

SUPPLY CHAIN MANAGEMENT OF CONFLICT MINERALS: CASE OF THE DEMOCRATIC REPUBLIC OF CONGO

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ABSTRACT

The mining and trade of minerals such as diamonds, gold, tin, tantalum, and tungsten from the Democratic Republic of Congo (Congo) still continue to cause suffering and social strife for Congolese people. This paper examines the extent to which the supply chain in the international trade of minerals from Congo follows the international guidelines instituted by the United Nations and the international community to help companies involved in mineral trade to respect human rights and avoid sponsoring conflict through their trade practices. The paper also discusses ethical issues and management difficulties in the implementation of the instituted mineral trade guidelines by companies and their partners in the supply chain. The paper looks at two time periods, the war period (1998-2002) with focus on Congo's diamond trade and the post-war era with focus on supply chain in the trade of tin, tantalum, tungsten and their mineral ores (the 3Ts) and gold.

Research Track: Management

1. Introduction

The second war of the Democratic Republic of Congo (Congo) started in 1998 and technically ended with the signing of the Lusaka Peace accord in December of 2002. However, atrocious and frequent violence still continues in the eastern part of the country to this day. The recurrent violence in the five eastern provinces of Congo continues to cause death and affliction in the life of the local population. According to a 2008 report of the International Rescue Committee (IRC), about 5.4 million Congolese died of war-related causes between August 1998 and December 2007 with about 2.1 million of these deaths occurring since the formal end of war in 2002 (IRC, 2008, p. ii). The IRC death toll figures have been challenged as excessive in a study by Human Security Report Group of Simon Fraser University, Canada British Columbia. The latter, claims that the IRC death toll figures were based on questionable methodological approach. (For more see Human Security Report Group, 2010). Nevertheless, one cannot refute the fact that Congolese people are still dying in eastern Congo even after the signing of a formal peace agreement.

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The deaths and human right abuses currently taking place in eastern Congo are mainly related to the extraction and trade of natural minerals such as tin, tantalum, and tungsten and their mineral ores (the 3Ts), diamonds, and gold as documented by numerous United Nations Security Council (UNSC) Resolutions concerning the situation in Congo. Thus, the supply chain in the mining and trade of these minerals and their mineral ores is the heart of the matter with regard to the human right abuses and killing in eastern Congo. Both upstream (minerals supply chain from the mine to smelters/refiners) and downstream (minerals supply chain from smelters/refiners to retailers) companies have a role to play in mitigating the suffering of the people of Congo.

According to the OECD Due Diligence Guidance, “the mineral supply chain-the process of bringing a raw mineral to the consumer market involves multiple actors and generally includes the extraction, transport, handling, trading, processing, smelting, refining and alloying, manufacturing, and sale of end product. The term supply chain refers to the system of all the activities, organizations, actors, technology, information, resources and services involved in moving the mineral from the extraction site downstream to its incorporation in the final product for end consumers.” (OECD, 2011, p. 14)

The international supply chain in minerals from their excavation point to their use in the final product is complex and difficult to control. The 1998-2002 war in Congo was mainly fueled by a supply chain of illegal mining and sale of Congo’s rough diamonds by rebel groups. These diamonds were later labeled conflict or blood diamonds by the international community, which in 2003 instituted the Kimberley Process Certification Scheme (KPCS) in an effort to curb the trade in such diamonds. The KPCS is an international diamond certification scheme that requires the 75 participating governments to certify the origin of rough diamonds and institute effective control to block the flow of conflict diamonds into the supply chain.

After almost a decade of being in existence, the KPCS has been deemed a success by some and a failure by others. The KPCS has, for instance, helped the government of Congo increase the quantity of rough diamond exports, curb the trade of diamonds by armed groups, and increase revenues from diamond sales. According to critics, the failure of the KPCS can be attributed to the complex supply chain in diamond trade and the blatant unethical behavior of companies and countries involved in these trades. In addition, there are too many flaws and loopholes in KPCS. These flaws and loopholes must be fixed in order for the KPCS to become an efficient system for control of diamond trade. Indeed, in order for the KPCS to succeed in stemming the flow of conflict diamonds in the international market, it must constantly be reformed to adapt to the changes occurring in the diamond supply chain. Unfortunately, there has been no reform of the KPCS since its inception. Most of the governments that use the certification scheme have shown no interest in reforming the process.

