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CORPORATE SOCIAL RESPONSABILITY AND THE SUPPLY CHAIN: Cell phone companies and the case of coltan

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1. SUMMERY OF THE THESIS

The mineral extraction process that occurs in the Democratic Republic of Congo and neighboring African countries have caused controversial around the world because it is characterized in the majority by child labor, sexual harassment and various human rights violations. Also, these raw materials, called as “conflict minerals” have been used during some periods to finance armed Groups.

Conflict minerals are Tantalum (Coltan), tungsten, tin and gold and are widely used metals by the electronics industry, including telecommunications equipment such as mobile phones.

“Corporate Social Responsibility in relation to suppliers”, is a topic increasingly treated in enterprises given the needs that globalization deals.

This thesis related to Corporate Social Responsibility and the supply chain, focuses on the role of cell phone companies and its value chain, how they manage the challenges of purchasing coltan (also, it is debated if it makes sense to ban purchasing coltan in conflict areas, specially in DRC) and, how the companies handle supply chain and include its CSR in there.

2. INTRODUCTION

Nowadays, we live in an age of globalization of the world and of the companies, where everything is interconnected and our society depends more than ever on information technology and communication (from now, ITC). The great transformation and fast development of the ITC has changed our daily lives in the last 20 years, carrying out large changes in our Society, Politics and Economy.

To this new situation, companies have adapted to progress, being very common to see how they have been internationalized, meaning that suppliers often come from other countries, having difficulty to know suppliers more closely and to observe their behavior, their ways of working, their policies within the company.

On the other hand, **there has been a growing interest on working the “ethics” of the business, in its broadest sense**, where Corporate Social Responsibility (from now, CSR) due to globalization between other reasons, starts being integrated most of the times into the company fold. Many companies have decided to adapt and extend this CSR to their value chain, not only involving their actions, but also considering their suppliers, although it is usually very complex and a lot of times becomes a challenge (Strandberg, 2010). Hence, it remains much to be done and to be improved.

Companies might often decide to include its value chain in its CSR to respond accordingly to their ethic principles or due to reaction to public media, Governments, or NGO’s pressure, trying to integrate Codes of Conduct, Supplier Requirements, Policies in their value chain.

Considering CSR and what this represents for the image of the companies and its reputation, accordingly to Reprtrak Evaluation in 2014, **Telecommunications and Bank sectors are the worst in the “reputation per sectors of the companies”**, with a corresponding result of 50 and 45,4 from 100 (Reprtrak, 2014).

Coltan is a mineral widely used in the technology industry, for capacitors and high power resistors. It is also used to make alloys to increase strength, ductility and corrosion resistance(Chemicool, 2015). Coltan (like other conflict minerals -gold, tin, tungsten) is a mineral that has been **closely related to financing armed groups during different periods in the Democratic Republic of Congo** (from now, DRC), especially in the area of Kivu.

The country has spent years suffering greatly due to the wars that have occurred in there and to its continuous spread of armed groups, some funded by neighboring countries, creating a lot of instability and times of extreme conflict, starring atrocities that cause violations of human rights, child exploitation, recruitment of child soldiers among many other things.

In this context, many NGOs, the UN, governments and many other organizations have drawn attention to this situation. Consequently, there has been much media

publication and it has been asked to companies that use these conflicting materials, in this case, in the DRC, to carry out actions.

Despite all problems that coltan extraction in DRC arise, It is explained how banning the purchase coltan in there wouldn't be the best solution for the country, because "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." (Oecd, 2013). But, there is long way to do from all parts involved, from Government to companies and inclusive, to consumers.

Therefore, this thesis wants to focus on technology companies, especially mobile companies, and in **what the extraction of the mineral "coltan" causes and triggers in the value chain, meaning that the top of this value chain- mobile companies- results affected from actions of the bottom.**

The topic of this thesis is only one example of the abuses that can coexist and affect in a big value chain, such as the extraction of other conflict minerals, diamonds, the sale of Nile Perch and many other cases that have similar and comparable issues, affecting the value chain of companies that are involved and violating human rights.

Technology sector is an important, recent and current sector with a big influence and should be ethic and responsible. That is why in this work is going to be mentioned the significance of CSR respect to suppliers and, also, in this sector.

Finally to make this complex situation more understandable, to conclude the thesis it is made a diagnosis of different type of cases, companies, which are positioned in different places of the value chain. Big and mature Cell phone companies with long stroke, Social or innovative new cell phone companies that can be a solution, Telecommunication companies, Multinational Retail Corporations and alternatives and ways that could help to the process to be better, where also, consumers can be involved to make more informed decisions.

3. CSR AND ITS VALUE CHAIN

Corporate Social Responsibility (CSR) is a subject matter increasingly known. Nowadays CSR concept has been remaking, which is in constant development and due to circumstances and to adaptation of the moments, CSR in companies has **evolved to a concept as a whole, to take into consideration it in its value chain**. Changes in markets have lead to a change in business models.

3.1 WHAT IS CSR

Expert Forum on CSR Ministry of Labor established in Spain the following definition: "The social responsibility of business is also strict compliance with existing legal obligations, voluntary integration by the company in its governance and management in its strategy, policies and procedures, social concerns, labor, environment and respect for human rights arising from the relationship and transparent dialogue with its stakeholders, and responsibility for the consequences and impacts derived from their actions. "

" Corporate Social Responsibility (CSR) is the voluntary phenomenon that seeks to reconcile growth and competitiveness, while integrating the commitment to social development and environmental improvement" (Foretica, 2015).

3.2 CSR AS A STRATEGY

There are too many reasons to decide to have Corporate Social Responsibility (CSR) in a business and also in its value chain. **Ethical commission, moral, social believing could be main reasons to incorporate CSR in the company because in this case, companies think this is the best way to do business.** Also, CSR might be considered because they know it is an essential element of **differentiation and competitiveness** in the market and as a way of improving outcomes, it generates value to the company and reassures stakeholders and is a strategy to position the company (EC, 2012).

Even CSR might be implemented to the company to respond both interests, **long-term economic development** (providing benefits such as cost reduction) and compliance of their **economical, environmental, social responsibility expectations** (Strandberg, 2010). Others, use CSR as a way of taking **more control over their suppliers**, guarantying the quality, security, characteristics of their product (Strandberg, 2010).

On the other hand CSR in its value chain, can be integrated to maintain or improve its **reputation** as a respond of the extern pressure from organizations (Strandberg, 2010). Also, it can be a way of **avoiding legal risks**, reacting to regulations that are going to be implemented or that are being developed and at the same time

obtaining the benefits of being first in the sector (in this case Telecommunications sector) (Strandberg, 2010)

Finally it could be because there is **no alternative**, they form part of a value chain where certain things are demanded and therefore the integration of Corporate Social Responsibility is necessary if they want to remain agreements with their distributors, buyers, suppliers.

3.3 CSR RESPECT TO SUPPLIERS

All topics that are usually discussed in the CSR of a company (labor and Human Rights, Health and Safety, Environment, Ethics, Management Commitment) due to globalization between other reasons, starts being integrated most of the times into the company fold. Companies explain what is expected from suppliers, according to the behavior , philosophy , politics and ethics company.

The International Chamber of Commerce (ICC, 2007) states that Supply Chain Responsibility is a **voluntary commitment from companies to manage their relationships with suppliers in a responsible way**. When companies purchase as an activity from the company, there is the opportunity to **influence constructively their suppliers social and environmental performance through mechanisms** (such as incentives, training, audits of suppliers practices) knowing that best performance is that one that achieves long-term collaboration relation between corporate buyers and suppliers.

UN Global Compact and Business for Social Responsibility, 2010, define Responsible or Sustainable supply chain as **"managing environmental, social and economic impacts, and the foment of good governance practices through life cycles of products and services"**

"Since the 1990s, when major consumer brands of the Occidental world faced scandals and campaigns pointing poor working conditions in their supply chains, companies have begun to establish programs to address CSR in the supply chain"(Roca & Ayuso, 2013) Corporate Social Responsibility has become an important part for enterprises, and due to these changes CSR has started to be moved into value chains. Therefore, there is a need of action as a whole. The vision of responsibility throughout the supply chain means that the company is responsible, not only for their actions, but also those of its suppliers (and its distributors, contractors, subcontractors) because economic and social performance can be affected (Strandberg, 2010).

4. CELL PHONE COMPANIES - THE CASE OF THE COLTAN

We live in a stage where Information and communication technologies (from now, ICTs) are so important for the day to day and are all around, they take advantages to society and they have become necessary to perform or conduct any action.. Thanks to its unsuspected and extraordinary possibilities, It can improve people's live in thousands of ways. Technology sector is constantly updated, it spreads and evolves really fast.

Focusing on the global mobile industry, it invoices around 1.13 billion euros per year and in 2013, it can be said the industry sold 1.800 million new mobile phones, being the half of them smartphones. The current number of unique users is more than 4,500 million, which is to say that 63% of the living human uses a mobile phone (Ahonen, 2014). There were 50.82 millions of mobile lines in October, 2014 and the penetration rate of mobile telephony in Spain was at 108.8% (ONTSI, 2014).

This thesis related to Corporate Social Responsibility (from now, CSR) and supply chain, focuses on the role of cell phone companies and its value chain, because it is a huge part from the sector **with a big influence which is in our day to day and should be ethic and responsible**. Therefore, it is going to be represented how they manage the challenges of purchasing coltan, a rare material classified as conflict mineral, specially in DRC and, how the companies manage their supply chain and include their CSR in there. Also, other alternative cell phone companies are going to be treated, and how different ideas have been coming up to provide a solution or another alternative of doing things.

To continue and understand the case of mobile phone companies and what deals they find in the downstream of the supply chain, first of all it is going to be explained in this chapter what coltan is, what this mineral implicates; causes and consequences of its extraction, where we it is located and why it causes so many controversies. Also, Government, non-governmental reactions, initiatives to combat the problem and different kind of companies' cases are going to follow this chapter.

4.1. WHAT THE COLTAN IS

Coltan is a raw material used in technology devices and it has created a lot of controversy and a complex situation in the area of the Lake countries in Africa. Due to that, It has come to question the importance of controlling the value chain of mobile business (in this case).

Coltan is a member of the four conflict minerals, which are tungsten, zinc, gold and coltan, which are in areas at risk of conflict or conflict areas, whose exploitation and trade contribute to, benefit from or result in the commission of serious violations of human rights, violations of international humanitarian law or violations

amounting to crimes (BGR, 2010). The term ‘conflict minerals’ is used if the “**control, exploitation, trade, taxation or protection contributes to, or benefits from the context of, armed conflict**” (World Bank, 2003). They are used in Aerospace & Defense sector, Automotive sector, Industrial products sector, Retail sector and Technology Sector (PWC, 2015).

Coltan (columbite-tantalite) is a dull black metallic solid mineral from which the elements niobium (formerly "**columbium**") and **tantalum** are extracted. **It is a mix of both components in non-defined proportions.** The niobium-dominant mineral is columbite and tantalum-dominant minerals are referred to as tantalite (GENESIS, 2015).

4.2. USES OF COLTAN, DATA PRODUCTION PRICES AND WHAT IT CAUSES

Coltan basically interests are the uses from tantalum, which is now a key enabler of our information and communication-intensive society. Tantalum is a rare, metallic element that due to its properties (heavy, shiny, gray, soft when pure and hard when ductile) has become a vital material for capacitors in miniaturized and portable electronic equipment including mobile phones that store energy in an electric field because of its high volumetric efficiency. But, It is applied in a lot of industries thanks to its characteristics, which enables different other usages (See table 6 in the annex)(Chemicool, 2015)& (MMTA, 2015).

Figure 1 Coltan to capacitor



Source: made by my own from Fairphone 2015, GU International 2013, Aliexpress 2010-2015.

Major sources of Coltan can be found in different places; Australia has the major primary source, but this one and Canada main mines are shut down or on care and maintenance -among other reasons- competition from cheaper regions. Other producing regions include Brazil, Ethiopia, central Africa, Nigeria, Mozambique, and China. There is limited large scale mining and consequently much ore comes from artisanal and small scale mining (60-70% of total supply) (MMTA, 2015).

