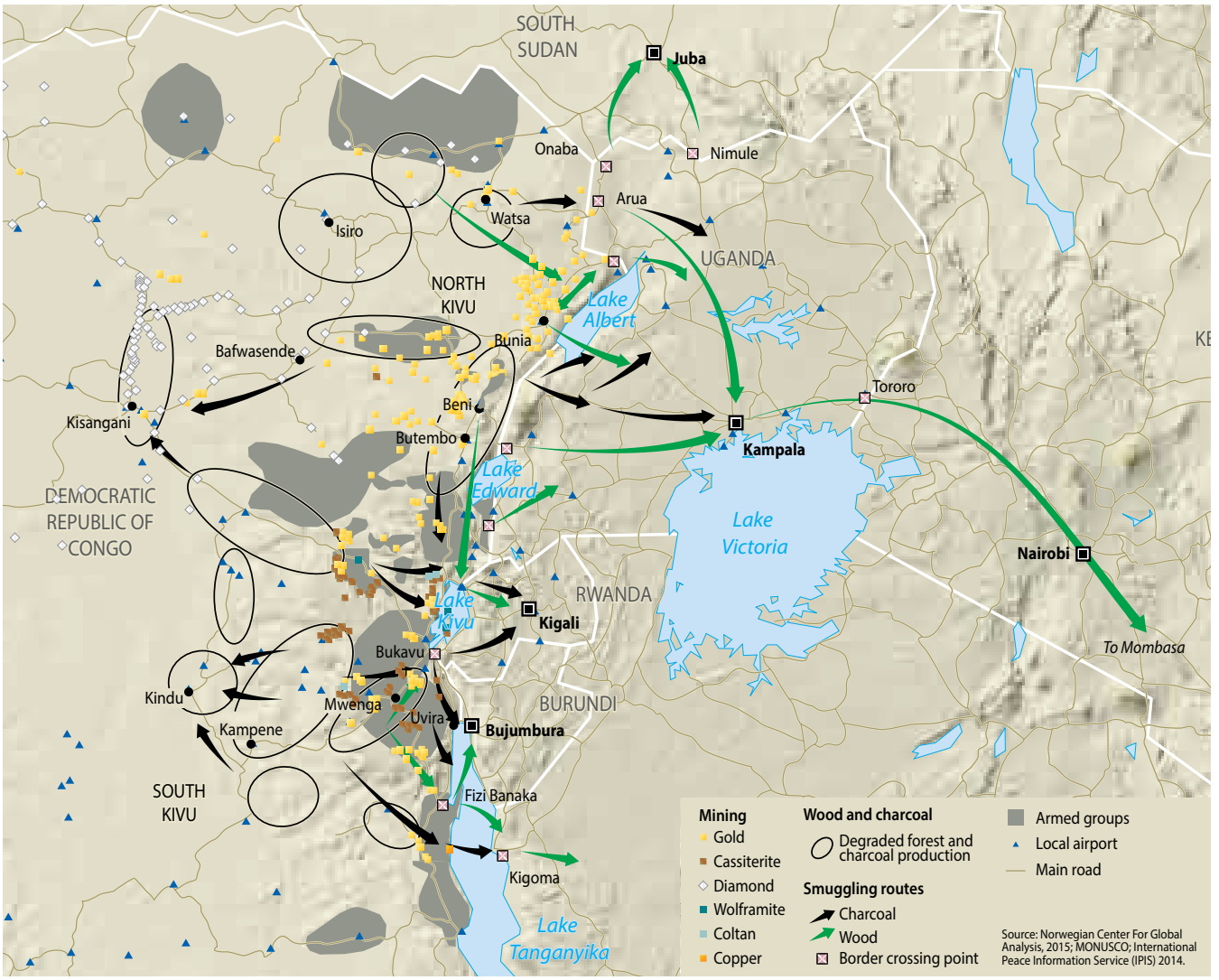


Figure 12: Smuggling by transnational organized crime from eastern DRC to criminal groups, companies or individuals in Uganda, Rwanda and Burundi.

migrants and commodities for profit. Islamic State is heavily involved in trafficking of oil and antiques.[176]

Armed groups across the planet are looking into environmental crimes as a low-risk high-profit source of revenue, depriving governments of revenues while threatening peace, development and security.

Around 98 percent of the net profits from illegal natural resource exploitation – particularly gold, charcoal and timber – goes to transnational organized criminal networks operating in and outside DRC. Armed groups retain only around two percent – equivalent to USD 13.2 million per annum – of the net profits from illegal smuggling. This income represents the basic subsistence cost for at least 8,000 armed fighters distributed on

Criminal networks exploiting natural resources in conflicts and funding rebel group

According to some estimates, illicit natural resources exploitation in eastern DRC is valued at over USD 1.25 billion per year (USD 722–862 million if excluding diamonds also sourced outside eastern DRC). Of these amounts, an estimated 10–30 per cent (range USD 72–426 million per annum) goes to transnational organized criminal groups.

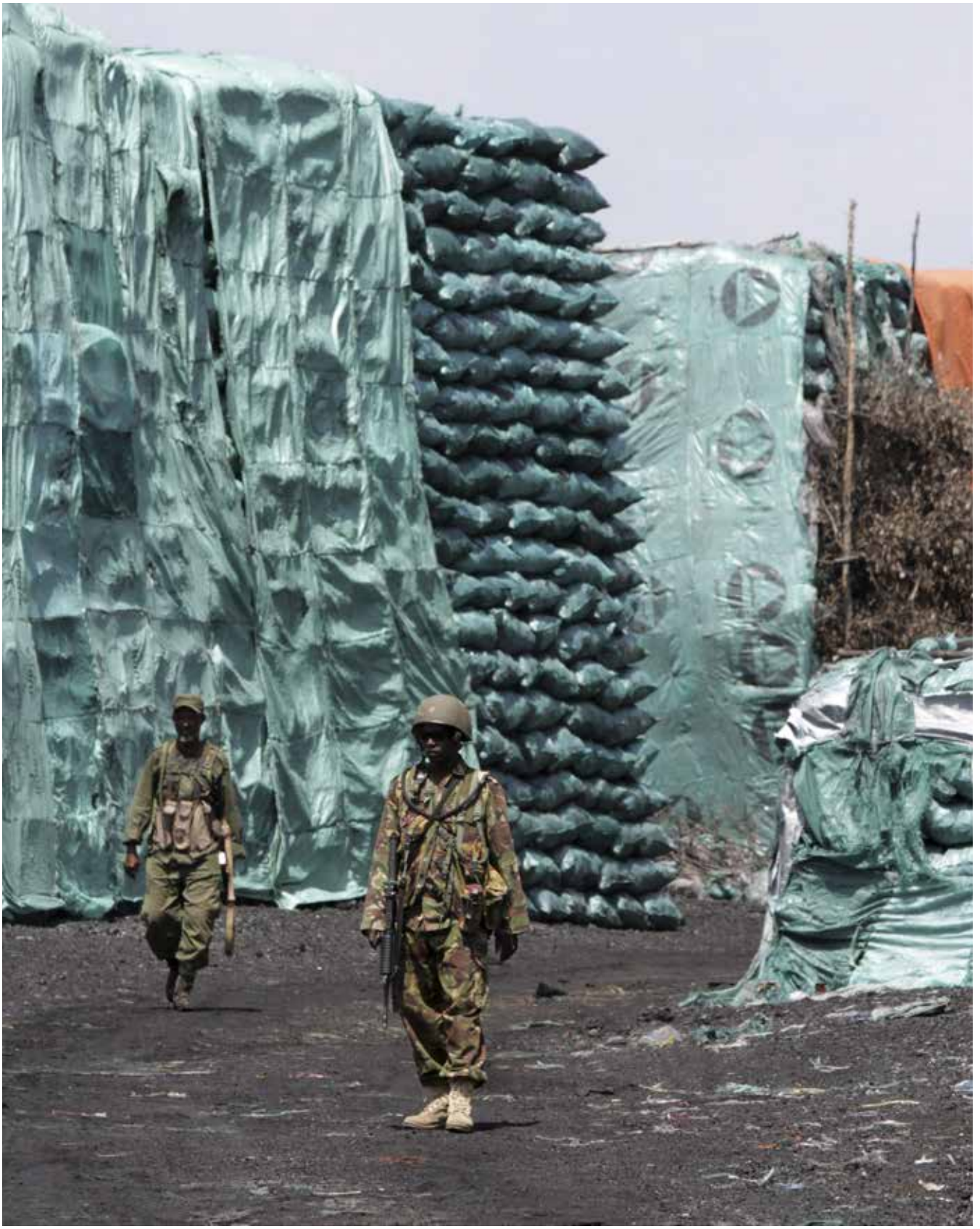
Annual net profits to organized crime is conservatively estimated to derive from: i) gold (USD 40–120 million); ii) timber (USD 16–48 million); iii) charcoal (USD 12–35 million); iv) 3T minerals (USD 7.5–22.6m); v) diamonds sourced mainly from outside the conflict zone (USD 16–48 million); and vi) wildlife, including ivory and fisheries, local taxation schemes, cannabis and other resources (USD 14.3–28 million).