The post-war era violence in eastern Congo remains the result of mineral extraction and trade but, has shifted from mainly the mining of diamonds to the mining of minerals such the 3Ts and their mineral ores (cassiterite, tantalite and wolframite) and gold. These

latter minerals are currently in higher demand in the international market especially after the global recession of 2008 that caused a fall in the global demand for diamonds. In the light of violence and human right abuses taking places in areas where the 3Ts and gold are mined, the international community decided to act and help stem the trade of minerals sourced from conflict-affected and high-risk areas. The OECD in collaboration with the United Nations (UN) and eleven countries of the Great Lakes Region agreed on certain guidelines for responsible supply chain of minerals from conflict-affected and high-Risk areas. These guidelines are presented in the 2011 OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas (Due Diligence Guidance).

Like the KPCS scheme, the Due Diligence Guidance is comprised of a list of complicated management and trade rules that companies should follow when trading in the 3Ts and gold to avoid supporting conflicts and human right abuses. The UNSC adopted the Due Diligence Guidance for use in the trade of Congo's minerals in its 2010 Resolutions 1952 [S/RES/1952(2010)]. However, the Due Diligence Guidelines seem to be too intricate, hence, companies and states mining and trading in these minerals might have trouble implementing them.

This paper shall examine the extent to which the supply chain in the international trade of minerals from Congo follows the international guidelines instituted by the UN and the international community in order to help all that are involved in mineral trade respect human rights and avoid sponsoring conflicts through their trade practices. The paper also discusses ethical issues in the trade of conflict minerals and management difficulties in the implementation of the instituted mineral trade guidelines by companies and their partners in the supply chain. The paper looks at two time periods, the war period (1998-2002) with focus on Congo's diamond trade and the post-war era with focus on supply chain in the trade of the 3Ts and gold.

The paper is organized as follow. Section 2 provides a short literature review on supply chain management. Section 3 presents the supply chain in diamond trade during the war and examines some of the ethical issues in diamond supply chain during that period. Section 4 discusses the supply chain in the trade of gold and the 3Ts. In addition, it explores some of the management difficulties encountered by companies and states in the implementation of the Due Diligence Guidance for trade in these minerals. The conclusion is presented in Section 5.

2. Literature Review

Supply chain management has been discussed from many viewpoints through which several definitions are derived. These various definitions come from studies such as Houlihan (1985), Lee & Billington (1992), Saunders (1997), and Christopher (2005). Saunders' (1997) definition is the one used in this study since it relates more to supply chain for minerals. Saunders defines supply chain management as the total chain of exchange from original source of raw materials, through various firms involved in

extracting and processing raw materials, manufacturing, assembling, distributing, and retailing to end customers.

An excellent review of the literature on supply chain management can be found in studies by Sachan and Datta (2005), Storey et al. (2006), and Cousins et al. (2006). In these studies, supply chain management is mainly viewed as an integrated global system that improves business performance. However, Mouritsen et al. (2003) argue that the basic understanding that greater integration (wider scope) leads to better management of the supply chain is not always correct. They showed that better management of the chain highly depends on the environment of the supply chain and the power relations among supply chain participants. This view is certainly true for conflict minerals where there is a constant power struggles among supply chain participants especially at the extracting level.

The global aspect of supply chain management also imposes new challenges and logistics difficulties to managers in charge of supply chain design. These challenges are discussed in different studies in the literature (Dornier et al., 1998; Wood et al., 2002; MacCarthy and Atthirawong, 2003; Chopra and Meindl, 2004) that focus on supply chain design problems, that is, the challenge of deciding, among other things, on the number and location of production facilities including international locations, the amount of capacity at each facility, and the company's supply chain partners (suppliers selection). Dornier et al. (1998) affirm that uncertainty and variability in currency exchange rates, economic and political instability in some locations in the chain, and changes in regulatory environment pose additional risks that affect business performance.

However, none of the studies in the literature has incorporated the discussion of external costs of supply chain that come in the form of conflicts and human rights abuses that exist within the global supply chain mainly at international locations. This study is the first that attempts to incorporate negative externalities in the study of international supply chain with focus on supply chain for minerals. These externalities are costs to local people due to, among other things; conflicts, human rights abuses, and environmental degradation. The basic objective of optimizing the performance of supply chain by adding more value at the least cost possible does not work when one, for instance, takes into account the negative externalities of conflict minerals. Neglecting to account for these externalities causes the costs within the supply chain to be underestimated and the benefits delivered by the supply chain to be overestimated.

This study further examines how companies can limit the negative impact of activities in their supply chain by applying some of the procedures put in place by the international community for companies dealing in minerals originating in high risk areas. Ethical issues and management difficulties in the implementation of the instituted mineral trade guidelines by companies and their partners in the supply chain are also discussed.