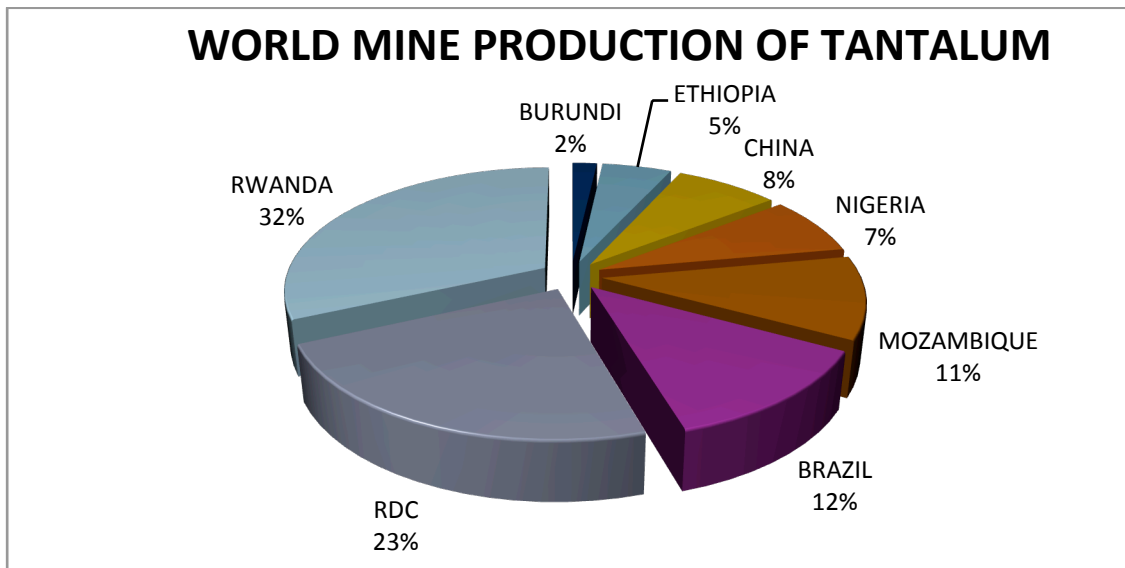
In 2011, 75% of Tantalum market supply came from conventional and artisanal mining. This has an explanation, artisanal mining is characterized by its flexibility, its quickly reaction to changing market conditions and is a cheaper way to extract minerals (Roskill, 2012).

During this period, the DRC had a very large role in the global supply of tantalum. As the report is going to focus on the extraction of Coltan in mines from DRC is

interesting to have an overview of the map of mines of this country (see Figure 10 in the annex).

In terms of Tantalum world production, DRC accounted for about 21% in 2014; and the Congo geographic area (Burundi, Congo, and Rwanda), about 53%(USGS, 2015). Paradoxically Rwanda is one of the leading producers despite not having reserves of coltan. Russia is also rich in this resource, although its deposits have not been exploited yet, as far as anyone knows. World Production of Tantalum in 2015 is represented in the table below:

Graph 1 Tantalum World mine production 2015



Source: Made by my own from USGS, 2015.

Spot market prices for tantalum showed few dramatic movements during most of the 2000s, but the **downturn in demand, significant downstream inventories and the continuing availability of low cost tantalum from Central Africa caused market prices to fall in mid-2009** (Roskill, 2012). The reason is that Tantalum prices depended on long-term contracts from conventional miners (such as Brazil and Ethiopia, and before Australia) and spot sales for material from artisanal mines (for instance Central Africa, Brazil and Nigeria) and elsewhere.

Before the economic slowdown, the price of tantalite was \$30 to \$40 per 0,45 kg of Ta₂O₅ content (USGS, 2015). Market conditions improved in 2010 boosting both market and contract prices and they peaked at an average of US\$140/0,45kg in 2011 (Roskill, 2012). In 2014, the average price per month of tantalum ore fell from about \$116.5 in January to about \$92.5 in August.

Since 2008/2009, world tantalum mine production has actually declined while prices increased; **It can be interpreted that stocks are being drawn down or that increased production is due to higher market demand but, coming from undocumented sources** (USGS, 2015).

4.3 THE MINERAL SUPPLY CHAIN

Electronics companies are increasingly acknowledging that the mining phase is part of their 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 the sale of end product** (OECD, 2012). The electronic products supply chain form a complex web, with brand name companies (which might be themselves also component suppliers) have many suppliers, who have also multiple suppliers (Europa, 2012).

The electronics industry as a whole consumes significant quantities of various metals sourced from conflict areas, for example from the Democratic Republic of Congo (Europa, 2012). In this country, **conflict minerals are mined in small, manual operations and transferred through several intermediaries in the country who consolidate the ores and negotiate the sales** (UN, 2008).

Unfortunately, the extraction of coltan is causing problems and conflicts with serious social repercussions, as other minerals such as tungsten, tin and or.

Coltan mining is moved by geopolitical conflicts, especially in the Republic Democratic of Congo, (since the technology boom, mines such as Australia, Brazil became scarce) where the interests of the state and neighboring countries, armed groups operating in the region, Western multinationals and smugglers intermingle.

4.4 DEMOCRATIC REPUBLIC OF CONGO

To understand conflict minerals, the case of coltan in this country, to have a brief introduction is necessary about the historical profile of the country.

Democratic Republic of Congo (DRC) located in Central Africa and it has approximately a population of 67.5 million people. **DRC is a country rich in natural resources, with a value estimated only in its untapped resources equivalent to the GDP of the US and EU together.** Its political and social history is really complex and despite its national wealth, It is one of the poorest and most violent countries in the world (Karen Hayes & Richard Burge, 2003).

DRC was a Belgian colony between 1908 and 1960. After its independence a period of instability started with separatist movements and three military dictatorships. Second one was Laurent Kabila regim: Ruanda and Uganda entered to the territory, beginning a devastating war. Third one was Joseph Kabila son. Finally, in 2002 a Peace agreement was signed between army groups and the Government of DRC(UN, 2015).

Even though the Peace agreement there is still a continuous proliferation of armed groups in neighboring states of Rwanda and Uganda, fighting each other and

against the Congolese army (FARDC) for **power and control of natural resources and minerals and the alleged defense of the interests and rights of their communities**. These clashes have led to widespread human rights abuses, whether perpetrated by the army and by armed groups, being common actions throughout the territory, especially in the regions of greatest conflict such as Ituri and Kivu (UN, 2015).

Abuses occur such as abductions, massacres, looting, mass murder, mass rape, mutilation, sexual violence against women, fire populations and recruitment of child soldiers which result in displacement of populations in the eastern region. At the end of 2012 had been internally displaced over 2.4 million people like Amnesty International said.

Currently the conflict persists in DRC, as a result of the persistence of illegal armed groups in provinces bordering Rwanda and Uganda, with financial and military support for parts of these, in order to maintain control over geographic areas politically and economically strategic (UN, 2015).

The biggest struggle of the Congolese army since May 2012 was against the armed group "March 23 Movement" (M23), supported by Rwanda in the form of supplies of arms, ammunition and recruits (CEAR, 2013) and was defeated in November 2013. Despite this event, it did not result in significant improvements in security and stability, **many foreign armed groups in the DRC contributed to the continuous instability in 2014**. Also, arms and ammunition Congolese army were diverted to armed groups, which highlights the broader problems facing the country to manage the stockpile in 2014 (UN, 2015).

Accordingly UN report, although progress has been made regarding traceability and due diligence of minerals produced in the Democratic Republic of Congo, there is still smuggling to border countries. In addition, some troops from the Congolese army (FARDC) and some **armed groups continue to engage in trade of minerals** and they probably introduce conflict minerals from conflict areas to supply chains of the Democratic Republic of Congo and neighboring States.

4.5. OPTIONS: BAN IT OR BUY IT

It has been showed that technologic market is really complex and has a big history behind. Raw materials are really important because of their properties and are so used in electronics. In some cases, such as the DRC, the extraction of minerals are closely related to the financing of armed groups and, thanks to this an other political and social factors, it can be associated to exploitation, environmental pollution, damage to the health of people, child labor, sexual harassment and various human rights violations.

If companies decide to ban the trade of Coltan in DRC, having other options where to purchase or large inventories existing on earth, it might be the easiest way and

safest option, more specific if companies want to not deteriorate their reputation because 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. But, it would also be really complicated because smuggling to other countries could occur and we would be almost at the same situation.

On the other hand, a regulated, Congolese, coltan industry would be beneficial for the development of the tantalum market. In conflict-affected and high-risk areas, companies involved in mining and trade in minerals **have the potential to generate income, employment, growth and prosperity, sustain livelihoods and foster local development** (Oecd, 2012).

There are organizations helping to disclose and trace supply chain and to know where raw materials come from, there are examples, such as the one of Fairphone (which is going to be explained later) that demonstrates that doing things so thoroughly and carefully it is possible to enter in challenging markets, including the improvement of working conditions. This option could contribute to the peace process in the region (Hayes& Burge, 2003). Also, with indicated procedures and the good voluntary of all parties to do things well could arise and become into long-term contracts, having more stability and more transparent and always helping to a country reach in resources but poor in term of GDP. At the same time **“this option is far more complex, not least as it raises significant questions about the acceptability and risk of doing business in a war zone. Paradoxically, however, this route could demonstrate greater corporate environmental and social responsibility”** (Hayes& Burge, 2003).

Most big companies have codes of conduct, audits (which NGO’s sometimes do it better), certifications, supplier requirements policies, conflict-mineral policies that help to improve the situation (though it is not the solution because at the end is only a piece of paper) and there is a long way to go to translate the words into action.

Finally if not banning would be the solution, in terms of Conflict-minerals, DRC and mobile phone companies and its value chain, there is a logical thinking that there is a need for a better and **higher support from Governments on Lake regions**. Also, there is a need for the education and explanation to supplier companies and countries the importance of the CSR, **what transparency, responsibility, information, sustainability means and why it is necessary and accessible to the public. Increase industry and consumers awareness**, also consumers should take action too, making informed decisions.

5. INITIATIVES FOR THE RESPONSIBLE MANAGEMENT IN THE SUPPLY CHAIN

More and more Corporate Social Responsibility is taken into account for many companies and organizations as a criteria in order to take decisions in their business, to choose a company as a partner or as a part of their supply chain. **Increasingly, it is demanded independent evaluations to be more credible. To give more strength to their CSR, companies choose to go through certification processes**, especially is charging more sense when the company operates in some countries where it is important to demonstrate compliance with the Global Compact principles and conventions of the Declaration of human and the International Labour Organization rights (EC, 2012). In the area of technology sector, in particular, it is acquiring more importance and even as a principal priority due to all the complexity that this value chain has and to maintain their CSR reputation.

There are many ways adopted to assess and explain conducts that companies want in their supply chain. In this chapter, not only it is going to be explained the standards that can be used for this purpose or for topics that the same CSR talks about (for instance environmental management) but also some issues that companies use for that, such as ethical codes, codes of conduct, reports, audits, companies that measure environmental impacts and so on. Finally, it is going to be explained some initiatives that Governments', organizations' or NGO's have been taken during the years considering the case of coltan in the DRC. Therefore, companies can decide to adhere them to their mission, objectives, conducts, being some of them voluntary or mandatory.

5.1 CERTIFICATIONS - STANDARDS

Considering there is a lot of standards that talk about CSR, in this chapter it is going to go beyond this and to be detailed the most common standards or certifications with the idea of focusing on the aspect of CSR and suppliers:

5.1.1.ISO 26 000 In the case of this standard which seeks to promote a common understanding of social responsibility the topic of suppliers is treated separately in every area defined as critical due to its relevancy.

5.1.2 SA 8000 provides an auditable, voluntary standard, based on the UN Declaration of Human Rights, ILO and other international human rights and labor norms and national labor laws, to empower and protect all personnel within an organization's control and **influence who provide products or services for that organization, including personnel employed by the organization itself and by its suppliers, sub-contractors, sub-suppliers and home worker** (Social Accountability International, 2014).

5.1.3 SGE 21 The Ethical Management and Social Responsibility (SGE21) constitutes an answer for organizations in terms of transparency, integrity and sustainability, based in three main issues: economical, environmental and social. It presents a chapter referring to suppliers to develop "best practices, support and improvement measures." Mentioning that organizations should do a systematic to classify suppliers and to be able to map their suppliers depending on the risk arising from its business, sector, location or business practices, among others.

5.1.4. IQNET SR10 it establishes the requirements for implementing a management system of social responsibility in organizations committed to the continuous improvement and contemplating a systematic **and effective relationship with all stakeholders of an organization implemented by Aenor** (Aenor, 2010).

5.1.5. AA 1000 are principles-based standards to help organizations become more accountable, responsible and sustainable. They address issues affecting governance, business models and organizational strategy, as well as providing operational guidance on sustainability assurance and **stakeholder engagement**.

5.1.6. ISO 14001:2004 This standard sets out the criteria for an environmental management system and its certification, mapping out a framework that a company or organization can follow to set up an effective environmental management system. Also, it provides assurance to company management and employees as well as external stakeholders that environmental impact is being measured and improved.

