

# Gold from children's hands

Use of child-mined gold by the electronics sector



Irene Schipper & Esther de Haan & Mark van Dorp

November 2015

# Colophon

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**Stop Child Labour**

'Stop Child Labour – School is the best place to work' (SCL) is a coalition coordinated by Hivos. The coalition consists of the Algemene Onderwijsbond (AOB), FNV Mondiaal, Hivos, the India Committee of the Netherlands (ICN), Kerk in Actie & ICCO Cooperation, Stichting Kinderpostzegels Nederland and local organisations in Asia, Africa and Latin America.

[www.stopchildlabour.org](http://www.stopchildlabour.org)



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SOMO

Irene Schipper, Esther de Haan and Mark van Dorp

Amsterdam, November 2015

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## Glossary

### Artisanal and small-scale mining (ASM)

Formal or informal mining operations with predominantly simplified forms of exploration, extraction, processing, and transportation. ASM can include men and women (and children) working on an individual basis as well as those working in family groups, in partnership, or as members of cooperatives or other types of legal associations and enterprises involving hundreds, or even thousands of miners.<sup>1</sup>

### ASM gold

Gold that has been produced by Artisanal and Small-scale Mining.

### Bullion

The generic word for refined gold in bar or ingot form<sup>2</sup>.

### Conflict-affected and high-risk areas

Areas identified by the presence of armed conflict, widespread violence, including violence generated by criminal networks, or other risks of serious and widespread harm to people.<sup>3</sup>

### Downstream companies in the gold supply chain

"Downstream companies" include refined gold traders and gold markets, bullion banks and exchanges or other entities that do their own gold vaulting, jewellery manufacturers and retailers, and other companies that use gold in the fabrication of products (e.g. manufacturers and retailers of electronics or medical devices).

### Due diligence

Due diligence is an ongoing, proactive and reactive process through which companies can identify, prevent, mitigate and account for how they address their actual and potential adverse impacts as an integral part of business decision-making and risk-management Introduction to the report.

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1 OECD, "OECD Guidelines for Multinational Enterprises", 2011, <http://www.oecd.org/daf/inv/mne/48004323.pdf> (14-10-2015)

2 OECD (2011)

3 OECD (2011)

**Gold supply chain**

The system that comprises all the activities, organisations, actors, technology, information, resources and services involved in moving gold from the source to end consumers.

**LSM Gold**

Gold that has been produced by medium and large-scale Mining

**Refiner**

An individual or entity that purifies gold to a commercial market quality, by removing other substances from doré, alluvial gold, recyclable/scrap or other gold-bearing feedstocks.

**Upstream companies**

“Upstream companies” include miners (artisanal and small-scale enterprises or medium and large-scale gold mining companies), local gold traders or exporters from the country of origin, transporters, international gold traders of mined/recycled gold and refiners.

## Acronyms

<b>ARM</b>	Alliance for Responsible Mining
<b>ASGM</b>	artisanal small-scale gold mining
<b>ASM</b>	artisanal small-scale mining
<b>CIS</b>	Commonwealth of Industrial States
<b>CFSP</b>	Conflict-Free Smelter Program
<b>CFSI</b>	Conflict-Free Sourcing Initiative
<b>DRC</b>	Democratic Republic of the Congo
<b>EICC</b>	Electronic Industry Citizenship Coalition
<b>GeSI</b>	Global e-Sustainability Initiative
<b>IMVO</b>	International Corporate Social Responsibility (Internationaal Maatschappelijk Verantwoord Ondernemen)
<b>LBMA</b>	London Bullion Market Association
<b>LSM</b>	large scale mining
<b>PCB</b>	printed circuit boards
<b>RJC</b>	Responsible Jewellery Council
<b>SD</b>	Specialised Disclosure
<b>SGE</b>	Shanghai Gold Exchange



# 1 Introduction to the report

## Objective

Hivos, as coordinator of the Stop Child Labour coalition, commissioned SOMO to conduct research on child labour in gold mining. The objective of the research is twofold; first to determine the magnitude and seriousness of child labour in the artisanal gold mining, and secondly to provide insight into the supply chain linkages with the electronics industry. The assignment also included a field study in Mali with a view to describing the specific conditions for child workers at artisanal gold mining sites.

The Stop Child Labour Coalition partners<sup>4</sup> are running a project called 'Out of work and into school' which supports the elimination of child labour by strengthening an area-based approach towards child labour free zones. Where possible, the partners seek the active participation of sustainability initiatives and companies. In the context of this project, the Stop Child Labour Coalition wants to reach out to electronics companies and urge them to take actions to combat child labour in their supply chains.

## Context of gold and electronics

In the Netherlands, the supply chain of gold has recently received attention through an initiative by the Ministry of Foreign Affairs. A round table was held in the Netherlands on the 9 June 2015 to discuss how different actors in the Netherlands could improve gold supply chain sustainability. The Ministry has now taken this initiative further in sector agreements on international corporate social responsibility (known in Dutch as *IMVO convenanten*).

Several research studies in the past years have been looking at gold mining and child labour. Human Rights Watch, DanWatch and the Bern Declaration, among others, have demonstrated the magnitude of the problem and the destructive conditions in which children are working. The most important findings of their studies will be described in this report.

On their part, electronics companies have set up several initiatives connected to the gold supply chain, all of them within the broader scope of conflict minerals. Gold is part of the 3TG (tungsten, tin, tantalum and gold) for which specific policies have now been formulated within the electronics industry, and several other sectors have followed suit. But these initiatives have so far been circumscribed to the Democratic Republic of the Congo (DRC). The question is to what extent the sector has taken steps to include non-conflict countries where gold is mined, and if there have been any efforts to address child labour.

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4 The partners in the Dutch Coalition are the General Union for Education (Algemene Onderwijsbond – AOb), the Federation of Dutch Trade Unions (FNV Mondiaal), Hivos, ICCO-cooperation, Stichting Kinderpostzegels Nederland and the India Committee of the Netherlands (ICN).

## Methodology

The research presented here will provide better understanding and clear insight into:

- The use of gold by the electronics sector and their way of sourcing.
- The gold sector, its key players, and existing initiatives for responsible sourcing, with a special focus on the electronics industry.
- The prevalence of child labour in artisanal gold mining worldwide and its linkages with the electronics sector.
- The conditions of children working at artisanal gold mining sites at a specific location (Mali).

Finally, the study will put forward a number of recommendations to electronics companies and other key actors.

SOMO mapped the conditions of children working in gold mining through desk research. It looked into the sector and largest players as well as the supply chain from gold to the electronics companies. Several electronics companies were subsequently contacted in search of better insights into the supply chain, and to inquire about any initiatives concerning minerals in the gold supply chain.

SOMO also contracted researchers in Mali to conduct field research into the conditions of child workers in gold mining in Mali. The research was carried out by a team of local researchers lead by Mamadou Seydou Diallo and Maïga Ibrahima Zacka. One of SOMO's researchers conducted research in Mali on the local gold supply chain and met with the local team to jointly carry out part of the research.

All of the companies profiled in this report, Sony, Philips, Metalor, Valcambi, Apple, Samsung, Fairphone, HP, NXP, STM, ASML, Intel, Acer, Google, Applied Materials, are given the opportunity to review a draft of the sections in which they are mentioned and to provide comments and corrections of factual errors. The following companies made use of this opportunity and provided comments that have been incorporated in the final version of this report : Sony, Philips, Metalor, Apple, Samsung, Fairphone, HP, and NXP.

## 2 Summary

### Objective of the research

This report is written for the Stop Child Labour Coalition with the aim of providing insights into the magnitude and seriousness of child labour in artisanal gold mining. It further seeks to establish the relation between gold mining, including supply chain linkages, with the third largest buyer of gold: the electronics industry. To this end, a field study in Mali examined the conditions of child workers at the artisanal gold mining sites.

### Results

The report shows that, in several cases, gold from artisanal mines in Africa where child labour is documented has ended up at the leading gold refineries located in Switzerland. Valcambi and Metalor are specifically mentioned, but the situation is not limited to these refineries. Rather, the case is illustrative of the fact that also the big refineries, which are properly certified, accept this gold without taking sufficient due diligence measures. Valcambi and Metalor are included in the supply chain of many electronics companies, as can be corroborated through the Specialized Disclosure Reports listing 3TG smelters and refineries. The linkages selected for this report describe the routes from Ghana, Burkina Faso and Mali to the refineries in Switzerland or to Dubai.

The use of children in artisanal gold mining is widespread; the ILO and the US Department of Labour have determined that this worst form of child labour occurs in 26 countries across Africa, Asia and South America. The most frequently used estimation is that around one million children work in gold mining worldwide. However, the actual number is probably much higher, and the ILO expects the figure is increasing, in sync with the ongoing growth of artisanal gold mining. Recent observations at mining sites in Burkina Faso indicate that between 30% and 50% of the labour force in gold mining were children.

### The field research in Mali

Twenty percent of all miners in Mali are children. They work long hours alongside their adult colleagues, carrying heavy loads. In 2009, the number of artisanal gold miners was estimated at 200,000; the Chamber of Mines of Mali, however, estimates the current number at one million, which would raise the number of children now working in Malian gold mines to 200,000. These children are sent to mining sites by their families for economic reasons. In Mali, girls generally start from the age of 8 washing the ore, while boys start later, at around 12 years of age. The tasks assigned to the youngest workers include transporting and processing ore (including pulling up and washing the ore); transporting it on their heads or backs, only occasionally in wheelbarrows or pushcarts; crushing, grinding, pounding and sifting the ore and gold panning; fetching water; looking after the babies on the site; preparing and selling meals and food. Most often, underground work is reserved for adult men.

While artisanal gold mining is dangerous for adult miners, the impact is even harder on children. The research in Mali reveals not just the physical damage, but also how it affects their development and thwarts their future as they drop out of school. Work-related illnesses include respiratory and pulmonary disease from excessive exposure to dust, skeletal injuries from heavy lifting, various eye

and skin conditions (body wounds that become infected in the poor hygienic conditions of the ponds that some children stand in all day), and fatigue because of the long hours and hard work. Shaft accidents and exposure to mercury were not encountered during this research but they are a known problem in artisanal gold mining. All this against the backdrop of widespread malnutrition in Mali. Food at mining sites is consequently both low in quality and insufficient to get through the day.

### **The use of gold by the electronics sector**

This research shows that the amount of gold used by the electronics sector is about 279 tonnes, accounting for 6.7% of the total gold demand in 2014. Gold is important for the electronics sector, as it is an excellent conductor of electricity and is therefore used for printed circuit boards, processors, semiconductors, etc. An average smartphone contains 30 mg of gold, a tablet about 104 mg and an LCD television 140 mg. The quantities in each device might be small, but they add up to a large amount of gold. In 2014, more than 1.2 billion smartphones were sold worldwide, containing 37,347 kilos of gold.

### **Global gold supply**

The global gold supply from mining in 2014 is estimated by the gold sector at 3,133 tonnes. This accounts for 74% of the total supply; the remainder comes from recycled gold. How much of the mined gold comes from artisanal mining is difficult to determine. Reliable statistics are not available, as artisanal gold mining is often informal, or even illegal, and much of the artisanal gold is smuggled out of the country and does not appear in official export figures. The most robust estimate is that artisanal gold has currently reached 15 to 20% of global gold production.

It is expected that artisanal gold production will increase in the coming years while industrial large scale mining is expected to remain stable. Africa's total share in gold production, for its part, is growing; this is largely due to increased production in countries like the DRC, Burkina Faso, Tanzania, Ghana and Mali. After South Africa (industrial mining), the largest African gold producers are Ghana, Mali and Tanzania, followed by the DRC, Burkina Faso, Sudan, Guinea and Zimbabwe.

### **The gold supply chain**

International gold refiners are the key players in the global gold supply chain, as they operate as the interface between end-users and gold suppliers. Switzerland is the world biggest hub for gold refining: processing around 70% of the world's gold. Gold refiners receive unrefined gold originating from both industrial and artisanal mining, as well as scrap (discarded gold suitable for reprocessing).

Industrial gold is supplied by medium and large gold mining companies, while the routes followed by artisanal gold are far more complicated. The local supply chain of artisanal gold starts with an on-site buyer who sells to a local trader, who in turn, sells to a local exporter. From here, it is exported to the refiners, either directly or through international gold traders. But the gold can also reach the refiners through another route, through the process of mixing illicit gold (from artisanal mining) into the formal trade channels. This often requires smuggling, falsification of documents (classifying the gold as scrap), and over-reporting of legal production. Despite the fact that almost all bigger refineries are certified (e.g. by the Conflict Free Smelter Program, the London Bullion Market Association or the Jewellery Council) neither the gold sector nor the electronics sector are taking any steps to eradicate child labour from gold mining.



*Children at Kola and Ouroun gold mining sites, Mali*

Alongside artisanal gold's non-transparent and complicated supply chain towards the refiners, two points on the route make gold difficult to trace and track: Dubai and Shanghai. Dubai plays a major role in smuggled gold, as 80% of the artisanal gold from the Great Lakes Region – countries such as Uganda, Tanzania and the DRC – is smuggled into the city. Despite the pressure the UN Security Council has put on Dubai in recent years, the authorities have failed to take any measures. Shanghai, on its part, has all gold traded through its Gold Exchange comingled; in the absence of any records regarding the origin of the mineral, it becomes almost impossible for electronics companies to trace the origin of the gold bought through Shanghai. To make matters worse, China requires that all imports of gold must go through the Shanghai Gold Exchange.

### **Initiatives by the electronics sector**

In 2010, the electronics sector launched what was hailed at the time as a ground-breaking initiative on transparency around conflict minerals: the Conflict Free Sourcing Initiative, now used by over 200 companies from seven different industries. The electronics sector has proven to be capable to set up and lead initiatives that concern the far end of their production chain. Some individual companies have taken further steps and become involved in in-region programs on the ground, in support of responsible sourcing from conflict areas. The Conflict Free Smelter Program, however, does not address the occurrence of child labour in the conflict affected areas. Child labour in gold mines outside conflict affected areas falls beyond the scope of the initiative, and the codes of conduct

of the electronics companies – all of which include a ban on child labour in their supply chains – do not reach the gold mines.

## **Conclusions**

Artisanal gold produced with the involvement of children ends up in the electronics supply chain. Although child labour is rampant in gold mining, and despite the fact that the working conditions can be very harmful to children, the electronics industry currently has no mechanisms to ensure child labour does not occur in the mining phase of their supply chain. The attention devoted to minerals by the electronics industry has so far been confined to a focus on conflict-free minerals, and the results are mostly limited to a reporting scheme within the Conflict Free Smelter Program.

## **Recommendations**

Policies and practices should be aiming at eliminating child labour in the mining of gold, but should not be directed at eliminating artisanal gold mining. Artisanal gold mining is providing income for 10-15 million artisanal miners and their families and communities, therefore eliminating this form of livelihood would have an enormous impact. It is important to take measures that will make the elimination of child labour an integral part of all efforts to improve the overall artisanal mining and labour conditions for (adult) workers. Part and parcel of such an improvement at artisanal mining sites are measures that are focused on ensuring internationally accepted labour rights as defined by the ILO and by the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas. Apart from eliminating child labour, these are: ensuring safe working conditions, banning of forced and compulsory labour; any forms of torture, cruel, inhuman and degrading treatment; other gross human rights violations and abuses such as widespread sexual violence and accompanying measures focused on reaching a stable family income as well as sustainable communities.

Electronics companies should acknowledge that their responsibility also applies to the mining phase, including the (artisanal) mining of gold; improve current due diligence efforts related to conflict minerals and stimulate refiners to take up an active role in these efforts too which includes integrating internationally accepted labour rights, including child labour, in the Conflict Free Smelter Program, following the OECD Due Diligence Guidelines for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Area; move beyond the area of conflict minerals in their due diligence with regard to the gold used in their products which implies not focussing solely on gold sourced from the DRC and neighbouring countries but extend policies to all countries producing (artisanal) gold.

## 3 Artisanal gold mining and the magnitude of child labour

### 3.1 What is artisanal and small-scale gold mining?

A distinction can be made between industrial and large-scale, on the one hand, and artisanal and small-scale mining on the other. The term 'artisanal mining' describes the low tech, low mechanised mining operations with predominantly manual (artisanal) work. Artisanal and small-scale mining (ASM) is a broader term encompassing all lower segments of mining (both non-mechanised and mechanised) that are not conventional industrial mining operations.<sup>5</sup>

In general, ASM takes place outside legal frameworks and is therefore mostly outside state regulation.<sup>6</sup> ASM is both a poverty driven and poverty alleviating activity. It attracts the economically weak and vulnerable; they are generally rural, less frequently urban populations seeking economic stability and the means to care for their families.<sup>7</sup>

Artisanal and small-scale gold mining (ASGM) can refer to individual gold miners, partnerships of two to a few dozen miners, and even large cooperatives or entire communities involving hundreds or even thousands of miners.

ASGM encompasses the entire production chain from prospecting, extraction, or processing, to marketing. Except in the case of individual gold miners, tasks are divided and specialization is visible throughout the supply chain. Mineral sorting and processing, transport, provision of water and food, and other similar activities qualify as "helper" tasks, often carried out by women and/or children.

Although the estimations differ, there are about 10-15 million ASGM workers worldwide, including 4-5 million women and children<sup>8</sup>, who extract about 15 to 20%<sup>9</sup> of the global annual gold production. Although these artisanal miners are responsible for about a fifth of annual gold output, they are said to make up over 90% of the labour force in gold mining.<sup>10</sup>

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5 This description is included in the report 'Addressing Forced Labor in Artisanal and Small Scale Mining (ASM)' to help to frame a common understanding, but it was not meant as a definition. Attempts to define ASM have all proved impossible due to the wide variety of minerals mined and the heterogeneity within the sector. Alliance for Responsible Mining, "Addressing Forced Labor in Artisanal and Small Scale Mining (ASM)", November 2014, <http://www.responsiblejewellery.com/files/ForcedLaborToolkit-Solidaridad-ARM.pdf> (16-10-2015).

6 L. Cremers & M. de Theije, "Small-Scale Gold Mining in the Amazon", Cuadernos del Cedla, 26, p. 1-16.

7 Alliance for Responsible Mining (November 2014).

8 Artisanal Gold Council, "World Artisanal Gold Production", 29 June 2011, <http://www.artisanalgold.org/publications/articles/world-artisanal-gold-production> (23-10-2015).

9 The World Bank uses the estimation of 20%. World Bank, "Artisanal and Small-Scale mining, <http://www.worldbank.org/en/topic/extractiveindustries/brief/artisanal-and-small-scale-mining>, (23-10-2015).

10 Fairtrade Labelling Organizations International, About, "Some facts", no date, <http://www.fairgold.org/partners/> (14-10-2015).





Artisinal mining site in Ouroun, Mali

The ILO estimates that about one million children work in mines and quarries.<sup>11</sup> However, the actual number is probably higher, because artisanal mining has been growing steadily since 2006, when the ILO originally made the estimation. In some countries the proportion of children is estimated to be as high as 30-50% of the workforce (Burkina Faso)<sup>12 13</sup>, and 20% in others (Mali).<sup>14</sup>

In discussing the use of child labour in gold mining, the focus here will be on ASGM, as child labour is known to take place predominantly in that type of gold mining. The findings presented in this chapter are based primarily on desk research, and the examples of child labour issues in ASGM provided here deliberately exclude the results of our field research in Mali, which will be presented in chapter six.

Local customs and varying characteristics of local ASGM will influence which tasks are to be performed by children, and from which age they will start. Overall, children do all kinds of work in the mining

11 ILO, Mining and Quarrying, <<http://www.ilo.org/ipec/areas/Miningandquarrying/lang--en/index.htm> > , (14-10-2014). Canadian International Resource and Development Institute, "Backgrounder: Artisanal and Small-Scale Mining (ASM) in Developing Countries", 27 January 2014, [http://www.cirdi.ca/wp-content/uploads/2014/01/ASM-Backgrounder\\_2014Jan27.pdf](http://www.cirdi.ca/wp-content/uploads/2014/01/ASM-Backgrounder_2014Jan27.pdf) (12-10-2015).

12 The Berne Declaration (September 2015).

13 ILO, Child labour in gold mining 010606, " Child labour in gold mining: The problem ", June 2006.

14 See field research SOMO in chapter 6.



process: digging, cleaning, shovelling, picking and transporting minerals, pounding ore with hammers, processing the mineral with mercury, looking for gold in mine tailings, they bring food and firewood to other workers, work in small businesses (shops, restaurants, motorcycle and ore repair).<sup>15</sup>

In the Philippines, for example, child gold miners are usually school dropouts between 15 and 17 years old, while in Ghana children often start working in ASGM at the age of 12.<sup>16</sup> Sometimes children are taught how to mine by their parents or other family members, while in other cases children have been victims of trafficking and are taught to mine by their 'bosses'.

It is not easy to draw general conclusions regarding the global scope of child labour in ASGM due to a lack of clear data on the topic. By definition ASGM is informal and often illegal. This is leading practitioners of ASGM to operate in secret, making it a difficult industry to research. Add to this the fact that child labour itself is also illegal, which may account for the lack of accurate and grounded estimates regarding the population of child labourers in ASGM. There are specialised studies of the specific regions where ASGM is practised, and where children are employed. Using these studies, this chapter will give an overview of the reasons children are employed in ASGM, as well as the dangers that this sector poses to their health and development.

## 3.2 Reasons for child labour in ASGM

Gold mining is known to be extremely dangerous to children participating in or living close to it.<sup>17</sup> Children may end up in ASGM 'voluntarily', pushed into those activities by poverty, or may actually be forced physically or by finding themselves in debt bondage, and its corollary, child slavery. Several of the reasons for this will be discussed below.

On average, ASGM provides at least slightly higher incomes than alternative trades like agriculture and construction. Although this difference goes hand in hand with the increased dangers the activity entails, a better payment can be reason enough for people in poverty to engage in the industry. Recent research on Burkina Faso states that although widespread child labour does allow children to contribute to their family's income, today child labour in ASGM in Burkina Faso is seldom an economic necessity for subsistence, but rather a means of gaining additional income.<sup>18</sup> Besides children mining to supplement their family's income, we also find children who have become displaced or who otherwise lack family support and therefore mine to fulfil their own basic needs.

But alongside these voluntary paths to mining work, large numbers of children are actually forced to work in this hazardous industry. In fact, in mining areas in Ivory Coast, Burkina Faso and Niger, children

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15 Alliance for Responsible Mining (November 2014).

16 International Labour Organization-International Programme on the Elimination of Child Labour, "Child labour in gold mining: The problem", June 2006, <http://www.ilo.org/ipecinfo/product/download.do?type=document&id=4146> (15-5-2015). Human Rights Watch, "Precious Metal, Cheap Labor: Child Labor and Corporate Responsibility in Ghana's Artisanal Gold Mines", 2015, <https://www.hrw.org/report/2015/06/10/precious-metal-cheap-labor/child-labor-and-corporate-responsibility-ghanas> (28-9-2015).