(Quoted from UNEP-MONUSCO-OSESG. 2015. Experts' background report on illegal exploitation and trade in natural resources benefitting organized criminal groups and recommendations on MONUSCO's role in fostering stability and peace in eastern DR Congo. Final report. April 15th 2015. Available at www.unep.org and www.rhipto.org)

25–49 rebel groups per year, and enables defeated or disarmed groups to continuously resurface and destabilize the region.

A recent report by Global Initiative Against Organized Crime, consisting of around 100 of the World's leading experts against organized crime, highlighted the devastating impact of illegal mining and its links to both armed groups and drug cartels in Latin America. In spite of declining prices recently, organized criminal groups engage in expansion of illegal gold mining. Estimates of the proportion of illegal gold mining are: About 28% of gold mined in Peru, 30% of gold mined in Bolivia, 77% of gold mined in Ecuador, 80% of gold mined in Colombia and 80–90% of Venezuelan gold is produced illegally. Hundreds of thousands of workers are employed, similar to DRC with some 500,000 artisanal and illegal mining jobs, often including labour trafficking and exploitation, sex trafficking and child labour.

Impacts on the environment are considerable – gold mining is one of the most destructive industries and illegal ignores legal requirements and restrictions by displacing communities, contaminating drinking water and polluting water and land with mercury and cyanide. Colombia has the largest population of displaced persons in the world, of which 87% come from areas with a heavy presence of illegal mining: Indeed, artisanal gold miners spill more than 30 tons of mercury in rivers and lakes in the Amazon region every year, poisoning fish and causing brain damage to humans living as far as 400km downstream. Cartels and militants often control the mines: GI reported that *"In Sur de Bolívar, Colombia, 1,500 workers were employed at a mine owned by the wife of an ex-AUC leader and were not able to leave the area without being accompanied by the narco-paramilitary group operating in the area."*[177]



The UN Security Council on terrorist and armed groups' illegal exploitation of natural resources

The UN Security Council expressed concern in S/RES/2195 (2014) that terrorists benefit from transnational organised crime, and from the illicit trade in natural resources including gold and other precious metals and stones, minerals, wildlife, charcoal and oil. The resolution discusses Al-Qaida as an example of such a terrorist group.

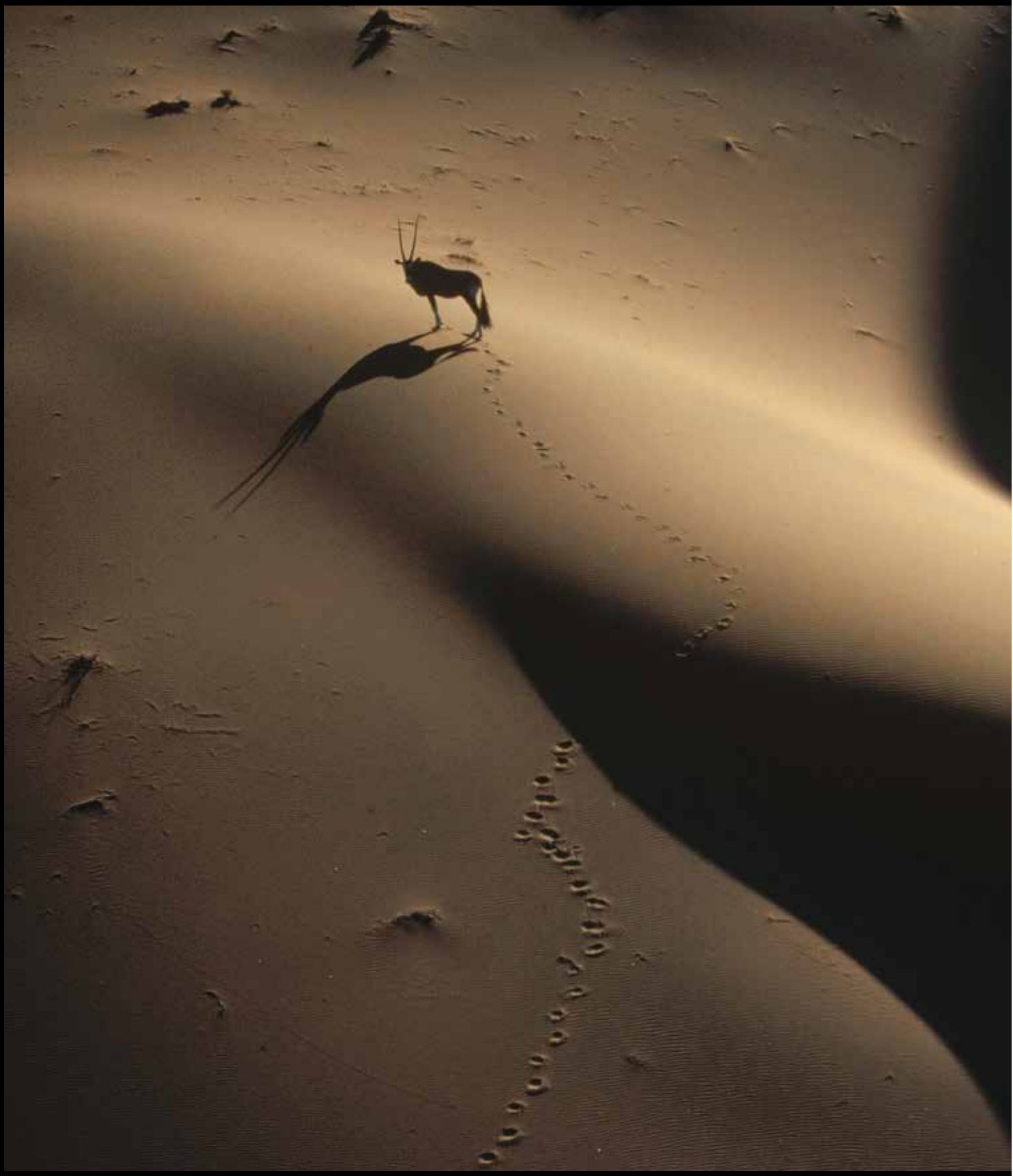
The Security council has also expressed concern about the illegal exploitation and trafficking of natural resources by armed groups, for example in the case of DRC S/RES/1857 (2008); S/RES/2136 (2014) and S/RES/2198 (2015). S/RES/2277 (2016) details particularly the Democratic Forces for the Liberation of Rwanda (FDLR); the Allied Democratic Forces (ADF) and the Lord's Resistance Army (LRA) as examples of armed groups involved in illegal exploitation of natural resources in DRC.