5.1.7. ECOVADIS 2015 says is a Sustainability Monitored Platform which offers tools to manage risks associated to supply chain of the companies. **Ecovadis promotes better social and environmental practices of companies relying on the ability to influence global supply chains**. Also, it is interesting because they do reference rankings that reflect the sustainability performance of suppliers.

5.2 OTHERS REFERRED TO ELECTRONICS

5.2.1. Ecolabel is a hallmark of the EU which takes into account environmental considerations into all kinds of products. In electronic focuses on energy consumption, hazardous substances, durability, ease of disassembly, recycling, free removal (Europa, 2015).

5.2.2 TCO is a sustainability certification for IT products that certifies duration, recovery of the products, hazardous substances, packaging for recycling, safety and emissions, energy efficiency, environmental management systems, manufacturing socially responsible (TCO development, 2014).

5.2.3 Ecological Footprint In the case of electronics it refers to a unit kind of "standardized" that measures life cycle of products, the use of mineral resources required in their manufacture, commercialize and use, recycling and management

of their residues (Ongawa, 2013). Ecological Footprint allows business to establish benchmarks, set quantitative targets and evaluate alternatives for future activities, providing aggregated and detailed results. (Footprintnetwork,&Earthday, 2015).

Certifications help to demonstrate that the company is aware on sustainable and responsible issues. But, at the same time is kind of contradictory because they could certificate they have good values in terms of environmental issues but they might not act really positive in terms of labor conditions. So, there should be an action from the company to act as whole.

5.3. ETHICAL CODES

These are documents made by the company explaining what are their ways of doing business, what they want to transfer and comply with its workers, what are their expectations and responsibilities required. These are "Principles, values, standards, or rules of behavior that guide the decisions, procedures and systems of an organization in a way that contributes to the welfare of its key stakeholders, and respects the rights of all constituents affected by its operations." (International Federation of Accountants, 2007). *These codes can be extended to the whole value chain. Most big companies have them and want their suppliers to adhere to them but, sometimes these don't have the impact desired. Hence, to implement and also, verify codes of conduct in supplier partners there are different ways* (Fairhorne, 2013):

Table 1 Ways of verifying codes of conduct

W o r k s	Supplier self-assessment questionnaires on social and environmental issues
	Social audits verifying compliance with the code
	Training and capacity building
	Productivity enhancements delivered to reduce working hours and increase wages

Source: Made by my own from Fairphone, 2015.

5.3.1 Electronic Industry Citizenship Coalition (EICC) mentions it is a non-profit coalition of electronics companies committed to supporting the rights and wellbeing of workers and communities worldwide affected by the global electronics supply chain. It has established codes of conduct in terms of participation of the supplier, offering performance and compliance guidelines in the areas of work, Health, security, environment, ethics and management.

5.4 THERE ARE OTHER WAYS TO GIVE CREDIBILITY TO THEIR CSR

Promoting responsible and sustainable strategies, participating in Sustainable indexes recognized worldwide, obtaining recognitions from EU, Governments or Autonomous Communities. In addition, Companies can be ascribed to high reputed international movements such as Global Compact of the United Nations, Carbon Disclosure Project, OECD recommendations and guidelines and recommendations of the European Union (EC, 2012).

5.5. CONFLICT MINERALS INITIATIVES FOR SUPPLY CHAIN

Focusing in the case of cell phone companies, their value chain and raw materials extraction, there are many principal international initiatives created from Institutes, Governments and Organizations due to conflict minerals situation with the idea to have a more responsible supply chain. These are figured out in this table:

Table 2 Initiatives

INITIATIVES	PRINCIPAL ORGANIZATION	OBJECTIVES
The Analytical Fingerprint (AFP)	(BGR) The Federal Institute for Geosciences and Natural Resources work in the DRC Mineral Certification VOLUNTARY	It is a Project that identifies mine site-specific geochemical and mineralogical parameters of conflict minerals. It's applied similarly to a DNA test. Traceability information can be achieved. It is completely independent of any shipping documentation and tagging procedures. Integrated into the Regional Certification Mechanism of the ICGLR. (BGR, 2015)
International Conference on the Great Lakes Region (ICGLR)	Eleven countries of the Great Lakes Region signed the Protocol against the Illegal Exploitation of Natural Resources (Protocol) as part of the broader 2004 Pact on Security, Stability & Development (Pact). 2006	The ICGLR Pact and the Protocol provide a critical legal and political framework via and Regional Approach to Peacebuilding. The ICGLR Certification Manual, which sets out the in region standards for traceability and certification of conflict-prone minerals, contains four main elements (ICGLR, 2012): 1. Mineral Tracking from Mine Site to Export 2. Regional Mineral Tracking via an ICGLR Database 3. Independent Third Party Audits 4. ICGLR Independent Mineral Chain Auditor
Tin Supply Chain Initiative	ITRI; Tantalum-Niobium Pact International Study	It provides a robust, verifiable system to address 'conflict minerals' minerals industry, from mine to smelter (the

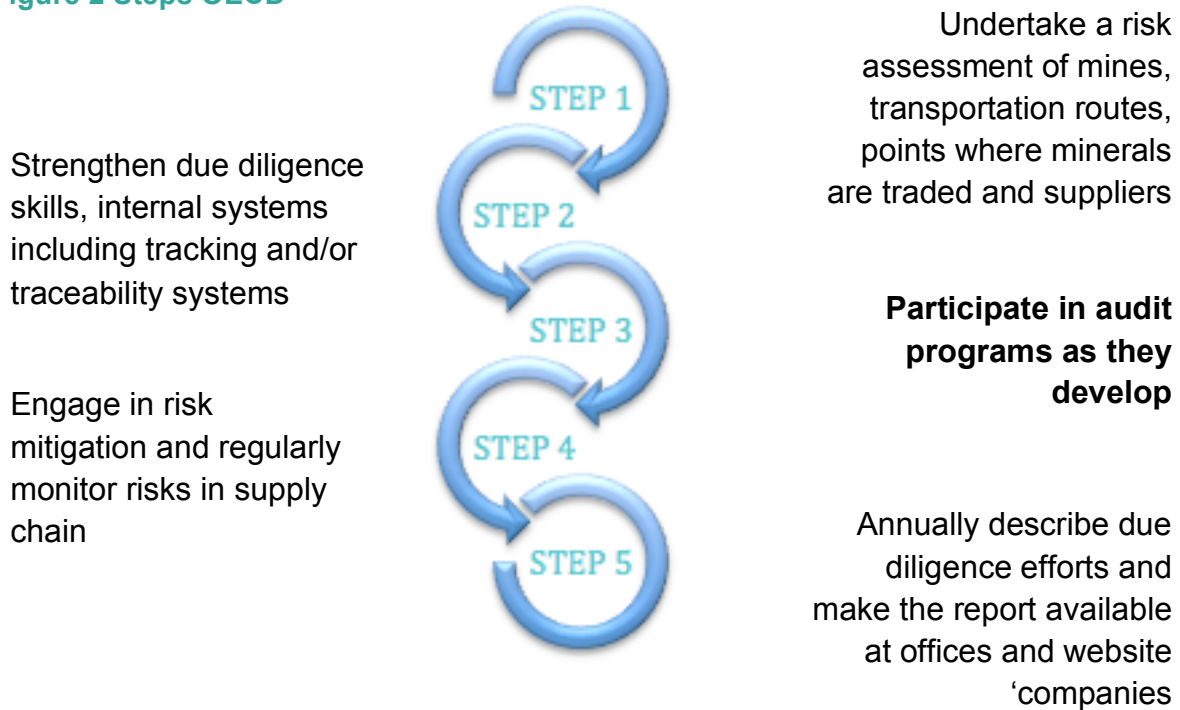
ITSCI PROGRAMME	Center; Channel Research	‘upstream supply chain’). iTSCI has three components: chain of custody data collection (traceability), risk assessment, and independent third party audits . Through these, iTSCI helps companies conform with the OECD DDG, but companies remain responsible for their sourcing practices. (ITRI, 2015).
	MANDATORY FOR MEMBER COUNTRIES	
Conflict-Free Sourcing Initiative (CFSI) and Conflict-free Smelter Program (CFSP)	Electronic Industry Citizenship Coalition (EICC) and Global Sustainability Initiative (GESI)	An initiative that offers downstream companies and their suppliers guidance and tools to identify and verify that the sources of conflict minerals processed by smelters are conflict-free. Seeks to operationalize the OECD Due Diligence Guidance for smelters and refiners(EICC&GeSI, 2015).
	VOLUNTARY	
(PPA) Public-Private Alliance for Responsible Minerals Trade	Participants representing governments, industries and key members of civil society.	It provides financing support and coordination of organizations working in the region to develop verifiable supply chains as 'conflict-free'; programs and practices for a responsible supply chain of custody; It promotes transparency. The PPA also provides a platform for coordinated, productive dialogue among government, industry, and civil society in a non-regulatory setting (RESOLVE, 2012).
	VOLUNTARY	
OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas	Organization for Economic Cooperation and development (OECD)	Offers recommendations for responsible action in mineral supply chains globally. It establishes a certification mechanism for mining and trade in conflict minerals from the region of the Great Lakes. It promotes accountability and transparency within the supply chain , in terms of minerals from conflict zones. Helping companies to respect human rights and avoiding to contribute to conflict through their purchasing decisions and practices of minerals or metals (OECD, 2013) See details below
	VOLUNTARY	
SEC Dodd-Frank	The Dodd-Frank Act Section 1502. Us	Companies related to purchase minerals from DRC or Lake region that could be a

Regulations	Government, Federal Agencies And State Department 2010	conflict minerals need to provide a report describing, among other matters , the measures taken to exercise due diligence and chain of custody of those minerals, which must include a private audit independent from the sector and report it (RESOLVE, 2012).
	MANDATORY FOR COUNTRY MEMBERS	

Source: Made by my own from resources cited in each cell

OECD Due diligence for conflict-free supply chains “is a guide which offers a process that companies or individuals should undertake to ensure that the extraction and trade of mineral ores containing tin, tantalum, tungsten and gold support peace and development, not conflict. This includes a five-step framework for risk-based to put in place strong systems of control over the supply chain”. (OECD, 2013). (See figure 12 the complexity of the risks in the supply chain of conflict minerals from conflict-affected and high-risk areas in the annex)

Figure 2 Steps OECD



Source: made by my own from OECD, 2013

5.6. NGO INVOLVED IN THE CASE OF COLTAN

Solutions for hope (SfH) tantalum program is a project that helps enable miners of tantalum to work and also “a global platform for supply chain initiatives designed to promote transparency, responsible sourcing, and local community development and promote economic stability in DRC” (Solutions-Network, 2015). The Solutions for Hope model starts pilot projects at small-scale that once tested, they share learning and support policy initiatives to **scale up and maximize impact**. This program has demonstrated over the years:

- It is feasible for downstream companies to establish supply chains originating with conflict-free mines in regions impacted by conflict;
- These **supply chains can be independently validated as conflict-free**, thus mitigating risks of in-region sourcing; and
- Leaders from civil society support responsible sourcing from regions experiencing conflict and recognizes companies participating in SfH, as a complement to regulatory initiatives focused on transparency.

Currently technology companies such a Motorola Solutions, AVX, HP, Intel, Nokia, Research in Motion participate in the Solutions for Hope Project (Solutions-Network, 2015)

Enough Project seeks to end genocide and crimes against humanity. It makes intensive field research, develops practical policies to address these crises, and shares sensible tools to empower citizens and groups working for change in South Sudan, Eastern Congo and others to counter rights-abusing armed groups and violent kleptocratic regimes that are fueled by grand corruption, transnational crime and terror, and the pillaging and trafficking of minerals, ivory, diamonds, and other natural resources. Also, **it provides rankings on how well companies do in terms for example of diligence in DRC** (Enough, 2015).

Partnership Africa Canada (PAC) is a Canadian nongovernmental organization which mission is to promote sustainable and inclusive human development in Africa through research, policy engagement and the implementation of initiatives locally and globally (Partnership Africa Canada, 2015).

In terms of Conflict-minerals, DRC and mobile phone companies and its value chain, there is a logical thinking that there is a need for a better and higher support from Governments on Lake regions, though there has been an improvement and a lot of initiatives that have arisen as the mentioned above. Also, there is a need for a better transparency from the companies. There is a need for the education and explanation to supplier companies and countries the importance of the CSR, what transparency, responsibility, sustainability means and why it is necessary.

6. CASES

As this thesis is based on telecommunications sector, especially in cell phone issues, it is represented different types of companies to show them as some examples with the intention to explain all information above in a practically way.