17 International Labour Organization-International Programme on the Elimination of Child Labour (June 2006).

18 The Berne Declaration (September 2015).

are brought in by labour traffickers who have deceived or abducted them.<sup>19</sup> Such labour trafficking may be done by criminal networks, but they often involve the child's own family too. These children are made to work in and around gold mines, often receiving only food and shelter in return. In other cases, their wages are retained to make them dependent; situations of debt bondage can be created by employers who overcharge for the goods they provide to these children.<sup>20</sup> However, as noted before, little information seems to be available regarding the size and spread of forced child labour in ASGM, as is usually the case with illegal activities.

### 3.3 How gold mining endangers children

ASGM can have a hazardous impact on children who participate in it. According to the International Labour Organisation, gold mining is one of the worst forms of child labour. The following pages discuss the multitude of negative health, safety and developmental impacts it entails.

#### Physical dangers of working in a mine

ASGM may take different forms depending on the size and location of the gold deposit. As stated above, mines can reportedly go up to 100 meters deep into the ground, with miners going down to dig up rocks and earth that possibly contain gold. Although most mines are shallower, reports of child labour in ASGM often describe mine shafts of about 10 meters in depth. In Tanzania, children climb down into 8 to 15 meter shafts using their feet to push against the walls. At other times, children hold on to a rope, but there were seldom any secure ways to enter mines.<sup>21</sup> While methods of entering a mine can have detrimental impacts on children in the event of somekind of failure, the structural flaws in the construction of mines can also be deadly to all those inside. According to the Ghanaian government, collapses in artisanal and small-scale mines caused 300 deaths in Ghana in 2011 and 2012 alone. Researchers in Burkina Faso reported one gold mine collapse had caused 46 deaths shortly before they arrived in a mining area.<sup>22</sup> Children participating in ASGM in Ghana have also reported to have sustained injuries from falling rocks.<sup>23</sup> Considering the informal or illegal character of ASGM, it seems clear that this sector is difficult to regulate; safety measures are consequently left up to those operating the mining shafts.

Another major safety issue concerning ASGM is the lack of ventilation in mines. For example, research in the Philippines described a case where a boy entered a gold mine to save his suffocating

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19 International Labour Organization-International Programme on the Elimination of Child Labour (June 2006).

20 Verité, "Risk Analysis of Indicators of Forced Labor and Human Trafficking in Illegal Gold Mining in Peru", 17 July 2012, [http://www.verite.org/sites/default/files/images/Indicators%20of%20Forced%20Labor%20in%20Gold%20Mining%20in%20Peru\\_0.pdf](http://www.verite.org/sites/default/files/images/Indicators%20of%20Forced%20Labor%20in%20Gold%20Mining%20in%20Peru_0.pdf) (28-9-2015).

21 Human Rights Watch, "Toxic Toil: Child Labor and Mercury Exposure in Tanzania's Small-Scale Gold Mines", 28 August 2013, <https://www.hrw.org/report/2013/08/28/toxic-toil/child-labor-and-mercury-exposure-tanzanias-small-scale-gold-mines> (28-9-2015).

22 The Berne Declaration (September 2015).

23 Human Rights Watch, "Precious Metal, Cheap Labor: Child Labor and Corporate Responsibility in Ghana's Artisanal Gold Mines", 10 June 2015, <https://www.hrw.org/report/2015/06/10/precious-metal-cheap-labor/child-labor-and-corporate-responsibility-ghanas> (28-9-2015).



brother, resulting in the death of both children from asphyxiation.<sup>24</sup> The lack of breathable air is further exacerbated by the risk of hitting a pocket of gas while digging. Furthermore, where ASGM workers dig so deep that the soil becomes wet, pumps may be used to remove the water from the bottom of the shaft. In Tanzania, such pumps were said to cause deadly gas levels in gold mining shafts.<sup>25</sup> Finally, the dust that is set loose through ASGM activities can be detrimental to the lungs, possibly causing silicosis, tuberculosis, and other lung conditions.<sup>26</sup> Both these ailments, as well as the aforementioned dangers of mining can have horrible effects on adult miners, but may be especially damaging for children not yet fully grown.

One type of gold mining that is extremely dangerous even as compared to the description above, is the Philippine practice called *compression mining*. This takes place in low areas and swamps, where gold is mined from pits filled with muddy water surrounded by wet, unstable soil. The miners, often teenagers, enter these pits breathing through a tube in their mouths, and are provided with air by a compressor at the top of the tube. Reports state that faulty compressors can cause miners to run out of air all of a sudden, 10 meters underwater. As they rush back up for air the miners can suffer from decompression sickness, which may lead to brain disorders, embolism, and joint pains. Below water, child miners dig tunnels in the muddy riverbeds, risking death from mudslides that may crush them or trap them under water.<sup>27</sup>

### Physical strain

Children are not only involved in the actual mining of soil that contains iron ore, but they also participate in the processing of soil. First, child miners will dig or cut soil in a mining shaft. Then it will be pulled up in sacks (or some other container), after which it will usually be carried to a processing area. There, the soil is crushed or ground, either manually or through the use of mills, and the remainders are washed or panned in order to separate heavier particles, like gold, from light particles, like dust. Finally, the gold is separated from all other materials through a process that often involves the use of mercury, and which will be discussed further on. These steps roughly describe an ASGM process, but they are by no means an exhaustive list, seeing as every mining operation will be subject to different conditions (type of soil, availability of water, etc.) which may alter the process.

It is not hard to imagine that digging out, carrying, and grinding large amounts of rock or dirt are heavy work. Reports of injuries due to such practices are widespread, with children as young as nine years old said to sustain spinal injuries from carrying heavy sacks in the Philippines. Children in Mongolia would suffer from exhaustion, joint and back pain, and respiratory, kidney, and urinary tract diseases.<sup>28</sup> While a continent away, in Ghana, they reportedly deal with pains, fractures, spinal cord injuries, lacerations, and other long term bodily damage. All this as a consequence of their work in ASGM.<sup>29</sup>

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24 Human Rights Watch, "What... if Something Went Wrong? Hazardous Child Labor in Small-Scale Gold Mining in the Philippines", 29 September 2015, <https://www.hrw.org/report/2015/09/29/what-if-something-went-wrong/hazardous-child-labor-small-scale-gold-mining> (28-9-2015).

25 Human Rights Watch (28 August 2013).

26 Human Rights Watch (10 June 2015).

27 Human Rights Watch (29 September 2015).

28 Human Rights Watch (29 September 2015). International Labour Organization-International Programme on the Elimination of Child Labour (June 2006).

29 Human Rights Watch (10 June 2015).

### Use of drugs

In order to cope with pain, fatigue, and other strain caused by ASGM, both adults and children have been known to use drugs. In Peruvian gold mines, cocaine has reportedly been provided to miners by their employers in order to suppress hunger and fatigue, at times causing them to become addicted, further strengthening their dependency on their employers. Although child miners' cocaine use was not specifically mentioned, child labour was said to be common in the same mining areas where cocaine was used to 'strengthen' miners.<sup>30</sup> There are straightforward reports of child miners' drug use in Burkina Faso, where mine owners were stated to provide children with varying drugs, such as cannabis or amphetamines, in order to suppress hunger and fatigue, but mostly to stop them from being fearful as they descended into claustrophobic mining shafts that suffer from collapse risk.<sup>31</sup>

### Mercury and cyanide poisoning

In ASGM, mercury is often used to separate gold from other materials. This happens after panning or washing has taken place, and is done by adding mercury to the mix of gold and other materials left over at that point, leading to the creation of the aforementioned mercury/gold amalgam. When burned, the mercury in said amalgam evaporates, leaving behind the gold. Although this is an effective method to obtain gold, mercury's poisonous nature also makes it a highly dangerous one.

Studies have shown that mercury can cause damage to the digestive, immune and nervous system, as well as the lungs and kidneys. Such damage can prove to be fatal, and children are even known to be relatively more vulnerable to such mercury poisoning.<sup>32</sup> Yet children are often involved in the amalgamation stage of artisanal gold production. In Ghana, child miners reportedly spread mercury out by hand in order to shift it towards gold particles.<sup>33</sup> Although still worrisome, mercury in liquid form is relatively safe, as long as it is not ingested.<sup>34</sup> However, during the burning of the amalgam, in which child participation was noted in reports on gold mining in Ghana, Tanzania, Mongolia, Peru and the Philippines that were studied for this research, mercury vapour is released into the air and inhaled by any children in the proximity. In these same reports, a general lack of awareness regarding any potential negative health effects of mercury was often found among child miners using the chemical substance.

Beyond the dangers to children who burn the amalgam themselves, mercury may also affect other children living in the same environment. In Tanzania, both child and adult miners were found to take the mercury/gold amalgam home at times, where they burned it on the same fire as their families cook with. Thus, mercury vapours were spread in their home, exposing their families to the poison.<sup>35</sup> Furthermore, mercury vapours can travel far, putting others living in the vicinity at risk. To stress the danger this poses, in Burkina Faso and Niger, it was observed that migrant miners usually brought

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30 Verité (17 July 2012).

31 The Berne Declaration (September 2015).

32 H. Gibb & K.G. O'Leary, "Mercury Exposure and Health Impacts among Individuals in the Artisanal and Small-Scale Gold Mining Community: A Comprehensive Review," *Environmental Health Perspectives*, vol. 122 (7) (July 2014).

33 Human Rights Watch (10 June 2015).

34 S. Bose-O'Reilly, B. Lettmeier, R.M. Gothe, C. Beinhoff, U. Siebert & G. Drasch, "Mercury as a serious health hazard for children in gold mining areas", *Environmental Research*, vol. 107 (1), p. 89-97.

35 Human Rights Watch (10 June 2015).



their families to live with them on the site. Mining communities usually live close to the mining site.<sup>36</sup> Mercury vapours eventually settle in the environment; under the water it is absorbed by plankton, which is then eaten by fish. The risk of ingesting mercury is therefore spread to fish-eating communities in ASGM areas.<sup>37</sup> In the Philippines, where ASGM itself often takes place under water, a specific form of gold processing called *whole ore amalgamation* is used: large amounts of mercury are dumped into the mills that crush the soil, so that it might attach itself to the gold in that soil. It was noted that the mercury waste was washed away once the process was concluded, and on one occasion it flowed straight into a nearby river.<sup>38</sup>

Mercury poisoning has been noted as the single largest danger in ASGM, both for children and adults.<sup>39</sup> It has been recognized internationally as a major social and environmental problem, and has given rise to both the creation of the UN International Development Organization-led Global Mercury Project and the UN Environmental Programme-led Minamata Convention on Mercury.<sup>40</sup>

Cyanide is another poisonous chemical used in ASGM, although it is reportedly used less often, and much less is known about the amounts in which it is used in ASGM. The process is called *cyanide leaching*, and consists on adding cyanide to gold ore, so as to dissolve the gold particles which can then be easily separated from the remaining material.<sup>41</sup> Although it has many practical uses, cyanide is also a powerful toxin that has proven poisonous to both humans and animals. In low doses, cyanide can be broken down biologically, but in larger amounts it can cause weakness, headaches, difficulty breathing, comas, and even death. Unlike mercury, however, the fact that lower doses can be broken down by animals and humans means it does not accumulate in food chains the way mercury does.<sup>42</sup> In the past, leakage of waste water containing cyanide has led to large scale environmental degradation and human poisoning.<sup>43</sup> Reports from Burkina Faso suggest that child miners in ASGM are often exposed to cyanide, although the health effects were not specifically stated.<sup>44</sup>

36 International Labour Organization-International Programme on the Elimination of Child Labour (June 2006).

37 H. Gibb & K.G. O'Leary (July 2014).

38 Human Rights Watch (29 September 2015).

39 Human Rights Watch (28 August 2013).

40 United Nations Industrial Development Organization, What we do, "About the Global Mercury project", no date [http://www.unido.org/en/what-we-do/environment/resource-efficient-and-low-carbon-industrial-production/watermanagement/mercury/global-mercury-project.html?ucg\\_no64=1%2Fdata%2Fproject%2Ffileadmin%2Fimport%2Ffileadmin%2Fdoc%2Findex.php](http://www.unido.org/en/what-we-do/environment/resource-efficient-and-low-carbon-industrial-production/watermanagement/mercury/global-mercury-project.html?ucg_no64=1%2Fdata%2Fproject%2Ffileadmin%2Fimport%2Ffileadmin%2Fdoc%2Findex.php) (28-9-2015).

Minamata Convention on Mercury, "Convention", no date, <http://www.mercuryconvention.org/Home/tabid/3360/Default.aspx> (28-9-2015).

41 N.L. Sieber & J. Brain, "A Mining Boom Brings Risk from Mercury Contamination", *Revista*, no date, <http://revista.drclas.harvard.edu/book/health-impact-artisanal-gold-mining-latin-america> (28-9-2015).

SGS, Metallurgy and Process Design, "Cyanide Leaching", no date, <http://www.sgs.com/en/Mining/Metallurgy-and-Process-Design/Cyanidation-Technologies/Cyanide-Leaching.aspx> (28-9-2015).

L. Pressly, "How mercury poisons gold miners and enters the food chain", BBC, 18 September 2013, <http://www.bbc.com/news/magazine-24127661> (28-9-2015).

42 Health Canada, Environmental & Workplace Health, "Cyanide", July 1991, <http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/cyanide-cyanure/index-eng.php> (28-9-2015).

43 S. Lücke, "Evaluation of a new, mercury-free method for small-scale gold mining in the Philippines", February 2005, [http://www.uu.se/digitalAssets/176/176303\\_3lucke-sofie.pdf](http://www.uu.se/digitalAssets/176/176303_3lucke-sofie.pdf) (28-9-2015).

44 The Berne Declaration (September 2015).



*Gold from Mali*

### Education

While ASGM work actively causes physical damage to children participating in it, as described above, it also causes them to miss school. In Ghana, Burkina Faso and Niger children in ASGM work up to 14 hours a day, seven days a week. Furthermore, in Ghana it was said that 35% of children employed in ASGM did not go to school at all, while 32% did not attend regularly.<sup>45</sup> In Tanzania, teachers working close to mines have reportedly complained of low attendance levels during the mining season.<sup>46</sup> Although children's working hours vary strongly between countries and mines, many children miss out on school while mining for gold. A UNICEF employee in Burkina Faso reportedly stated that the economic incentives of ASGM were just too large to keep children in school, saying that even if one were to pay their tuition fees, they would still go mining.<sup>47</sup>

Less drastically, children in Mongolia were reported to go to school on weekdays, but to mine on all other days, while in the Philippines child miners do miss school days, but actual dropouts are said to be extreme cases.<sup>48</sup> However, even when these child miners do show up to school, they are often

<sup>45</sup> Human Rights Watch (10 June 2015).

International Labour Organization-International Programme on the Elimination of Child Labour (June 2006).

<sup>46</sup> Human Rights Watch (28 August 2013).

<sup>47</sup> The Berne Declaration (September 2015).

<sup>48</sup> International Labour Organization-International Programme on the Elimination of Child Labour (June 2006).  
Human Rights Watch (29 September 2015).

tired, unmotivated, slow and unfocused, due to the heavy work they do in their 'time off'.<sup>49</sup> Thus mining decreases children's capacity for learning, both by keeping them away from school, and by otherwise limiting the positive impact school can have on them. Beyond the obvious developmental issues this causes, denying children their education also limits their future chances to earn a living, and therefore damages their outlook even further.<sup>50</sup>

### Sexual violence

Although this is not a strictly mining specific issue, sexual violence has been reported to take place in ASGM areas around the world. Children who participate in ASGM may be forced to work, or do so to alleviate poverty, often without receiving protection from their families. Girls in this situation lack social protection, and are therefore particularly vulnerable to sexual harassment and assault, as is reported to be the case in Burkina Faso and Niger.<sup>51</sup>

Besides girls carrying out activities in ASGM, there have also been reports of ASGM leading to increased child prostitution and harassment in the surrounding area. In Tanzania, girls working in restaurants near mines reported regular harassment, while incidences of rape were more frequent in areas around gold mines. Some of the girls who worked in restaurants stated that they didn't earn enough from their jobs, and therefore they engaged in sex work. Meanwhile, HIV levels among sex workers in Tanzania have been found to be significantly higher than among the general population, with studies reporting levels between 40 and 60%.<sup>52</sup> Sexual violence also pervades the Peruvian system of labour trafficking in ASGM which we mentioned earlier, with reports of children and adults becoming sex workers after having been victims of trafficking, sometimes by their own family. But girls in particular have also been offered jobs as cooks near ASGM areas, only to be exploited as sex workers instead.<sup>53</sup>

## 3.4 Countries with child labour in gold mining: facts and figures

The use of children in artisanal gold mining is widespread; based on the information collected by the ILO and the US Department of Labour a list of 20 countries in Africa, Asia and South America can be drafted where this worst form of child labour takes place.<sup>54</sup> SOMO added some countries to this list based on literature and internet sources: Burundi, Cameroon, Ivory Coast, Mozambique, Uganda, and Zimbabwe. On Nigeria there is too little information but there are quotes in articles that gold is illegally extracted in some parts of Nigeria like Zamfara where child labour is rampant and their

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49 Human Rights Watch (28 August 2013).

Human Rights Watch (10 June 2015).

Human Rights Watch (29 September 2015).

50 UNICEF, "Child Labour and UNICEF in Action: Children at the Centre", May 2014, [http://www.unicef.org/protection/files/Child\\_Labour\\_and\\_UNICEF\\_in\\_Action.pdf](http://www.unicef.org/protection/files/Child_Labour_and_UNICEF_in_Action.pdf) (30-9-2015).

51 International Labour Organization-International Programme on the Elimination of Child Labour (June 2006).

52 Human Rights Watch (28 August 2013).

53 Verité (17 July 2012).

54 Based on <http://www.dol.gov/ilab/reports/child-labor/list-of-goods/> and International Labour Organization-International Programme on the Elimination of Child Labour (June 2006).





*Gold miner's camp Syentoula, Bougouni District, Mali*

conditions are very bad<sup>55</sup> and the same accounts for Liberia<sup>56</sup> and Uzbekistan. Of these identified countries, there are only, sometimes very diverging, estimations of child labour in the literature and for most countries no estimation at all could be found. All efforts to find estimations of child labour in ASGM are documented in a table in Annex 1.

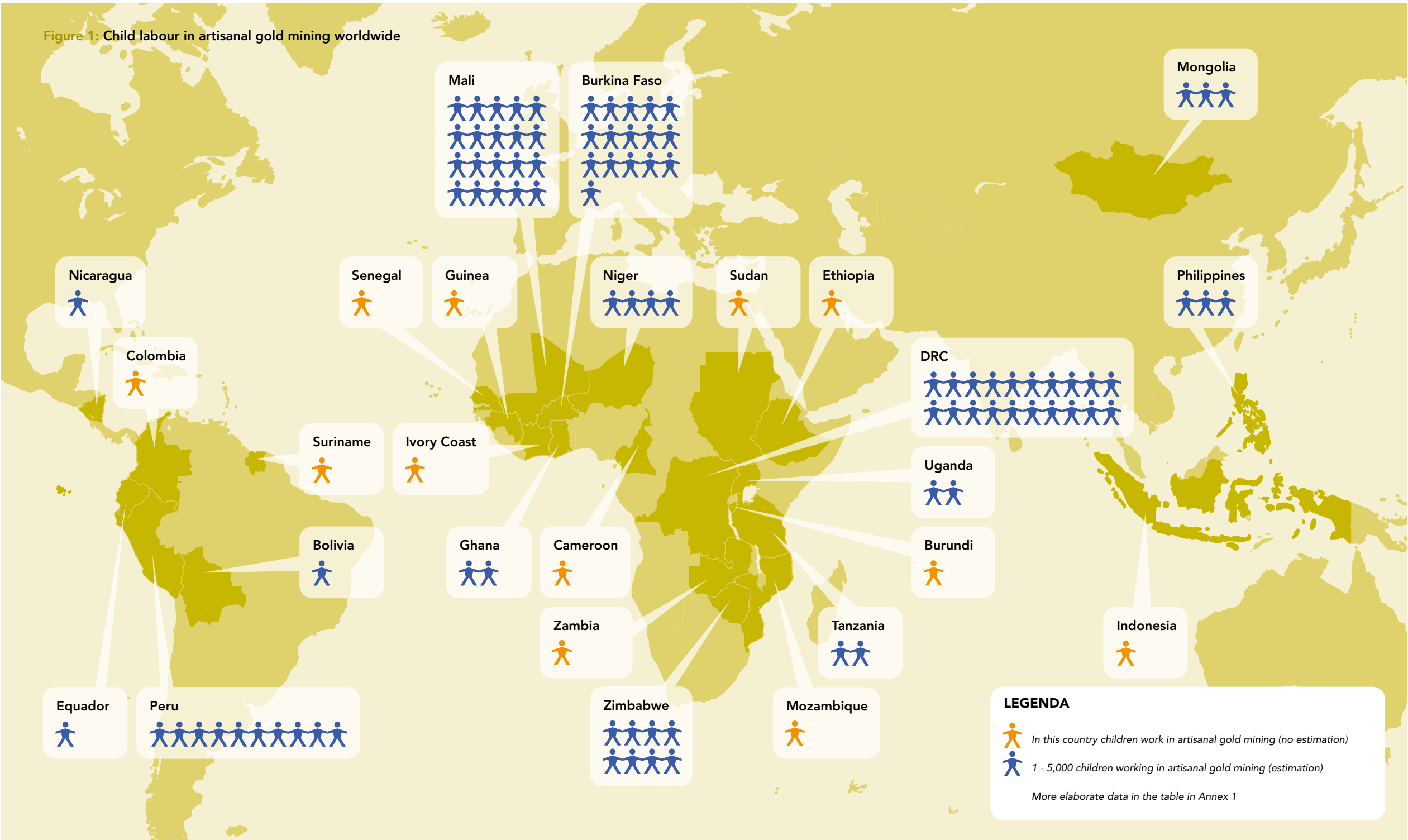
A country like South Africa is known for industrial gold mining but increasingly also has artisanal mining; the South African Human Rights Commission released a report in 2015 on unregulated artisanal mining, in it estimating South Africa hosts anywhere between 8 000 and upwards of 30 000 artisanal miners.<sup>57</sup> But child labour is not mentioned related to South Africa. China also has a big proportion of artisanal gold mining, however, no information can be found about the presence of children in these mines.

55 Qatar Tribune, June 17, 2014, "Gold-mining pact with S Africa thrills Nigerian expats".

56 Africa News, June 1, 2014, Liberia; "Trading the Future for Gold - a Story of Drug Trafficking, Child Labor, Crime & Violence in Liberia's Illicit Mines".

57 Cape Argus (South Africa), October 09, 2015, "All that glitters: driven underground by poverty; Zamas zamas have little choice but to dig deep for gold in order to survive".