3. Supply Chain in Diamond Trade

3.1 Congo's Diamonds and the Kimberley Process

Rough diamond trade was at the center of the second Congo war. During the war, different rebel groups relied on revenues from diamond sales to buy weapons and food to support the war. The diamond supply chain during the war showed the significant roles played by private companies, neighboring countries, the diamond trading countries, and private individuals in the illicit exploitation of Congo's natural resources. According to the UNSC panel on the illegal exploitation of Congo's natural resources, the Belgian company Sabena Cargo and SDV of the Bollore group were among the key companies engaged in the illegal transportation of Congo's natural resources during the war (UNSC, 2001). Some companies were directly involved in the war by trading arms for natural resources and others had facilitated access to financial resources used in the purchase of weapons. Companies trading minerals in Congo through their criminal networks set up illegal field of operation in the country. (For more on the diamond supply chain during Congo's war, see Koyame, 2005).

The KPCS was put in place in 2003 to stem the flow of conflict diamonds in the global market. The KPCS not only requires participating governments to certify the origin of diamonds but it also demands that they only trade rough diamonds with each other thus, creating a serious incentive for countries that want to produce, trade, and process rough diamonds to become members. Member countries are also required to affix a Kimberley Process Certificate to their diamond exports. As of 2010, the KPCS includes participation by 75 member countries, advocacy organizations, and the diamond industry. The KPCS has had notable successes in the past decade such as helping the international community deal with the problem of blood diamonds and also helping countries worst hit by diamond- fuelled wars like Congo to raise their official diamond revenues. But, critics of the KPCS insist that it needs to be reformed to take into account noticeable changes in the diamond supply chain.

The supply chain in Congo's diamond trade in the post-war era still continues to support violence and human rights abuses in eastern Congo. The existence of the KPCS may have stopped the diamond trade from fuelling Congo's war, since the war has ended, but, it has not stopped it from causing violence and human right abuses. It has been documented in a 2010 report by a UN group of experts on Congo that the mining and trade in diamonds and other minerals in eastern Congo are, lately, the causes of violence and human right abuses that include killings, beatings, rape, and torture by armed groups and criminal units in the Congolese national army (UNSC, 2010a). However, since the KPCS focuses exclusively in stopping the trade in diamonds that help fund rebel movements seeking to overthrow national governments, Congo's diamonds that originate from violent and inhumane environments are not classified as conflict diamonds and are being traded as conflict-free diamonds.

The KPCS will continue to fail to stop the trade in diamonds mined under violent and inhuman settings (high-risk areas) unless its members agree to reform it. In addition, the

KPCS definition of a conflict diamond as a diamond that finances rebel groups in civil wars must be broadened to include diamonds produced under inhumane and violent settings. Some analysis in the literature such as the one by Brilliantearth.com have suggested that the term “conflict diamond” be replaced by “unethical diamond” as a broad terminology that helps capture all the ethical problems related to diamond trade including wars. Without this reform, the KPCS will continue to grant conflict-free certification to diamonds mined in high risk areas because such diamonds have not helped fund civil wars.

The smuggling of rough diamonds also continues to be a problem in the diamond industry probably because the KPCS has not been able to enforce stronger control since it does not require that diamonds be traced to their mine of origin but to their country of origin. This lack of mine traceability causes member countries to often give Kimberley Process certification to diamonds with questionable origins making it easier for smuggled banned diamonds to enter the certified supply. If diamond smugglers can easily evade the KPCS then, conflict diamonds cannot be fully kept out of the certified diamond supply. According to Ian Smillie, one of the leading conflict diamond experts who helped create the KPCS, “The Government in Congo has no idea where 40% of its diamonds come from-they could be coming from Angola or Zimbabwe or even from Mars” (BBC News, 2010, P.4). Moreover, in some parts of eastern Congo, diamonds are being mined by child labor or by adults earning next to nothing.

The KPCS does little to stem violence, worker exploitation, and environmental degradation or to confront some of the ethical problems facing the diamond industry nowadays. There is also very little regulation of the diamond supply chain by the KPCS because it does not require an independent auditing of diamond buyers and sellers. Nonetheless, to compensate for the lack of independent auditing, the diamond industry asks that manufacturers and retailers of diamond provide a warrantee on their invoice guarantying that their diamonds originate from conflict-free regions.