There are few examples of terrorists directly funded by natural resources, but relatively many examples of armed groups funded by them. Al Shabaab (UN listed as SOe.001) are sanctions listed by UN's S/RES/1844 (2008) Sanctions List. They are also listed as a terrorist organisation by 8 states, including the UK and the US, and are affiliated with Al-Qaida according to the UN Group of Experts (S/2013/467). The Group of Experts (S/2014/726) have also documented charcoal's role in funding Al Shabaab with a market value of at least USD 250 million in 2013 and 2014, continuing the trend documented in 2012 (S/2013/440).

LRA (UN listed as CFe.002) with its leader Joseph Kony (UN listed as CFi.009) exemplify an armed group that is listed on the UN sanctions list, for among other things, elephant poaching (S/2014/42 para 232) and trafficking since at least 2014, and looting gold and diamonds.[178]

Other examples where the UN Security Council has prohibited natural resources include:

- Oil imports to stop or limit funding to armed groups such as the military junta in Sierra Leone (1997–1998) S/RES/1132 and UNITA in Angola (1993–2002) S/RES/864 (1993); the 1991 coup in Haiti (1993–1994) S/RES/841 (1993).
- Oil exports from non-government controlled areas of Libya (2014–2016) S/RES/2146 (2014); S/RES/2213 (2015) and S/RES 2278 (2016).
- Diamond exports from Angola (1998-2002) S/RES/1173 (1998); Sierra Leone (2002–2003) S/RES/1306 (2000) and S/RES/1385 (2001); Liberia (2001–2003) S/RES/1343 (2001) and (2003–2007) S/RES/1521 (2003) and S/RES/1689 (2006); Cote d'Ivoire (2005–2014) S/RES/1643 (2005).
- Timber from Liberia (2003–2006) S/RES/1478 (2003) and S/RES/1521 (2003).
- Charcoal exports from Somalia (2012-) S/RES/2036 (2012); its interdiction S/RES/2182 (2014) and S/RES/2244 (2015)
- Oil imports or exports including modular refineries involving Al-Qaida and Islamic State S/RES/2161 (2014) and S/RES/2199 (2015)
- Import of acetic anhydride benefiting the Taliban (2001–2002) S/RES/1333 (2000).



Addressing root causes of environmental crime

The root causes of environmental crime vary greatly, and subsequently the design, identification and implementation of appropriate responses must be carefully planned. Root causes are primarily the low risks and high profits in a permissive environment as a result of poor governance and widespread corruption, minimal budgets to police, prosecution and courts, inadequate institutional support, political interference and low employee morale, minimal benefits to local communities and rising demand in particular in Asia. For recruitment of low-level perpetrators at the frontlines, also poverty is a main concern.[179] Hence, organized crime have found a virtual free haven to engage.

Poverty as a driver

Poverty is considered a root cause simply because it facilitates recruitments of low-level perpetrators, smugglers or couriers. It is also major cause of especially poaching of bushmeat because poor people hunt to satisfy basic needs.[180-181] Poverty as a cause of poaching is associated with losses of hunting rights, dispossession of land in favour of protected areas, and lack of employment and education opportunities.[182-184]

Local support for conservation does not necessarily follow from community programmes. The positive impacts of such programmes are often outweighed by increasing land scarcity, population densities and income inequality as well as increased wildlife crop raiding and illegally trespassing livestock.[185] The returns from the programme must exceed the returns from poaching by a substantial degree, such that it improves the local economy. In one study from the Serengeti poaching was found to pay better than any other activity, with USD 425 per year, compared with USD 118 for small business, USD 79 for crops, and USD 61 for livestock.[186] Nonetheless, in other cases potential losses of benefits from integrated conservation and development projects were cited as a deterrent against poaching, yet this was not as strong a deterrent as law enforcement.[187] This applies all across the range: Without minimal coordination, enforcement and prosecution in the sector of environmental crimes, recruitment opportunities remain high and the engagement of organized crime will continue to thrive and grow.

Demand as a driver

With large demand for anything from wildlife, timber, pulp to cheap illegal chemicals and unregistered gold and minerals, recruitment and illegal trade will continue, simply due to the lucrative nature of the business. Buyers place higher value on illegal wildlife products when they are considered rare and uncommon, which drives up prices. If supply side anti-poaching efforts are effective, they may nonetheless contribute to driving up prices.[188] The price of ivory has been

driven up by demand in China from USD 750/kg in 2010 to USD 2,100/kg in 2014, albeit dropping by 50% from 2014 to 2015.[189-190] At the same time ivory costs only about USD 150/kg in domestic markets in Africa, leading to enormous profits, even with the recent price drop. These prices also make it very attractive to invest in ivory, and stockpile it for future sales, when scarcity is higher.[191] A culture of conspicuous consumption has historically been a key driver of demand, particularly in terms of ivory and rhino horn used for decorative and traditional medicinal purposes in Asian markets.[192] Three quarters of urban Chinese who had consumed illegal tiger products preferred wild over farmed products, and 88% knew that it was illegal to buy or sell tiger products.[193]

For illegal timber, the demand will continue to rise when prices are much lower than the at legal markets and controls are almost non-existent. Vessels and trucks openly transport millions of logs every year across borders or by sea, mixing with legal sources or classifying it as plantation wood or pulp from plantation wood or mixing with wood from other country of origin. Permits are rarely controlled or verified, making the

illegal trade extremely easy for perpetrators. Cases reporting mass-scale issue of false eco-certification permits, hacking of government websites for false transport permits and falsification of customs papers and transport permits, or use of false customs codes are widespread.

Organized Crime-driven root causes

After decades of efforts against drugs, prostitution and haman trafficking, with laws, customs, police and prosecution efforts, these traditional crime areas are perceived as higher risk – though still thriving. At the opposite scale are environmental crimes, which offer a low risk permissive environment, where items such as timber, charcoal, gold and minerals can be transported freely with a few bribes or even rudimentary falsified or purchased "permits". This situation is far worse for waste products and especially electronic waste: If perpetrators classify electronic waste as second-hand goods they can transport it carelessly and dump it. Hazardous waste can be mixed with ordinary waste and chances of inspections are negligible.