Figure 1: Child labour in artisanal gold mining worldwide



Source: Multiple sources see Annex 1

## 4 The use of child labour in artisanal gold mining in Mali

This chapter starts with a short introduction to gold mining in Mali, including production statistics. Next, an overview of the industrial and artisanal gold mining sector is provided. This is followed by a chapter on the use of child labour in artisanal gold mining, including the findings of a field study in Bougouni district, South Mali. Next, the value chain of artisanal gold is described, along with its linkages to industrial gold mining. Finally, the role of the government is briefly discussed.

### 4.1 Countries with child labour in gold mining: facts and figures

Gold has been mined in Mali and neighbouring countries for many centuries. The large West African kingdoms built their wealth on gold mining from Western Mali and the Trans-Saharan gold trade. Already in the seventh century, trans-Saharan trade linked the Mediterranean economies—which demanded gold and could supply salt in exchange – to the sub-Saharan economies, where gold was abundant.<sup>58</sup>

As the map below shows, the main gold mining regions in Mali are located in the west and south, specifically in the Kéniéba area on the Senegalese-Malian border, the area around Kangaba (southwest of the capital Bamako), and in several areas of the Sikasso region (south and southeast of Bamako). While mining in Kéniéba and Kangaba goes back centuries, many of the mines in the Sikasso region have been opened in recent years.<sup>59</sup>

The country's mining potential is very great and varied. The main deposits relate to gold, uranium, manganese, bauxite, iron, copper, rare earth metals, tungsten, niobium, petroleum and phosphate. According to the Malian Government, current gold reserves amount to 800 tonnes<sup>60</sup>.

In 1984, the mining sector accounted for only 1.5% of Mali's GDP. Its mining code was amended in 1991 to introduce standards that would attract more international investments, such as guarantees, tax and customs advantages<sup>61</sup>. Industrial gold production increased from 4 metric tons in 1991 to 48 metric tons in 2008. In 2008, gold mining as a share of GDP was 8%, the gold exports value was more than 75% of total exports of goods and services, and gold tax receipts provided 17% of total

58 Metropolitan Museum of Art, The Trans-Saharan Gold Trade (7th–14th century), no date, [http://www.metmuseum.org/toah/hd/gold/hd\\_gold.htm](http://www.metmuseum.org/toah/hd/gold/hd_gold.htm) (12-10-2015).

59 Human Rights Watch (6 December 2011).

60 Investment Promotion Agency of Mali. Agence pour la Promotion des Investissements au Mali, Profil Secteur des Mines, no date, [http://www.apimali.gov.ml/uploads/profil\\_secteurs/mines.pdf](http://www.apimali.gov.ml/uploads/profil_secteurs/mines.pdf) (9-10-2015).

61 B. Campbell, "Regulating mining in Africa. For whose benefit?" (Uppsala: Nordiska Afrikainstitutet, 2004).

**Figure 2: Map of gold mining areas in Mali**



Source: Human Rights Watch (2011)<sup>62</sup>

government revenue<sup>63</sup>. In 2012 gold mining as a share of GDP was 19.53%<sup>64</sup>. Since 1999, gold has been Mali's number one export commodity, followed by cotton<sup>65</sup>.

Since March 2012, Mali has experienced a series of socio-political crises, resulting in the occupation of three northern regions of Mali (Timbuktu, Gao and Kidal) and part of Mopti by armed groups and institutional instability in the country as a whole. While the economy has recovered since 2013, this growth could be upset by unpredictable prices for Mali's two main exports, gold and cotton, and the fragile security situation.<sup>66</sup>

Presently, Mali is the sixteenth largest gold producer worldwide, and the third largest gold exporter from Africa, after South Africa and Ghana. This represents 1.5% of world production<sup>67</sup>. According to Mali's National Statistics Institute the country produced 45.8 tonnes industrial gold in 2014 and 7.4 tonnes artisanal gold.<sup>68</sup>

<sup>62</sup> Human Rights Watch (6 December 2011).

<sup>63</sup> S. Thomas, "Mining Taxation: An Application to Mali", IMF Working Paper, 2010, <https://www.imf.org/external/pubs/ft/wp/2010/wp10126.pdf> (9-10-2015).

<sup>64</sup> World Gold Council, Global gold facts map, no date, <http://www.gold.org/gold-mining/global-gold-facts-map> (23-10-2015).

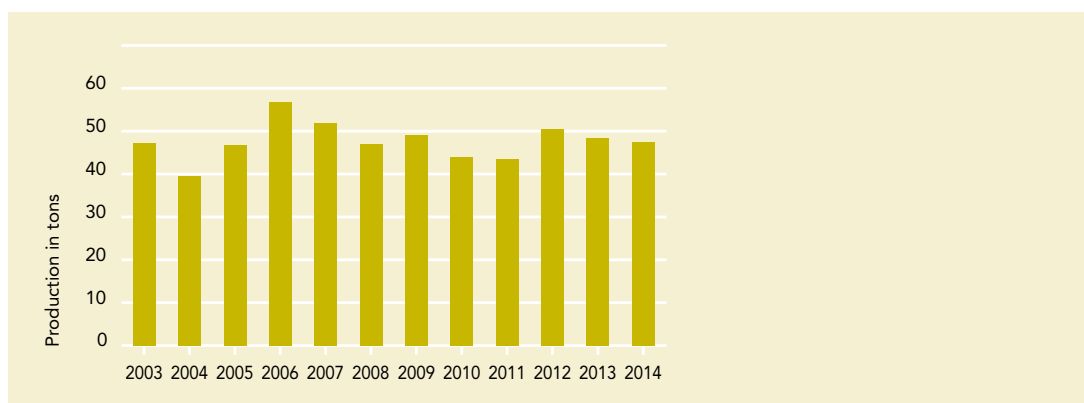
<sup>65</sup> Human Rights Watch (6 December 2011).

<sup>66</sup> African Economic Outlook, Country Notes, "Mali", <http://www.africaneconomicoutlook.org/en/country-notes/west-africa/mali/> (9-10-2015).

<sup>67</sup> R. O'Connell et al. (April 2015).

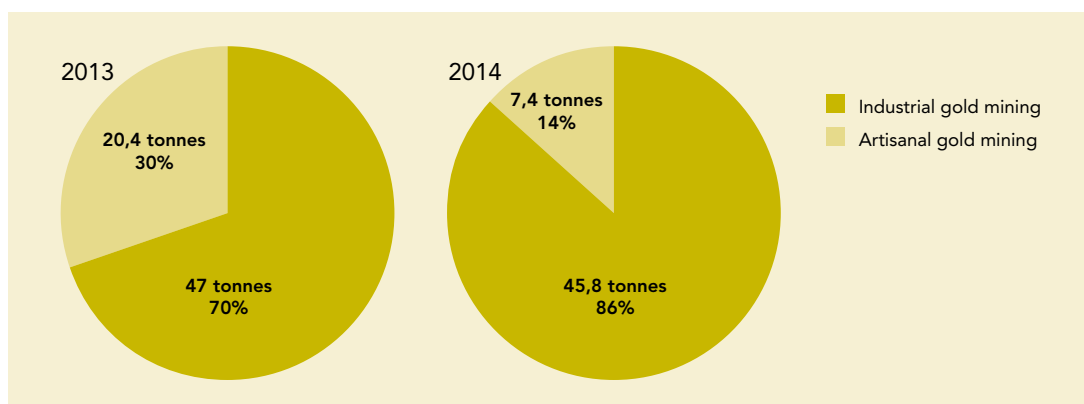
<sup>68</sup> Reuters, "Mali's gold exports down 21 pct in 2014 on drop in artisanal mining", 8 April 2015, <http://www.reuters.com/article/2015/04/08/mali-gold-exports-idUSL5N0X53FU20150408> (9-10-2015).

**Figure 3: Gold production in Mali 2003-2014**



Source: Thomson Reuters GFMS Gold Survey 2013 and 2015<sup>69</sup>

**Figure 4: Production of gold in Mali in 2013 and 2014 (in tonnes per year)**



Source: Reuters (8 April 2015)

While industrial output has been relatively stable over the last 10 years (ranging between 43.5 and 56.9 tonnes annually in the period 2005-2014) ASM production shows a decrease of 64% from 20.4 tonnes in 2013 to 7.4 in 2014. However, an unofficial statement, (and a more plausible one, as it is more in line with preceding years), by the National Federation of Artisanal Gold Miners speaks of 21 tonnes for 2014.<sup>70</sup>

<sup>69</sup> R. O'Connell et al. (April 2015).

<sup>70</sup> SOMO research, September 2014.

Figures reported by other countries on gold imported from Mali corroborate the figures of the National Federation of Artisanal Gold Miners<sup>71</sup>

The division between artisanal and industrial gold mining is displayed in the figure below. These numbers are provided by the Government of Mali. According to the National Federation of Artisanal Gold Miners, the difference between official statistics and their own data are explained by the output smuggled to neighbouring countries.<sup>72</sup>

The main gold deposits where mining takes place are concentrated in three regions<sup>73</sup>:

- Mining Region No. 1, West Mali (administrative Region of Kayes)
  - Gold deposits: Sadiola, Yatela, Loulo, Segala, Tabakoto, Farabantourou, Medinandi.
  - Indications of gold deposits: Tintiba, Dioulafourou, Wili Wili-Mamoudouya Kome, Dandogo
- Mining Area No. 2: South of Mali (administrative regions of Sikasso and Koulikoro)
  - Gold deposits: Syama, Kalana, Kodieran, Bay, Misséni Fiat, Morila gold deposits
  - Indications of gold deposits: Sagala (Morila) Kekoro (Morila) Foulaboula, Pitiangoma, Narnpala and Darabougou, Kalaka, Kobada, Banancoro
- Mining Area No. 3: Northern Mali: (administrative region of Kidal)
  - Gold deposit: Darset

The number of known artisanal gold mining sites (called *placers* in Mali) is 330<sup>74</sup>. According to the 2010 census, gold mining currently takes place in 150 sites, the others were all inactive. Most of these sites are located in lowland areas, close to forest tracts. They are rarely within 10km of asphalt road and most of them are at least 5km off a laterite road.

**Table 1: Number of artisanal gold mining sites in Mali (2010)**

Area	Gold mining sites
Kayes	54
Koulikoro	43
Sikasso	53
Total	150

Source: Ministère du Développement Social, de la Solidarité et des Personnes Âgées, 2011

71 UN Comtrade Database, <http://comtrade.un.org/> (12-11-2015).

72 This is in line with the findings in a recent report of the Berne Declaration (2015), which reports that large quantities of artisanal gold from Burkina Faso are smuggled to Togo and then exported to Switzerland.

73 Ministère du Développement Social, de la Solidarité et des Personnes Âgées, "Mines et développement socioéconomique au Mali: enjeux et perspectives", 2011, consulted in Mali.

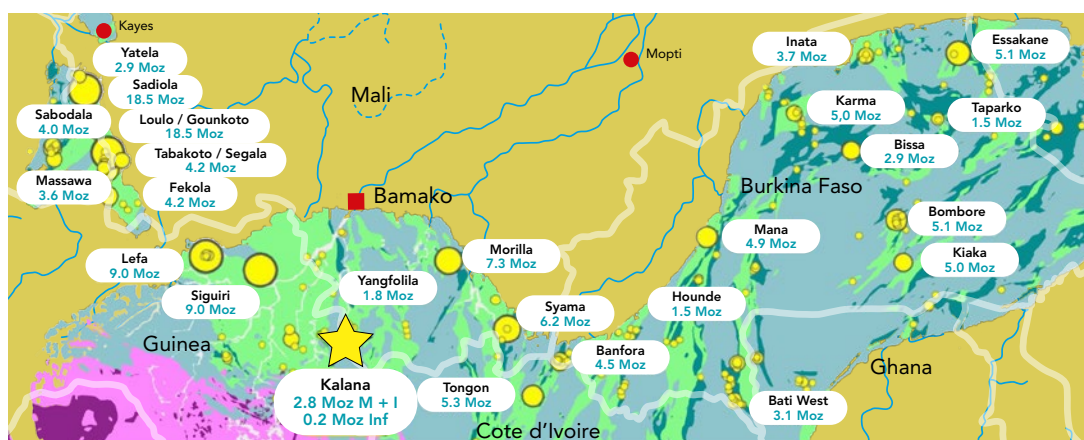
74 A "placer" (mining site) is an area where alluvial has accrued as exploitable minerals such as gold. Once the operation of the zone starts, it constitutes a site of gold mining; Ministère du Développement Social, de la Solidarité et des Personnes Âgées, 2011.

## 4.2 Industrial Gold mining

Most of Mali's gold is produced in large industrial mines. According to the Malian Chamber of Mines, 3,862 people, mostly Malians, are employed in the nine industrial mines that are currently operational: Samisy, Morila, Sadiola, Somika, Yatela, Wassoul'Or, Somilo, Goukoto and Semico. The total employment created by the mining companies and their sub-contractors amounted to 11,958 people in 2012.<sup>75</sup>

The map below shows the location of major mines along with their estimated gold reserves. Based on our field research, there are no indications that child labour occurs within industrial mining companies. According to experts interviewed, industrial mining companies have workplace policies that strictly forbid the use of child labour. It was outside the scope of this research to verify this point with the companies themselves, as the focus of the research was on artisanal gold mining.

**Figure 5: Map of major mines in Mali**



Source: Unaudited estimates based upon total resources and reported depletion from company reports and industry publications

## 4.3 Artisanal gold mining

Over the past 15 years, the number of artisanal gold miners has significantly increased, although there are no reliable statistics. Artisanal gold mining activities increased significantly from the 1980s, following the effects of drought, which resulted in a rush for gold among the poor. This trend was supported by an ongoing process of liberalization, hikes in the price of gold, and by the discovery of new gold reserves during country-wide geological prospecting campaigns<sup>76</sup>. With the increase in artisanal miners, the number of children working in the mines has also grown.

<sup>75</sup> Chambre des Mines du Mali, "Impact Sur L'Economie au Mali", no date, <http://www.chambredesminesdumali.org/impacte-economie.php> (8-10-2015).

<sup>76</sup> Chamber of Mines of Mali, Bamako, September 2015, interview by author.





*The tombolomans of the Ouroun gold mining site, Mali*

The informal character of artisanal gold mining in Mali does not mean that the sector is unorganised. On the contrary, it involves several traditional management practices. The day-to-day management of the mine is done by *tombolomans* (site management team), on behalf of the village chief. These *tombolomans* interface between different parties such as the village chief, the mayor and the government. It is their job to set the distance between the wells, to assign shafts to different miners, to manage metal detection equipment and to organize housing plots. They are also responsible for the site's security and harmony, for example, by resolving conflicts between miners. The *tombolomans* are always males, and they work under the authority of the village chief. Historically, the village chief has been considered to be the owner of the land.<sup>77</sup> Next to the mines, temporary villages often arise consisting of shacks and little shops that sell basic necessities.

A study from 2011 showed that artisanal gold miners are generally farmers who practice artisanal gold mining as a seasonal activity when they are not involved in agricultural production. According to this study, 82.7% of artisanal gold miners were farming before they started mining for gold.<sup>78</sup> A distinction should be made here between local farmers who only see gold mining as a temporary, seasonal livelihood to complement their farming income, and migrants who have abandoned farming altogether and have become full-time gold miners. None of the existing data differentiates between these groups.

<sup>77</sup> Human Rights Watch (6 December 2011).

<sup>78</sup> Ministère du Développement Social, de la Solidarité et des Personnes Âgées, "Mines et développement socioéconomique au Mali: enjeux et perspectives", 2011, consulted in Mali.



## 4.4 Field research into child labour in artisanal gold mining in Mali

The goal of the field research was to obtain a more detailed understanding and insight into the problem of child labour in artisanal gold mining. This consisted of a qualitative survey across three mining sites in the south of Mali, as well as interviews along the value chain with miners, buyers, middlemen and exporting companies.

The field research was carried out between 25 August and 9 September 2015 across 3 gold mining sites in Bougouni district, Sikasso region: Kola, Ouroun and Syentoula. These mining sites were selected as a local NGO, ENDA Mali, is conducting activities at these sites in a project supported by the Stop Child Labour Coalition within the program 'out of work and into school'.<sup>79</sup> The project started in 2014 so no clear results on the elimination of child labour are to be expected yet. The sites were not selected based on the participation within the program but merely on the fact that access to these sites would be easier compared to other mining sites, because of the established contacts with Enda Mali. In addition, the 3 sites are situated in a region that is peaceful, contrary to many other sites that are located near the border with Guinee and Cote d'Ivoire and where regular conflicts occur between local communities and miners from across the border. These sites have also been researched by Danwatch, in 2013<sup>80</sup>.

The three mining sites are considered as representative for other mining sites in Mali. This assessment is based on the interviews with actors along the supply chain as well as with other experts from civil society, government and traders. While it was observed during our visit to the 3 sites that the interventions of Enda Mali have led to increased awareness of the problems of child labour, no conclusions can be drawn about the impacts on child labour in artisanal gold mining on these sites. The goal of the field survey was to collect data on the situation of child labour, not to evaluate the interventions of Enda Mali<sup>81</sup>.

The research team consisted of two local researchers, assisted by five interviewers. At each site, the team first met with local authorities, such as the mayor, the village chief and *tombolomans*, to seek their support. One SOMO researcher joined the research team during two days of field work

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79 This is a program against child labour in the small-scale traditional gold mines of the district of Bougouni in Mali.

The intervention areas of the project are the ones that have been targeted by the study conducted by DanWatch in 2013 and which dealt with child labour in the gold digging sites in Mali. The overall objective is to improve, by the end of the project, the living conditions of children through the elimination of child labour in small-scale traditional gold mining sites in the communes of Kola, Ouroumand Syentola, in the district of Bougouni. Source: Enda Mali, Project proposal "Out of Work and into School: Joint Efforts towards Child Labour Free Zones Program against child labour in the small-scale traditional gold mines in the district of Bougouni, Sikasso Region, Republic of Mali".

80 Danwatch, "Child mined gold in your gadgets? Child labour in Ghana and Mali and sourcing policies of IT brands", 2013, [http://ibis.dk/sites/default/files/media/pdf\\_global/csr\\_pdf/child\\_mined\\_gold\\_in\\_your\\_gadgets\\_final.pdf](http://ibis.dk/sites/default/files/media/pdf_global/csr_pdf/child_mined_gold_in_your_gadgets_final.pdf) (9-10-2015).

81 In general, it can be concluded that in Mali there is more awareness about the problem of child labour compared to a couple of years ago, due to sensitization efforts of NGOs as well as the government, in particular the National Unit against Child Labour. It should also be noted that the security crisis that started in 2012 has led to a drop in the efforts to combat child labour, mainly because of a decrease or withdrawal of many international actors in Mali, including the ILO, who has ended their program against child labour because of security reasons.



Mining shaft in Kola gold mining site, Mali.

to obtain a better understanding of the artisanal mining sector and to provide further guidance to the local researchers.

A total of 23 children and 26 adults – 10 men and 16 women-- were interviewed. Because artisanal gold mining is physically demanding, the workers are generally young. Most of the adult respondents were between 25 and 35 years old (table X). All of the adults interviewed who responded to the question (21 of 26) are married, 5 of them polygamous, with children (18 responded), most have between 1 and 4 children.

**Table 2: Age distribution of the respondents (adults)**

Age in years	18 – 24	25 – 35	36 – 45	46 – 55	56 – 65	Over 65
Amount	6	9	5	4	2	0

Source: SOMO field research 2015

The respondents were recruited on site and were clearly informed about the objectives of the study, and their right not to answer. When working with children, interviewers followed the ethical guidelines for research with children. The interviews were conducted in the local language Bambara.

Out of the 23 children interviewed, five had their life stories recorded. This was done with the permission of the parents or family guardians, who signed parental permission documents. To guarantee the anonymity of the children, their full names have been replaced by fictional names. Photos and videos were also made.

In addition, interviews were held in the capital Bamako with representatives of several NGOs, government institutions and gold traders to investigate the gold production chain:

- ENDA Tiers Monde
- National Unit for the Fight Against Child Labour
- Chamber of Mines
- ICCO
- The Collective of Miners,
- The buying houses Boité and SACKO,
- Smelter company BAH
- Observatory of Sustainable Human Development
- National Directorate of Trade and Competition
- The National Directorate of Customs
- Educational Activity Centre Bougouni

The field research results are complemented with findings from other studies such as the report by Human Rights Watch in 2011, the DanWatch report (2013), as well as official documents and statistical information.

## 4.5 Child labour in artisanal gold mining in Mali

There are no reliable statistics that can help determine how many children (both boys and girls) work in artisanal gold mining in Mali. But based on related government statistics, a study by ILO in 2009 estimated the number of children working in artisanal gold mining in Mali at around 20% of the total workforce in gold mining.<sup>82</sup> From the estimated 100,000 to 200,000 artisanal gold miners in Mali, Human Rights Watch calculated the number of children involved in artisanal gold mining would be between 20,000 and 40,000.<sup>83</sup> However, based on a more recent estimate by the Chamber of Mines of Mali, with 1 million artisanal gold miners, the estimated number of children working in artisanal gold mining could be as high as 200,000.

At the three sites of the present research, an estimated total of 10,000 artisanal miners were active. Considering that 150 artisanal mining sites are currently active, SOMO finds that the above estimates of 100,000 or 200,000 artisanal miners might be too conservative indeed. The Chamber of Mines of Mali and the National Federation of Artisanal Gold Miners are currently attempting to formalize and develop the artisanal gold mining sector, with support from the Ministry of Mines. The National Federation of Artisanal Gold Miners stated that a survey is currently under way to estimate the number of artisanal gold miners, but the results were not yet available at the time of writing.

As regards the causes that lead to children being sent to mining sites by their families, first and foremost there are economic reasons. The incidence of poverty in Mali is high, especially in rural areas.<sup>84</sup> For the past decade, the economy has been severely affected by political instability and climate change; droughts and soil degradation are making Mali's agriculture vulnerable. In the Human Development Index of 2014, which measures the standard of living, health and education, Mali ranks #176 out of 187 countries.<sup>85</sup> Hence, child labour is very common in Mali, and it is driven by an economic necessity to increase family income. In addition, girls are often sent to work to earn their own wedding dowry. The children work in all sorts of sectors, from agriculture to commerce, mining and domestic work, and these kinds of jobs often go hand in hand with specific human rights issues such as trafficking and sexual abuse.<sup>86</sup> However, child labour is much more than an economic phenomenon. There is also a socio-cultural cause: in Mali, parents consider working a part of a child's upbringing, also known locally as *socialization*. By working, children learn about contributing to the common good. It makes them 'good children' and helps them integrate into their social environment. Child labour is therefore widely accepted in Mali.

Regarding the age at which children start working in gold mining, Human Rights Watch reported that children start working as young as six years old<sup>87</sup>. In our own interviews with experts on child labour in Mali, we found that girls generally start from the age of eight washing the ore, while boys start at a later age, at around 12, because of the physical demands required by their tasks (which include

82 International Labour Organization, "Étude transfrontalière sur le travail des enfants", December 2009, <http://www.ilo.org/ipainfo/product/download.do;jsessionid=e51788f2fc4cbbf6495e59ce5f397c4033f3db66c15f43a869c5f9e1d3ff4569.e3aTbhuLbNmSe3uKc40?type=document&id=21235> (9-10-2015).