There are going to be mentioned different cases, representing different companies situated in the different stages from the large value chain. First of all, cell phone companies cases are compared, secondly Telecommunication companies that sell cell phones, thirdly multinational retail companies in the area of cell phones and finally different organizations, companies that re-use cell phones or materials, websites that inform consumers about properties related to environment, raw materials, among others, of the products and to end, the uses of other materials are explained with the idea of showing there are other options to face these problems. Some companies have had to face challenges, put some new goals in terms of CSR and, solved problems that have found in their path.

6.1. CELL PHONE COMPANIES

This section will discuss 4 cases very differentiated. First of all it is to talk about Nokia and Apple, which represent existing companies in the sector, with a long experience. It is showed how they try to do better to control suppliers in the mineral supply chain, after realizing on what the purchase of Coltan implicates.

Secondly, it is to talk about another company totally different, Fairphone. It is new in the sector, it has social values and, it has arisen from concerns about transmitting more awareness around the abuses in the supply chain of electronics.

Therefore, theses companies have their own advantages. Fairphone is new, small; it exists due a concern and not due to be a company to grow fast, easy and with the idea of having the biggest incomes as possible. They can look after closely the suppliers and have the opportunity to choose because they have no compromises from previous contracts, and can change easily. On the other hand, Nokia an Apple are big, they have expertise, they know where to go, they have options, money and they have power if they want to take decisions, change suppliers, they have power of pressure.

Finally, It is showed Project Ara through its partner Phonebloks. Project Ara is a development effort and not an official Google product. It is to talk about it to highlight there are other ways of doing business and consider the industry. It is another interesting path to pursue such issue because it solves different problems of the existing sector and shows an intelligent way of recycling and re-thinking Product Life Cycles.

NOKIA

Until recently, Nokia was a key participant in the mobile devices market through its Devices & Services business. Nokia was positioned as one of the world's biggest

manufacturers of mobile phones, though this changed due its agreement with Microsoft (Interbrand, 2014) which was announced in September 2013 whereby it sold substantially all of its Devices & Services business to Microsoft. The transaction was completed on April, 2014 (Nokia, 2015). Following this agreement, Nokia became the leading provider of smartphones with Windows Phone.

Nowadays, Nokia (headquartered in Finland) is a leader in 3 fields: Networks (NSN), which offers network infrastructure software, hardware and services; HERE, which provides location intelligence; and Technologies, through which it pursues advanced technology development and licensing

In the early 2000, this company **had a lot of media attention** when a lot of catchy slogans, and documentaries with names such “Blood in the mobile” were talking about how international companies -where Nokia was included- were using minerals from DRC, which were related to finance armed groups in that country. In that point, the word conflict minerals started to have a meaning and actions from NGO, governments were made. Nokia reacted in that way and since that, there reacted and made improvements.

These changes and improvements can be shown by the perception of the employees had from the company in 2013, where 83% of Nokia employees considered Nokia to be socially and environmentally responsible, which was six percent higher compared to previous year. Now, **Nokia is one of the leading companies in sustainability**: Interbrand₁ in its Best Global Green Brands Ranking placed Nokia in 6th position and in Reprtrak reputation ranking, Nokia resulted in the 24th position (Reprtrak, 2014).

In its Nokia People Planet Report, 2013 (which is the last report which one can log in) sates that one of its challenges for next years is the **Understanding and driving change in sustainable supply chain management** because “one of the great challenges is finding the best ways to effect change on a larger scale.

Nokia has put a lot of effort during years in terms of recycling, reducing use of energy, innovation in more sustainable products, registering raw materials, and requiring to suppliers to accomplish its Nokia Substances List, where there are some forbidden (Strandberg, 2010). For instance, it created devices that remember owner when to disconnect the cell phone when battery is full charged (Strandberg, 2010). In terms of transportation, Nokia reduced thousands of trucks distribution, used ships instead of planes, meaning an estimated 80% reduction in CO2 emissions. Also, it published energy use and greenhouse gas emission generation of its suppliers.

Nokia, as it can be seen, has had implication in terms of sustainability but, as this thesis treats, CSR is not only about the firm, is more, iand this means knowing the performance of its value chain and take care of it.

Nokia has its NOKIA’S SUPPLIER CODE OF CONDUCT (Nokia, 2015) that states it has been created based on the principles set in internationally recognized

standards such as the **United Nations Declaration of Human Rights** and International Labour Organization (**ILO**) including key elements from the Electronic Industry Code of Conduct (**EICC**) and which expects all suppliers meet or exceed to go beyond compliance them. In this code of conduct it treats:



Figure 3 Areas Nokia Code of Conduct

Source: made by my own from NSN, 2013.

Nokia makes verifying process with audits or assessments to suppliers' facilities, records, business processes to see compliance of Codes of Conduct. Violation of the Code of Conduct may result in the disqualification as a Nokia supplier and the termination of their business relationship.

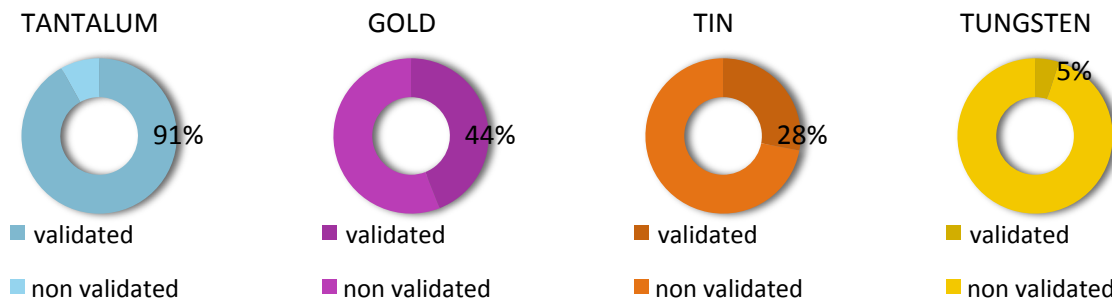
In the area of Ethics, responsible materials sourcing is treated and watched over suppliers saying that if they manufacture components, parts, or products containing tin, tantalum, tungsten or gold, they must source those materials from environmentally and socially responsible sources only. Suppliers in this category must exercise due diligence regarding the source and chain of custody of these minerals and make any due diligence measures available to customers upon request and if these contribute to conflict, are unacceptable (Nokia, 2015).

Nokia Solutions and Networks Conflict Mineral Policy (NSN, 2013) states *"is concerned about the potential that the mining and trade of minerals these metals are extracted from is fueling military conflict, related human rights violations and environmental degradation, for example in certain regions of the DRC and adjoining countries"*. NSN (NSN, 2013) communicates its Conflict Minerals policy (which is fully in line with its *Code of Conduct*) **to its suppliers, requiring all its partners, subcontractors, and suppliers to implement equally high standards**. Assessing and responding to the identified risk, and having a plan in case of finding conflict minerals and identify the suppliers of those products. Nokia demand and follow up corrective actions plans, conduct on-site detailed audits if necessary.

Nokia defends that Supply chains in its industry are complex and long but there is a growing **demand** for making sense of that complexity, tracking eg. the **origin of different raw materials and driving change for more sustainable practices when needed**. Therefore, NSN collaborates with Information and Communication

Technology industry and the mining sector with **initiatives, validation or certification mechanisms** ensuring companies that the metals used in their products are not contributing to conflict **because NSN supports seeking sustainable solutions to that**. Also, collaborating in improving both the traceability of minerals and the transparency of global supply chains. Finally, it is remarkable Nokia makes Public Reporting due to first step in OECD (Establish strong company management systems) of the progress of the implementation of its Policy as part of its annual corporate responsibility reporting.(Nokia, 2014). In these reports, it is listed the smelters from its supply chain that are conflict-free.

Based on its due diligence efforts they found that results of devices & services Supply chain report 2013 (Nokia, June 2014) 92% of direct suppliers adopted a conflict mineral policy and **41% of smelters were validated by CFSP or mutually recognized programs:**



Graph 2 Smelters validated

Source: made by my own from Nokia Supply chain report, June 2014.

In conclusion, Nokia Conflict Mineral Report 2013 (Nokia, 2014) stated: “ As a downstream company, our diligence measures can provide only reasonable, not absolute assurance regarding the source and chain of custody of the Conflict Minerals. Our due diligence process is based on the necessity of seeking data from our direct suppliers and the direct suppliers seeking data within their supply chain to identify the original sources of the Conflict Minerals. **We also rely to a large extent on information provided by independent third party audit programs.** Such sources of information may yield inaccurate or incomplete information and may be subject to misstatements.”

APPLE

Apple is an American multinational company founded in 1976, very popular for its electronic equipment (such as the smartphone iPhone), software productions and innovative designs.

Previously, Apple was strongly criticized for alleged in an effort to evade taxes in several countries. Also, for their practices against the environment and labor exploitation suffered by employees of **outsourcing companies** (Musgrove, 2006 & Serraller, 2013) Due to this, Apple has made strong efforts to improve its reputation and public relations issues considering topics such as sustainability, CSR in supply

chain, labor conditions as some of the points to be treated in the company and to find solutions. Now, Interbrand in its Best Global Green Brands Ranking placed Apple in this case in 21th position. Apple resulted in 4th position in the Reputation Ranking 2014 from Reprtrak with a score of 78.23 from 100 with an evolution of 36 positions more compared to previous year thanks to the admiration from respondents people to its innovation, products and services, leadership, financing, work and CSR (in this case, being in the 5th position).

In terms of supply chain and CSR, it should be highlighted that Apple has its **Supplier Employee Education and Development program**, an initiative for training and development for suppliers, such as IT courses, languages, CSR and environmental education, management and engineering (Apple Inc, 2015).

In terms of sustainability Apple declares to want its suppliers to be as responsible as it is. It has created Ellen MacArthur Foundation, a like-minded group working to establish a more circular economy. Also, It has eliminated many toxic substances from its products. It set out to achieve a worldwide **recycling collection rate of 70 percent of the total weight of the products they would have sold seven years earlier**. All electronic waste it collects worldwide is processed in the region where it's collected. Apple reduced 31% energy carbon footprint between years 2011 and 2013, which includes emissions from its facilities, supply chain and the use of Apple products by its customers, even though its energy consumption increased by 42% during that period. Some Apple stores in the US and all of Australia are supplied by 100% renewable energy (Apple Inc, 2015).

There is a great data to notify that Apple has included in its webpage all **products environmental reports**, explaining in a detail way Greenhouse Gas Emissions for the product, its Energy Efficiency, Material Efficiency, Packaging, if it is recyclable, restricted substances, materials and their impacts (Apple Inc, 2015).

Apple has its APPLE SUPPLIER CODE OF CONDUCT (Apple Inc, 2015) that goes beyond mere compliance with the law by drawing upon internationally recognized standards to advance social and environmental responsibility and asks its suppliers its compliance. It is made from internationally principles accepted such as SA 8000, Ethical Trading Initiative, the Electronic Industry Code of Conduct, ILO, Social Accountability International, National Fire Protection Association, OECDGuidelines for Multinational Enterprises, and OHSAS 18001. It treats:

Figure 4 Areas Apple Code of Conduct



Source: made by my own from Apple Inc, 2013.

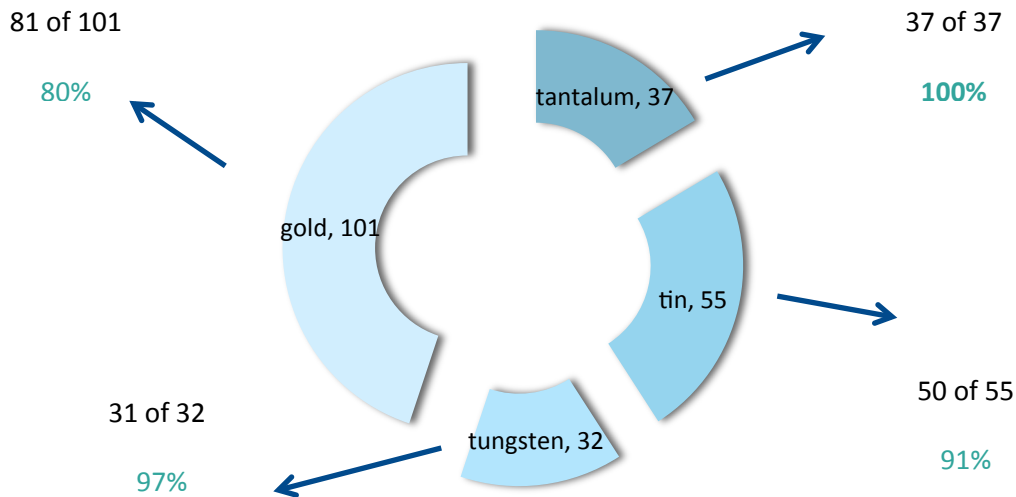
Any serious infringement (such as child labor, physical abuse, forced labor, falsification of information, impairments in auditing, preparation of workers for audits or retaliate against them if they provide information, bribery, high levels of pollution, etc.) **to its Supplier Code of Conduct is taken seriously. Auditoria is made to detect cases such as labor forced, child labor, discriminatory conducts from workers.** Apple demands to take an **action immediately and to rectify it**, instead of going directly with termination of the relationship with the supplier because they think that changing suppliers would switch to a same situation. But, if **these kind of violations unrelieved, relationship stops** (Vilariño, 2013).