Illegal trade in wildlife products ranks after drugs, counterfeit products, and trafficking in humans in revenues, with USD 7–23 billion.[194] Compare this with meagre conservation budgets, with many parks relying entirely on park fees and donors to support enforcement and conservation: In Tanzania the wildlife sector was allocated just over USD 2 million in the government budget per year between 2010–2012, despite wildlife bringing in 80% of tourism income to the country.[195-197] Some reserves, like the worst hit Selous, experienced a drop in incomes from 2.8 million USD in 2004 to 0.8 million USD in 2008, the same period that poaching increased dramatically.[198] In spite of this, Tanzania has through the national plan approved by CITES and through the training of over 2,000 rangers in recent years, and with NGO-, IGO-, INTERPOL and UN-support managed to break the rising curve of poaching. Poaching is currently slightly declining. However, far more resources from the international community are required to help accelerate this success.

The situation is even worse in other sectors regarding transport of chemicals, waste including electronic waste, minerals and especially gold, where the illegal trade far surpasses the legal trade in many African and Latin American countries by a factor of 5–10.

Organized criminal groups, especially transnational, are a major threat and once established, they rarely today restrain themselves to one type of income market only. As recognized by UNTOC and INTERPOL, organized crime, including environmental crime, diversifies and it is dynamic, adapting to law enforcement tactics and technique. Sophisticated and far reaching networks are not only involved in poaching and smuggling, but conduct laundering of products and profits, tax fraud and forgery. These networks constitute a particular threat and establish, spread and thrive in countries with challenges in enforcement or judicial sectors.

Permissive environment root causes:

Many African countries and some Asian ones have some of the lowest number of police officers per capita, extensive challenges of corruption and dwindling budgets.[199] Cost estimates from the 1980s and 1990s assessed USD 200–400/km^2 as necessary for effective enforcement. Selous Game Reserve, the largest concentration of Savanna Elephants in Africa, was in 2003 enforced at a cost of only USD 3/km^2, or about 1 percent of the recommended funding.[200] The situation is also extremely poor for prosecution and courts/the judiciary in many developing countries, where the latter two are seriously under-resourced. Indeed, a regional breakdown between North America and the countries of southern Africa in terms of the relative expenditure on police, prosecution services and courts revealed that in North America 43% of these funds went to prosecution and courts, while only 16% in Southern Africa.[201]

Such a degree of underfunding creates a highly permissive environment for poachers and international criminal networks. In addition, political interference from high levels tied to local powerbrokers sometimes undermine law enforcement officers' work, which leads to demotivated officers and inertia instead of initiative at the front line.[202]

Responding to environmental crime

Much of the international focus has centred around iconic species, as well as the illegal wildlife trade related to endangered species mainly listed under CITES. However, the wider range of environmental crime from corporate forestry crimes to carbon credit fraud, trafficking hazardous waste or involving threat finance to non-state armed groups and terrorist groups have not yet received a system-wide response. The collective impact is not only severely causing loss of revenues and undermining legal trade and businesses, it is also putting development, peace and security at risk.

Different needs must be recognized, and different tools are required depending upon whether environmental crime is a result of poverty and perceptions of restrained livelihood opportunities, or as a source of revenue by non-state armed groups including terrorists and militias, or by organized criminal networks – or a combination.

In the last decades many efforts have been dominated by voluntary actions and awareness programmes. For example, over 99% of the billion dollar REDD programmes and EU FLEGT have largely focused on voluntary agreements and NGO support. Programmes such as ICCWC,[203] INTERPOL or national enforcement and security sector reform have received comparatively modest support in spite of major successes. Combining the successes of programmes such as REDD and ICCWC may lead to breakthroughs in approaches to natural resources management and stemming the tide of ITW.

Currently, the resources available on environmental crimes to CITES, INTERPOL, WCO and UNODC, primary institutions in reducing the global illegal trade, probably amounts to around 20 million USD (2016). This compares to a global trade worth 91–258 billion USD and representing losses in revenues to governments of at least 9–26 billion USD annually. By comparison the United States Drug Enforcement Administration (DEA) alone in 2015 spent USD 442.6 million on international enforcement, compared with USD 1.59 billion on domestic enforcement.[204]

Interestingly, the largest success achieved on environmental crime was the Brazilian sector wide Plan for Protection and Combating Deforestation in the Amazon (PPCDAM) unparalleled by any in its enforcement lead and success.[205] It has not been replicated to date. While many have attempted to take credit for this success, it was primarily a Brazilian led initiative with national funding, initiated in July 2003. Phase one 2004–2008 involved command and control through a focused and sustained effort by enforcement agencies. Over 41,000 fines worth USD 3.9 billion were issued, 700 were arrested and many prosecuted, one million cubic meters of tropical timber seized; 11,000 properties, equipment and assets were confiscated or destroyed, and nearly one million hectares of productive land (pastures and soybean) were embargoed.

Perhaps the most important key to the Brazilian success was that a single office was given full responsibility for coordination: the Executive Office of the Presidency in close collaboration with the Federal Police, with coordination and implementation with 13 ministries and more partners.[206] The plan involved four primary components:[207-208] 1) Command and Control (Executive office with the Federal police) including enforcement and satellite monitoring; 2) Regularization of land use and tenure; 3) Incentives for sustainable economic activities including interventions in soy and beef supply chains and 4) Expansion of protected areas and their enforcement.

The ozone layer is another example where a concerted response from the international community has turned the tide from reduction to recovery. The journey started with the scientific discoveries of the 1970s of the threats by chlorofluorocarbons (CFCs) against the ozone layer.