83 Human Rights Watch (6 December 2011).

84 World Bank, "Mali Country Overview", 1 April 2015, <http://www.worldbank.org/en/country/mali/overview> (9-10-2015).

85 UNDP, "Human Development Report 2014. Mali", [http://hdr.undp.org/sites/all/themes/hdr\\_theme/country-notes/MLI.pdf](http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/MLI.pdf) (9-10-2015).

86 Human Rights Watch (6 December 2011).

87 In the research conducted by SOMO several children were interviewed who were younger than 10, but the majority were older than 10 years old.





*Artisanal gold miner showing a piece of gold ore, Kola, Bougouni District, Mali*

crushing ore).<sup>88</sup> Usually, children attend school before they start to work as gold miners, or they do not abandon school at all, as with children who only work in the weekends and during the holidays. Generally, girls and women dominate the artisanal gold mining sector in terms of numbers, even though the management of mining sites is strictly in the hands of groups of men (the *tomboloman*).

The risks and working conditions for children obviously vary depending on whether they carried out their tasks in galleries, open pits or river beds. Generally, underground work is reserved for adult men, and the regulations of the artisanal mining policy prohibits labour by girls and boys in underground mines<sup>89</sup>. This was also confirmed during the field research, during which no cases of children working in underground mines were observed or heard of<sup>90</sup>.

The process of artisanal gold mining involves several steps that are mostly carried out by hand, and require physical strength and endurance. The mines are therefore operated collectively. Underground work – digging the holes, preparing the shafts and descending in the wells - is generally carried out

88 National Federation of Artisanal Miners, Bamako, September 2015, interview by author.

89 According to a bylaw from 2009, it is prohibited for children under 18 years to carry out a large number of activities in artisanal mining, including the digging of wells. Republique du Mali, "Arreté No. 09-0151/MTFPRE SG du 4 Fév. 2009", 2009, [http://www.ilo.org/dyn/natlex/country\\_profiles.nationalLaw?p\\_lang=en&p\\_country=MLI](http://www.ilo.org/dyn/natlex/country_profiles.nationalLaw?p_lang=en&p_country=MLI) (9-10-2015).

90 The Human Rights Watch report of 2011 did find children working underground. At the mining sites researched by SOMO this was not conformed.



Researchers met Mohamed at the mining site of Kola. The interview was held in the camp, where he lives with his parents.

*"My name is Mohamed. I am 13 years old and I have two younger brothers. I am from the village of Mangana, in the circle of Kolondiéba. I've been helping my parents for three years now. My mum is a housewife and my father is a gold miner. He digs holes at the Kola mine to construct shafts. My mum and I crush stones at home in the camp. People can request this service. We use a mortar. You need to have much strength in your hands. After that, we wash the crushed stones. If there is no work at home, I go somewhere else and help others to crush stones. Sometimes I pull up the ore from the shafts. We do that with a group because it requires strength. In the evening, I sometimes feel tired.*

*I do not like the work because the benefit is low. We do not earn money, but pebbles. The amount is not fixed; it's whatever they give us. I would like to go to school and become a mechanic and work with cars and motorbikes. When I was younger, I had a wound on my foot and it got swollen. I don't remember the cause. It happened at the same time as when I was supposed to go to school. I couldn't walk. I would like to go to school but my mum thinks I can no longer enrol. I have passed the age of entry."*

by men. One *tomboloman* in the research stated: "there is no gold mining without men". Despite the importance and status of men, they are outnumbered by women, who are responsible for collecting and washing the soil. In Kola, *tombolomans* estimated that 1,800 out of the 3,000 workers are women. In Ouroun and Syentoula, *tombolomans* also estimated there should be more women than men. There are no official figures on the number of miners. Even though they are required to register themselves at the town hall before starting at the mines, they usually fail to do so.

The different steps in extracting the gold are<sup>91</sup>:

- Digging and constructing shafts: this is mainly done by adult men, helped by boys. The shafts can be up to 100 meters deep and are not secured.
- Working underground to dig soil or rocks: this is mainly done by adult men.
- "Pulling the rope" to drag buckets of soil or rocks from the pit: this is done by men and women, often assisted by boys and girls.
- Transporting ore to places where it is stored or crushed, ground and panned: often done by men and boys.

91 Human Rights Watch (6 December 2011).

- ❑ **Crushing ore:** in case of hard and rocky ore, it is crushed and ground before it can be panned for gold. The ore is crushed to a fine substance, either by machines or by hand using hammers and mortars, a task often performed by men and boys.
- ❑ **Panning ore:** after the ore has been ground to a fine sandy quality, it is washed for gold. By moving the water around, heavier materials – like gold – will sink to the bottom. This is called “panning”. This work is largely considered women’s and girl’s work.
- ❑ **Amalgamation of ore:** An alternative method for separating the gold from the ore is by using mercury. The mercury is mixed with the ore so that the gold will bind to the mercury, creating an amalgam. Next, the amalgam is heated to evaporate the mercury so that only the gold remains. The use of mercury is dangerous, because it is highly toxic. It is important to note that gold traders also deal in mercury, which is a flourishing business. The mercury often originates from countries in the subregion, notably Ghana and Burkina Faso.
- ❑ **At an artisanal gold mine,** there are several other tasks that are often fulfilled by girls, such as taking care of babies (while their mothers are working), fetching water and firewood and preparing food.

Interviews with children during the research confirmed the specific tasks of children were the transport and processing of ore (including washing the ore); transporting ore on their heads or backs, or occasionally in wheelbarrows or pushcarts; crushing, grinding, pounding and sifting the ore; fetching water; monitoring babies on the site; the preparation and sale of meals and foods; selling beverages, cigarettes, and snacks.

## 4.6 Research findings in Kola, Ouroun and Syentoula

### 4.6.1 Conditions at the mining sites

#### **Profile of the villages / mining sites**

The villages of Kola, Ouroun and Syentoula have a population ranging from roughly 4,000 to 8,000 people. The mining sites are situated a couple of kilometres outside the villages. In Kola, *tombolomans* estimated that 3,000 workers were active at the mine, 1,800 are thought to be women, and about 600 are estimated to be children. The mine of Syentoula employed approximately 1,000 people. These two mines have seen declining yields and the amount of miners has diminished accordingly. In Ouroun, a new mine was recently established, and once the news spread, it experienced explosive growth in the number of miners. Over the last couple of months, the number of workers grew from 3,000 to an estimated 6,000 with over 600 children.

At the time of the field research, the three mining sites were officially closed and it was forbidden to dig for gold, as decided by the Governor of Sikasso with support from the local mayors. The reason for this closure was to ensure that farmers would take care of their crops, as it was the harvesting season. Nevertheless, all three mines were being operated, as mining is the main source of income for most of the workers.



Aminata is a 15 year-old girl, originally from Wassoulou. Researchers met her on the gold mining site of Syentoula. She prefers gold mining over education, as she thinks girls have little opportunity to finish school because of marriage.

*"My name is Aminata and I am from the village of Wassoulou. I would love to become a trader and sell traditional clothing (pagnes). But I have never been to school, I have always helped my mum. She works as a gold miner at home. My father is a farmer.*

*I came to the mine with my sister to earn some money, because we are poor. We live with a family member in a nearby village. So far, I haven't earned much because the shaft isn't ready yet. My job is to pull buckets out of the shaft. We do that with a group of 8 people. I also make a little bit of money by scraping the land and washing the soil to extract gold powder. Everything I earn goes to my parents. I earn CFAF 1000 (€ 1,52) per day at most.*

*If I had to choose between working at the mine and going to school, I would choose the first. It's easier to earn money in this business than through school. Girls often don't finish their studies because they get married."*

### Adult miners

Out of the 26 adult respondents, only eight were of local origin. The remaining 18 respondents were migrant workers, meaning that they were from outside the village and sometimes even from outside the country, among others Guinea and Burkina Faso. A new category of miners seemed to be unemployed urban youngsters, who are drawn to the mines seeking for fortune. The eight respondents who originated from the village were mostly farmers looking for additional resources to support their families. Of the children interviewed, only two were migrant workers i.e. they are not from the village where the mining site is located but from another region in Mali or from a neighbouring country.

Work days are long at the mining sites. In the all three sites, work starts early in the morning, at around 7 a.m. On average, adult miners that were interviewed work 9.8 hours a day, with most working between 9 and 11 hours per day. In general, it is reported that miners work between 10 and 12 hours per day in artisanal gold mining in Mali.<sup>92</sup>

92 Cellule Nationale de Lutte contre le Travail des Enfants, "Note sur le Travail des Enfants dans l'orpaillage traditionnel", 2014, consulted in Mali.



**Table 3: working hours**

Duration of workday	7 hours	8 hours	9 hours	10 hours	11 hours	12 hours
# Respondents	2	1	7	8	6	2

Source: SOMO field research 2015

### Payments to authorities

Miners will pay different amounts to different authorities. They pay quarterly fees for the use of the well. In addition they have to give a part of the soil collected to the village chief. The village chief then washes the soil and the gold found is for the benefit of the village.<sup>93</sup> There is also an amount to be paid directly to the *tomboloman*, which is divided equally between him, the mayor and the village chief (each receiving one third).<sup>94</sup>

## 4.6.2 Child labour in Kola, Ouroun and Syentoula

A total of 23 children – 16 girls and 7 boys – took part in the field research. Most of them were between 10 and 15 years old, as can be seen in the table below. One respondent was younger than 7. Children's jobs generally include pulling up, transporting, grinding and panning the ore. They also perform other activities at the mining site or near the mining sites such as watching their siblings, fetching water or selling drinks and food. The researchers did not find evidence that children are working underground. According to one *tomboloman*, this is because children don't have enough physical capacity. The tasks assigned to them – washing, panning – are considered "easy".

**Table 4: Age division of the respondents (children)**

Age in years	Under 7	7 – 10	10 – 15	16 - 18
Amount	1	4	15	3

Source: SOMO field research 2015

### Accompaniment

Most of the children interviewed came to the mining site with their sibling(s) or with peers. Four children came alone. Only two were accompanied by their parents. Most children live close to the mining sites with their families.

<sup>93</sup> Unidentified Tomboloman, in Kola, Ouroun and Syentoula site, September 2015, interview by author.

<sup>94</sup> Human Rights Watch (6 December 2011).

### Use of heavy equipment

The children use any type of 'equipment' that they have at their disposal. Out of the 23 child respondents, 18 stated that their equipment is not heavy. As an example, they named calabashes (bowls), plastic cups and picks. The other five respondents do have to deal with heavy equipment, such as mortars, hammers, and containers for pulling the ore out of the shafts. One child spoke of using machine spare parts (a crankshaft).

### Earnings

Out of the 23 children interviewed, 21 had succeeded in finding gold. The other two had not yet struck gold. Almost all of the children interviewed are contributing to their family; 19 out of 23 are paying money to their parents, 3 to another family member. Only one child said it kept the money itself. The gold is generally sold on site to what the children referred to as "business men". When asked how much they earned per week, a majority of 12 children said between CFAF 2,000 and 10,000 (€3.04 to 15.24). A similar number of children felt their earnings are not much. Only four were satisfied with their earnings. Much like adult miners, children are coming to the mining sites to make quick money. Instead they find very small amounts of gold. In general it gives the children enough to provide for the essentials and a bit more, They can buy clothes, sometimes a cell phone, shoes, cups, money for a wedding or for school supplies for those who continue to attend school.

**Table 5: Children's earnings per week**

Earnings in CFAF	Nothing	< 500	500-1,000	1,000-2,000	2,000-10,000	> 10,000	No answer
Earnings in EUR	Nothing	< 0.76	0.76-1.52	1.52-3.04	3.04-15.24	> 15.24	No answer
# of children	2	1	2	0	12	5	1

Source: SOMO field research 2015

At the time of research, the gold price paid to local gold miners was around 16,000 to 17,5000 CFAF per gram.

The children interviewed were usually working between three and six (nine children) and seven and eight (nine children) hours per day. About four mentioned they were working over eight hours per day, only one child less than three hours per day.

### Health and Safety

Artisanal gold miners, including children, are exposed to several health risks. These risks can be divided between those caused directly by mining itself, and those caused by the work environment.<sup>95</sup> Obviously, miners are at risk of accidents caused by sharp tools, old holes, or shafts caving in. The risk of accidents increases through other factors, such as fatigue. The strenuous work of digging, crushing

95 UNICEF, "Briefing paper No 4. Children Working in Mines and Quarries. Evidence from West and Central Africa", April 2012, [http://www.unicef.org/wcaro/english/Briefing\\_paper\\_No\\_4\\_-\\_children\\_working\\_in\\_mines\\_and\\_quarries.pdf](http://www.unicef.org/wcaro/english/Briefing_paper_No_4_-_children_working_in_mines_and_quarries.pdf) (9-10-2015).



Girls washing ore in search of gold, Kola gold mining site, Mali.



The research team met Mariam in Ouroun. She is from Ivory Coast and had recently arrived at the mine.

*"I am Mariam and I am 15 years old. I left my village 5 months ago with my grandmother. We went to Kabaya, but didn't find gold. That's why I came to Ouroun, together with an aunt. This is our second day here. My job is to crush bits of soil. Then, I put it in a bowl with water to distil the gold from the soil ('panning'). I have sold the gold that I found to a local buyer.*

*My family is from Odienné, Ivory Coast. I have six siblings, of which five are younger than me. Two of my siblings are going to school. Back in Ivory Coast, I helped my mum selling water and 'bissap' (hibiscus juice). She is a merchant. My father sells meat.*

*I don't like working here. I would like to become a merchant. I told my parents I would like to go back to school. But my mum said no. She didn't tell me why. If I would earn CFAF 200,000 (€ 303), I would leave the job. I would use the money for my wedding. I would like to get married in Ivory Coast. I don't know when yet. I am too young right now."*

and carrying heavy loads causes back pains. Of the children interviewed for the research, about half mentioned they had physical problems and were feeling tired. Some children said they were taking painkillers to suppress these pains. Furthermore, not only the miners but also other people at the mining site in support functions suffer from many indirect, long-term health issues, such as deafness from noise, lung diseases caused by dust, and skin and eye problems caused by fumes or chemicals.

Health risks are large for children who are working several hours a day pounding and washing the ore. Due to the presence of their mothers on the sites, babies are exposed from an early age to the dust and noise of the mines.

Physical risks and constraints to which children are exposed on mining sites include the following:

- ❑ lung disease and silicosis caused by fine dust
- ❑ the risk of deafness by the constant noise of the pestle or hammer
- ❑ fatigue because of crushing and grinding the ore
- ❑ the risk of injury from stone chips in the eyes
- ❑ body wounds turning into infections because of bad hygienic conditions of the ponds that some children stand in all day
- ❑ various eye and dermatological conditions

One of the girls interviewed, whose task consisted of washing the ore in a dirty pond, had several wounds on her legs, one of which was clearly infected. When asked why she did not go to see a doctor, the girl answered that her aunt, who was taking care of her, did not have enough money to travel to



Researchers met Fatouma on the gold mining site of Kola where she was busy washing soil with her friends and her aunt, in search of gold. She is a pupil in the fourth year of school and is working during school holidays.

*"I am Fatouma and I am 13 years old. I started coming to the mine three years ago. Every year during school holidays, I leave my village for three months, together with my aunt. My parents don't come with us. My father works as a farmer and my mother is a merchant. I like working here because I find gold regularly. I earn between CFAF 750 (€ 1.14 EUR) and CFAF 1500 (€ 2.28) per day. I keep a small part (CFAF 100 / € 0.15) for myself to buy something to eat. I give the rest to my parents. My father manages my school tuition. Sometimes I give a small amount (CFAF 50 / € 0,07) to my younger siblings.*

*There are mosquitoes and scorpions here, and I have seen a snake once. I don't have any problems with the work environment. Occasionally I feel tired, but then I take a painkiller. If I could find another job that earns more money, I would leave the mine. I would like to become a teacher later, to share my knowledge. I have been going to school for four years. I would also love to grow some crops, like rice and peanuts."*

the nearest health clinic and pay for medicines or treatment. Therefore, the wounds were not treated, even though she indicated at the same time that she was doing this work to provide her parents with additional income.

Add to this the fact that malnutrition is a common problem. The food at mining sites often is of poor quality and insufficient to get through the day. Children, may see their growth negatively affected by such low calorie-intake.

## Education

Dropping out of school is very common among children at mining sites, and children are the first victims of the gold fever. Despite the fact that the Malian Constitution provides for free and compulsory education, many children have never gone to school and never will go. Schools are often far away from rural areas and due to poor infrastructure are not easily accessible. Moreover, the costs may discourage parents from sending their children to school. Although there are no school fees, parents are expected to pay for additional costs such as uniforms and books.<sup>96</sup> Children that do go to school must juggle their education and their job. In general, children in mining villages do not attend school, and the rare educational structures around sites are often deserted due to the gold fever. The sites are rarely permanent, groups of miners migrate quickly to other sites, reacting to

96 US Department of Labor, "Mali. 2014 Findings on the Worst Forms of Child Labor", 2014, <http://www.dol.gov/ilab/reports/child-labor/mali.htm> (9-10-2015).

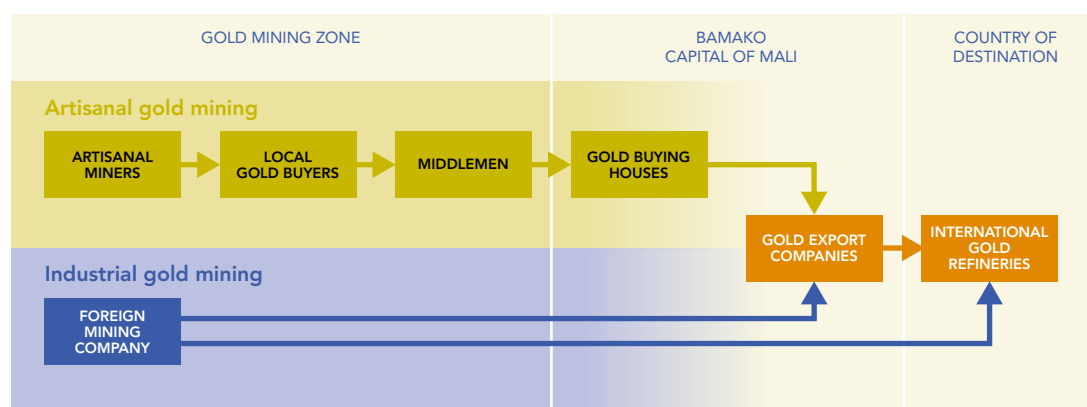
new discoveries or rumours. Children drop out of school and are often forced to work with their parents who take them along to the sites. In other cases, children decide themselves to leave school to try their luck, following their friends who are digging for gold and able to buy a bicycle or a radio. When they are not working, children are left on their own by their parents, who spend all their time looking for gold. The weakening and disruption of family structures characterises mining sites. In such circumstances, children suffer and live in a family atmosphere that is disrupted by disputes, alcoholism and violent parents.<sup>97</sup>

When visiting the sites during the research many children who were normally going to school were also working on the sites because of the holidays. It was explained that this provides them with the opportunity to earn a little extra income to be able to support their parents. Of the children interviewed during the research 13 out of 23 had attended school (of which at least seven left school at the time of the interview), while the other 10 had never attended school. Of the children who did go to school, eight attended only primary school, while four were in secondary school. For one child there is no information about the level of schooling. The children who left school gave different reasons, a 10 year old said he did not like studying. Other reasons were to help the mother with housekeeping (13 year old), to take care of a sick parent (age 15) and that they were not good at studying (age 17), that they had moved (age 13).

## 4.7 Mapping of key actors involved in the value chain

The value chain of artisanal gold in Mali basically looks as follows:

**Figure 6: Value chain of artisanal gold in Mali**



Source: Traders and exporters, Mali, September 2015, interviews by author

97 Unidentified person, in Kola, Ouroun and Syentoula mining sites, September 2015, interview by author.



The different actors in the chain, based on the desk and field research, can be described as follows:

### **Artisanal miners (orpailleurs)**

The work process is organized by groups of artisanal miners who agree at the outset how they will divide the gold mined. Groups may consist of adults and children. After extraction, artisanal miners sell their gold to local buyers and the revenues are shared among the members of the group. Workers originate from different parts of Mali, as well as from other countries in the West African subregion, such as Guinea and Burkina Faso.

### **Local gold buyers (acheteurs/detaillant)**

At every site, several small buyers will be operating.<sup>98</sup> The buyers originate from Mali, Guinea, Senegal and Burkina Faso. Some of these buyers actually reside on the site, while others are travelling around to buy up gold at different sites. Generally the miners do not know the exact market price, contrary to the local buyers, who are asking for the market price at the gold buying house that they work for. The price paid to local gold miners depends on the quality of the gold, which differs from one site to the other. Often, these buyers also sell mercury to artisanal gold miners, or miners might come to the local buyer's shop to ask him to do the amalgamation.<sup>99</sup>

### **Gold traders (commerçants demi-grossiste or grossiste)**

Local buyers work for traders based in larger cities like Bougouni or Koulikoro. These traders transport the gold to Bamako, the capital, and sell it to buying houses. They usually travel by motorbike or by public transport. In some cases, they smelt the gold from different sources together and sell the it as unrefined gold. Most often they sell the gold as powder or gold dust.

### **Gold buying houses ("comptoirs")**

In the capital Bamako, there are a large number of trading houses that buy up gold from middlemen. The buying houses determine the buying price of gold based on the market price at the London Gold market every hour.<sup>100</sup> They generally use an app on their smartphone, such as Netdania<sup>101</sup>. There are no reliable estimates on the number of buying houses. According to the National Federation of Artisanal Miners in Mali, there are 127, but a major trader in Bamako estimated the number of buying houses at 300.

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98 For instance, in Ouroun, a site where gold production is booming and where 6,000 miners operate, there are 23 local buyers active and six or seven middlemen; Gold buyers, Ouroun, September 2015, interviews by author.

99 One local buyer told us that he buys mercury in Bougouni, and that it probably originates from Ghana or Burkina Faso.

100 Since 1919 the most common benchmark for the price of gold has been the London gold fixing, a twice-daily telephone meeting of representatives from five bullion-trading firms of the London Bullion Market. Furthermore, gold is traded continuously throughout the world based on the intra-day spot price, derived from over-the-counter gold-trading markets around the world (code "XAU").

Wikipedia, "Gold as an investment", no date, , [https://en.wikipedia.org/wiki/Gold\\_as\\_an\\_investment](https://en.wikipedia.org/wiki/Gold_as_an_investment) (9-10-2015).

LBMA, "London is home to the international prices for Gold, Silver, Platinum and Palladium", no date, <http://www.lbma.org.uk/pricing-and-statistics> (9-10-2015).

101 Netdania.com, Products, "Forex & Stocks", <http://www.netdania.com/mobile/> (9-10-2015).





Moussa is a 15 year-old boy who sells bags of drinking water. Researchers met him on the gold mining site of Oroun. He doesn't like being at the mine and would rather learn a trade.