Also, it treats **Ethics Responsible Sourcing of Minerals** where it is mentioned that Supplier shall exercise due diligence, in accordance with the OECD Due Diligence Guidance on its entire supply chain with respect to the sourcing of all tin, tantalum, tungsten, and gold contained in its products. It elaborates Conflict Minerals Reports and **also publishes its smelters' and refiners' names, countries and CFSP participation status, and updating this list publicly each quarter.** Also, it is engaged with non-governmental organizations, trade groups, government agencies to promote change and it is committed to programs mentioned above such as ITRI, PAC, PPA, Solutions for Hope, Conflict-free Tin Initiative.

In 2009 Apple began investigating the uses of conflict minerals in its products (tantalum, tin, tungsten, and gold), being one of **the first companies that started first mapping its supply chain** to the smelter or refiner level in 2010. Since 2011, Apple has been driving smelters and refiners to **comply with the CFSP or equivalent independent third-party audit programs.** Apple is really involved in creating opportunities and economic development to source conflict-free minerals from DRC and adjoining countries The idea of Apple is to expand the base of smelters and refiners that have been verified as conflict-free, **rather than concentrate its demand through a limited number of smelters and refiners, or avoiding those sourcing in Central Africa** (Apple Inc, 2015).

A part from that Apple **continue to conduct independent research** on smelters and refiners and to work with suppliers throughout its supply chain to re-validate, improve, and refine their information. **Apple has made a clear improve, in February 2014, all 37 tantalum smelters from Apple known to be in its supply chain, had been designated conflict-free.** More than 88% of the identified smelters and refiners have either successfully completed conflict-free audits or have begun the audit process, and Apple is working with its suppliers to verify the rest or remove them from its supply chain. It launched in 2014 a strict deadlines 'campaign for smelters and refiners to demonstrate their progress in that sense Apple personnel conducted 38 visits with smelters and refiners and traders and established action plans. As a consequence 4 terminated because they didn't want to engage in their process (Apple Inc, 2015).

Graph 3 Smelters and refiners verified as conflict-free or in audit process



TOTAL.....199 of 225 (88%) Source: made by my own from Apple Inc, 2015

On the other hand, Apple recognizes in its Conflict Mineral Report, from period 2014: “Based on these due diligence efforts, **Apple does not have sufficient information to conclusively determine the countries of origin of the Subject Minerals in its products or whether the Subject Minerals in its products are from recycled or scrap sources.** However, based on the information provided by Apple’s suppliers, smelters, and refiners, as well as from the CFSI and other sources, Apple believes that the countries of origin of the Subject Minerals contained in its products include countries listed in its Report, as well as recycled and scrap sources”.

FAIRPHONE

Fairphone is a social enterprise headquartered in Netherlands dedicated to sell smartphones, not linked to tantalum or other conflict minerals and with fair labor conditions for the workforce along the supply chain (Ballester,M., December 2014)

Fairphone beginnings were in 2010 just as a campaign aimed to create more awareness around the abuses in the supply chain of electronics and the conflict with minerals (Ballester, M., june 2013). After that, it was decided that instead of complaining about such a conflict situation like the one in DRC, they wanted to create their own phone putting social values at the base of their mission, in order to expose every step in the production with an emphasis on the mining situation in DRC. The goal was to understand the system and see if things could be done differently finding a balance between their mission and size (Fairphone, 2013). **They wanted to understand where stuff come from, how they are sourced, where they are manufactured and under what conditions.**

Table 3 Fairphone step by step, within 5 core action areas

MINING They support local economies, not armed militias. They're starting with conflict-free minerals from the DRC.

DESIGN They look for long and **repairable** products to extend the phone's usable life and give buyers more control over their products.

MANUFACTURING Factory workers deserve safe conditions, fair wages and worker representation. They work closely with manufacturers that want to invest in employee wellbeing

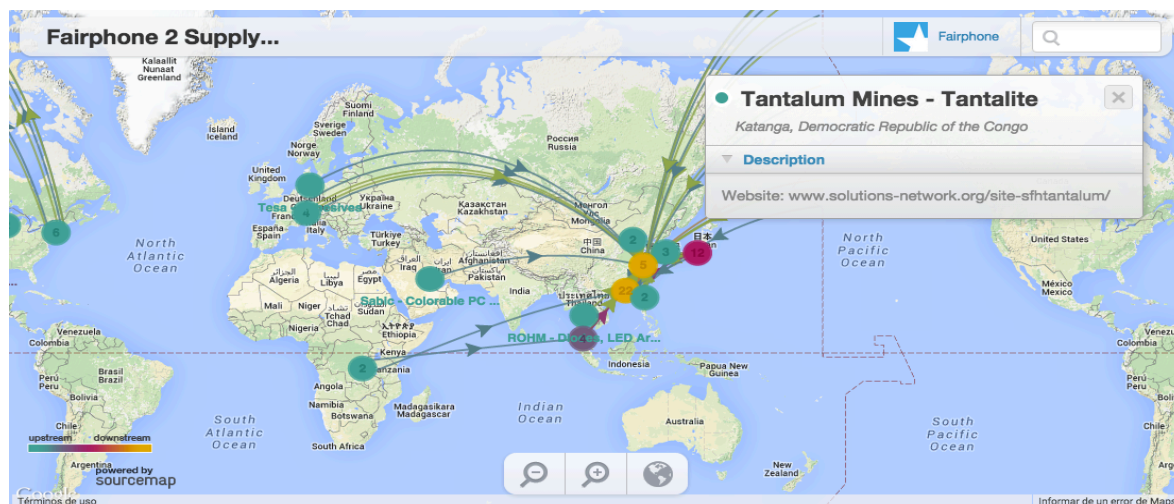
LIFE CYCLE They address the full lifespan of mobile phones, including use (extend longevity), reuse and safe recycling.

SOCIAL ENTREPRENEURSHIP By operating transparently and sharing the Fairphone story, they're helping consumers make informed decisions about what they buy, with a focus on social values.

Source: made by my own from Fairphone, 2015.

One of their clear aspects is that they want to be completely **transparent** in all of their achievements, including the areas where they have not yet made progress (Fairphone, 2014). They give a breakdown of all its value chain with public access to this information and provide visualization. They establish a closed-pipe supply chain (including mines, smelters and manufacturers) to provide greater transparency and supply conflict-free minerals from regions experiencing ongoing conflict (Fairphone, 2015). **Thanks to their size they can establish a direct and open relationship with the factories and the mines they get their minerals from.**

Figure 5 Tantalum supply chain map from Fairphone, step by step



Source: Fairphone, 2015

Fairphone, 2015 mentions it uses conflict-free tantalum for one of the capacitors. This comes from the DRC via the Solutions for Hope (SfH) initiative. Thanks to this initiative and their members, it's possible to guarantee the minerals are extracted and traded without supporting armed groups. This demonstrates that it's possible to source conflict-free tantalum from the DRC.

They have their manufacturer in China, where major suppliers in mobile technology are. They want to prove that responsible manufacturing is possible and that it should be done even in challenging markets (Fairphone, 2013).

Also, on the website one can see all components and parts of the cell phone having tutorials with the explanation on how to repair parts (Ballester, M., December 2014). In addition, they have a cost breakdown to explain consumers to know the whole story and why they have these prices. Also, social awareness exists, giving 3 euros per mobile to Closing the Loop to recycle, with e-waste program.

They are working on a program that goes beyond the typical audits that consists on developing a social assistance fund and **creating systems of choice for workers to decide where the money from this fund is spent** (from manufacturers). This takes a lot of legal work and involves going through several layers of management of their supplier. (Ballester, M., June 2013).

Thanks to their initiative, **they have taken importance in the society and their words are taken into account when legislative conflict minerals issues are made** from Holland Government (Ballester, M., December 2014).

They are trying that other initiatives or companies to adhere to them. Vodafone, KPN are some examples. Rabo Mobiel, GSM and GSM Loket RetourPlan have also supported. (Ballester, M., June 2013).

It is interesting to highlight that the project raised money selling phones through pre-orders like a business model, they do not create cellphones until they arrive to the number of orders they wanted as a goal. The company is thriving, proving the business opportunity and sustainability long-term wise.

So, Fairphone with their program has aimed to demonstrate that it is feasible for downstream companies to establish supply chains originating with conflict-free mines in regions impacted by conflict; these supply chains can be independently validated as conflict-free, and leaders from civil society can support responsible sourcing from regions experiencing conflict and recognize companies participating in Solutions for Hope in order to complement to regulatory initiatives focused on transparency (Joseph-Gabriel, 2014).

PHONEBLOKS

Phonebloks, 2014, are defined as an **independent** organisation with the purpose of **encouraging the development and production of products** to find a way to **reduce electronic waste**.

Created by Dave Hakkens in the Netherlands with the aim to show the industry, through their growing community, what the public wanted and what the planet needed. **He purposed a new kind of phone, made of blocks to attach all blocks.** Being all connected to the base and, the base connected everything together. Becoming an **easy way to repair or upgrade without the need for whole widget replacement.**

If for instance, a piece would break, one could replace it for a new one, or if one would like to have a faster component, one could attach a new one with more speed, or updated it to the latest version. It would be possible to share a module with the family, or swap one with friends. Therefore, one could customize its cell phone, buy the blocks that wants, support the brands it wants or develop its own blocks.

Figure 6 Phoneblok design-idea



Source: Phonebloks, 2014.

So, it started as an idea based on a vision of the need for a phone of worth keeping (He didn't have plans to build a mobile phone himself but it was an effective way to show the mobile industry the need for a change). Therefore, this idea spread out to

the world and inspired big companies. Nowadays, there are lots of partners interested and working together to make this idea possible, such as Sennheiser or Project Ara from Google. The idea is to achieve a holistic approach to end or reduce the various ethical and environmental problems existing in the consumer electronic market today.

Phonebloks believes in a transformation from a flat to a circular economy, a more sensible industry with their help on logistic solutions and production materials, creating less waste and pollution as well as a longer life-cycle and higher level of recyclability (or even bio-degradability) for the end product. **Ending in an increase of the life span of the product, at the same time reducing waste** (Phonebloks, 2014).

Figure 7 Phonebloks key areas



Source: Phonebloks, 2014.

Phonebloks also advocates transparency, open source and open innovation and want to be the hub where the industry talks and listens to each other and to the public.

Project ARA

When Project ARA saw the video of Phonebloks they decided to partner with Dave Hakkens, since his idea was similar in concept to what they were working on Project ARA (Google Inc, 2015).

Therefore, Project ARA is an initiative by Google (originally headed by the Advanced Technologies and Projects team within Motorola Mobility while it was a subsidiary of Google) that **aims to develop a free, open hardware platform for creating highly modular smartphones** and also looks for an elegant industrial design (Google Inc, 2015).

This initiative looks for a hardware that achieves to create a highly personal, functional and customizable experience phone. With experience they mean that they want something to have the ability to choose what you want your phone to do and to how you want your phone to look (Phonebloks, 2014).

Therefore, it has to be said that Project Ara is a development effort and not an official Google product. Consequently, there is not a market launch date. However, they want a limited market pilot in 2015, in Puerto Rico (Google Inc, 2015).

Considering that this thesis is focusing in the CSR and the value chain and the use of raw materials and cell phones, these 4 cases are some examples of how decisions have been taken with this topic, where supply chains in this industry are really complex.

Nokia and Apple represent big companies that were in the sector when coltan mining took media attention. Apple took fast decisions and was one of the first ones to consider tracking its value chain meanwhile, Nokia made it but not as an immediate decision. On the other hand, it should be mentioned that now, they try to be as transparent as they can in concordance to OECD steps. At the same time it seems that these two companies they have been taking these decisions as a way to maintain their reputation and as a consequence of implications that not taking care of their suppliers could give them. Also, analyzing their conflict minerals reports, they always conclude they can not absolute assure sources of information about chains of conflict minerals may yield inaccurate or incomplete information and may be subject to misstatements.