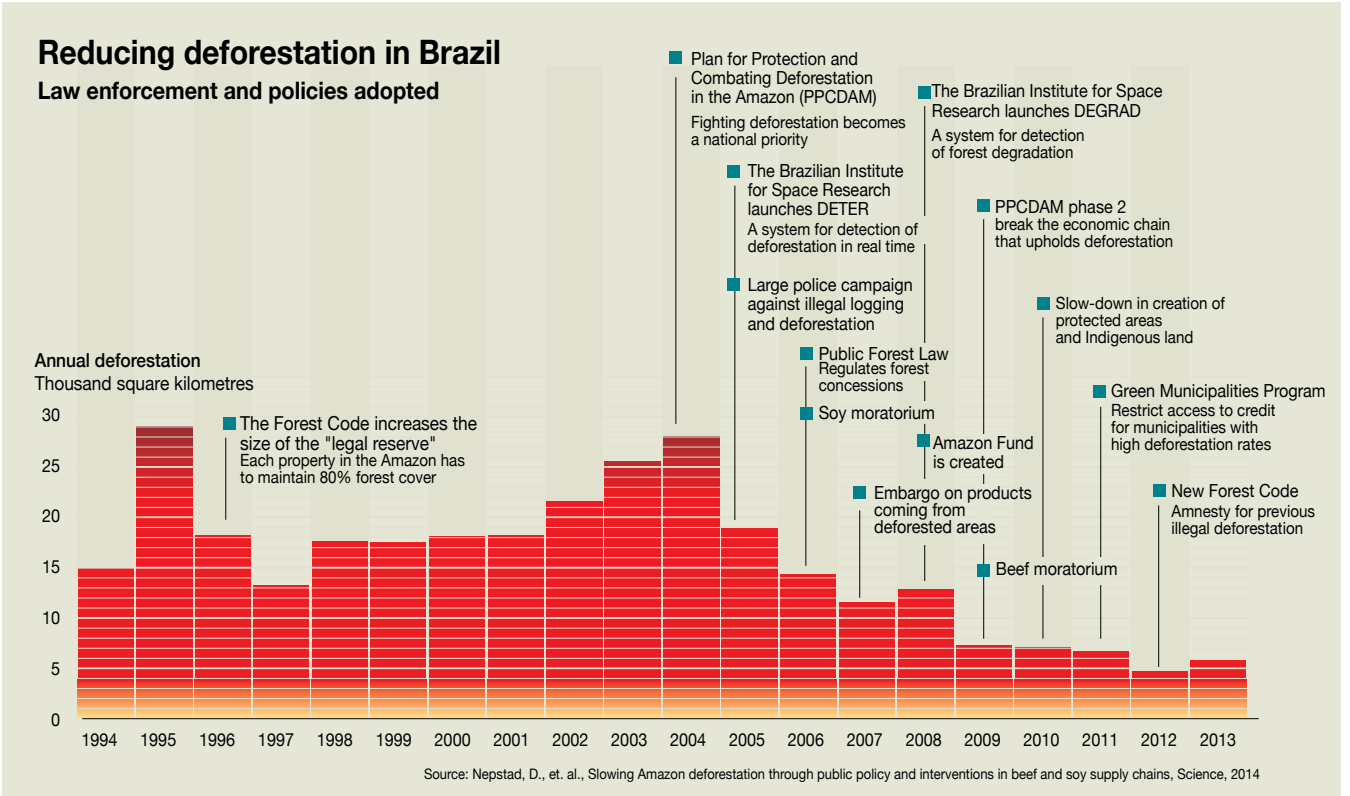


Figure 13: The successful 76% reduction in deforestation in Brazilian Amazon was achieved through unity of command and unity of efforts. A task-force involving 13 ministries was created to elaborate a plan for combating deforestation. This plan, which became operational in March 2005, included actions within three areas: command and control (or law enforcement), regularization of land use and tenure, and incentives for sustainable economic activities (Source: Nepstad, 2014).

Deforestation in Brazil: 1990 (top image) **and 2000** (bottom image)

Hailed as the most successful international environmental agreement ever, the Montreal Protocol on Substances that Deplete the Ozone Layer plays an important role in reducing the illegal trade in ozone depleting substances (ODS) such as CFCs and HCFCs through the provision of many initiatives, including (1) customs training on a national and regional basis provided by the Protocol's Multilateral Fund for the past 23 years and primarily delivered by UNEP's OzonAction Compliance Assistance Programme, (2) the informal Prior Informed Consent (iPIC) mechanism launched by UNEP OzonAction in 2006, and (3) focused enforcement operations organised jointly between the Regional Intelligence Liaison Office of the World Customs Organization and UNEP OzonAction (Sky Hole Patching I and II).[209]

Thanks to the Project Sky Hole Patching I and II, about 800 tons of ozone depleting substances was reported to have been seized as of 2010. With regard to the iPIC, out of 211 consultations between government focal points in 2014 and 2015, more than 551 tonnes of illegal or unwanted ODS trade was prevented. Thanks to the increased vigilance of customs authorities and the transition to alternative technologies catalysed by the Protocol, the scale of illicit CFC trade was reduced and criminal markets have almost been eliminated.

However, the emergence of illegal trade in HCFCs illustrates that the situation is dynamic and requires continued vigilance. HCFCs are still widely used and will be phased out only in 2030. As this deadline approaches, the availability of HCFCs will

EXAMPLES OF ODS SMUGGLING PATTERNS IN ASIA AND THE PACIFIC

Source: UNEP ROAP, *Illegal trade in ODS in Asia and the Pacific*, September 2006.

Figure 14: The illegal trade in ozone-depleting substances in the Asia-Pacific.

become progressively limited as a result of Montreal Protocol controls. The CFC case demonstrates how implementing environmental rule of law through global agreements can effectively both obtain environmental goals and also shut down a global illegal trade of commodities by providing no safe havens.

The Stockholm, Rotterdam and Basel conventions are the conventions responsible for helping prevent the illegal trade in chemicals and waste. In 2013, UNODC reported that illegal trade in E-waste to Southeast and the Pacific was estimated at 3.75 billion annually or 1.5 times larger than the illegal trade

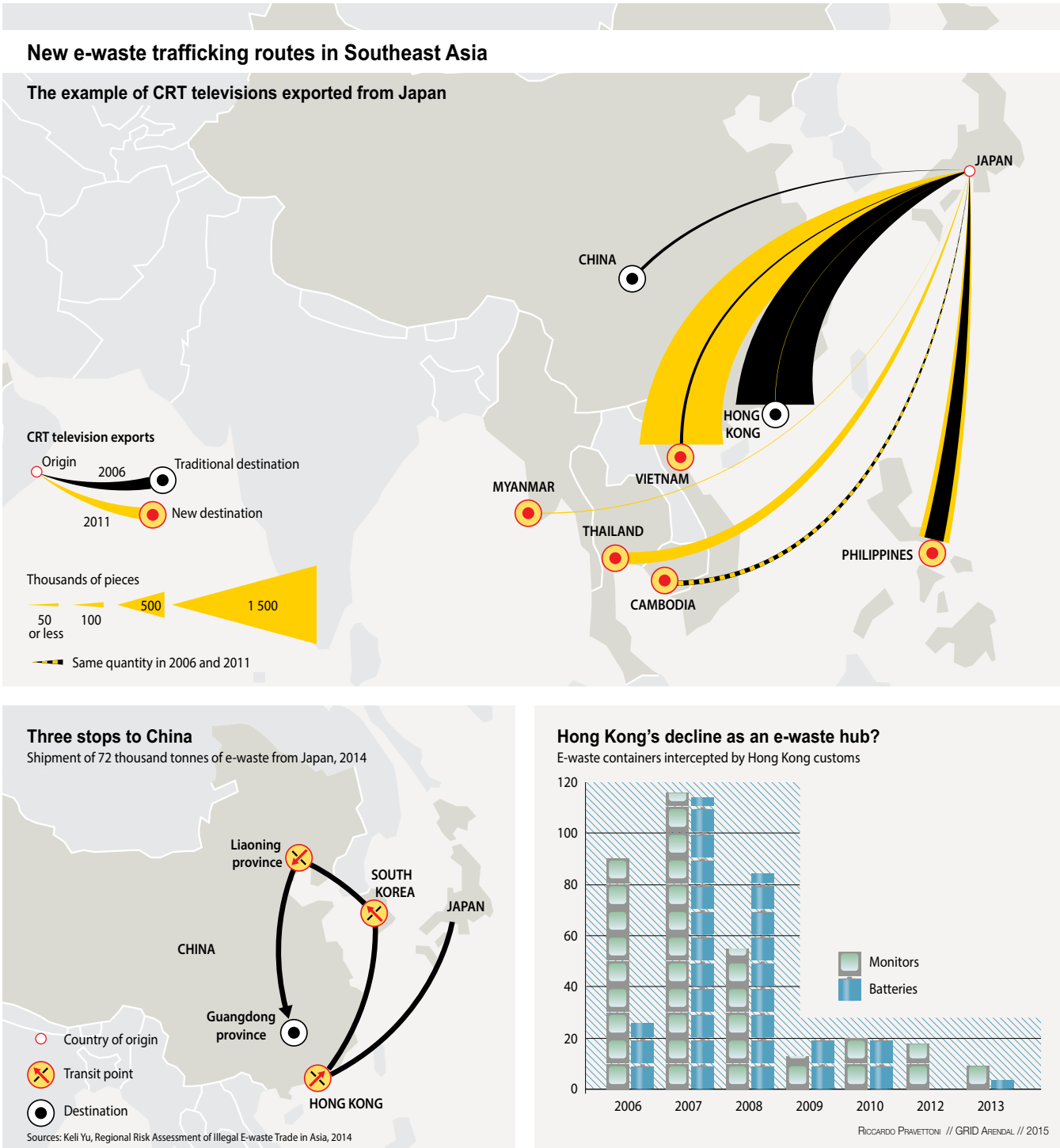


Figure 15: New e-waste trafficking routes in Asia (Source, UNEP 2015).