*"My name is Moussa and I am 15 years old. I come from a big family: I am the sixth of eight children. Some of my siblings have left. For example, one brother finished school and went to work in Lomé, Togo. My older sister got married and now lives in*

*Mauritania. I have attended school until the eighth grade but I recently quit. My mum's health is deteriorating and I wanted to help out. My eldest brother took care of the land and the animals, but it was too much work. The animals couldn't find food and some got ill. Other animals got stolen. To see these animals disappear before my eyes made me decide to quit school to work as a shepherd. When I suggested it to my mum and brother, they agreed. Now, the animals are fine. I made a fence and I give them food and water every day. By selling an animal, we can buy medicine for my mother.*

*During the rainy season, I go to the mine to work, with other children from my village. It's my second time. Last year I worked in Sélingué. I went into a six-meter shaft and earned a lot of money. Right now, I can't find a mining job. That's why I sell bags of water to the miners. I sell them at CFAF 50 (€ 0.07 ) each. This way, my profit is CFAF 750 (€ 1,14). I carry the water on my head.*

*I enjoyed school but I am not sure if I would go back, because I got very attached to the animals. If I call them, they always come to me. If I could choose a profession, I would like to have a shop or work as a mechanic."*

### Gold exporting companies (exportateurs)

A limited number of specialized exporting companies buy up the gold from the buying houses. First, they take care of the smelting of the gold into small bars (see photo below), a task carried out at a number of specialized smelting workshops in Bamako. They also deal with the paperwork, such as export permits, payment of export duties, and they ensure that the gold is actually transported to the country of destination. The export of gold takes place by aeroplane, usually carried personally in briefcases by the traders themselves. Even though over a hundred companies have a license to export, the market is dominated by no more than five companies which export gold in substantial quantities.<sup>102103</sup> The exporter interviewed did not want to go into detail about his profit margin and

102 The three major export companies are Samba Ba, Fagou Traoré and Ets. Sacko, all based in Bamako;. Chamber of Mines, Bamako, September 2015, interview by author.

103 Gold exporting company, September 2015, Bamako, interview by author.

the sales prices, as he stated that he did not want to “reveal his success formula to his competitors”.<sup>104</sup> Sometimes, representatives of foreign refineries import gold from Mali by buying directly from buying houses in Mali.<sup>105</sup>

### International gold refineries

Foreign companies buy the artisanal gold originating from Mali. Sometimes, representatives of these companies travel to Mali to buy the gold themselves, and sometimes they buy the gold from Malian businessmen travelling to the country of destination. One of our informants told us that there are cases of foreign companies (probably gold refineries) that request a gold exporting company to buy gold worth a certain amount (e.g. F CFA 500 mi. or around €762,000). Sometimes the company provides an advance to be able to buy the gold, and if the gold is available at the exporters office they might buy it directly.<sup>106</sup> From earlier trade data collected by Human Rights Watch in 2011, it appeared that Swiss, UAE and Belgian companies imported artisanal gold from Mali.

But the main export destination for industrial gold from Mali is China. Based on interviews with local buying houses, the main export destinations for artisanal gold from Mali are Dubai (United Arab Emirates) and Switzerland. It was also found that gold is likewise smuggled to neighbouring countries, such as Burkina Faso and Guinea, to be sold there and moved along further export routes. An extensive search for trade data was undertaken. Unfortunately, no detailed trade data were available from the Malian authorities, despite repeated requests.

## 4.8 The role of the government

### 4.8.1 National & international law regarding child labour

Mali’s Constitution dates from 1992 and includes a Labour Code. The minimum age to work is set at 14 years, although it has been proposed to raise it to 15 years.<sup>107</sup> However, the minimum age to do *hazardous work* is set at 18 years,<sup>108</sup> in line with ILO Conventions 138 and 182 which have been ratified by Mali. What constitutes hazardous work is defined in Mali’s “Hazardous Occupations List” and includes, among other things, digging wells, crushing and panning.<sup>109</sup> In 2002, the government issued a binding ordinance named the Child Protection Code, which lays down key protections for children. The Code prohibits economic exploitation of children, such as child labour and sexual exploitation.

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104 Gold exporting company, September 2015, Bamako, interview by author.

105 Danwatch, “Child mined gold in your gadgets? Child labour in Ghana and Mali and sourcing policies of IT brands”, 2013, [http://ibis.dk/sites/default/files/media/pdf\\_global/csr\\_pdf/child\\_mined\\_gold\\_in\\_your\\_gadgets\\_final.pdf](http://ibis.dk/sites/default/files/media/pdf_global/csr_pdf/child_mined_gold_in_your_gadgets_final.pdf) (9-10-2015).

106 National Federation of Artisanal Gold Miners, Bamako, September 2015, interview by author.

107 National Child Labour Unit, Bamako, September 2015, interview by author.  
Republic of Mali, Law 92-020 Article 187, 1995 <http://www.ilo.org/dyn/travail/docs/1328/Mali%20-%20Code%20du%20Travail.pdf> (8-10-2015).

108 Republic of Mali (1995).

109 Republic of Mali (1995).

Other national laws and regulations related to child labour include the Prohibition of Forced Labour (article 6 of the Labour Code), the Prohibition of Child Trafficking (article 244 of the Penal Code), the Compulsory Education Age (article 26 and 34 of the Education Law) and the Free Public Education Law (article 18 of the Constitution). The latter two provide that education is free and compulsory.

In addition to national law, Mali has also ratified multiple international treaties related to child labour. The Convention on the Rights of the Child (CRC), the International Covenant on Social, Economic and Cultural Rights (ICESCR) and the African Charter on Human and People's Rights, to name a few. These international laws take precedence over Mali's national legislation.<sup>110</sup> In 2014, the Malian government imposed a ban on artisanal mining during the rainy season (May-October), because the wet soil enlarges the chance of cave-ins and because it wanted to encourage farmers to take care of their harvest instead of going to the mines. The fact that the field research took place in September and artisanal mining was ongoing shows that this ban is not being successfully implemented.

The government has also tried to improve access to education, to no avail. In the field research, informants noted that the area has a huge problem with school dropouts, among others because some teachers have themselves left their schools to become gold miners.

#### 4.8.2 Policies and initiatives to combat child labour

The government of Mali has established several policies and initiatives related to child labour. One such mechanism is the National Coordinating Committee for the Fight Against Trafficking in Persons and Associated Practices, which is made up of government bodies, NGOs and civil society groups and aims to coordinate efforts related to fighting human trafficking.<sup>111</sup> Another important mechanism is the National Unit to Fight Against Child Labor (CNLTE). This unit, consisting of representatives of several Ministries, is tasked with coordinating Mali's efforts to eliminate child labour.

Under the direction of the CNLTE, a National Plan to Combat Child Labor (PANETEM) was launched in 2011. Its aim is to eliminate the worst forms of child labour by 2015, and all other exploitative child labour by 2020. Concretely, this means increasing awareness about child labour, improving the legal framework and improving people's livelihood. The action plan is carried out in collaboration with several Ministries, including the Ministry of Education.

More recently, the government adopted the National Policy for Child Promotion and Protection, which also includes a National Action Plan (2015-2019). This action plan is mainly preoccupied with enhancing Mali's legal framework to protect children from violence, human trafficking and exploitative work.<sup>112</sup>

110 Republic of Mali, Constitution of Mali article 116, 12 January 1991, [www.focusonland.com/download/51c081caa15cc/](http://www.focusonland.com/download/51c081caa15cc/) (9-10-2015).

111 US Department of Labor, "Mali - 2014 Findings on the Worst Forms of Child Labor", 2014, [http://www.dol.gov/ilab/reports/child-labor/mali.htm#\\_ENREF\\_48](http://www.dol.gov/ilab/reports/child-labor/mali.htm#_ENREF_48) (9-10-2015).

112 US Department of Labor, "Mali - 2014 Findings on the Worst Forms of Child Labor", 2014, [http://www.dol.gov/ilab/reports/child-labor/mali.htm#\\_ENREF\\_48](http://www.dol.gov/ilab/reports/child-labor/mali.htm#_ENREF_48) (9-10-2015).



Two girls washing the soil from underground gold mines, Ouroun mining site, Bougouni District, Mali

Specifically in the field of gold mining, a national forum on artisanal gold mining was held in September 2014. Discussions focused on three themes:

- ▣ Legal and institutional instruments applicable to artisanal gold mining
- ▣ Support, promotion and organisation of artisanal gold mining
- ▣ Security and development of local communities.

With regards to child labour, one of the Forum's recommendations is "the formal prohibition of child labor in artisanal gold mining. Another important recommendation is the creation of gold mining corridors (*couloirs d'orpaillage*) in cooperation with local and traditional communities, in which the existing gold mining sites are structured and formalized. By organizing artisanal miners into unions of cooperatives, it is hoped that the miners will improve their skills and their productivity, and as a result will be able to work in a more professional way, reducing the risks currently associated with small-scale artisanal mining.<sup>113</sup> The Chamber of Mines is currently implementing this strategy. This includes a number of measures taken jointly by the Government and the Chamber of Mines, such as negotiating with banks to give miners easier access to financing for equipment, and the creation of newly formed cooperatives for a more equitable revenue distribution.<sup>114</sup> Finally, an important recommendation for

113 Chamber of Mines, Bamako, September 2015, interview by author.

114 CNBAfrica.com, "Mali to Boost Funding and Policing of Artisanal Gold Mining", 12 February 2015, [http://www.cnbafrica.com/news/mining/2014/09/20/mali-artisanal-mining-funding/\(9-10-2015\)](http://www.cnbafrica.com/news/mining/2014/09/20/mali-artisanal-mining-funding/(9-10-2015)).

mine workers and the families living near the mines is “the formal prohibition of the use of hazardous chemicals in gold mining”, such as mercury.

### 4.8.3 Other initiatives

In collaboration with the Malian government, international organisations and NGOs have also taken measures to address child labour in the country, in the form of projects and programs. For example, UNICEF ran a campaign in 2012-2013 to get children ‘Back To School’. The Education Development Center, funded by USAID, is finishing a five-year project named ‘Out of School Youth Program’, which aims to provide education to 10,000 out-of-school youth.

The International Labour Organisation (ILO) has been involved in multiple projects in the country. In support of the NAP, the ILO has implemented a project targeting children in artisanal gold mining in Sikasso. It has also provided support to the CNLTE to set up a Child Labor Monitoring System.<sup>115</sup> The Dutch government funded a one-year program in 2014 named Combating Child Labor through Skills Training for Older Children, and aimed at improving access to education. The government of Spain funded a five-year program (2009-2014) that aimed to strengthen the public sector and CSOs, so that they can take up the combat against child labour.

In 2004, a Chamber of Mines was created. One of the tasks of this organization was to move miners out of the informal sector by providing them with training and by helping them set up artisanal mining cooperatives.

But all the measures and programs described above have been met with doubts about their effectiveness. According to the US Department of Labor, the implementation of the 2011 national action plan to combat child labour had not yet started even by the end of 2014.<sup>116</sup> Furthermore, these efforts are hampered by a lack of means, widespread corruption, language barriers, insufficient awareness of children’s rights and a failing legal system that has created a climate of impunity. Interviews with experts confirm that, despite a number of promising initiatives to combat the issue, the government does not have sufficient capacity to implement the national and international legal framework against child labour.

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115 US Department of Labor, “Mali - 2014 Findings on the Worst Forms of Child Labor”, 2014, [http://www.dol.gov/ilab/reports/child-labor/mali.htm#\\_ENREF\\_48](http://www.dol.gov/ilab/reports/child-labor/mali.htm#_ENREF_48) (9-10-2015).

116 US Department of Labor, “Mali - 2014 Findings on the Worst Forms of Child Labor”, 2014, [http://www.dol.gov/ilab/reports/child-labor/mali.htm#\\_ENREF\\_48](http://www.dol.gov/ilab/reports/child-labor/mali.htm#_ENREF_48) (9-10-2015).

## 5 The use of gold by the electronics industry

Whenever you use your mobile phone, your tablet, or laptop, your fingers will be touching gold, but you will rarely give it a second thought. Gold can be found in any of these electronics, as it is an excellent conductor of electricity. Any one of the electronics devices that you most probably use on a daily basis contains various metals, including precious metals such as silver and gold. But also washing machines, televisions, fridges and cars are manufactured from a diverse range of common metals such as aluminium, copper, iron; less common metals such as barium, bismuth, gallium, tantalum, and precious metals such as gold, silver and palladium.

In this chapter we will address the use of gold by the electronics industry and its place in the global gold supply chain.

### 5.1 Gold in electronics

On average a smartphone<sup>117</sup> contains 30 mg of gold. Against a price of €33,096 per kilogram<sup>118</sup> this small amount of gold used in a smartphone is already worth almost €1 for each phone. It is a small price to pay for one customer, but the numbers do add up. In 2014 1.9 billion mobile phones were sold worldwide<sup>119</sup> of which more than 1.2 billion units were smartphones. The more than 1.2 billion smartphones alone contain 37,347 kilos of gold. Samsung was the best seller of smartphones in 2014, with more than 300 million units, containing – when we take the average of 30 mg gold per smartphone – 9,228 kilos of gold. The second largest is Apple, using 5,743 kilos of gold for its smartphones. See for more information on smartphone sales table 6.

The 4.6 million smartphones sold in the Netherlands<sup>120</sup>, would yield 138 kilos of gold – worth €4,567,248 – if recycled, and this is just the phones sold in one year. Unfortunately not all phones are recycled, by far. In fact, only a small percentage will ever reach that stage, as most phones are left to gather dust in drawers.

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117 M. Buchert, A. Manhart, D. Bleher & D. Pingel, "Recycling critical raw materials from waste electronic equipment", Oeko Institute, 24 February 2012, <http://www.oeko.de/oekodoc/1375/2012-010-en.pdf> (14-10-2015). Freiburg cites an analysis from Umicore that mentions an amount of 24 mg of gold in a mobile phone, and an estimate amount of 30 mg for a smartphone. Alex Scott, "Dialing back on Cell Phone Waste: Chemicals and Engineering news", 92 (35), p. 30-33, <http://cen.acs.org/articles/92/i35/Dialing-Back-Cell-Phone-Waste.html> (14-10-2015).

118 BullionVault, "Gold Price Chart", 21 October 2015, <https://www.bullionvault.com/gold-price-chart.do?modal=true> (14-10-2015).

119 Tech Crunch, "Led By iPhone 6, Apple Passed Samsung In Q4 Smartphone Sales, 1.9B Mobiles Sold Overall In 2014", 3 March 2015, <http://techcrunch.com/2015/03/03/led-by-iphone-6-apple-passed-samsung-in-q4-smartphone-sales-1-9b-mobiles-sold-overall-in-2014/#.dm17qp:8exz> (14-10-2015).

Gartner, "Gartner Says Smartphone Sales Surpassed One Billion Units in 2014", 3 March 2015, <http://www.gartner.com/newsroom/id/2996817> (14-10-2015).

120 O. van Miltenburg, "Nederlanders kochten in 2013 4,6 miljoen smartphones", 12 February 2014, <http://tweakers.net/nieuws/94267/nederlanders-kochten-in-2013-4-komma-6-miljoen-smartphones.html> (14-10-2015).



**Table 6: Worldwide Smartphone Sales to End Users by Vendor in 2014 (Thousands of Units)**

Company	2014 Units	2014 Market Share (%)	2013 Units	2013 Market Share (%)	Kg gold in 2014
Samsung	307,597	24.7	299,795	30.9	9,228
Apple	191,426	15.4	150,786	15.5	5,743
Lenovo*	81,416	6.5	57,424	5.9	2,714
Huawei	68,081	5.5	46,609	4.8	2,042
LG Electronics	57,661	4.6	46,432	4.8	1,730
Others	538,710	43.3	368,675	38.0	16,161
Total	1,244,890	100.0	969,721	100.0	37,347

Source: Gartner 2015<sup>121</sup>

Gold is being used in all but the most simple electronics. In the Netherlands alone consumers spent an amount of €1.44 billion on consumer electronics in 2014<sup>122</sup>, for example on televisions and audio equipment, all containing a small amount of gold. In LCD television sets one can find about 140 mg gold, mostly on the printed circuit boards (PCBs) and the contacts.

Gold has an occurrence of about 104 mg in notebooks/tablets, more than half of which can be found on the motherboard (see figure 7 on page 54).<sup>123</sup>

### Why use gold?

Gold has an excellent ability to conduct electricity. Although it is not the only metal with high conductivity, it is considered to be a superior conductor, and is also resistant against corrosion and tarnishing both at very low and very high temperatures. Its resistance to corrosion brings the electrical contact resistance of gold close to zero. Its high thermal conductivity ensures rapid dissipation of heat when gold is used for contacts.

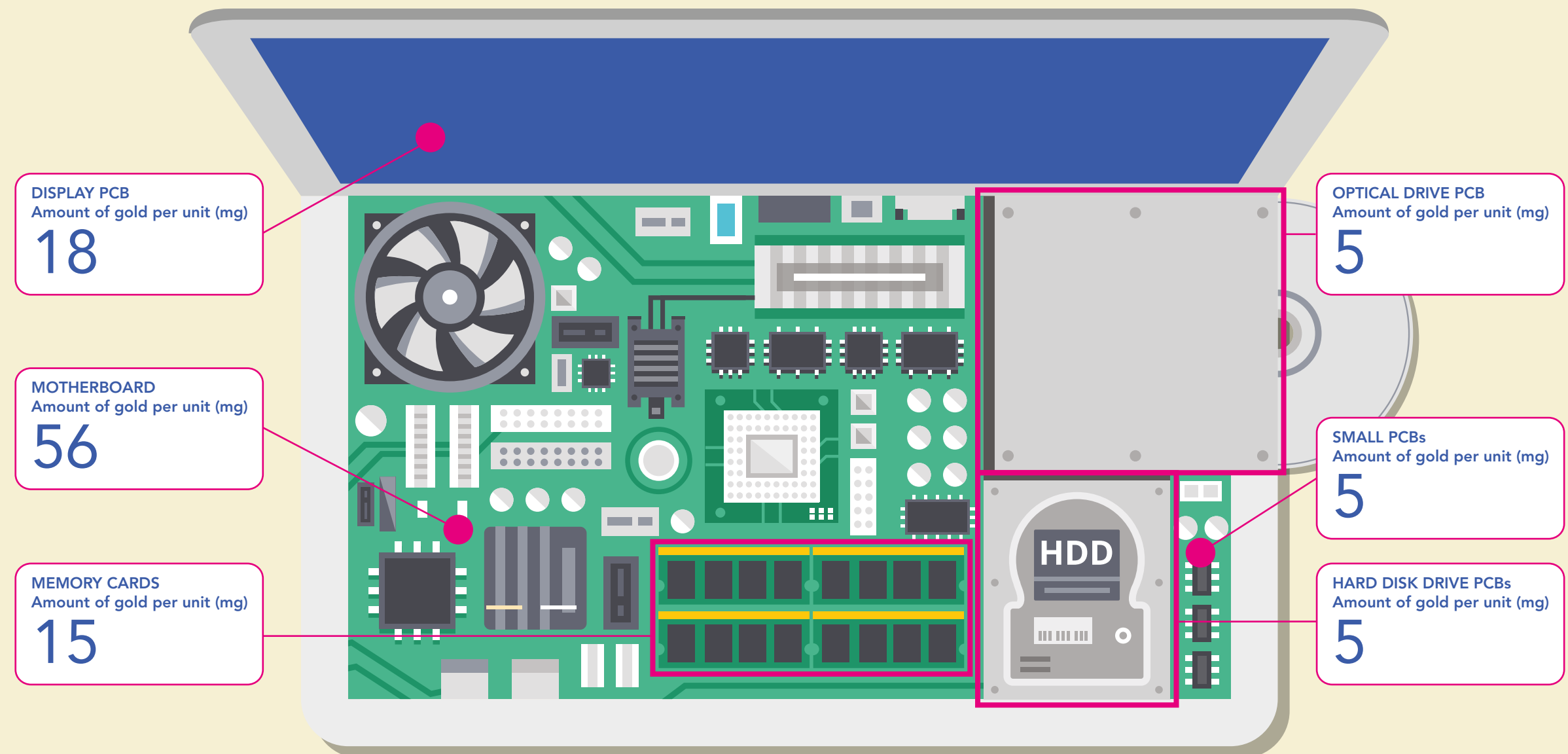
Gold can mostly be found on the PCBs and electrical connectors. PCBs are used in most electronics as a support base to assemble and connect components through conductive pathways that are deposited or printed on the board. The components that are thus connected are resistors, transistors, integrated circuits, diodes, among others.

121 Gartner, <http://www.gartner.com/newsroom/id/2996817>.

122 Growth from Knowledge, Consumentenelektronica, "Consumenten elektronica markt stabiliseert", no date, <http://www.gfk.com/nl/retail-reports/q4-2014/Markten/ce/Paginas/default.aspx> (14-10-2015).

123 Buchert et al. (2012).

Figure 7: Amount of gold in Printed Circuit Boards (PCB's) in notebooks in mg



Source: Buchert et al (2012)



Gold buying house, Bamako, Mali

There are two main uses of gold that account for most of the gold required annually by the electronics industry:

- Gold is mainly used for contacts, in a very thin film and in fine strips to connect parts of semi-conductors<sup>124</sup>. Gold plating is the coating of an article with a layer of gold, sometimes also called a 'gold dip'. The gold is used for the production of 'gold potassium cyanide' (GPC), contacts are normally electro-plated with a very thin film of GPC<sup>125</sup>. Gold-plated contacts are used in everything from washing machines to computers to telecommunications. The ordinary touch-tone telephone contains thirty-three gold contact points. Gold-plated connectors are an integral part of plugs and sockets for cable terminations, integrated circuit sockets, computer back plates and printed circuit boards. The more sophisticated the equipment and the greater the degree of reliability required, the more gold plating is used in connectors.
- Gold's other main use in electronics is for fine wire or strip that binds or connects parts of semiconductors such as transistors and integrated circuits, ensuring reliable connections between components. Wire bonding is the method used to attach very fine wire (typically thinner than a human hair at 10-200 microns) from one connection pad to another, completing the electrical connection in an electronic device. This bonding wire is specially refined up to 'five nines' (999.99) and has a typical diameter of one hundredth of a millimetre.