By certifying unethically mined diamonds; that is, diamonds that lead to violence, worker exploitation, human rights abuses and environmental degradation; as conflict-free, the KPCS does not only protect human rights abusers but it also misleads consumers into believing that they are purchasing diamonds that come from certified ethical sources when in reality these diamonds are sources of social strife and human suffering. Since the KPCS is not able to separate ethical diamonds from unethical ones, it is a moral obligation for countries involved in the diamond trade, the diamond industry, and diamond consumers to demand a better diamond certification scheme. Countries like The Republic of Congo (ROC), a neighboring country of Congo, and Belgium that deal one way or the other in Congo’s diamonds should feel morally or ethically responsible for the human suffering in Congo and make every effort possible to avoid trading in diamonds sourced from violence inflicted areas.

Belgium, for instance, a country that supported trade in conflict diamond during the war in Congo, through its imports of rough diamonds, is currently doing much better in making sure that all diamonds imported in its territory have a Kimberley Certificate. It

was reported in 2004 by Daniel Balint-Kurti of the Associated Press that smuggled diamonds were being traded in centers with lesser control such as the diamond centers of Switzerland and the United Arab Emirates to avoid more scrupulous controls at the world's diamond hub in Antwerp, Belgium. (Daniel Balint-Kurti, 2004)

ROC on the other hand continues to trade in smuggled conflict diamonds including diamonds smuggled out of eastern Congo. ROC was accused in 2004 of blatantly sending smuggled diamonds worth millions of dollars into the global market and was banned from the legitimate world diamond trade by the Kimberley Process. The suspension was imposed in July 2004 after a Kimberley Process mission in ROC found that ROC couldn't account for the origin of significant quantities of its official rough diamond exports. ROC had virtually no diamond production of its own; therefore, all diamonds from its exports were smuggled in from neighboring countries such as Congo and Angola. ROC continued its unethical conduct in diamond trade even after it was expelled from the KPCS. Indeed, according to Global Witness, Lebanese 2005 Custom data showed that ROC exported rough diamonds worth an estimated US\$156 million into Lebanon (Global Witness, 2005, p.1). Rough diamond trading outside of the KPCS is not illegal among non-participants; however, it is unethical for a country like Lebanon to knowingly import diamonds from a country that was removed from the KPCS due to its dealing in smuggled conflict diamonds. ROC was readmitted back to the KPCS in 2007 after showing serious effort in getting its domestic systems for tracking diamond to the level required by the KPCS.

3.2 Ethical Issues in the Supply Chain of Diamonds

Laws are rules that are codified and come with potential penalties attached when violated. Ethics, by contrast, are more like guidelines than rules, are not codified in any meaningful way, and come *sans* penalties. Adding to the complexity of ethical analysis is the fact that there are several well-established schools of ethical thought which utilize varied basis for analysis. These enumerated distinctions are meaningful not only in theory but in practice.

Of the numerous schools of ethical thought, three seem most ripe for analysis of conflict minerals: Free Market, Utilitarian and Ethics of Care. These were selected as each approaches ethics from a distinctly different point of view; the results of the tri-fold analysis will vary, and each is appropriate for business transactions.

Free Market ethics holds as its basic principles that executives and managers are the employees of the shareholders and as such should act in shareholder best interest which normally is assumed to be to maximize profit (Friedman, 1962). However Free Market places limitations on the profit maximization imperative such that actors must limit their activities to that which is legal and within ethical custom. What these restrictions mean is that fraud, theft, etc. are not valid means of profit maximization; neither are activities which, if known, would shock the conscience of the shareholders, customers, and other stakeholders of the firm. The first limitation likely requires little justification. Violations of law come with the potential of penalties attached such as

finances, legal representation fees, prison sentences (in rare instances) as dictated by the courts, and the loss of credibility leading to the decrease of stock value which is the market imposed penalty.

Relative to the purchase of conflict minerals, there are no “laws” to be violated. The KPCS is not so much a law (which can be imposed) as a list of suggestions which can be ignored. The UN has some moral authority in this area, but cannot impose meaningful penalties on most parties; rather it must hope for cooperation in the supply chain to prevent purchases. To punish those who engage in the purchase of diamonds outside of the KPCS, the UN must depend on the voluntary cooperation of others in the supply chain and that may or may not be forthcoming. This is the ultimate proof that the KPCS is not a law. The conscience shocking aspect requires a second analysis. Many people do not understand (or “suffer” from willful blindness) regarding the back-story of conflict minerals. If the child labor, forced “slavery”, appalling working conditions, and environmental degradation were understood, much less the slaughter and rape that are financed from the mining of these minerals, then the consciences of most westerners, however strong their Free Market beliefs, would be shocked leading to voluntary withdrawal from the supply chain interactions for conflict minerals.