Therefore, in this industry there are improvements and an effort in seeking data from direct suppliers and the direct suppliers seeking data within their supply chain to identify the original sources of the Conflict Minerals, about making independent third party audit programs. Most big companies have codes of conduct, certifications, supplier requirements policies, conflict-mineral policies to help to improve the situation but it doesn't seem to eradicate these problems. At the end there is just a piece of paper and at the end there is a serious need to ensure that these words are translated into action (Fairphone, 2013). There is a long way to go, CSR consists not only in doing one part of the business well it is about doing good things in all parts and in all value chain.

Fairphone exists as a concern about conflict minerals and mobile industry. They demonstrate that is possible to look after closely the suppliers, having started from the inside of the value chain and trying to choose the most fair options as possible.

Finally, It is showed Project Ara through its partner Phonebloks. Project Ara which is a development effort that shows there are other ways of doing business and consider the industry. it solves different problems of the existing sector, from uses of other materials, intelligent way of recycling to product Life Cycles.

6.2. TELECOMMUNICATION COMPANIES

TELEFONICA/ movistar

Telefónica is a telecommunications company leader in Spain, which principal activities are **fixed and mobile telephony, broadband services and applications of information technology telephony.**

Telefónica is one of the most international companies of the sector, having more than **76% of the business out of domestic market**. It is located in 21 countries, most of them in South America & Europe and has 120,000 workers. Telefónica brands are Telefonica, O2, Movistar and VIVO (Telefónica SA, 2015).

In 2013 the Allies program was awarded by the Mexican Center for Philanthropy (Cemefi), the Alliance for Corporate Social Responsibility in Mexico (AliaRSE) and Business Forum in recognition of Best Practices in Corporate Social Responsibility 2013 of Telefonica Mexico. And, **in Best Companies for Leadership, Telefonica was ranked in a globally scale in 9th position in 2013** (Telefónica Group, 2014). In the World's most valuable brands, GLOBAL 500 2014, Telefónica was ranked in 88th position.

Telefónica (Telefónica Group RC y Sostenibilidad, 2015) participates in the **world's main sustainability indexes**: Dow Jones Sustainability Index (DJSI), FTSE4Good, Sustainalytics, Vigeo, Morgan Stanley's MSCI, among others.

Telefónica says "is one of the leading telecommunications companies in Europe by sustainability criteria and it is the only global operator of all of them with a rating 23 percentage points higher than the average for the sector, according to the DJSI. In its most recent evaluation, the RobecoSAM rating agency gives them a score of 80 out of 100"

Telefónica Sustainability Report 2013 sites that through its foundation creates programs for education. It supports "start-ups" from projects such as "Wayra" improving quality of lives from people with disabilities. In terms of Health, e-Health platform monitors chronic patients. Also, 10 million euros to actions and initiatives aimed to improve the socioeconomic conditions of the people have been allocated. In the environmental management issues, mentioned in Telefónica Sustainability Report Summary 2013, 31.275 tonnes of waste were recycled and reused and shared 34,400 sites minimizing the environmental impact. It created 16 energy efficiency projects implemented and consolidated of the Smart Cities sustainability model.

In terms of suppliers, the Marco Polo project in 2013 gives an **End to End management in the supply chain having a direct relationship with suppliers, allowing participation of Telefónica in the whole process**. Moreover machinery to promote local manufacturing. Also, Telefónica has promoted face meetings with key suppliers along their geography: 85% of suppliers have been registered by auditoria to have complied.

The Supply Chain Responsibility Policy of Telefónica group, 2010 based on ILO conventions, ISO, and UN Universal Declaration of Human rights explains the Standards that Telefonica expects its suppliers achieve, following the key aspects of sustainability:

Table 4 Standards Telefónica expects its suppliers to comply

BUSINESS PRINCIPLES

ETHICAL STANDARDS

ENVIRONMENTAL STANDARDS

HEALTH & SAFETY STANDARDS

Source: made by my own from Telefónica, 2010.



In a part of Telefonica Sustainability Report 2013, Telefónica touches on “Sustainability in the supply chain: responsible purchasing of minerals”, 2013. Telefónica alludes “its compromising respect to Human Rights and its hard working with its suppliers to apply efficiently its responsibility policy in its supply chain”.

“Telefónica believes, that in some regions, the extraction, processing and commercializing processes of minerals can create an armed conflict or derive in Human Rights violations. Telefónica understands that this extraction is an important economic part for the countries in Lake regions, meaning that if interruption of extraction and processing them there would cause a negative impact in the areas for their development. It understands that finding **a solution for this situation is complex and goes beyond the companies themselves**. Therefore, a joint commitment of governments and local authorities, companies and nonprofit organizations is needed to take action, in order to the various initiatives launched succeed. Such measures include all actions aimed at promoting transparency of the supply chain, obtaining conflict free minerals or impact management presents mining and mineral processing on the environment and working conditions”

Therefore, Telefónica has taken action since 2013, following OECD guidelines, 1502 Dodd-Frank law, and Consumer Protection law. Also, it participates in Electronic Industry Citizenship Coalition (EICC) and Global e-Sustainability Initiative (GeSI) Extractives Working Group, PPA and ITSCI project. What Telefonica expects from its suppliers:

1. Establish robust systems management in the company
2. Identify and assess risks in the supply chain
3. Design and establish a strategy for responding to identified risks
4. External independent audits at points identified in the supply chain, through proper diligence
5. Report of due diligence supply chain.

Also, they ratify that suppliers comply by external evaluations such as:

-  360° evaluations to suppliers made from Ecovadis since 2013
-  Auditories to risk suppliers

VODAFONE

Vodafone is one of the biggest Telecommunication companies of the world in terms of revenues. In the World's most valuable brands, GLOBAL 500 2014, Vodafone was ranked in 16th position. Vodafone provides cell phone services in 26 countries and has business relationships in 55 more (Vodafone Group Plc, 2015).

It should be distinguished that Vodafone has launched, a mobile payments platform, called M-Pesa that contributes to economic development in emerging markets. Also, it provides mHealth solutions, SMS for Life, which is helping to ensure health clinics in Tanzania don't run out of essential medicines by using a text message system to track medicine stock levels. Moreover, the "Learning with Vodafone' service" aims to improve the standard of education for schoolchildren in India by using innovative software and mobile Internet. Furthermore, Vodafone is contributing to the global effort to alleviate poverty, for instance in 2011/12, it contributed on more than £11.1 billion in cash to the public finances in countries where they operate. Additionally it is doing efforts on investments in programs that promote sustainable development through their Foundation.

On the other hand, Vodafone has some negative data, which needs to improve; it is the case with its CO2 emissions from their networks that are why they have started programs to reduce them like M2M. Also, improvements in e-waste recycling must be done specially in emerging markets where it is more challenging (Vodafone Group Plc, 2015).

Referring to the company, to provide its services, Vodafone acquires network equipment, terminals and other products from direct suppliers. So, **Vodafone does not manufacture products itself but does have influence on the manufacturing and design process for a number of products, including many of these that carry the Vodafone brand. For this reason, Vodafone has its Code of Ethical Purchasing, jointly with its Supplier Management Program, ethical social and environmental criteria that suppliers must comply and which will be explained below (Vodafone Group Plc, 2013).**

Table 5 Priority areas for Vodafone

Safety of contractors working on our network infrastructure in emerging markets

Social and environmental standards in suppliers operations and factories

Mining of minerals in conflict regions

Source: made by my own from Vodafone, 2013

Since April 2013, Vodafone has a Conflict Mineral Policy. They recognize in their Tackling conflict minerals (Vodafone Group Plc, 2013) that "ceasing to source minerals from legitimate mines, as well as those funding armed groups, is likely to have a negative impact on economic development and people's livelihoods in the

region”. Thereupon it is detailed in their policy that any product made for Vodafone, its raw materials must not come from RDC or any adjacent country or if it comes from there, **must be certified and traceability must be done, guarantying that raw materials are not associated with conflicts**. Necessary controls to verify and guarantee Vodafone complies requisites are established in its report, accordingly to 1502 Dodd frank law. In case of finding products with conflict minerals, **Vodafone would work accurately with suppliers to eliminate it, suspending purchases of new products from this supplier until problems will be solved** (Vodafone Group Plc, 2014).

Also, they participate in initiatives led by the Global e-Sustainability Initiative (GeSI) and the Electronic Industry Citizenship Coalition (EICC). Vodafone has an interesting thing to be mentioned: **It has created Eco-rating with the help of Fairphone**.

Vodafone’s Eco-Rating scheme enables customers to choose their new phone **according to sustainability criteria and get them informed of environmental and social impacts of different mobile phones**, thanks to its scores, represented in an easy way to understand. Ranges are from one to five (where five is the most sustainable) and is displayed alongside the mobile phone (Vodafone Group Plc, 2013).

Figure 8 Eco- rating Vodafone exemple



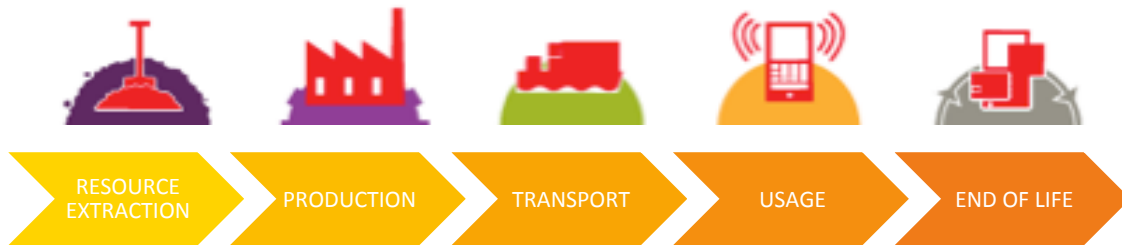
Resource: Vodafone Group Plc, 2013.

To be made scores, **manufacturers are asked to answer the questions and provide supporting evidence in order to gain a product score for each mobile phone**. Questions to report the score asked to manufacturers are related to:

PRODUCT QUESTIONS

Lifecycle is analyzed to assess the environmental impact. Therefore, questions **related to the use of raw materials that make up the phone, its extraction mining and bribery**, to its production (the amount of energy and water used, emissions), transport, use (additional points are earned for ‘green’ design features and manufacturing choices that are particularly important to customers or demonstrate innovation) and disposal, how easy is to replace individual components, separate and recover for recycling are elaborated.

Figure 9 Product Lifecycle



Source: Vodafone Group Plc, 2013

CORPORATE QUESTIONS

Mobile phone manufacturer's practices and policies in managing the environmental and ethical impacts of the production of the phone, **such as certifications, standards, reports.**

Finally, two independent third parties- Bureau Veritas and SKM Enviros- who request further evidence if it is needed to verify all answers. And by last, PWC, verifies scores.(Vodafone Group Plc, 2013)

Telefónica and Vodafone as telecommunication companies can influence in suppliers. They contribute in the tracking process, following OECD guidelines, 1502 Dodd-Frank law, and Consumer Protection law in its suppliers: establishing supplier systems management in the company, identifying and assessing risks in the supply chain, doing independent auditoria, 360° evaluations to suppliers, having ethical codes of purchasing, ethical social and environmental criteria that suppliers must comply and Eco-Rating schemes that enable customers to choose their new phone being informed of environmental and social impacts of different mobile phones.

6.3. MULTINATIONAL RETAIL CORPORATION

Retailers are in the upstream of the big value chain. More accurately in this case, for the smartphones, it is important to mention some examples about retailers because they have a power to influence the consumption; Retailers can decide what to purchase and which information is given to consumers.

WALMART

Walmart is an American multinational retail corporation from Arkansas that operates a chain of discount department stores and warehouse stores. Sam Walton created it in 1962 and it is a big retailer that could be one of the upstream of the big value chain of smartphones. According to the Fortune Global 500 list in

2014 Walmart is the world's largest company by revenue, as well as the biggest private employer in the world.

Especially should be noted that Walmart decided to launch in 2009 **The Sustainability index**, with the collaboration of (TSC) The Sustainability Consortium, which is a global organization dedicated to improve the sustainability of consumer products. This index is a data amalgamator, gathering the best peer-reviewed science on the lifecycle impacts and “material” environmental and social issues for a given product category. **The group identifies the “hot spots” in the value chain that create the most risk and footprint.** The information was drawn from detailed research on known and potential social and environmental impacts across product life cycles (Arizona State University and University of Arkansas, 2015).

The aim was to improve their sustainability on their products, explaining when they are made, purchased, and used, with a focus on manufacturers and the retail buyers who decide what products to carry in stores, being conflict minerals topic also explained and evaluated.