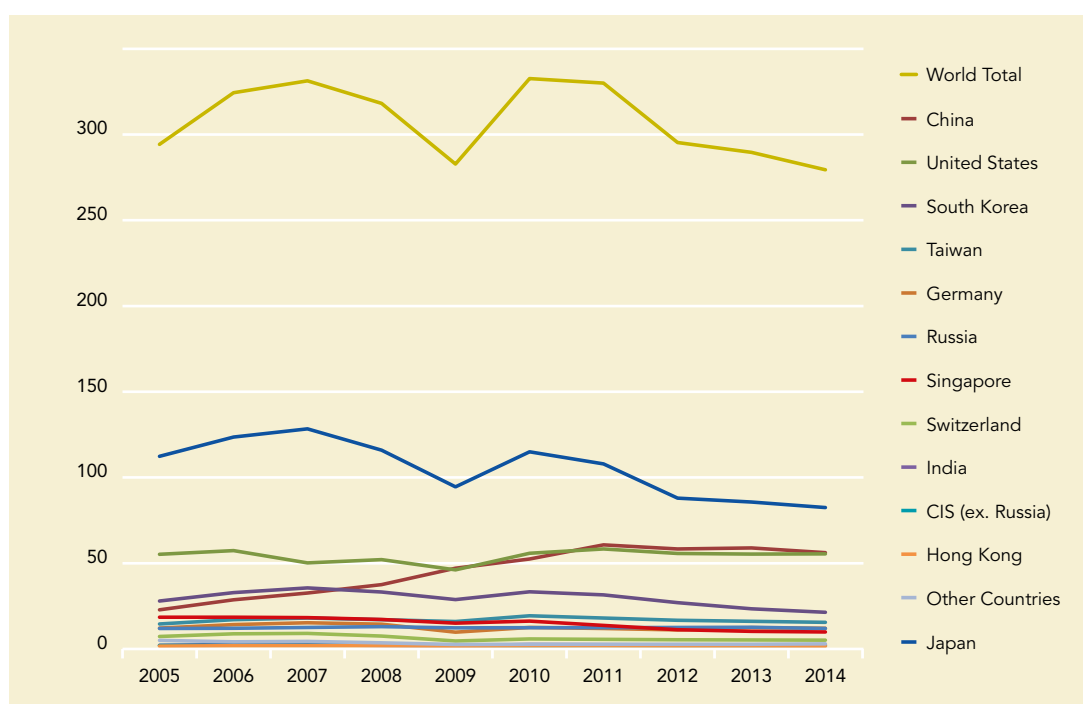
124 GoldAvenue Encyclopaedia, "Electronics", no date, [info.goldavenue.com/info\\_site/in\\_glos/in\\_glos\\_electronics.html](http://info.goldavenue.com/info_site/in_glos/in_glos_electronics.html) (14-10-2015).

125 GoldAvenue Encyclopaedia (no date).

A third use is 'thick' and 'thin' film often used in micro circuitry, where the circuit is printed on a ceramic base using an ink-like paste containing gold.<sup>126</sup>

The PCB market has been valued at 60.2 billion dollars in 2014. China, Taiwan, Japan and South Korea are taking about two thirds of world PCB production.<sup>127</sup> Several of the largest PCB manufacturers are Nippon Mektron (Japan) Young Poon Group (South Korea), Unimicron (Taiwan) Zheng Ding Technology (Taiwan), SEMCO (South Korea) and Ibiden (Japan)<sup>128</sup>, Figure 8 details the export destinations for gold used by the electronics sector.

**Figure 8: Tonnes of gold for electronics (including the use of scrap) from 2005-2014**



Source: GMFS 2015

126 GoldAvenue Encyclopaedia (no date).

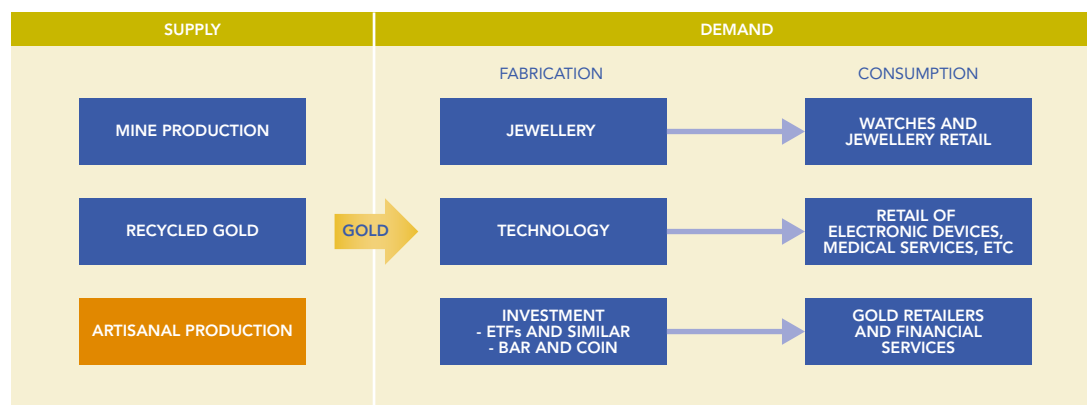
127 IPC, "World PCB Production in 2014 Estimated at \$60.2 Billion IPC World PCB Production Report Released", 28 September 2015, <http://www.ipc.org/ContentPage.aspx?pageid=World-PCB-Production-in-2014-Estimated-at-60-2-Billion> (14-10-2015).

128 Printed Circuit Design & Fab, "A Two-Team Race?", 1 August 2014, <http://www.pcdandf.com/pcdesign/index.php/editorial/menu-features/9469-nti100-1408> (14-10-2015).

## 5.2 The use of gold by the electronics sector

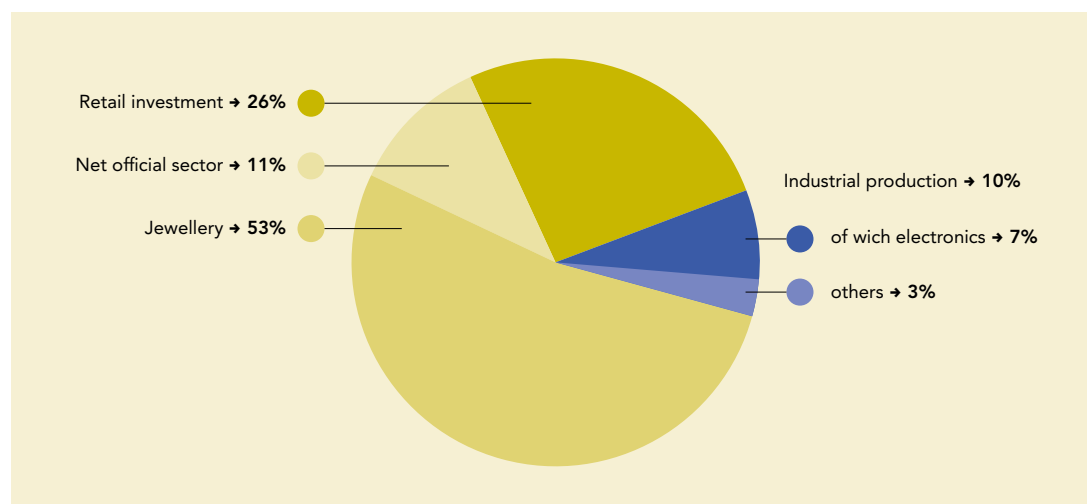
The global gold demand is driven by three sectors: jewellery, investment, and industrial fabrication. Jewellery uses most of the mined gold, the second largest sector is gold for investment. The third largest buyer of gold is industrial fabrication, with electronics taking the lion's share of the demand.

**Figure 9: The gold value chain**



Source: The World Gold Council, PWC, "The direct economic impact of gold", October 2013.

**Figure 10: Gold demand for 2014**



Source: GFMS 2015

The electronics sector uses between 5.7 and 8.2 % of the yearly gold demand during the years 2010-2014.<sup>129</sup>

**Table 7: Gold supply and demands in tonnes**

Company	2010	2011	2012	2013	2014
Gold Supply	4,349	24.7	4,513	4,310	4,362
Gold Demand	3,807	15.4	4,321	5,042	4,158
Jewellery	2,033	6.5	2,008	2,439	2,213
Retail Investment	1,221	5.5	1,343	1,775	1,079
Industrial fabrication	476	4.6	426	419	400
<i>of which electronics</i>	333	43.3	295	289	279
<b>Electronics in % of total demand</b>	<b>8.8%</b>	<b>100.0</b>	<b>6.8%</b>	<b>5.7%</b>	<b>6.7%</b>

Source: GMFS Gold Survey 2015

As the above table shows, the global gold demand for use in electronics declined in 2014. This is due to economic conditions and ongoing substitution.

The electronics demand for gold fell for the fourth year in succession, slipping to 279 tons in 2014. While there has been a recovery in consumer demand for electronics in many countries, the global picture is far from being uniform. Economies within the Eurozone, China, and Japan have felt the impact of sluggish economic growth.

Another reason for the declining demand is substitution. Gold used in bonding wire production, which is largely used in the production of semiconductors, consumed a significant portion of the total offtake of gold in this sector. As prices have risen in the last decade<sup>130</sup> electronics manufacturers have been looking for cheaper alternatives such as copper and silver. This proved particularly successful in the production of bonding wire, where copper wires, bare or coated with palladium, have increasingly replaced gold wires.

Last year saw a 4% decline in the gold used in Japanese electronics, reflecting lower domestic demand and substitution strategies in a fragile economy. China's 5% drop, on its part, corresponded to a lower demand for white goods and home appliances, and to the growing use of palladium-coated copper bonding wires. In countries like Taiwan and South Korea a reduced offtake has been noticed in gold potassium cyanide (GPC), primarily used in the plating sector.<sup>131</sup>

129 R. O'Connell et al., "GMFS Gold Survey 2015" (London: Thomson Reuters, April 2015).

130 The Real Asset Co, "Gold price charts", no date, <http://therealasset.co.uk/charts-and-graph/gold-price-charts/#!prettyPhoto> (14-10-2015).

131 R. O'Connell et al. (April 2015).



## 6 The production chain of gold mining

### 6.1 Introduction

Until 2006, South Africa was the world's dominant gold producer. An estimated 40% of all the gold ever mined on earth had been extracted from the mines on the South African Witwatersrand.<sup>132</sup> But China has now taken over as the largest producer in the world, accounting for around 15 per cent of total production. Asia as a whole produces 22% of all newly-mined gold, 20% comes from Africa, 17% from Central and South America, 15% from North America, and 14% from the Commonwealth of Industrial States (CIS) region.<sup>133</sup> These figures are mainly based on industrial production by large-scale mining operations.

How much artisanal gold is produced per year is an important question, but one that is difficult to answer. Solid data tends to be sparse in informal sectors; activities like ASGM are relatively elastic and can grow and shrink more rapidly than the formal gold mining sector. The most robust estimate is based on variety of types of data from 70 countries, which uses the trade in mercury as an indicator because a very large percentage of ASGM gold is produced using mercury. This estimate made in 2009 is 330 tonnes of gold per year or 12% of official world production.<sup>134</sup> 10-15 million artisanal gold miners, including 4-5 million women and children, are estimated to be involved in the sector.<sup>135</sup> The evolution in the price of gold has created a growing incentive for poor people to mine ASGM, certainly since 2009. Observations on the ground indicate an increased activity, and it is therefore safe to estimate the current proportion of ASGM to be at least 15% of global gold production.<sup>136</sup> The World Bank uses an estimation of 20%.<sup>137</sup>

In this chapter we will elaborate on the global gold supply, the key players in the gold supply chain (the refiners), and the linkages with the electronics sector. We focus in this chapter on gold mined in Burkina Faso, Ghana and Mali, as these countries are associated with child labour in gold mining and reports published in 2015 have extensively documented this. The examples presented in this chapter

132 H.E. Frimmel & W.E.L. Minter, "Recent developments concerning the Geological History and Genesis of the Witwatersrand Gold Deposits, South Africa" in *Integrated Methods for Discovery: Global Exploration in the Twenty-First Century*, Eds. R.J. Goldfarb & R.L. Nielsen (Littleton: Special Publication Society of Economic Geologists), p.17-45.

133 R. O'Connell et al. (April 2015).

134 K.H. Telmer & M.M. Veiga, "World emissions of mercury from Artisanal and small scale gold mining" in *Mercury Fate and Transport in the Global Atmosphere*, Eds. N. Pirrone & R. Mason (Dordrecht: Springer Science, 2009). United Nations Environment Programme, "Global Mercury Assessment 2013", 2013, <<http://www.unep.org/PDF/PressReleases/GlobalMercuryAssessment2013.pdf>>, (16-10-2015).

135 United Nations Environment Programme, *Artisanal and Small-Scale Gold Mining, "Reducing Mercury in Artisanal and Small-Scale Gold Mining (ASGM)"*, no date, <<http://www.unep.org/chemicalsandwaste/Metals/GlobalMercuryPartnership/ArtisanalandSmall-ScaleGoldMining/tabid/3526/Default.aspx>>, (23-10-2015).

136 Artisanal Gold Council, "World Artisanal Gold Production", 29 June 2011, <http://www.artisanalgold.org/publications/articles/world-artisanal-gold-production> (23-10-2015).

137 The World Bank, "Artisanal and Small-scale mining", <<http://www.worldbank.org/en/topic/extractiveindustries/brief/artisanal-and-small-scale-mining>>, (23-10-2015).

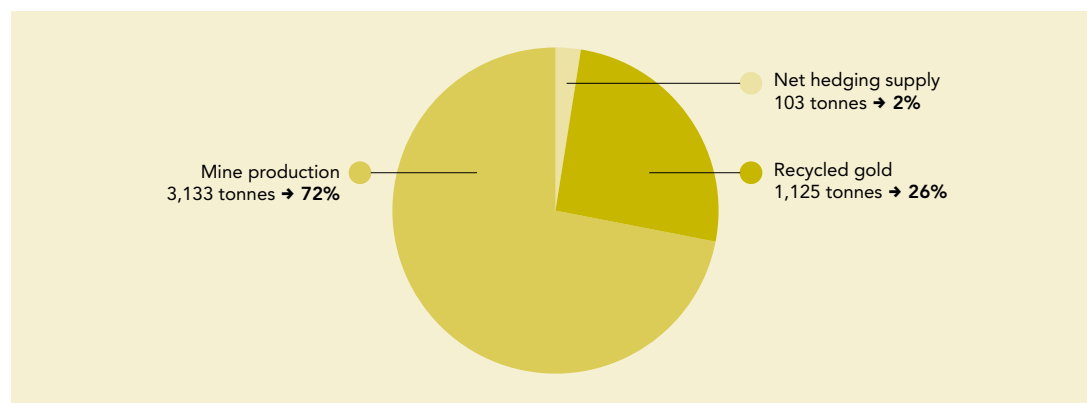
are broadly illustrative of the problems pertaining to the sector as a whole. Finally, we will explain how tracking and tracing of the origin of gold is being made impossible by the major trading hubs of Dubai, Switzerland and Shanghai.

## 6.2 Global gold production

### 6.2.1 The global gold supply

At the end of 2014, there were 183,600 tonnes of above ground stock globally; we are talking of all the gold mined throughout history.<sup>138</sup> Only a tiny amount, about 2%, has been lost. Three quarters of all gold supply comes from mine production, whereas recycling existing jewellery and other products (also called scrap) makes up for about one quarter. Gold has a very efficient product cycle, as recycling does generally not lead to degradation in quality. But this does not mean that its origins cannot be at all traced. With a specific scanner, it will always be possible to determine whether gold is made from scrap or from ores. This can be useful when artisanal gold is being offered as scrap.<sup>139</sup>

**Figure 11: Global gold mine production and supply of recycled gold (tonnes 2014)**



Source: GFMS Gold Survey 2015

Gold production from (industrial) mining has been increasing year-on-year since 2008 to 3,133 tonnes in 2014 (a 2% growth in 2014). Canada, the DRC and Mongolia saw the greatest production increases.<sup>140</sup> It is expected that the growth in industrial production will level out in the coming years

<sup>138</sup> World Gold Council, "Supply and Demand", no date, <http://www.gold.org/supply-and-demand/supply> (21-10-2015).

<sup>139</sup> Partnership Africa Canada, "Contraband Gold in the Great Lakes Region", May 2015, [http://www.pacweb.org/images/PUBLICATIONS/Minerals\\_and\\_Great\\_Lakes/Contraband\\_Gold\\_in\\_the\\_Great\\_Lakes\\_Region\\_May-2015.pdf](http://www.pacweb.org/images/PUBLICATIONS/Minerals_and_Great_Lakes/Contraband_Gold_in_the_Great_Lakes_Region_May-2015.pdf) (21-10-2015).

<sup>140</sup> World Gold Council, "Gold demand trends – full year 2014", February 2015, [http://www.gold.org/download/file/3691/GDT\\_Q4\\_2014.pdf](http://www.gold.org/download/file/3691/GDT_Q4_2014.pdf) (20-10-2015).

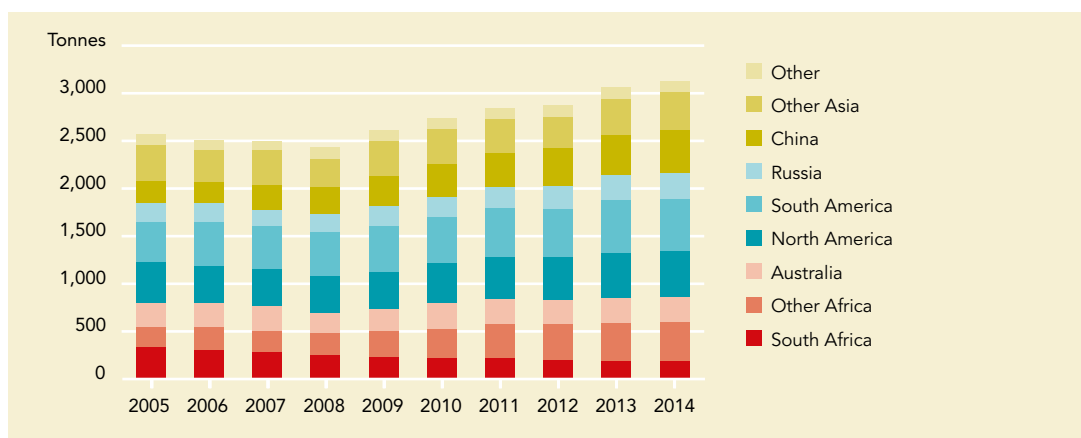
due to a range of factors, including cost pressures, lack of substantial discoveries and a reduced project pipeline. The time it takes to develop gold mining projects and bring them to production, which can be decade or longer, means mining companies cannot easily respond to immediate market conditions. It is, intrinsically, a long-term industry.<sup>141</sup>

**Figure 12: 10 year gold price in USD/oz**



Source: *The real asset*<sup>142</sup>

**Figure 13: Global gold production**

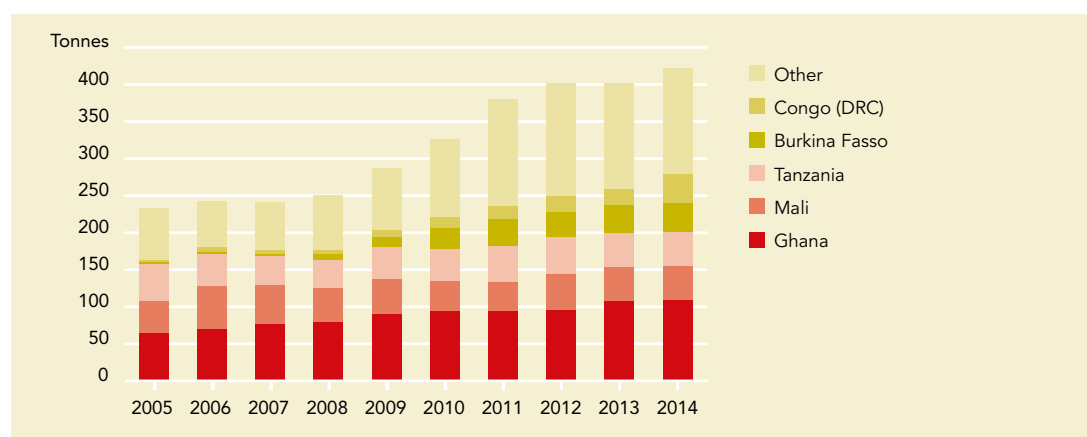


Source: *GFMS Gold Survey 2015*

141 Word Gold Council, Gold Mining, "Interactive Gold Mining Map", 18 June 2015, <http://www.gold.org/gold-mining/interactive-gold-mining-map> (20-10-2015).

142 The Real Asset Co (no date).

**Figure 14: Other African mine production**



Source: GFMS Gold Survey 2015

Artisanal gold production, however, is expected to grow.<sup>143</sup> The incentives for poor people to mine have been increasing, as crop failures by droughts and wars, coupled with relatively high gold prices, have led to gold rushes in various African countries. Since 2013 prices have been falling back, but gold is still profitable enough for people to mine artisanally.

## 6.2.2 Mine production in Africa

Although mine production in South Africa has already been in decline for ten years, the total share of Africa in the global gold mine production is growing, and it is countries like the DRC, Burkina Faso, Tanzania, Ghana and Mali that account for this rise.

Table 8 shows the top twenty gold mining countries in 2013 and 2014. By far the most important producer of gold from mining is China, accounting for 15% of global production in 2014. China is followed by Australia (9%), Russia (8%), the US (6.5%), and Peru (5.5%).

Among the African countries, we see that in 2014 the three largest (industrial) gold producers were Ghana (accounting for 3.4% of global production), Mali (1.5%), and Tanzania (1.4%). They are followed by the DRC (1.3%), Burkina Faso (1.2%), Sudan (0.7%), Guinea (0.7%), Zimbabwe (0.6%), Ivory Coast (0.6%), Ethiopia (0.4%), Egypt (0.4%), Mauritania (0.3%), Senegal (0.2%), Zambia (0.2%) and Eritrea (0.05%).<sup>144</sup> The amount of artisanal gold mine production included in these figures is unknown.<sup>145</sup>

<sup>143</sup> Partnership Africa Canada (May 2015).

<sup>144</sup> R. O'Connell et al. (April 2015).

<sup>145</sup> R. O'Connell et al. (April 2015).

**Table 8: Top 20 Gold mining countries**

Rank			Production (t)	
2014	2013	Country	2013	2014
1	1	China	438.2	461.8
2	2	Australia	268.1	272.9
3	3	Russia	248.8	262.2
4	4	United States	229.5	205.0
5	5	Peru	187.7	172.6
6	6	South Africa	177.0	163.8
7	7	Canada	133.3	153.8
8	8	Mexico	119.8	118.2
9	9	Indonesia	109.6	116.4
10	10	Ghana	107.4	108.2
11	11	Brazil	80.1	80.7
12	12	Uzbekistan	77.4	80.4
13	14	Argentina	50.1	59.8
14	13	Papua New Guinea	60.5	58.2
15	18	Kazakhstan	42.6	49.2
16	16	Mali	48.2	47.4
17	17	Tanzania	46.6	45.8
18	15	Chile	48.6	44.2
19	19	Colombia	41.2	43.1
20	20	Philippines	40.5	42.6
Rest of World			506.4	546.9
World Total			3,061.5	3,133.1

Source: GFMS Gold Survey 2015

The contribution and significance of gold mining to different national economies in terms of contribution to the Gross Domestic Product (GDP) varies considerably. The contribution expressed as a share of GDP is estimated to be the largest in Papua New Guinea, about 15% of GDP in 2012. In Ghana this was 8% and in Tanzania 6%.<sup>146</sup> These are typically countries that score low on the human development index, and where gold mining has been established more recently.<sup>147</sup> Gold mining is therefore highly significant for the country. Although in China gold mining has the highest economic contribution in terms of value, its significance there is low because it makes up for only a small portion (0.22%) of the total output of this large economy.<sup>148</sup>

146 T. Ogier, M. Ambler & Y.J. Teow, "The direct economic impact of gold", October 2013, <https://www.pwc.com/gx/en/mining/publications/assets/pwc-the-direct-economic-impact-of-gold.pdf> (16-10-2015).