Highlights of 2015 INTERPOL Coordinated Operations (Wildlife, Fisheries and Forestry Crime)

Operation PAWS II targeting criminal networks involved in wildlife crime in Asia	Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Singapore, Thailand, Vietnam, with support from Australia, Canada, Russia, and the United States	The operation resulted in a number of significant outcomes, including the location of a Red Notice fugitive, the issuing of a number of Purple Notices and 305 arrests including arrests of middlemen in the tiger and ivory trades. The operation also resulted in the seizure of 12 big cat skins (including three tiger skins) and quantities of bones, 9.3 tonnes of ivory and 37 rhino horns, almost 2,000 turtles plus other reptiles, five tonnes of processed pangolin meat, 275 kg of pangolin scales, 282 pangolins and almost 1,500 tonnes of rosewood.
Operation Worthy II targeting ivory and rhino horn trafficking in Africa	Ethiopia, Kenya, Malawi, Mozambique, Namibia, South Africa, Sudan, Swaziland, Tanzania, Uganda and Zambia	The operation resulted in 376 arrests, the seizure of 4.5 tonnes of elephant ivory and rhino horn and the investigation of 25 criminal groups involved in the illicit trade. In addition to this, 2,029 pangolin scales, 173 live tortoises, 55 kg of sea cucumber, warthog teeth, big cat, pangolin and python skins and impala carcasses, as well as 532 rounds of ammunition, five firearms and two home-made rifles were seized during the operation The participating countries issued 25 INTERPOL notices, or international alerts, during Operation Worthy II: seven Red Notices for wanted persons, four Blue Notices to gather information about individuals, 10 Purple Notices providing information on common modus operandi, and one Green Notice warning other countries about known criminals. During the operation, Investigative Support Teams were deployed to Kenya and Tanzania and also to Asian countries including Singapore and Thailand where several tonnes of elephant ivory and rhinoceros horn were seized.
Operation Log targeting the illegal trade of timber in West Africa	Benin, Burkina Faso, Côte d'Ivoire, Gambia, Ghana, Mali, Mauritania, Senegal and Togo	The operation resulted in the seizure of more than USD 216 million in illegally harvested rosewood (Pterocarpus Erinaceus) and other timber species, with 44 individuals arrested and the identification of key trade routes used by criminal networks to traffic illegally rosewood in the region.
Operation Amazonas II targeting illegal logging and trade of timber in Central and South America	Argentina, Bolivia, Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Paraguay and Peru	The operation across 12 countries has led to the seizure of more than 53,000 cubic metres of illegal timber – enough to fill 20 Olympic-sized swimming pools. In addition, 25,000 logs and 1,200 sacks of charcoal were also recovered, and more than 200 individuals were arrested. Types of timber with the highest risk for trafficking were pine, black rosewood, big-leaf mahogany, cedar and laurel – most of which are protected species.

Operation Stingray II	Australia, Canada, New Zealand, Norway and the United States of America	Six vessels of interest were targeted: the SNAKE, THUNDER, KUNLUN, SONGUA and YONGDING, and PERLON (not subject to an INTERPOL Purple Notice). As of May 2016, the SNAKE and THUNDER are out of service (sunk), and the SONGHUA, KUNLUN and YONGDING are detained by law enforcement. The Captain and two crew members of the THUNDER are found guilty in Sao Tome and Principe of multiple charges related to the sinking of the vessel in April 2015. Prison sentences range from 32 to 36 months, and a fine of EUR 14,000,000 Vessel PERLON has been sanctioned USD 3.5 million by the Malaysian Authorities
		Only in 2015 6 INTERPOL Purple Notices and 17 Blue Notices were issued at the request of member countries to support national investigations in Indonesia, Malaysia, São Tome and Principe, Spain, Senegal and Thailand. During these investigations, companies involved in a network of illegal fishing vessels were raided, nine people were arrested in two countries, and 17 remain under investigation on charges of organized crime, money laundering, document falsification, and crimes against the environment.
Operation Pescam	Colombia, Costa Rica, Ecuador, el salvador, Guatemala, Mexico, Panama, Peru, Dominican Republic	The operation resulted in the identification and disruption of criminal networks behind the illegal trade of shark fins, illegal trade of protected species such as Iguanas Maritimas, sea cucumber and sea horses; and the Illegal trade of bill fish called Pez Vela in Guatemala.

in wildlife in the region, estimated at 2.5 billion.[210] UNEP estimated in 2015 that the trade globally amounted to amounted to 12.5–18.8 billion USD annually, however, the how much of this e-waste that was subject to the illegal trade or simply dumped, was not known.[211]

Programmes such as the UNODC-CCP represent the first really effective strengthening and building of a global system that can be useful for targeting ANY type of contraband, thus much more effective in preventing the tactical shifts by smugglers to new routes and commodities. Strengthening such programmes and building enforcement efforts across sectors will be more effective and generates fast-line communication systems, similar to the work of INTERPOL – on any form or type of transnational organized crime. Radical strengthening of these institutions will be required if the rise in transnational organized environmental crimes is to be curbed. This will also help enforcement and prosecution in other crime sectors through strengthening overall police, prosecution and judiciary resources.

Restoration case studies recovering from environmental crimes

Across decades, many local wildlife populations have been eradicated by poachers and habitat loss. Conservation translocations, the deliberate movement of wildlife for the purposes of conservation have helped protection and restoration of species. The IUCN Species Survival Commission (SSC) Reintroduction Specialist Group (RSG) and Invasive Species Specialist Group (ISSG) released in 2013 the IUCN "Guidelines for Reintroductions and Other Conservation Translocations."[212-213]

In the following, examples are brought to light of how populations were either saved from extinction from poaching in the last final phases due to dedicated efforts, or how they were lost during conflict or post-conflict periods where organized crime thrived, but yet later reintroduced.[214-216]

Rhinos in Nepal and South Africa

In Nepal, rhino populations dropped by 88% to 100 animals in 1960 in just a decade due to poaching.[217] A Rhinoceros Action Plan for Nepal was developed[218] and an intense protection scheme including the army and the Department of National Parks and Wildlife Conservation, and translocations of a total of 87 rhinoceros took place between 1986 and 2003 (at an average cost of USD 4,000 each). When the war gradually broke out in Nepal in 1996 tourism dropped by 41% in two years[219] and rhino numbers dropped by 1/3 in five years to only 408 in 2005 as they were targeted for profits by armed groups. Dedicated rangers and antipoaching units in Bardia and Chitwan National parks fought hard to rescue remaining rhinos at the height of the conflict. Even after the war the fight continued, now with intact organised criminal networks smuggling rhino horn through Pokhara and Kathmandu to China. As populations were at its very low, protecting the remaining was vital. Indeed, due to intense efforts Nepal celebrated in 2015 the third year (also 2011 and 2013) without the loss of a single rhino to poaching.

Another remarkable success was that of the southern white rhino in South Africa. In the early 1900s, only around 50 white rhinos remained. Targeted conservation efforts brought these back to between 19,682 and 21,077[220] now the largest rhino population of all rhino species. But once again massive poaching is threatening these rhinos and entire different scale of efforts will be needed to prevent its fall once again.