Therefore, the index allows Walmart to have **strong tools to collaborate in both sides of the supply chain projects, improving Index scores by addressing key hot spots, driving efficiency and reducing waste.** The Toolkits are science-based and stakeholder-informed, including input by companies, academics, civil society organizations, and government agencies. With this, Walmart introduced a new section of its website featuring elect products from companies that met Wal-Mart’s criteria to wear a sustainability badge (Wal-mart stores, inc, 2015).

This index mentioned in its website helps to both retailers and suppliers to:

- ✓ Improve the sustainability of the products customers love
- ✓ Integrate sustainability into the business of buying and selling merchandise
- ✓ Reduce cost, improve product quality and create a more resilient supply chain
- ✓ Strengthen customers’ trust in retailers and the brands they carry (Wal-mart stores, inc, 2015)

Walmart is aware that “Electronic devices contain minerals, including gold and ores of tantalum, tin, and tungsten, that may be mined in areas where groups responsible for human rights abuses control and profit from mining operations. For this reason, they defend that manufacturers should ensure that materials in their products are sourced responsibly and are not from these areas, and should try to help improve stability and quality of life for miners and their communities” (Wal-mart stores, inc, 2015).

So, Walmart, more specifically Rob Kaplan, Director of Sustainability at Walmart knows that being best-in-class is not the same as being sustainable. Walmart recognizes that some products that they sell in electronics may still have conflict

minerals in them, but the TSC questions help identify the brands that are handling the issue the best.

The group contributes with the conflicts that supply chain of technology sector carries, identifying the “hot spots” in the value chain that create the most risk and footprint of their products, explaining when they are made, purchased, used, with a focus on manufacturers and the retail buyers who decide what products to carry in stores, being conflict minerals topic also explained and evaluated.

6.4. CONSUMERS

Considering consumers have the last word and are the ones that buy products, in this case, cell phones, it is interesting to mention:

GOODGUIDE

Goodguide is a webpage that categorizes products and analyzes different issues from products and makes a kind of process where products are evaluated depending on Health, Environment and Society. It is independent, therefore it is interesting because it doesn't form part of the value chain of the product. Also, it provides own ratings (acquiring data over 1,000 different sources) of products of different categories where best products are rated 8 or above; and worst 4 or below.

Focusing on cell phones products, they have linked impacts associated with the energy use needed to power devices, material selection and sourcing of raw materials, working conditions in assembly plants, and end-of-life device management. In the case of raw materials, they examine company policies and practices regarding traceability, auditing certification, stakeholder engagement, public policy. But, their scores do not indicate whether a specific company's cell phones contain or do not contain conflict minerals because manufacturers do not generally disclose the source of raw materials used in their phones. (Goodguide Inc, 2014).

Goodguide is one good example to make the consumer take part on the process, and being able to take informed decisions. Also, it could be interesting if companies could disclose the source of raw materials, specifying each product they sale the materials they have, their origin, if they are free of conflict as a mandatory thing by law. Therefore, consumers could take informed decisions, if demand doesn't exist, sales either.

6.5. END LIFE OF PRODUCT

Accordingly to “ Guidance of responsible consumption of electronics” made by Ongawa, 2013 the electronic waste is currently the kind of garbage fastest growing in Worldwide. In this generation not all electronic products are properly treated, usually exporting the electronic waste to developing countries, especially in Africa

and Asia, sometimes illegally, to countries like Nigeria, China and Pakistan, where there is an adequate environmental legislation.

There have been improvements in the market, where companies are aware that this can pollute and have big negative impacts and they have plans such as recycling, using more sustainable products, putting efforts to incentive consumers to bring old products to stores for recycling processes.

Also, governments have taken legislations treating these topics and an example is EU which “lays down measures to prevent the creation of electrical and electronic waste and to promote reuse, recycling and other forms of recovery, to reduce the quantity and improving the environmental performance of the operators involved in its management. In addition, to contribute to the recovery and disposal of waste electrical and electronic equipment, as well as the protection of human health, the EU also provides measures restricting the use of hazardous substances in these products” (Europa, 2010).

In most of the emerging world, there is no properly organization of e-waste developed from governments or NGOs. **As a result, electronic devices end up in landfills and are often burned.** And so, this lag of environmental programs turn e-waste into a problem for people’s health and their environment. Adding the factor that metals are becoming more and more scarce (Closing the Loop, 2015).

There are companies in Spain such as **Indumental**, which says is a “leader in the industry specialist with extensive experience in the comprehensive management of Waste Electrical and Electronic Equipment and complex scrap, including logistics, on-site industrial facilities dismantling and recycling in our treatment plants industry”. Also, **Residuos Electrónicos** says it is “ a company that provides an alternative waste management of all kinds of scrap computer, electrical and electronic origin products, **and provides o different producing industries of raw materials** (metal smelters, recycling of plastics, paper, and so on), **selected products for their refinement and incorporation into the production cycle”**.

On the other hand, there are other options such as **Eurekamovil**, which applies purchasing-selling mobile phones and also helps to environment allocating around 75% of the mobiles to repair them in developing countries or the 25% to be recycled in United Kingdom.

In recent years, some organizations have sought to combine business sense with a drive for social returns, and became active in ITC reuse.

CLOSING THE LOOP

“Closing the Loop” buy end-of-life mobile phones in developing countries and bring them to Europe. Being good for every party in the circle, for people in developing countries and for the mobile industry. **They prove that collecting and recycling mobile phones from Africa and Asia can be done in a profitable way, to demonstrate that recycling can be done and avoiding informal recycling,** which it is usually only possible to recover 25% of gold, silver and palladium.

They have projects and pilot projects in Ghana, which has an area, one of the moistest toxics locations globally, Nigeria, Kenya, Uganda, China, purchasing, recycling, reselling, repairing are their commitments. With Umicore, one of world's highest quality smelters, they extract 95-99% of the metals and recycle them in a responsible way to new raw materials.

YOLOREPARO

It is an enterprise established in Spain, in Galicia. It promotes to repair cell phones, providing instruction manuals that provide one, steps to repair it by oneself. It rent Boxes to do all procedures there. Also have an on-line shop where components can be bought to introduce them as new or to replace old ones that don't work (Satvigo, 2015).

Finally, the end-life of product is really important, these are examples of making the end-life of product last longer. Also, as it is shown before, Ara project could be another way of re-thinking the lifecycle, only substituting the parts that can not be used anymore. In addition, these solutions mentioned above allow not to mine that much because products can be reused.

6.6. OTHERS - USE OF OTHER MATERIALS (GRAPHENE)

Properties of this material are revolutionizing all type of industries and there is a lot of scientific investigation behind this recent and discovered material.

It has a lot of advantageous properties. Its hardness is approximately to diamond materials. **At the same time is really elastic, dense, transparent and light, being one of the properties that mobile industries, such as Samsung and Nokia, are more interested due to its wide range of designing possibilities.** Also, it conducts heat very well, using less amount of electricity, meaning that **batteries from mobile or portable computers, would last much longer.** It reacts chemically with other substances and supports Ionizing radiation, meaning it could be applied in areas like Health, for instance in radiation therapies. Also, it is studied the behavior of graphene with living organisms and opens up possibilities for use in the food industry or in biomedicine because bacteria do not grow in it (Infografeno, 2015). Finally, It is organic, that is, does not pollute the environment nothing because it is organic matter. **Therefore, current batteries that are highly polluting could be substituted (Bosch, 2014).**

To conclude, it should be said that investigations through this material are being made since around 10 years ago. It has a lot of big and important properties but, there is no need to anticipate events because there is still much research to be done from this material to become an useable and affordable material for companies (González, 2011).

Continuing the issue talked before, the use of Graphene could eradicate the conflict mineral mining. Also in terms of sustainability it seems that lasts longer and needs less electricity and either doesn't pollute because it is an organic matter.

7. CONCLUSIONS

Our society is continuously changing, and depends constantly on ITC due to globalization. As it has been mentioned during this report, there is an increase demand on having incorporated a “CSR in relation to the supply chain”. **Companies from electronics sector usually have a large supply chain and many parts are involved, being a complex market.** Therefore, it should be managed in a responsible and ethic way.

Raw materials are really important in electronics because of their properties. In some cases, such as the DRC, the extraction of minerals is closely related to the financing of armed groups.

It has been showed that there is an **increase involvement of Cell phone companies to integrate CSR in their supply chains.** In the thesis measures are mentioned “which say they help to reduce the main negative effects of conflict minerals, its production and consumption”, and some initiatives report “the present efforts of governments, NGO’s and electronics industry are underway”. Initiatives adopted and cases are analyzed in the report to see how companies face these problems, and other ways of business are considered **because the context of business needs increasingly parameters** (due to economic changes) **and social responsibility.**

There has been studied that certifications help to demonstrate that companies are aware on sustainable and responsible issues. But, at the same time it is kind of contradictory because they could certificate they have good values in terms of environmental issues but they might not act really positive in terms of labor conditions. **So, there should be an action from the company to act as whole, considering all risks of the company.** Also, codes of conduct, certifications, supplier requirements policies, audits, conflict-mineral policies are conducted and explained above and also including all of this in the company, it doesn’t seem to eradicate the problems.

The way of how this sector is working since now should be improved meanwhile other materials (graphene) or other way of thinking in the industry can be done physically (as Project Ara, which would solved most of the problems).

Considering the case of DRC and the supply chain of Coltan, the solution wouldn’t be to ban it, because companies involved in mining and trade in minerals have the **potential to generate income, sustain live hoods, foster local development and if it would be banned smuggling to border countries would exist** (as it has been demonstrated until now) and the problem would be still there (OECD, 2012). But, there is a need for a **better and higher support from Governments on Lake regions** because it seems that organizations are really corrupt in the country (UN, 2015). Also, there is a need for a **better transparency from the companies,** such as Fairphone does and which demonstrates that doing things carefully and thoroughly it is possible to enter to challenging markets. On the other hand, there is

a need for **education, increasing industry and consumers awareness**, making consumers to take part in the process too.

There is an utopic solution where **cooperation from all parties should be done perfectly**. Governments with effective supervision and solutions without bribery, changes in society behavior in Lake region areas, perfect due diligence from supply chain cell phone companies, increase of consumers perception and laws that eradicate these problems. But, there is the possibility of a big improvement from all parts. In conclusion, it can be extracted to what it has been analyzed during the thesis, in terms of mobile phone parts of the industry that:

COMPANIES

❖ **DIMENSIONED ECONOMIES OF SCALE ALLOWING ITS GRASP**
It should be interiorized in ethics of companies that growing is good since it is measurable and grasps. **Meaning that the size will be good since they can control all their suppliers and know what happens in their value chain.**

❖ **TRANSPARENCY:** Introduce transparency as a normative.
For example Fairphone **publicizes all steps they do. They communicate if things go well and bad respect to suppliers.** They provide all information about each component of the Fairhone, from where it comes (mapping exactly who they have in their supply chain as it is showed in figure 5), each material, where it is placed. They also provide where every euro paid goes for purchasing its product.

❖ **ACTION:** For example Apple knows that DRC has these problems, they say they help to a lot of initiatives because they believe these problems can be diminished. **All companies should join to the most initiatives they can.** Therefore, as more companies do things as good as it is possible, **more influence they have in the downstream and consequently, changes in values and ethics can slowly change.**

❖ **LESS WASTE-MORE LONGETIVITY TO PRODUCTS- MORE ACCESIBILITY TO RECYCLE**
The economic model forces consumers to change products every 2 or more years. It causes the need of buying new materials for new products; at the same time it creates a lot of electronic waste. There is a need that “brands have to look into their **purchasing practices including issues related to price, speed of delivery, and changes in production and how those decisions impact workers on the factory floor**” (Fairphone, 2013)

Phonebloks comes up with a solution that makes the **lifecycle of the product last longer**. Also, It could be a solution to push economy to behave more responsibly enforcing companies (in their possibilities, depending on the product and availability of sources) to achieve a high % of recycled materials in their products, as a mandatory thing. In addition, **second hand companies** as Eurekamovil should increase in number. As less products are and more possibilities to recycle and re-use materials exist, **less problems of electronic waste and less need of supply materials.**

❖ ALTERNATIVES

Looking for new models in the electronics. Phonebloks seems a good example that if it works it could comply with most of the points mentioned, it is **accessible, easy to change or repair components when needed, they can be produced with recyclable products**. Also, Graphen looks as a pledge, where a lot of issues mentioned can be solved: **waste, facilities, durability, pollution between others**.

Also, Fairphone is a good example of driving a movement to change the electronics industry from the inside out. By producing a smartphone in a way that puts **social and environmental values first, starting discussions and stimulating demand for fairer electronics**. Increasing awareness and motivate the entire industry to act more responsibly.