Adding a bit of a twist to the consideration of the diamond trade are the *uses* of diamonds which are basically industrial and jewelry grades. While industrial grade diamonds could arguably be necessary in that they are used in the production of other goods of value to society (diamond impregnated grinding and sawing tools used in stone work for example), it is very hard to assert that jewelry is necessary in the same sense. Jewelry diamonds are luxury and status ultimate consumer items with no “practical” value.

A further complexity arises from the artificially contrived scarcity of diamonds which leads to higher than natural market prices for the mineral. Diamonds are not actually as scarce as most people believe. While there are substantial deposits in some locations such as central and southern Africa, India, Russia, Brazil, and Canada, there are also smaller, widely scattered deposits in many locales including in the United States and elsewhere. (For example, see www.craterofdiamondsstatepark.com.) De Beers has successfully sought to manage the diamond mineral trade by creating a collusive oligopoly which they encourage other major holders of diamond resources to join such that the supply is restricted which acts to keep the price high. This oligopolistic market structure helps to make the trade in conflict diamonds all the more lucrative due to the artificially high price received for them.

A second complication arises from the fact that relatively few businesses, countries, and families are concentrated in the diamond supply chain. Such concentrations change the analytics in the ethical analysis, at least from the standpoint of those so engaged. If a major percentage of an entity’s wealth arises from diamonds, they may tend to see the market activities as perfectly acceptable regardless of the blood and pain involved. (When have drug lords, pimps or slavers ever thought their activities to be other than

entirely appropriate? “After all, someone will benefit from this trade so it might as well be me and mine.”)

So, while the few in the supply chain who are heavily invested may claim there is little harm and great good in the trade (at least from the most personal of perspectives), countries where child labor, slavery, rape, etc. are illegal as well as conscience-shocking would have reasons to adhere to the KPCS and refuse to trade in conflict diamonds. Note that it is the self-interest angle that most clearly accounts for the involvement in conflict diamonds of such countries as Belgium, which is certainly seen on most accounts as a highly evolved, highly civilized country.

Utilitarian ethics are driven by the perspective that the right decision is the one in which the greatest happiness is produced taking into account the costs and benefits to all the parties that will be affected. One can conceive of this as a balance scale upon which the costs of all parties are weighed against the benefits to all parties. The side with the greatest weight would therefore drive the selection of the ethical decision. Clearly utilitarianism is an outcome (or consequentiality) rather than a process oriented school of thought (DesJardins, 2011, p. 29).

The utilitarian analysis hinges on the parties who are affected by the activity. Those parties must include all those who benefit such as the companies, families and countries that garner profits from the trade. Those profits are highly substantial amounting to billions each year. For the part of the diamonds that relate to industrial uses (some 60% of all diamonds mined), there is some value to society as a whole as well. Also, it is not to be missed that much charitable good can derive from those profits depending on how those to receive the profits choose to dispose of them. Scholarships may be endowed, religious institutions may invest in marvelous architecture or badly needed social programs, and endangered species and forests could be saved for the enjoyment of future generations...or not. Good works funded by profits from the purveying of conflict minerals is probabilistic at best and only a percentage, which may be perishingly small, of the profits and all based on violations of human rights for many so that a small few can claim philanthropic status.

On the other side, the physical and psychological pain associated with child labor, slavery and the more or less permanent degradation of the environment associated with the illegal mining of conflict minerals imposes dramatically high costs on those so affected. When the profits from the trade are then spent on weapons and wars waged for political power and personal aggrandizement, when children are made into soldiers, women raped as part of a systematic program, and many thousands are displaced, then it is clear that the costs of participation in the trade in conflict diamonds far outweigh the benefits. The civil rights of thousands of people are violated before, during, and after the trade in conflict diamonds.