Golden Lion Tamarin reintroductions in Brazil

In 2003, Brazil – and the World – could celebrate the downlisting of the status of the Golden Lion Tamarin (Leontopithecus rosalia), a primate, from critically endangered to endangered on the CITES list. The Tamarin only persists in a few patches in the Atlantic tropical rain forest in southeastern Brazil in Poço das Antas Biological Reserve, Fazenda União Biological Reserve and in some private land through the Reintroduction Program.[221]

The reintroduction programme including breeding programmes not only contributed significantly to increasing numbers in the wild, but also to the protection 3,100 ha of their habitat, vital to their survival.[222] Over thirty years of intensive conservation efforts managed to save this primate from extinction. Numbers remain uncertain, but are believed to have grown in recent years, but peer-reviewed documentation still lacking of population size, that is believed to be around 1,500 individuals, by some estimates over 3,000 individuals in 2014, although populations are vulnerable.[223] Most of the remaining coastal Atlantic tropical forests in Brazil within the species' original distribution consists of smaller fragments too small to sustain populations. Fragmentation and isolation of remaining forest patches, and their connectivity, along with illegal hunting and predation, are the primary threats to the future survival of the species.[224]

Re-establishing elephant populations

Elephant populations have suffered greatly from poaching in the last decade. Over 2/3 of Africa's forest elephants have been killed,[225] and at least 1/4 of the World's elephant population have been killed by poachers in the same period across Africa and Asia.[226] As a result, efforts not only to curb poaching, but also to bring elephants back are underway.

In Africa, countries like Angola are looking into strengthening elephant populations. The partly transboundary elephant populations in the Namibian Caprivi are wedged in between Botswana and Angola. Elephant populations grew to 120,000 elephants in Chobe National Park.[227] Still, numbers remain low on Angolan side. Luiana Partial Reserve (PR) in south-east Angola was used by UNITA forces (National Union for the Total Independence of Angola). They killed elephants for both meat and sale of ivory to purchase arms and pay for salaries.[228] Three aerial surveys of Luiana suggested that elephant numbers increased from 366 in January 2004 to 1,827 in November 2005 and elephants with satellite collars in northern Botswana and the Caprivi Strip migrate across the Chobe river.[229]

Indeed, the region, which has only modest potential for agriculture but a large one for tourism, has suffered by high abundance of land mines, that have been known to blow off feet and trunks of elephants. However, elephants largely adapted, and began avoiding areas with abundance of land mines to the extent that villagers often use elephant trails as a safe route through land mine infested country side. Indeed, recent research has confirmed these findings, that elephants can smell TNT and detect land mines, and hence, sometimes avoid them.[230]

The entire region including Angola, Namibia's Caprivi strip and Chobe National Park provide a unique opportunity for transboundary parks to help preserve and rebuilt elephant populations. On 18 August 2011 at the SADC Summit in Luanda, Angola, the Presidents of the Republics of Angola, Botswana, Namibia, Zambia and Zimbabwe signed a Treaty which formally and legally establishes the Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA).

Bringing back brown bears

The brown bear populations in Europe have increased both in size and extensiveness since the 1950's and consist of 17,000 animals, forming 10 populations mostly with native origin, and presently occur permanently in 22 countries.[231-233] The reasons behind the recovery include protective legislation, supportive public opinion, and practices making coexistence with people possible. As an example, the Scandinavian population, one of the largest in Europe, experienced a historic low number estimated to 130 individuals in the 1930s, due to state driven elimination policies reducing the population from 4–5,000 animals in the 1850's. The population slowly recovered during the last century due to bounty removal and finally official protection by law, and consist today of approximately 3,000 animals and is subject to controlled harvesting.[234]

Brown bears are poached in Scandinavia, and remarkably more so in the large protected areas of Northern Sweden with low public presence and low intensity of law enforcement (e.g. patrolling by provincial rangers), implying that although large protected areas can serve as refuges and source populations for large carnivores, these areas can also be sink habitats when poachers face a low risk of detection.[235] Poaching and socio-economic conflicts e.g. depredation on livestock, pose threats especially to the smallest and recently established populations. In Austria the last descendent of three bears released between 1989–1993, had finally disappeared by 2011 likely due to illegal killing in combination with the small population size, and the population is now formally considered extinct. However, most populations of brown bears in Europe are either increasing or stable, but are still facing threats from habitat loss due to infrastructure development, human disturbance and low public acceptance.

Coordination of efforts

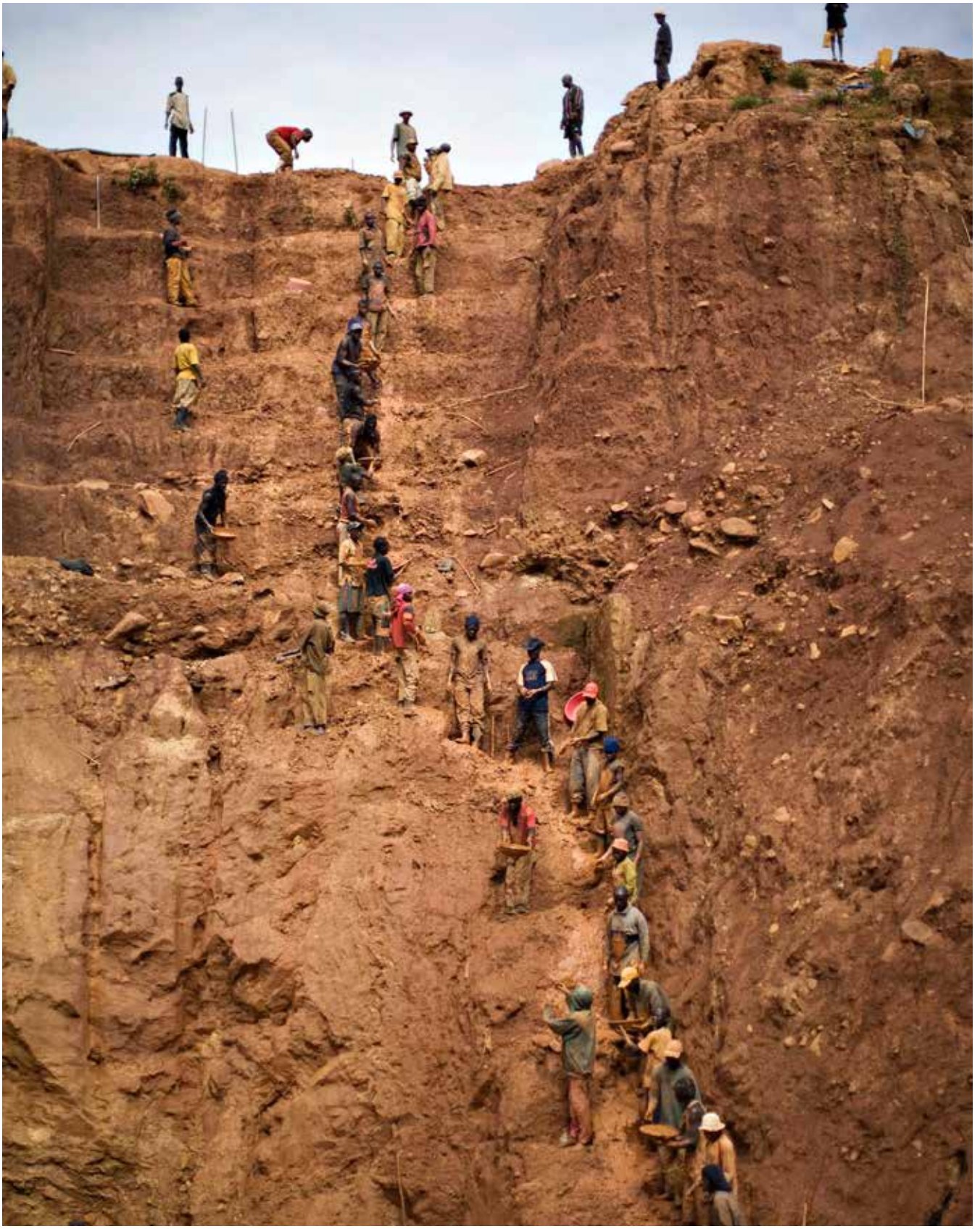
This report illustrates that organized crime is increasingly involved in environmental crimes and threat finance, the latter well recognized recently also by the UNSC in resolution S/RES/2195 (2014). The report also shows that criminals are becoming more advanced shifting from one wildlife species to another, from smuggling ozone depleting CFC and shifting to HCFCs as this market emerge, shift from regular VAT fraud to carbon credit fraud as the carbon credit market emerged, and shift to laundering illegal tropical timber through pulp and paper when customs target round logs or furniture and adopt a variety of "white collar" criminal methods including use of shell companies, tax havens, internet hacking, dark webs and fraud. Natural resources such as minerals, gold, charcoal and timber are exploited as new means of threat finance instead of drugs, diamonds and ivory. Criminal networks also shift locations geographically at high rates to circumvent limited enforcement efforts.