147 World Gold Council, Gold Mining, "Responsible gold mining and value distribution, 2013 data", 23 October 2014, <http://www.gold.org/download/file/3517/Responsible-gold-mining-value-distribution-2013-English.pdf> (16-10-2015).

148 World Gold Council, Global gold facts map, no date, <http://www.gold.org/gold-mining/global-gold-facts-map> (23-10-2015).





Before explaining the role of the gold refiners we will first provide some insight into the process of gold refining and gold trade. Refining involves removing impurities that remain after the smelting process. Refining companies receive gold as doré bars that are usually created at the mine, almost pure but still containing some silver and other metals. This is unrefined gold originating from large scale mining (LSM) gold as well as ASM gold. In this simplified supply chain, the LSM gold is supplied by the mining companies via the mine smelthouse.

The actual supply of ASM gold is already more complicated, given that it can be routed through the mine smelthouse (if it is mixed up with LSM gold in the country of production), but it can also be supplied by local exporters, directly or via international gold traders/recyclers. Another major circuit is the smuggling route along neighbouring countries, finally to be sold to international gold traders/recyclers and then supplied to the refiners.

Refiners also receive gold as scrap, from recyclers who work with old jewellery, or banks and electronics waste. Once the refiners have produced the refined gold, it is traded into different sectors: jewellery, investors and banks, and to industries such as the electronics sector.

The refiners are the interface between the end users and the gold suppliers, and therefore possess a significant influence upon the demand side of the gold trade. They are in a position to determine the country and mine of origin if they apply due diligence efforts, and they have sufficient leverage to change the current way of sourcing into a more responsible one.

### Leading gold refiners

Switzerland is known for high quality gold refining. It not only purifies gold to the highest levels (.9999 or even .99999) but it is also the world's biggest hub for gold refining. It is said that a full two-thirds of the world's gold goes through Switzerland. In an average year, it refines grossly 70% of the world's gold, which is subsequently exported around the world to jewellers, investors or central banks and electronics companies.<sup>150</sup> Four of the world's major refineries of gold are located on Swiss soil. There is a chance that the gold in your mobile phone or tablet is made with gold refined by Valcambi in Balerna, PAMP in Castel San Pietro, Argor-Heraeus in Mendrisio or Metalor in Neuchâtel. These Swiss refiners show up in most of the public lists of gold refineries that are published by electronics companies. Such lists can be found in the Specialized Disclosure Reports on conflict minerals. All companies that are required to comply with the Dodd-Frank Act (the companies traded on the US Stock Exchange) are also required to publish these disclosure reports on conflict minerals.

Table 9 provides an overview of the leading gold refineries by capacity. The amount of gold actually refined is much less per year than the capacity suggests. For example, the gold refining capacity of Valcambi is 1,400 tonnes per year, but Valcambi has on average a throughput of 945 tonnes gold per year.<sup>151</sup>

150 GoldBroker.com, "Switzerland's Role in the Gold Market", 28 April 2014, <https://www.goldbroker.com/news/switzerland-role-gold-market-483> (20-10-2015).

151 Reuters, "Jeweller Rajesh Exports buys refiner Valcambi for \$400 million", 27 July 2015, <http://in.reuters.com/article/2015/07/27/valcambi-m-a-rajesh-expo-idINKCN0Q109G20150727> (20-10-2015).

**Table 9: Leading gold refineries worldwide, by capacity**

Company	Country HQ	Parent/ownership	Refineries in Countries	Annual capacity (tonnes)
Valcambi	Switzerland	Rajesh Exports Ltd (100%)*	Switzerland	1,400
Metalor	Switzerland	Owned by the French Private Equity Astorg Partners SA, Swiss bankers and businessmen.	Switzerland, USA, Hong Kong, China and Singapore	650
Rand Refinery	South Africa	AngloGold Ashanti (42.4%), Gold Fields (2.8%), DRD GOLD (11.3%), Harmony Gold Mining (10.4%), SA	South Africa	600
Tanaka Kikinzoku Kogyo	Japan	Tanaka Holdings, Japan	Japan	540
PAMP	Italy	MKS, Switzerland	Switzerland, India**	450
Heraeus	Germany	Heraeus Holding, Germany	Germany, China and USA	450
Argor Heraeus	Switzerland	Heraeus Holding, Germany	Switzerland	400
Perth Mint	Australia	Government of Western Australia	Australia	300
Asahi Refining***	United States	Asahi Holdings, Japan	USA and Canada	250

\* Website Valcambi.<sup>156</sup>

\*\* MMTC-PAMP India is a joint venture between PAMP SA Switzerland and MMTC Ltd, a Government of India Undertaking – operates under the direct technical supervision of PAMP.

\*\*\* Asahi completed the acquisition of Johnson Matthey's gold and silver refinery business in March 2015.

Sources: The Real Asset Co, "Unveiling the gold market's working parts", 17 May 2013, <http://therealasset.co.uk/gold-market-unveiled/> (18-10-2015). Gold Bars Worldwide, "Major gold refiners & brands", no date, [http://www.goldbarsworldwide.com/section03/HTML\\_2\\_MajorGoldRefiners.html](http://www.goldbarsworldwide.com/section03/HTML_2_MajorGoldRefiners.html) (18-10-2015). D. Mariana, "Switzerland - The world's gold hub", Swissinfo, 12 October 2012, <http://www.swissinfo.ch/eng/switzerland--the-world-s-gold-hub/33706126> (18-10-2015).

Several countries are competing with Switzerland as the largest hub for gold refining. In Dubai, Kaloti Precious Metals plans to bring a new refinery into operation in 2015 with enough capacity to refine up to 1,400 tonnes of gold and up to 600 tonnes of silver. India's gold refining capacity continues to grow, but the country has difficulties in sourcing sufficient raw material doré, mainly because of the sheer number of refiners in the country. Since the Indian government supported the establishment of new refiners in India among others through tax incentives and by establishing a special economic zone in the north of the country, up to 20 new refineries have been added. In India alone, refining capacity now comfortably exceeds 800 tonnes. However, utilisation rates barely exceed 20%. Eight to ten Indian refiners are importing doré, of which three or four make up around 90% of the total.<sup>153</sup> India's largest and only London Bullion Market Association (LBMA)-accredited refiner is MMTC-PAMP. Valcambi, the world's largest refiner in terms of capacity has recently been acquired by the Indian company Rajesh Exports from Newmont Mining and Swiss shareholders.

<sup>152</sup> <http://www.valcambi.com/about-us/corporate-structure/>.

<sup>153</sup> Platts, "India's gold refiners struggling to source key raw material", Platts Metals Daily, 27 August 2015.



Rand Refinery, based in South Africa, states that it is refining 100% of the newly mined gold and silver in South Africa and 75% of all the gold mined in Africa.<sup>154</sup>

We see that global gold refining capacity is growing and exceeds the global mine production; the global refining capacity is roughly 2.5 times that of annual gold mining production.<sup>155</sup> This probably has the effect that gold will be easily accepted although the origin of the gold is not always clear.

A comprehensive list of all known processing facilities in the world is published by the US Department of Commerce, and it includes many of the known processing facilities that treat the minerals tin, tantalum, tungsten, or gold.<sup>156</sup> This list, published in September 2014 as a requirement of the Dodd-Frank Act,<sup>157</sup> was compiled by the International Trade Administration (ITA), limiting its scope to those refineries that produce gold that is ready for end-use (138 in total). ITA points out that gold from artisanal mines is most often processed into intermediate semi-refined forms of gold at or near the mine site before being processed by an 'end-refinery' into a form which is ready for end-use. Thus, the gold refineries listed may be one or several steps removed from the direct source of ores.

154 Rand Refinery, "Refining services", Services, no date, [http://www.randrefinery.com/services\\_refining.htm](http://www.randrefinery.com/services_refining.htm) (16-9-2015).

155 Platts, "India's gold refiners struggling to source key raw material", Platts Metals Daily, 27 August 2015.

156 US Department of Commerce International Trade Administration, "Department Of Commerce Reporting Requirements Under Section 1502(D)(3)(C) Of The Dodd-Frank Act World-Wide Conflict Mineral Processing Facilities", no date, <https://ita.doc.gov/td/forestprod/DOC-ConflictMineralReport.pdf> (18-10-2015).

157 This list combines existing lists from: 1) the U.S. Geological Survey, 2) the U.S. Government Accountability Office, 3) the Organization for Economic Co-operation and Development (OECD), 4) the London Bullion Market Association, 5) the Electronic Industry Citizenship Coalition (EICC) and the related Global e-Sustainability Initiative (GeSI), 6) the Dubai Multi Commodities Centre (DMCC), and 7) the World Gold Council (WGC).

## 6.4 Linkages of child-mined gold with the electronics sector

The central question is how artisanal gold production from countries where child labour in gold mining is documented reaches the supply chains of electronics companies.

The answer, however, is not readily available from official import and export statistics of national governments, or the sectoral industry organisations, simply because artisanal gold cannot obtain official export documents when it is derived from unlicensed (illegal) mines. Neither does the gold that is often smuggled to neighbouring countries for tax reasons end up on any formal records. Reliable statistics on artisanal gold production simply do not exist. Valcambi confirms that the official export figures for gold exports from certain geographies are unreliable and difficult to verify as unlicensed artisanal mined gold is purchased by licensed and unlicensed traders who then either sell on to an export license holder or smuggle the gold to another country.<sup>158</sup>

Take for example the gold mine production in Mali (see also chapter 4.1) which was 47.4 tonnes in 2014<sup>159</sup>. This figure merely reflects industrial production exported by the large mining companies in Mali.<sup>160</sup> According to Mali's National Statistics Institute, the country produced 45.8 tonnes of industrial gold in 2014, and 7.4 tonnes artisanal gold.<sup>161</sup> To make matters even more complicated, an unofficial estimation by the National Federation of Artisanal Gold Miners speaks of 21 tonnes for 2014.<sup>162</sup> This would raise the total gold mine production of Mali to 68.4 tonnes for 2014, a figure that is nowhere to be found in official Malian statistics but is probably the most accurate one. Import statistics reported by UAE confirm the estimation made by National Federation of Artisanal Gold Miners.<sup>163, 164</sup>

Another explanation for the unreliability of existing statistics is 'gold laundering'; this is the process of mixing illegally mined or unlawfully obtained gold with legal gold. The physical entry of illicit gold into the formal trade channels is one of the main distorting factors in gold trade statistics. It involves

158 Circumnavigation of tax obligations is certainly one reason for smuggling but is definitely not the only reason. This is a complex situation and smuggling has to be viewed in a holistic fashion taking into account many factors including cultural situations, traditional trading routes (that often pre-date the establishment of nation-states' boundaries and institutions), and the wider political economy and geography of the region in question. CEO Michael Mesaric, Valcambi, 12 November 2015, email to author.

159 R. O'Connell et al. (April 2015).

160 Large mining companies in Mali are Randgold Resources (SA), AngloGold Ashanti (SA), Iamgold (Can), Resolute Mining (Aus), Avneel Gold Mining (UK), B2Gold (Can), Merrex Gold (Can), Robex (Can), Hummingbird Resources (UK), Endeavour Mining (Can).

161 Reuters, "Mali's gold exports down 21 pct in 2014 on drop in artisanal mining", 8 April, 2015, <http://www.reuters.com/article/2015/04/08/mali-gold-exports-idUSL5N0X53FU20150408> (18-10-2015).

162 SOMO research, September 2014.

163 US Comtrade Statistics, [comtrade.un.org/](http://comtrade.un.org/).

164 Valcambi agrees that statistics of gold production and trade from ASM sectors are unreliable. "However we are aware the World Bank and Government of Mali has released a tender for an organisation to carry out a census and a situational analysis of ASM and build a database. This should generate more accurate figures and is also evidence that actors in this space are attempting to improve data on the ASM sector, as the basis for improving governance by producer governments and helping the market do supply chain due diligence. We welcome the efforts of development agencies and governments to improve and make publicly available data on and understanding of ASM sectors so that we are more able to enfranchise ASM enterprises into responsible supply chains." CEO Michael Mesaric, Valcambi, 12 November 2015, email to author.

smuggling, falsification of documents and over-reporting of legal production, among others.<sup>165</sup> Add to this the fact that some countries, like China, do not even publish trade figures.

For Ghana it is documented how the mixing up of legally mined gold and legal gold takes place. Human Rights Watch (2015) interviewed traders who stated that they were purchasing from unlicensed mining sites, and some were also buying gold directly from children. The Ghanaian government-owned gold trading company, the Precious Metals Marketing Company (PMMC), provides trading licenses to about 700 individual buying agents and trading companies without requiring traders to use any human rights criteria such as a check on the use of child labour when purchasing gold. PMMC officials stated they were aware of traders buying from sites without a mining license. Neither does the government Minerals Commission make its export licenses conditional on human rights due diligence.<sup>166</sup> This is how official Ghanaian gold export comes to include gold from various sources, not excluding gold mined by children.<sup>167</sup>

#### 6.4.1 The Ghana route

Human Rights Watch identified six international refiners that source from Ghana, a country with thousands of children working in gold mining: Metalor (Switzerland), Produits Artistiques Métaux Précieux (PAMP, Switzerland), Kaloti Jewellery International (UAE), Emirates Gold (UAE), Kundan (India), and Rand Refinery (South Africa). Four refineries confirmed their sourcing from Ghana and two (Kundan and Emirates Gold) did not respond.

Four Ghanaian exporters—Asap Vasa, Asanska, Guldrest, and AA Minerals – as well as the government-owned PMMC – told Human Rights Watch that they exported to Metalor. The London Bullion Market Association (LBMA) has awarded Metalor a Responsible Gold Certificate, and the Responsible Jewelry Council (RJC) has certified its compliance with the RJC Chain-of-Custody Standard. The company itself states that its business partners are licensed by the government to buy and export gold, and that gold can only be bought from duly licensed small-scale mining operations. However, the research of HRW revealed that licensed traders have bought gold from unlicensed sites, where child labour occurs, and that the government is indeed aware of the sale of gold from unlicensed mines to licensed traders and did not prevent it.<sup>168</sup> This means that the gold refined by Metalor most probably includes child-mined gold. Metalor comments that they have been sourcing from Ghana but that the list of gold suppliers is not correct. Metalor never bought gold from Guldrest as this company did not pass their due diligence. Metalor stopped doing business with ASAP VASA since December 2013 and AA Minerals since June 2013. As far as PMMC and Asanska are concerned, Metalor has stopped doing business with both of them in October 2015.

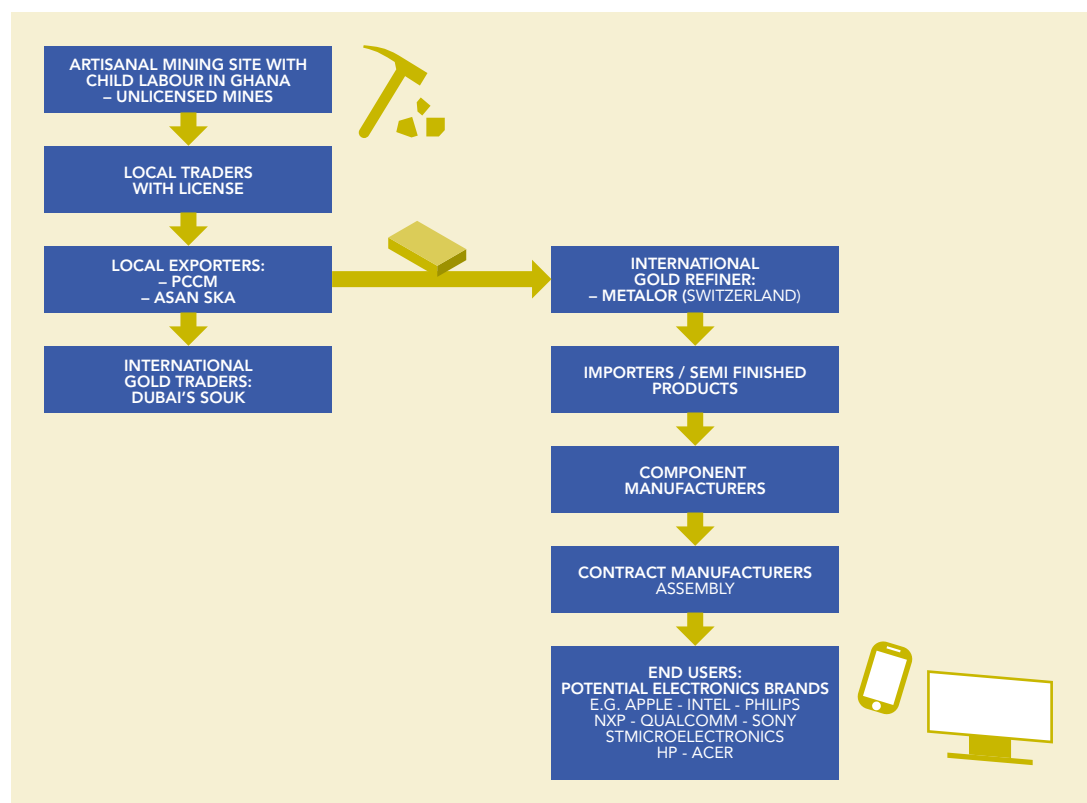
165 Profundo, "Options for sustainability – strategic gold chain assessment", 14 July 2015, [www.profundo.nl/files/download/BUZA1507.pdf](http://www.profundo.nl/files/download/BUZA1507.pdf) (15-5-2015).

166 Human Rights Watch, "Precious Metal, Cheap Labour", 10 June 2015, [https://www.hrw.org/report/2015/06/10/precious-metal-cheap-labor/child-labor-and-corporate-responsibility-ghanas\(14-10-2015\)](https://www.hrw.org/report/2015/06/10/precious-metal-cheap-labor/child-labor-and-corporate-responsibility-ghanas(14-10-2015)).

167 Valcambi comment: Valcambi refines gold on behalf of Newmont who have two large scale industrial mines in Ghana. We are aware of the issues you raise for the artisanal sector and due to these risks we have not received any materials from PMMC or artisanal miners in Ghana. CEO Michael Mesaric, Valcambi, 12 November 2015, email to author.

168 Human Rights Watch, 2015.

**Figure 16: The route from Ghana to the electronics sector**



Graphic by SOMO based on the 2015 report by Human Rights Watch, *Precious Metal, Cheap Labour*. Metalor has been sourcing from PMMC and Asanska until October 2015.<sup>169</sup>

The decision of the company stems from the fact that they want to avoid being exposed to the potential risk of child labour, even though PMMC and Asanska are authorised official exporters and Metalor does not have any reason to believe that any child labour was or is happening on their sites.<sup>170</sup>

Several Ghanaian traders, including the Precious Minerals Marketing Company Limited (PMMC) indicated that they were exporting gold to Dubai. Local traders who were not exporting themselves also mentioned Dubai as one of the main export destinations.

<sup>169</sup> In a reaction to this figure, HP mentions that Ghana was not included among the countries HP identified through their due diligence efforts as origin of gold. Leslie A. Collins, Hewlett Packard Enterprise, email to author 30 October, 2015. In the same email HP also states that it is not feasible for them to map the supply chain all the way back to the artisanal mines and this is also not possible due the layer of confidentiality between upstream and downstream actors which is built in in the assessment program they use.

<sup>170</sup> Mr. Jose Ramon Camino, Metalor, email to author 6 November, 2011.



Metalor told SOMO it does source from Ghana from industrial mining companies and not from artisanal or small scale mines where controlling child labour may be a challenge. Metalor has paid a site visit to its gold suppliers [the industrial mining companies in Ghana – addition SOMO] and no child labour has been observed there. This was done as part of their due diligence efforts to tackle child labour in its supply chain.<sup>171</sup> Indeed child labour is not considered to be a problem at industrial gold mines, the problem is that artisanal mined gold is purchased by licensed and unlicensed local traders who then sell on to an export license holder. This is how gold mined by children end up at PCCM and Asanska as reported by Human Rights watch, where Metalor sourced gold until October 2015.

#### 6.4.2 Great Lakes Region to Dubai

The United Arab Emirates (UAE) has long been a destination for gold smuggled out of the Democratic Republic of the Congo through neighbouring states. In January 2015, the Group of Experts on the Democratic Republic of the Congo reported to the Security Council that, despite the measures taken by the Government of UAE in 2013 to address gold coming from conflict zones, nothing has changed. The Group documented the willingness of jewellers in the gold souk (the gold market) of Dubai to buy gold from the Democratic Republic of the Congo with no questions asked about its origin. The authorities of UAE told the Group that only consolidated statistics per country are available, making it impossible for Dubai importers to know from which specific mines the gold is being imported. A representative from a refinery in Dubai confirmed that customs officers do not ask where imported gold comes from.<sup>172</sup>

The continuing situation of gold smuggled from the conflict zones to Dubai is confirmed and described in even more detail by the Partnership Africa-Canada (PAC) in its May 2015 report. This study established that the smuggling of ASM gold from the countries of the Great Lakes region<sup>173</sup> is a massive problem, and that the UAE (principally Dubai) is its primary destination. Among the report's conclusions was the fact that there are few effective controls on gold smuggling into UAE/ Dubai; import procedures for hand-carried gold appear to be lax and a mere formality. Dubai customs do not demand any kind of certificate of origin, export permit or other government documents from the country of origin. Once the courier has passed customs, there are two types of potential customers: the various gold souks, or Dubai's five gold refineries. Gold dealers in the Dubai souks showed to be eager to purchase ASM gold, with little documentation required. If these gold dealers want to sell the gold to one of the refiners they would be required to show documents indicating the origin of the gold in order to satisfy the due diligence requirements of the refiners. But the interviewed gold traders explained that they would classify the gold as scrap towards the refiners.<sup>174</sup> This is gold laundering through falsification of documents; illegal gold comes into the legal trade by classifying its origin as scrap.