Given the personal pain and suffering that derives from the mining of conflict diamonds, much less from the uses to which the profits are put, no utilitarian could countenance trade in conflict diamonds. Ian Smillie, a co-founder of the KPCS, could be considered a

utilitarian. As a co-founder of the KPCS, Ian Smillie was certainly appalled by the human costs ensuing from trade in conflict diamonds. He continued to be greatly concerned about conflict diamonds and the ineffectiveness of the KPCS to address some of the serious ethical issues associated with the diamond supply chain. Consequently, he decided in 2010 to resign from the KPCS. In an interview with BBC News concerning his resignation from the KPCS, Mr. Smillie said, "I could no longer, in good faith, contribute to pretense that failure is success-We haven't figured out how to stop car theft, which has been going on for 110 years, and we know there will always be theft, but when you have a regulatory system that refuses to come to grips with obvious cases then you have a serious problem." (BBC News, 2010, P.4)

The **Ethics of Care** school of thought emerged from the work of Carol Gilligan as she worked on the question of moral development (Halbert&Ingulli, 2012). This school would look at the trade in conflict diamonds from yet another perspective. This school proposes that all humans are bound in webs of inter-relationships such that what one person or group does impacts others and how they see and interact with each other. This school rests much less on individual rights and obligations and much more on needs and reactions/interactions of the parties involved. Some thinkers have expanded this concept to include animals and the general environment itself. (For example, see the conference on the Gaia Hypothesis at <http://www.gaiatheory.org/>). Those who truly believe in this school of thought could not engage in the conflict diamond trade. What child forced into labor, what person enslaved will ever again trust anyone? How can the web of inter-relationships be anything but permanently damaged when so many suffer so much for the benefit of so few who benefit so much?

The question then becomes what can be done? One answer would be for the UN to be able to exercise true legal authority. Of course that would not really stop trade in conflict diamonds; it would only allow for real sanctions to be imposed on those who are caught. To make this point more clearly, slavery is actually illegal virtually everywhere in the world yet still exists. Prostitution, theft, murder, rape etc. are also illegal and still exist all over the world. The criminal element will always be with us. So long as there is money to be made, there will be those who are willing to provide the products/services so demanded regardless of laws and ethics.

4. Congo's Mineral Supply Chain Post-War Era

4.1 The Due Diligence Guidance for Conflict 3Ts and Gold in Congo

Unlike diamond trade that is regulated by the KPCS, the trade in other conflict minerals would likely follow the guidelines for responsible supply chains of minerals from conflict-affected and high-Risk areas presented in the 2011 OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas (Due Diligence Guidance). The Due Diligence Guidance is the result of a collaborative effort among the Organization for Economic Co-Operation and Development (OECD), the UN, eleven countries of the Great Lakes Region (Angola, Burundi, Central African Republic, Republic of Congo, Democratic Republic of Congo, Kenya, Rwanda, Sudan,

Tanzania, Uganda and Zambia), industry, and civil society in order to foster openness and accountability and in the supply chain of minerals from conflict-affected and high-risk areas.

The Due Diligence Guidance was approved by the OECD Investment and Development Assistance Committees and endorsed in the Lusaka Declaration of 15 December 2010 by the eleven member states of the International Conference on the Great Lakes Region (ICGLR). Its objective is to help companies involved in mineral trade respect human rights and avoid sponsoring conflict via their mineral transactions. It sets guidelines that apply to all involved in the mineral supply chain of 3Ts and their ores or smelted derivatives, and gold sourced from conflict-affected or high-risk areas. The Due Diligence Guidance is anticipated to help promote transparency in the mineral supply chains and sustainability in corporate engagement in the mineral sector and hence, help countries benefit from their mineral resources and prevent the mining and trade of minerals from becoming sources of conflicts, insecurity, and human rights abuses.

According to OECD, “In conflict-affected and high-risk areas, companies involved in mining and trade in minerals have the potential to generate income, growth and prosperity, sustain livelihoods and foster local development. In such situations, companies may also be at risk of contributing to or being associated with significant adverse impacts, including serious human rights abuses and conflict.” (OECD, 2011, p. 12) The OECD defines high-risk areas as areas of political instability or repression, institutional weakness, insecurity, collapse of civil infrastructure and widespread violence. Widespread human rights abuses and violations of national or international law are the traits of high-risk areas such the five eastern provinces of Congo.

There have been serious human rights abuses associated with the mining and trade in the aforementioned minerals and some against women and children. Thus, any company engaged in the mining and trade of these minerals incurs the “risks” of supporting conflict and human right abuses. According to OECD, “Risks are defined in relation to the potentially adverse impacts of a company’s operations, which result from a company’s own activities or its relationships with third parties, including suppliers and other entities in the supply chain. Adverse impacts may include harm to people (*i.e.* external impacts), or reputational damage or legal liability for the company (*i.e.* internal impacts), or both. Such internal and external impacts are often interdependent, with external harm coupled with reputational damage or exposure to legal liability. A company assesses risk by identifying the factual circumstances of its activities and relationships and evaluating those facts against relevant standards provided under national and international law, recommendations on responsible business conduct by international organizations, government-backed tools, private sector voluntary initiatives and a company’s internal policies and systems.” (OECD, 2011, p. 13)