Designing appropriate and proportionate responses across the UN in partnership with countries will become the chief challenge ahead – from legislative responses, enforcement, investigation, customs efforts, in conflict zones addressing both security and preventing armed groups from benefitting from exploitation of natural resources – to prevention, community engagement, poverty alleviation and restoration of wildlife and ecosystems, to securing revenues and incomes from sustainable management of natural resources.

This also means that *efforts must entail targeted intelligence and information gathering on the smuggling routes, actors and causes* in order to design the best response.

This requires full engagement both in the enforcement and judicial chain, but also on prevention, alternative livelihoods support and restoration. To effectively increase the probability of perpetrators being caught and prosecuted, along with promoting sustainable business opportunities, *it is vital that the information and analysis is available to decision makers for designing appropriate and proportionate responses, designed specifically to the challenge at hand.*

In conclusion, a system-wide strategy, including in countries and across the international community, will be required to address the wider threats of environmental crime to peace, development, revenues and security. This, in turn, will provide the foundation and framework imperative to the sustainable management, protection, conservation and restoration of our ecosystems and the services they provide for the economy, health and wellbeing of the planet.



Conclusion

Characteristics of progress made, such as in Brazil and through the NIAPs (National Ivory Action Plans from countries through CITES), are that environmental, enforcement, economic incentives and development projects MUST be coordinated through a focal cross-agency lead point in-country.

This requires cross-sectoral and cross-agency collaboration both at national and international levels on information and analysis, prevention, enforcement and restoration of and from environmental crimes. Across the UN, this requires consensus building, information sharing and collaboration across agencies. It furthermore requires Unity of Command and Unity of Efforts on both coordination and implementation in concrete targeted country plans. This requires national coordination at the highest level with one lead agency and full coordination and cooperation with other relevant entities; Finally, it requires strengthening economic incentives, state institutions and awareness raising. This requires that plans for alternative livelihoods, economic incentives, consumer awareness also in recipient countries, along with possible restoration programmes are designed in full coordination with enforcement and protection. Once again, specific programmes must be designed for the full engagement, along with willingness and dedication from donor communities to coordinate their efforts through a focal point in-country, including from ODA support, to avoid duplication or uncoordinated efforts.

Recommendations

1 **Reduce threats to security and peace:** Strengthen the information collection, analysis and sharing, across sectors, in peacekeeping missions, Sanctions Committees and across the UN as a whole on the role of natural resource exploitation in conflicts and security in order to inform holistic responses towards securing peace, security and sustainable development. This includes integrating INTERPOL liaison officers in peacekeeping missions.

2 **Rule of law:** The international community must recognize and address environmental crimes as a serious threat to peace and sustainable development and strengthen the environmental rule of law at all levels to prevent safe havens including disrupting overseas tax havens, improve legislation at international and national levels, implement dissuasive penalties, substantial sanctions and punishments, capacity building and technological support, in order to enhance the enforcement and adjudication capacities in the area of environmental crime.

3 **Leadership:** Governments should establish central coordination and national cross-sectoral plans, with unity of command and unity of efforts, in coordination with the relevant UN entities, INTERPOL, and other relevant international treaty bodies and institutions, as appropriate, to combat the involvement of criminal organized groups in environmental crimes.

4 **Financial support:** Call upon the international development community to recognize and address environmental crime as a serious threat to sustainable development and strengthen the share of ODA to governance and judicial sector reform including to combating and preventing environmental crime. This should be targeted to capacity building and technological support to relevant agencies, national, regional and global law enforcement efforts against environmental crimes, such as information and analysis, inter-agency collaboration, enforcement, prosecution and the judiciary, especially in developing countries and fragile states.

5 **Economic incentives and consumer awareness:** Strengthen economic incentives, relevant institutions and awareness. This requires that plans for alternative livelihoods, economic incentives and consumer awareness also in importing countries are fully integrated and coordinated with enforcement efforts. Identifying best practices in behavioural change should be undertaken to reduce demand, including through a Communications Summit to address all points of this trade.

Contributors

Editorial team

Christian Nellemann (Editor in Chief), RHIPTO
Rune Henriksen, RHIPTO
Arnold Kreilhuber, UNEP
Davyth Stewart, INTERPOL
Maria Kotsovou, INTERPOL
Patricia Raxter, Old Dominion University, Norfolk, VA
Elizabeth Mrema, UNEP
Sam Barrat, UNEP

Cartography

Riccardo Pravettoni, RHIPTO
Philippe Rekacewicz (figure 11)
Emmanuelle Bournay (figure 14)

Layout

GRID-Arendal

Contributors and/or reviewers

Miles Amoore, UNEP
Michael Logan, UNEP
Ibrahim Thiaw, UNEP
Bianca Notarbartolo, UNEP
Mette Wilkie, UNEP
Monika MacDevette, UNEP
Dirk de Langhe, UNODC (CCP)
Ketil Ottersen, UNODC (CCP)
Eve de Coning, PescaDOLUS
Robert Costanza, The Australian National University
Catherine Ayres, UNEP
Allan Meso, UNEP
Johan Robinson, UNEP
Jafari R. Kideghesho, Sokoine University of Agriculture
Ieva Rucevska, GRID Arendal
Valentin Yemelin, GRID Arendal
Neville Ash, UNEP
Glen Salmon, Australian Fisheries Management Authority
Alistair McDonnell, INTERPOL
Tina Birmpili, Head of Ozone Secretariat, UNEP
Shamila Nair-Bedouelle, UNEP
Ezra Clark, OzonAction, UNEP
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United Nations Environment Programme
P.O. Box 30552 - 00100 Nairobi, Kenya
Tel.: +254 20 762 1234
Fax: +254 20 762 3927
e-mail: uneppub@unep.org
www.unep.org

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