TELECOMMUNICATION COMPANIES-RETAILERS

Supplier Systems Management in the companies, assessing risks in supply chain, ethical codes of purchasing and environmental criteria that suppliers must comply.

COMPANY TO CONSUMER

Making environmental **issues to consumers more available publicly in a direct and easy way to access from websites of the company**. Also, being possible to **quantify or to make it easy to compare**, as WallMart and Vodafone do. **Disclosing the source of raw materials**. It might be a good idea that brands had to specify each product they sale and have a **label explaining the materials they have, their origin, if they are free of conflict as a mandatory thing by law**.

CONSUMER

“In the case of cell phones most consumers **base their selections on features and pay relatively little attention to the environmental and social impacts** associated with their production and use. But these impacts are significant” (Goodguide, 2015). There are **rankings** provided from companies, NGO’s, audit companies, companies specialized in processing rankings, that identify sustainable and responsible issues from products, such as the one from Greenpeace or Vodafone, WalMart, raise Hope for Congo, Goodguide. **Consumers need to start to take part of the process, they can decide what to buy and why, making informed decisions**.

Consumers taking action, **demanding to favorite companies to compromise in these good values**, to take care and plan, face conflict-minerals. **Education on Sustainable and responsible Management**.

INDEPENDENT PARTIES

Creating more measures, certifications-whatever that helps to show social values from companies- that can be **measurable, comparable, quantifiable**, such as the Footprint. **Unannounced audits and interviewing workers** outside of the factory (Fairphone, 2013). **360° evaluation to suppliers**, such as Telefónica does.

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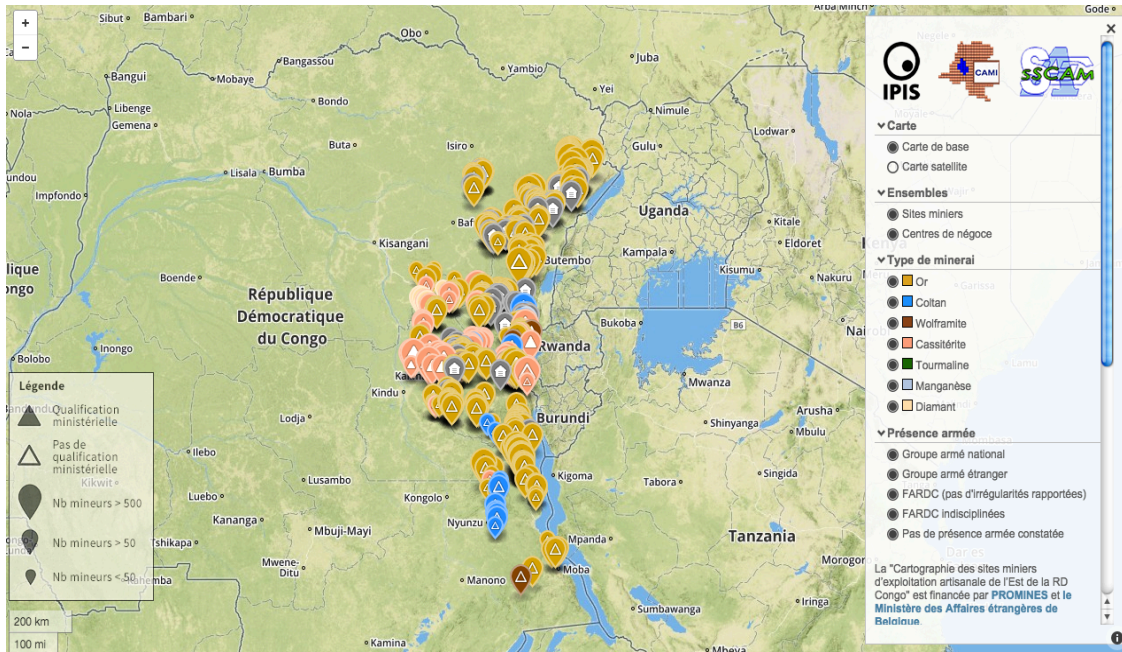
ANNEX

Table 6 Coltan usages

INDUSTRY	USAGE	CHARACTERISTICS	PRODUCT
AUTOMOTIVE	Anti-lock brake systems, airbag activation systems and engine management modules	High strength, resistance to high temperatures	Tantalum powder
CERAMICS & SURFACE COATINGS	Ceramic capacitors, glass coating, camera lenses and X- ray films	High strength	Tantalum oxide and yttrium tantalate
CHEMICALS	Chemical processing	Ductile, resistance to corrosion	Tantalum metal
CONSTRUCTION	Cathode protection systems for large steel structures such as oil platforms and corrosion resistant fasteners such as screws, nuts and bolts	High strength, resistance to corrosion	Tantalum metal
ENGINEERING	Cutting tools	Resistance to high temperatures (carbides)	Tantalum carbide
ELECTRONICS	Capacitors, surface acoustic wave filters for sensors and touch screen technologies, hard disk drivers and led lights	High and temperature insensitive volumetric capacitance, thermodynamic stability	Lithium tantalate, tantalum powder, tantalum ingots and tantalum nitride
MEDICINE	Pacemakers, hearing aids and prosthetic devices such as hip joints	Bio-inertness	Tantalum metal
METALLURGICAL	Furnace parts, super alloys for jet engines and rocket engine nozzles	Resistance to high temperatures	Tantalum metal and ingots
MILITARY	Missile parts, night vision goggles, and Global Positioning Systems (GPS)	Resistance to high temperatures, High and temperature insensitive volumetric capacitance	Tantalum ingots and oxide

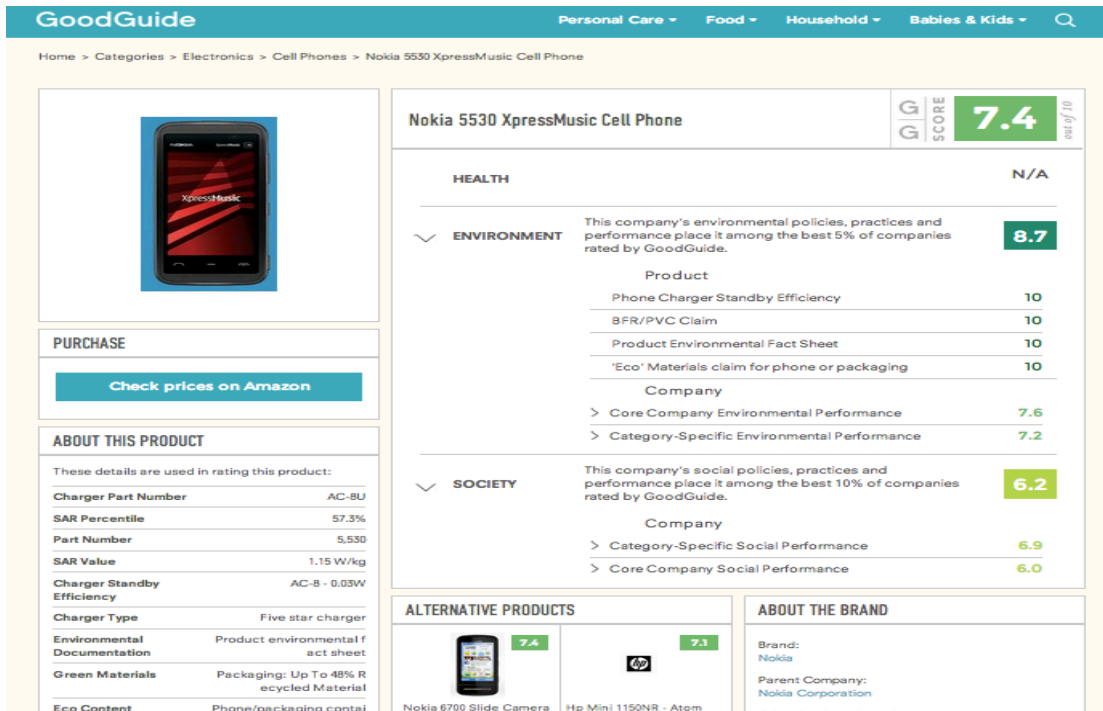
Source: MAJOR USES OF TANTALUM BY INDUSTRY. British Geological Survey (BGS), *Niobium-Tantalum Commodity Profile*, Commodity Profiles (Nottingham: British Geological Survey (BGS), 2011).

Figure 10 Map of conflict minerals representation in DRC



Source: IPIS, 2015. Conflict Mapping.2015. retrieved in February 20, 2015 from <http://ipisresearch.be/>

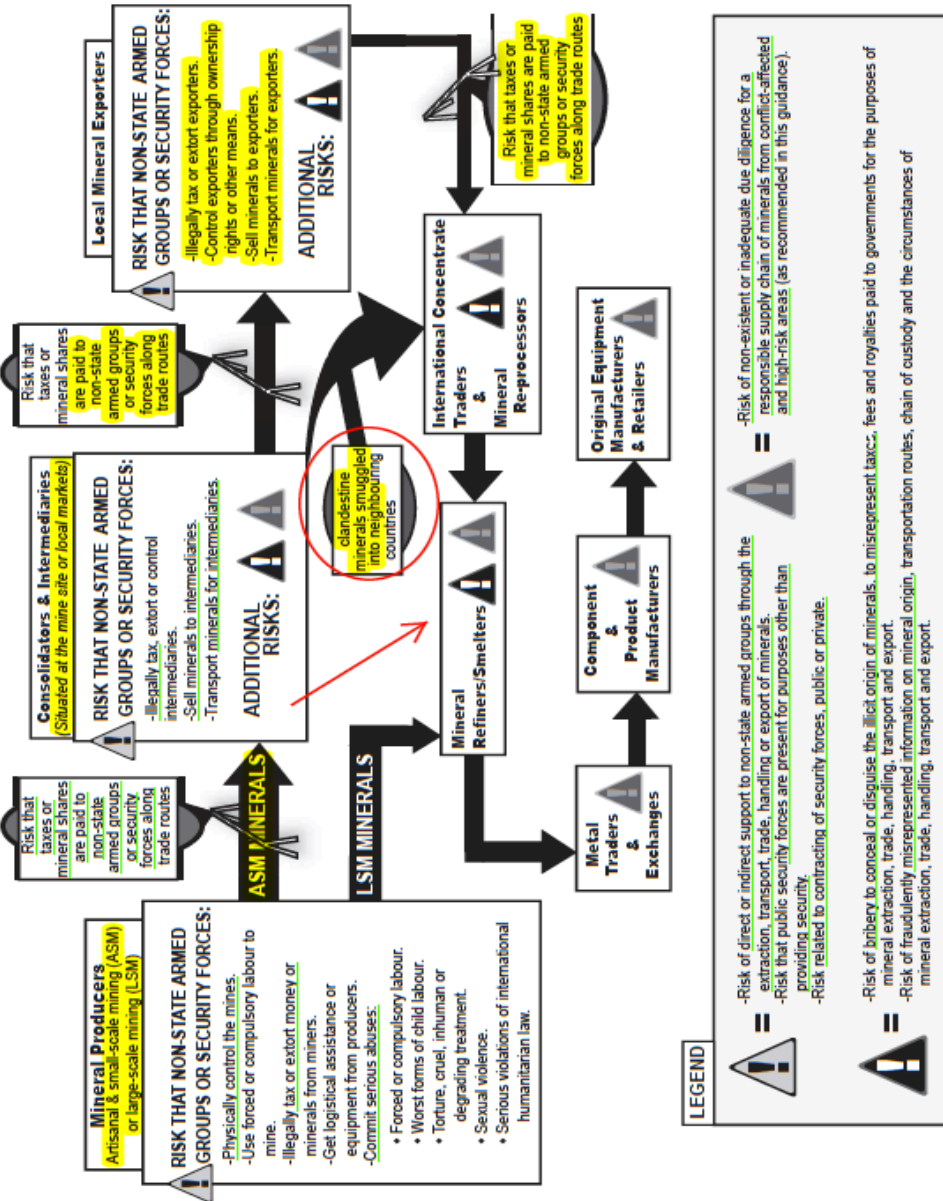
Figure 11 Goodguide Features



Source: GOODGUIDE INC. Scoring Cell phones. 2014. Retrieved in February 25, 2015 from <http://www.goodguide.com/about/methodologies/332304-cell-phones>

Figure 12 Risks in the supply chain of conflict minerals, OECD

Figure 1. Risks in the supply chain of tin, tantalum and tungsten from conflict-affected and high-risk areas



Source: OECD (2013), OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas: Second Edition, OECD Publishing, 2013. Retrieved March 10, 2015 from <http://dx.doi.org/10.1787/9789264185050-en>