The Due Diligence Guidance provides step-by-step management recommendations for global responsible supply chains of minerals by companies in their purchasing decisions and practices especially for minerals and metals such as the 3Ts, their ores and mineral

derivatives, and gold. The Due Diligence Guidance may be used by any company that deals with minerals or metals that can potentially originate from conflict-affected and high-risk areas. It is an on-going, proactive and reactive process that ensures that companies sourcing from or directly operating in conflict-affected and high-risk areas respect human rights and not support conflicts. The Due Diligence Guidelines also helps companies make certain that they are complying with domestic laws and observing international law, including those regulating UN sanctions and the illicit trade in minerals.

The Due Diligence Guidance provides specific recommendations on mineral supply chain to *upstream and downstream companies*. Upstream companies include miners (artisanal and small-scale or large-scale producers), local traders or exporters from the country of mineral origin, international concentrate traders, mineral re-processors and smelters/refiners. Downstream companies include metal traders and exchanges, component manufacturers, product manufacturers, original equipment manufacturers and retailers.

For upstream companies the Due Diligence Guidance recommends, among other things, that these companies establish a system of internal control over the minerals in their possession (chain of custody or traceability) and establish on-the-ground assessment teams responsible for generating and sharing verifiable, reliable, up-to-date information on the qualitative circumstances of mineral extraction, trade, handling and export from conflict-affected and high-risk area. These assessment teams may be set up jointly through cooperation among upstream companies while retaining individual responsibility. The Due Diligence Guidance calls on these upstream companies to provide the results of risk assessments to their downstream purchasers and have due diligence practices of the smelters/refiners audited by independent third parties, including via an institutionalized mechanism.

For downstream companies, the Due Diligence Guidance recommends, among other things, that they identify and review, to the best of their efforts, the due diligence process of the smelters/refiners in their supply chain and assess whether they adhere to due diligence measures put forward in the Due Diligence Guidance. Because the internal control mechanisms based on tracing minerals in a company's possession are generally unfeasible after smelting and with refined metals entering the consumer market as small parts of various components in end products, downstream companies should establish internal controls over their immediate suppliers and may coordinate efforts through industry-wide initiatives to monitor sub-suppliers, overcome practical challenges, and effectively execute the due diligence recommendations contained in this Guidance.

A UN Group of Experts on the situation in the Democratic Republic of the Congo endorsed and relied on the OECD Due Diligence Guidance for their 2010 final report to the UNSC where they presented supply chain due diligence recommendations for Congo's minerals sourced from red flag locations. These due diligence recommendations were adopted by the UNSC in its resolution 1952 (2010)

[S/RES/1952(2010)] as “guidelines for due diligence for importers, processing industries, and consumers of Congolese minerals in order to mitigate the risk of further exacerbating violence and human right abuses in the eastern part of Congo by providing direct or indirect support to illegal armed group; to those found violating the asset freeze and travel ban on sanctioned individuals and entities as imposed by paragraphs 9 and 11 of resolution 1807 (2008); and to criminal networks and perpetrators of serious violations of international humanitarian law and human rights abuses, including those in the national armed forces.” [Paragraph 7, S/RES/1952(2010)]

4.2 Management Issues in Executing the Due Diligence Guidelines

From the management perspective, it is important that the processes urged upon actors in the supply chain be both effective relative to ensuring conflict minerals do not get into to the supply chain and efficient in that the processes are least cost and effort for the desired outcome. That is, if the prescribed process is less (rather than more) expensive and easier (rather than harder), then voluntary cooperation is more likely. Both the Due Diligence Guidance and the KPCS could be improved by looking to solutions that have worked in private business, solutions such the use of Six Sigma approach to business. The Six Sigma offers a means to analyze systems to streamline out the pain of inefficiency and ineffectiveness. The Six Sigma was originally developed at Motorola in 1976 but only became famous with the push of Jack Welch when at General Electric. Several versions of the Six Sigma idea exist, but each more or less focuses on designing processes to enhance customer satisfaction. (For more on Six Sigma see Peterka, 2012).

All versions of Six Sigma are data driven and that will be the key to utilizing it in the supply chains for conflict minerals. Each member of the chain will need to work to deliver the data from which the alterations in processes will derive. Note that noticeable changes in the diamond supply chain have occurred over time and reforms are needed to take these changes into account. It also seems clear that the Due Diligence Guidance is superior to the KPCS and so should act as pattern from which improvements can be fashioned for the diamond trade.

From the ethical perspectives examined earlier in this paper, it is easy to conclude that ultimate consumers are more likely to be satisfied by knowing that they are not participating in the conflict minerals trade and will likely be willing to pay a modest premium to ensure the proper inspections and documents are produced along the way. Nevertheless, making the process as clean, clear and inexpensive as possible will also be keys to success. The better the legitimate system works, the smaller the margin there is for those who would circumvent the process to make a profit. Where there is little profit to be had, there is little motivation to engage in the unethical and/or illegal.

It may well be that technology can offer solutions post refining via labeling and tracking for the refined minerals. Above and beyond the technology solutions are those to be had by development of personal relationships based on mutual desire to adhere to these protocols. It is not possible to know for certain that people will behave ethically,

but the best predictor of future behavior is past behavior. Those who have refused to trade in conflict minerals can form networks such that they can help and rely on each other. Over and above that, former President Regan's mantra "Trust but verify" also seems to apply. The partners in the relationship all up and down the supply chain need to ensure the clarity and cleanliness of the parts of the process over which they have responsibility and stand ready to provide that proof.

5. Conclusion

Both the KPCS and the Due Diligence Guidance arose from the perceived need to establish some measure of control over the profitable trade in conflict minerals. Each of these processes has had some measures of success for which the international community should be proud. However, changes in the supply chain over time must lead to commensurate changes in these protocols. For example, the KPCS which was originally established to take profits away from rebel groups must be revised to also deal with a current need of taking profits from the hands of national armies operating more or less in their own best interest. Regrettably, the adherents to these accords are not eager to change them. This is not surprising, for change is fraught with uncertainty and usually comes with front-loaded costs. For many the "devil" you know is preferable to the one you don't. But there are changes that could be for the better.

Moreover, neither the KPCS nor the Due Diligence Guidance is without flaws that are and could be easily exploited by conflict mineral purveyors. Therefore, the need to revise and update the processes is clear despite hesitancy on the part of adherents to the protocols. The UN and the lead actors in the supply chain need to institute joint action to mend the flaws that currently exist. One way of getting buy-in of the protocol adherents would be to ensure the revisions are not principally under the control of bureaucrats who are good at writing laborious, ineffective, and cumbersome policies and procedures. Rather, it would be useful instead to engage Six Sigma experts to work cooperatively with the supply chain participants and the UN to create effective and efficient procedures. Even under the best of circumstances it will be impossible to create a 100 percent sound global system for mineral trades; criminals will continue to exist where there is demand and supply to meet it at a profit. But the creation of sound procedures at low cost to the participants will help in getting companies to use them.

Currently, there are companies working hard to comply with the established international procedures regardless of the costs or difficulties in implementation. Apple, a company whose products use the 3Ts, is one of the companies trying to comply with the Due Diligence guidelines. For instance, in its latest report about suppliers in its supply chain, Apple continues to show efforts in avoiding conflict minerals with an ongoing identification of smelters in its supply chain. Apple found a total of 175 smelters in their supply chain in 2012, an increase of fifty smelters compared with 2011 (Apple, 2012). Apple efforts should be applauded because identifying the number of smelters that a company has in its supply chain is not an easy process and many companies considered it too difficult to accomplish. The identification of smelters is critical because it makes it much easier for companies to track conflict minerals. Apple is also training

smelters in its supply chain to become knowledgeable about conflict minerals. More companies should follow the example of Apple if the international community can have a chance of putting a dent in conflict mineral trades.

The negative externalities caused by the trade in conflict minerals are compounded by the way in which profits are used which causes additional pain. All three schools of ethical thought attest to the fact that the trade in conflict minerals should be considered unethical. Actions designed to foreclose conflict mineral trades via process improvements are needed. The international community must not be weary of helping countries such as Congo in their fight against the illegal trade in conflict minerals. People need to know where minerals used in the manufacturing of products such as computer and cell phones come from and the negative effects that the mining of such minerals has on people's lives. There are a few number of Internet sites that address this type of issues but we believe that more still need to be done in informing the citizens of the world about conflict minerals and the role that they can play in limiting the trade of such minerals.

Future studies on global supply chain design for conflict minerals could incorporate strategies that deal with the new reporting requirements instituted by the U.S. Securities and Exchange Commission on August 22, 2012 (SEC, 2012). These requirements ask companies to disclose their use, in the production of a product they manufacture or contract to manufacture, of the 3Ts and gold originating in Congo or an adjoining country.

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