171 Mr. Jose Ramon Camino, Metalor, email to author 6 November, 2011.

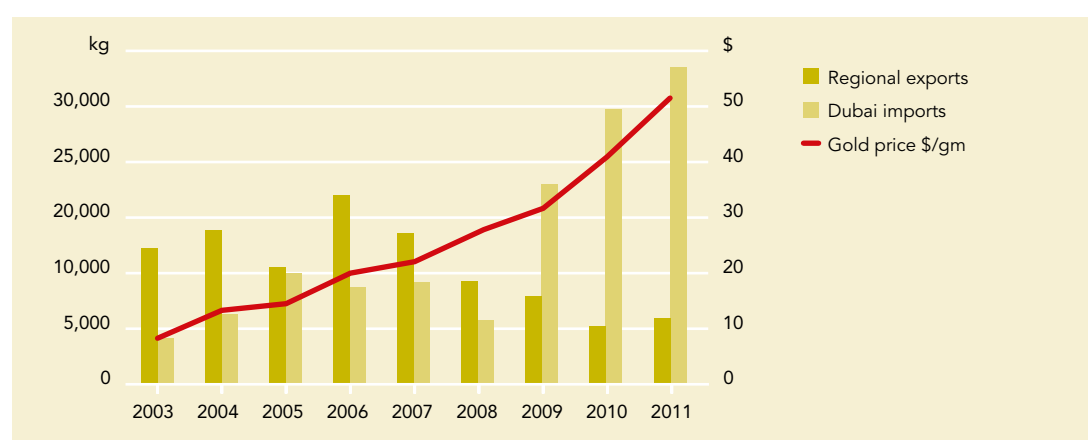
172 United Nations Security Council, letter from the Security Council Committee Chair, S/2015/19, 12 January 2015, [http://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/s\\_2015\\_19.pdf](http://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/s_2015_19.pdf) (21-10-2015).

173 The Great Lakes countries are: Angola, Burundi, Central African Republic, Republic of the Congo, Democratic Republic of the Congo, Kenya, Rwanda, Sudan, South Sudan, Tanzania, Uganda and Zambia.

174 Partnership Africa Canada (May 2015).

The following graphic shows the magnitude of the problem, as it illustrates the discrepancy between legal gold exports and official UAE imports. It becomes clear that the legal export figures from the countries of the Great Lakes Region decline from 2006 onwards, while the UAE import figures from these very same countries grow exceptionally. By 2011, over 22,500 kg of gold that was not officially exported from the region is being imported from the region into Dubai according to UAE import statistics. In other words, this 22,500 kilo ASM gold from the Great Lakes region was smuggled out of the region into Dubai where customs do not question the import of the gold. This is 80% of the total imports (28,516 kg, see also figure 17). As none of the industrial producers in the Grates Lakes Region ship to the UAE, it is logically that all of the gold entering Dubai from the Great Lake Region is ASM gold.

**Figure 17: Official gold export from the Great Lake Region compared to UAE's (Dubai) gold imports (kg).**



Source: PAC (2015)

## Taxes

Naturally, when gold is smuggled, no export taxes are paid over this gold. Countries such as Uganda, Kenya, Rwanda, Tanzania, and Zambia are therefore missing out important tax incomes. Collectively, against the most conservative tax rate of 2% they will be missing out some 15 million Euro in tax revenue<sup>175</sup> Gold smuggling into Dubai is thus not only affecting the DRC, it affects many other countries with artisanal gold production in the region.

The PAC study further shows that whenever a country raised its export taxes on gold, the ASM gold export dropped. Tanzania is a perfect example: a royalty increase was implemented at the end of 2009, and indeed in 2010 the ASM export declined substantially. There are strong indications that production is being smuggled to neighbouring countries with a lower royalty rate, or smuggled to Dubai where no royalties have to be paid at all.<sup>176</sup>

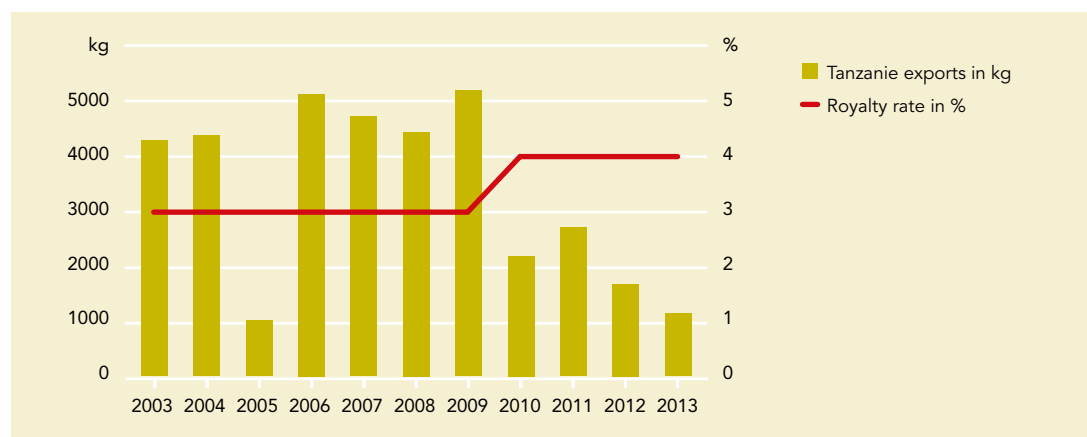
<sup>175</sup> Based on 22 October 2015 gold market prices.

<sup>176</sup> Partnership Africa Canada (May 2015).



Mining shaft in Ouroun gold mining site, Mali.

**Figure 18: Tanzanian inferred ASM gold exports (kg) and royalty rates (%)**



Source: PAC, May 2015, 'Contraband Gold in the Great Lakes Region'.

### 6.4.3 The route from Burkina Faso

Another country with a substantial proportion of child labour in artisanal gold mining is Burkina Faso. The Swiss NGO Berne Declaration was alerted by a whistle blower; in a subsequent report published in September 2015 they documented how artisanal gold from Burkina Faso, which is mined with the use of child labour, ends up at the biggest refinery in the world: the Swiss Valcambi.<sup>177</sup>

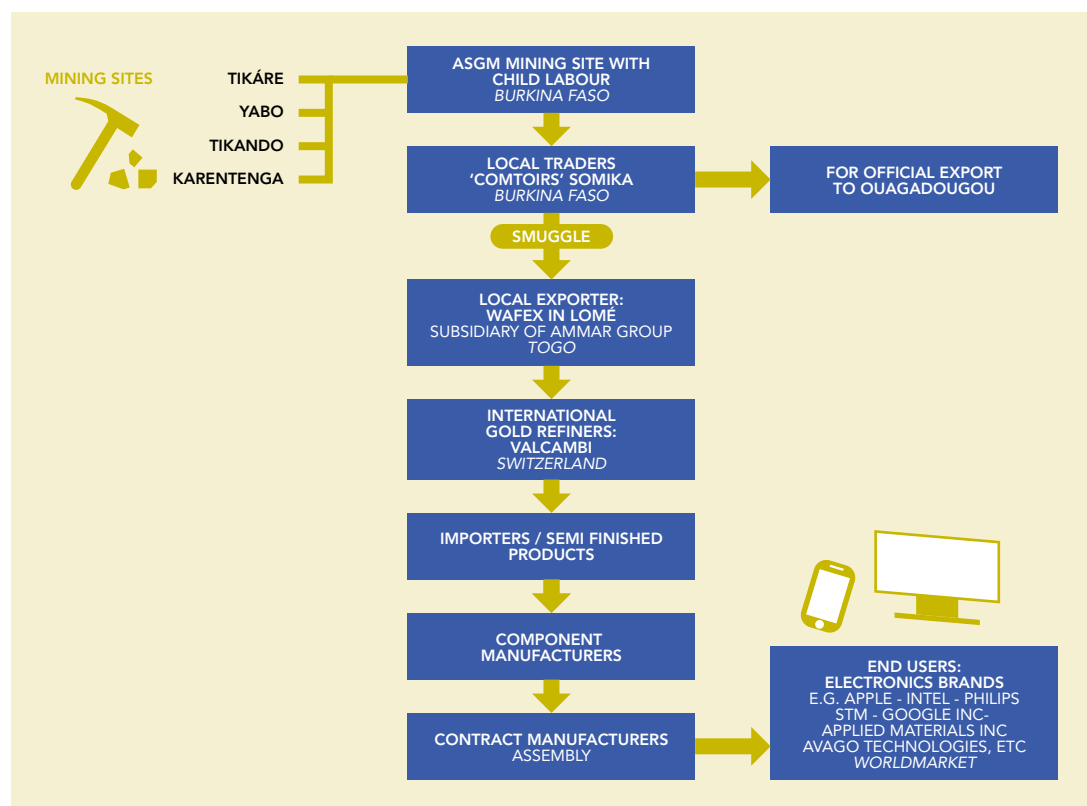
In short, the supply chain is as follows. The ASM gold from the mining sites in Burkina Faso, Tikaré, Yabo, Tikando and Karentenga, is sold to *comptoirs* (local traders). One of the largest local traders in Burkina Faso is SOMIKA. SOMIKA buys gold from these four sites and is one of the main suppliers of the Ammar Group's subsidiary, Wafex, in Lomé, Togo. The company subsequently makes arrangements to take the pre-refined gold, in batches of no more than 1 kg each, and smuggle it overland into Togo. Once in Lomé, the gold is "legalised"; it is declared to the relevant authorities and enters the formal trade system. From there on it is considered to be gold produced in Togo, even though Togo itself only has a small, and artisanal, gold production sector.<sup>178</sup>

177 Valcambi commented that "the Berne Declaration has not yet provided us with any substantiated proof that a.) gold has been smuggled from Burkina Faso to Togo and b.) that the alleged smuggled gold from BK has been refined in Valcambi and c.) the mines they allege we source from are the mines we actually sourced from at that time. However we remain open to receiving evidence that supports the claims made by Berne Declaration." CEO Michael Mesaric, Valcambi, 12 November 2015, email to author.

178 Mbendi, "Mining in Togo", <http://www.mbendi.com/indy/ming/af/to/p0005.htm> (02-11-2015).

In Lomé, the “legal” gold is purchased by Wafex SARL, a subsidiary of Ammar Group, which in turn exports the gold in batches of 50 – 100 kg to Switzerland using its Geneva-based arm, MM Multitrade SA (MMM). Ammar Group’s gold leaves Lomé on an Air France flight for Zurich, Switzerland, via Paris Charles-de-Gaulle. Valcambi SA then refines and sells this gold.<sup>179</sup>

**Figure 19: The route from Burkina Faso to the electronics sector**



Source: Graphic by SOMO based on a report by the Berne Declaration, ‘The golden racket’, 2015. The names of the electronics companies are added by SOMO and based on the Specialised Disclosure forms that companies fill in to report on the use of conflict-minerals to the Securities and Exchange Commission in the US.<sup>180</sup>

179 The Berne Declaration, “A Golden Racket”, September 2015, [https://www.bernedeclaration.ch/fileadmin/files/documents/Rohstoffe/BD\\_2015\\_Investigation-Gold.pdf](https://www.bernedeclaration.ch/fileadmin/files/documents/Rohstoffe/BD_2015_Investigation-Gold.pdf) (14-10-2015).

180 Valcambi claims “we have full traceability on our 99.999 gold used for the electronic industry and none of this gold came from Burkina Faso”. Valcambi has not provided details about their traceability. CEO Michael Mesaric, Valcambi, 12 November 2015, email to author.

As a result of the report of the Berne Declaration Valcambi has stopped accepting gold imports from clients sourcing from Burkina Faso and Togo and has instigated a process to ascertain the veracity of the claims made by the Berne Declaration. They are also reviewing their due diligence practices when sourcing from mined sources.<sup>181, 182</sup>

This route loses Burkina Faso – ranked as the seventh least developed country in the world – its royalties on gold (FCFA 500 per gram of gold). It is estimated that about 7 tonnes of gold are smuggled out of the country. The royalties on gold are ten times lower in Togo.<sup>183</sup>

#### 6.4.4 The route from Mali to electronics

The following example describes the supply chain from three mining sites in Mali where SOMO conducted its research in September 2015.

The sites Kola, Ouroun and Syentoula are three of the estimated 330 artisanal mining sites in Mali where child labour is a known phenomenon, as described in chapter 4. The gold from the artisanal mines is directly sold to a local buyer on site. The local buyers work for traders based in larger cities like Bougouni or Koulikoro. These traders transport the gold to Bamako, the capital, by motorbike, and sell it to one of the many buying houses. A limited number of specialized exporting companies buy up the gold from the buying houses. The exporting companies also receive gold from large mining companies producing in Mali.

Exporting companies sell the gold to international trading companies or refineries located in Dubai and Switzerland. Some of it is sold to foreign refineries who travel to Mali to buy the gold, and some of it is again smuggled into neighbouring countries.<sup>184</sup>

A recurring remark during the field research was that the gold is exported to Dubai and Switzerland. The name of the importers remained undisclosed during SOMO's research in 2015. In Human Rights Watch 2011 research, one of the importers was found to be Decafin (Switzerland)<sup>185</sup>, and the gold

181 CEO Michael Mesaric, Valcambi, 12 November 2015, email to author.

182 Valcambi commented; "Valcambi itself accepts it has a responsibility to carry out due diligence on its supply chains in conformance with the OECD Due Diligence Guidance. We are presently undergoing a review of our systems to ensure this conformance. This includes doing due diligence on the payment of taxes by our suppliers. However, we are of the opinion that it is also the responsibility of the government of Burkina Faso to create an enabling policy and legal framework that makes the formalisation and professionalisation of artisanal and small-scale mining, and the trading chains that emanate from them, more feasible and desirable for all businesses and individuals operating within their jurisdiction. Noting the capacity constraints faced by countries like Burkina Faso that sit at the bottom end of the development index, and noting that artisanal and small-scale gold operations exist (formally and informally) in over 70 nations, we appeal to development agencies, including those in Switzerland, and multi stakeholder platforms to provide resources and political impetus to such reforms in producer nations, so that businesses are both incentivised and enabled to operate formally, including paying their taxes." CEO Michael Mesaric, Valcambi, 12 November 2015, email to author.

183 The Berne Declaration (September 2015).

184 Research SOMO, September 2015.

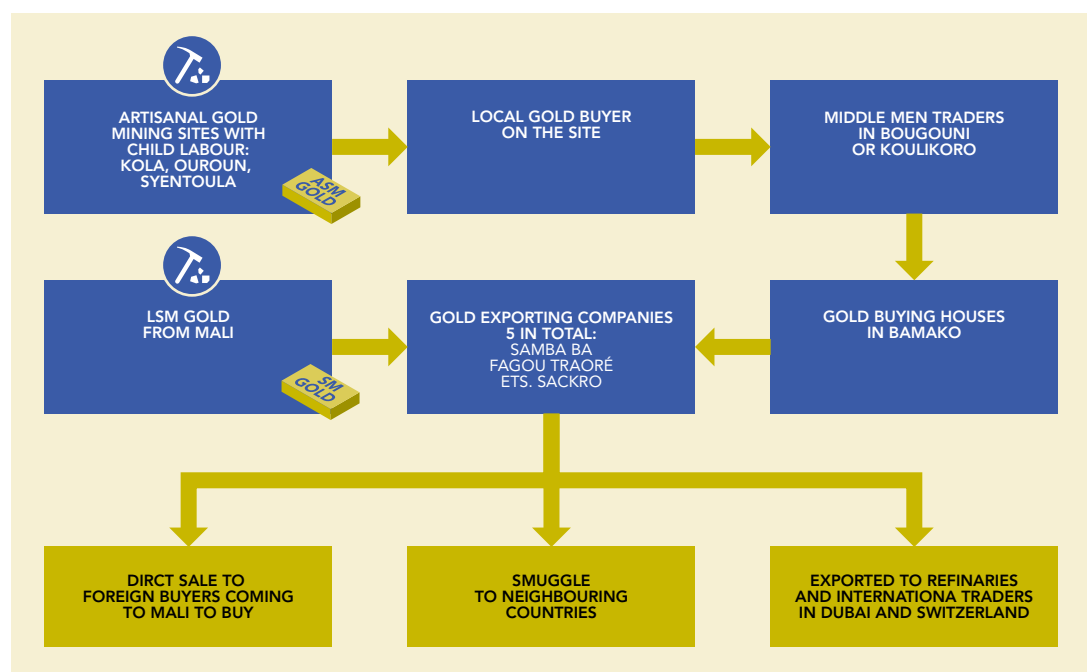
185 Human Rights Watch, "A Poisonous Mix", 6 December 2011, <https://www.hrw.org/report/2011/12/06/poisonous-mix/child-labor-mercury-and-artisanal-gold-mining-mali> (5-10-2015).



was later refined by Valcambi.<sup>186</sup> Valcambi comments to this that within 24 hours of this report [of Human rights Watch 2011] being published Valcambi suspended business with Decafin and stopped sourcing from Mali.<sup>187</sup>

The paragraph of this report that deals with Dubai explains that authorities and traders are not really interested in the origin of gold, and that from there the gold reaches the international markets, with falsified documentation if needed. Electronics companies cannot subsequently trace the origin of this gold.

**Figure 20: The route from Mali to the electronics sector**



Source: Graphic by SOMO based on field research in September 2015.

#### 6.4.5 The problem with Shanghai

The Shanghai Gold Exchange (SGE) constitutes another obstacle for electronics companies to trace the origin of gold. The US department of Commerce, which was required by the Dodd-Frank Act to make a complete list of gold refiners, was frustrated by the SGE's lack of transparency. When they introduced the list, they noticed that gold purchased through the SGE accounts for 15-20% of all the gold used for commercial purposes. That the vast majority of the gold sold worldwide is co-mingled

<sup>186</sup> The Berne Declaration (September 2015).

<sup>187</sup> CEO Michael Mesaric, Valcambi, 12 November 2015, email to author.





Worker at specialized gold melting workshop, Bamako, Mali

at the SGE is, according to the US department of Commerce, a well known fact. *“The SGE has not released, nor does it keep, records of where its gold is sourced. Therefore, any material that is purchased through the SGE is untraceable to a smelter, refiner, or processor of origin.”*<sup>188</sup>

Data about gold imports to the mainland are treated as a state secret by China.<sup>189</sup> Their strict regulation of the gold trade makes the tracing very complex. Currently all import and trade of gold must go through the SGE. Companies importing gold need to be accredited by the SGE to be eligible to import gold, and auditors of Chinese governmental agencies regularly verify whether the gold used by manufacturers in their production was indeed purchased through the gold exchange.<sup>190</sup>

The example of Fairphone is illustrative. The sustainable smartphone initiative is exploring possibilities to import Fairtrade gold from Peru into China so as to supply its PCB manufacturer. The search is complicated due to the lack of traceability of the gold through the SGE, which makes it hard to earmark the Fairtrade gold during the import process. All gold is comingled at the SGE, so when electronics manufacturers buy gold at the SGE, they cannot select the specific refiners they want to buy from. Fairphone therefore decided to use an alternative route, described further in chapter X.<sup>191</sup>

188 US Department of Commerce International Trade Administration (no date).

189 Reuters, “Shrouding China’s gold trade, more imports go under radar”, 10 June 2014, <http://www.reuters.com/article/2014/06/11/china-gold-shanghai-idUSL4N0OQ0HP20140611> (21-10-2015).

190 Fairphone, Blog, “The search for responsibly sourced gold for the Fairphone”, 11 May 2015, <http://www.fairphone.com/2015/03/11/the-search-for-responsibly-sourced-gold-for-the-fairphone/> (1-10-2015).

191 L. Gerritsen, Fairphone, Amsterdam, 1 October 2015, interview by author.

## 7 Electronics companies and responsible gold sourcing

### 7.1 Introduction

In 2007, SOMO published several reports under the banner of an awareness-raising campaign called makelTfair which highlighted serious human rights violations in the supply chain of electronics companies at the mining level.<sup>192</sup> The reports dealt with the mining of copper, tantalum and tin in the DRC and Zambia, tin in Indonesia and platinum in South Africa. This work was complemented with other global awareness campaigns that explained how natural resources in the DRC were being used to fund groups engaged in extreme violence and human rights violations. Taken together these efforts have resulted in a heightened international concern, as well as calls for action to governments and the electronics sector. This sector is particularly important given that they are large-scale end-users of specific minerals. The particular incidence of human rights violations is now widely recognised as being linked to the extraction of tantalum, tin, tungsten, and gold (3TG), also known as “conflict minerals.”

At that time the electronics companies argued that they could not influence the extractive industry since they only use limited amounts of these minerals in their products. Another argument they espoused was that there are typically seven or more tiers in the supply chain between the mine and the first tier supplier of the electronics brand, which left them with no leeway to do anything meaningful. However, in the course of the following year, a number of electronics brands jointly conducted their own research, and this attitude changed considerably. Crucial to this change was the acknowledgement that their sector constitutes a sizeable end-market for these minerals and as such, has considerable leverage. The result was the first step towards the Conflict Free Smelter Initiative (CFSI), an at that time groundbreaking project on transparency launched by the electronics industry but which has also been adopted by various other sectors that use conflict minerals in their products.

Most companies, however, only became active, after introduction of the US Dodd-Frank Act 1502 on conflict minerals of 2010, which came into effect on January 31 2013. Its introduction set an important precedent with its legal requirement that US listed companies conduct due diligence and mandatory reporting on their use of conflict minerals from the DRC or from adjoining countries.<sup>193</sup>

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192 makelTfair, “Connecting Components, Dividing Communities”, December 2007, [http://somo.nl/publications-nl/Publication\\_2549-nl](http://somo.nl/publications-nl/Publication_2549-nl) (9-10-2015).

SwedWatch, “Powering the mobile world: Cobalt production for batteries in the DR Congo and Zambia”, November 2007, [http://somo.nl/publications-nl/Publication\\_2319-nl](http://somo.nl/publications-nl/Publication_2319-nl) (9-10-2015).

193 The term “adjoining country” is defined in Section 1502(e)(1) of the Act as a country that shares an Internationally recognised border with the DRC, which presently includes Angola, Burundi, Central African Republic, the Republic of the Congo, Rwanda, South Sudan, Tanzania, Uganda, and Zambia. Securities and Exchange Commission, 17 CFR PARTS 240 and 249b, 13 November 20112, <http://www.sec.gov/rules/final/2012/34-67716.pdf> (24-10-2015).

The Act is a first step towards the integration of international human rights standards into national legislation for companies. The two leading international guidelines in this respect are not legally enforceable: the United Nations Guiding Principles on Business and Human Rights (UNGP)<sup>194</sup> and the Organisation for Economic Development and Cooperation's Guidelines for Multinational Enterprises (the OECD Guidelines).<sup>195</sup> The UNGP stipulates that "business enterprises whose operations or operating contexts pose risks of severe human rights impacts should report formally on how they address them". The OECD has developed the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas to help companies conduct conflict due diligence.<sup>196</sup> It provides a roadmap to help companies avoid contributing to conflict through their mineral purchasing practices. The OECD guidance includes a supplement on gold which outlines the recommended steps companies should take to identify and respond to risks in the gold supply chain.<sup>197</sup>

These international standards have not yet been integrated into EU legislation, however, the European Commission (EC), has proposed new regulation with a voluntary due diligence framework on conflict minerals. Their proposal is based on the OECD guidance, and restricted to companies that import 3TG minerals, and it is currently being discussed in the European Parliament and European Council, with a decision expected in 2016. The geographical scope of the EC proposal is not circumscribed to the DRC and its nine adjoining countries, as it includes 'conflict-affected and high-risk areas' not only connected to the DRC. Civil society organisations are currently lobbying against the limited scope of the legislation on 3TG minerals, trying to broaden it beyond merely minerals trading, importing and smelters/refineries, and against its voluntary nature.<sup>198</sup>

In this chapter we will give an overview of responsible sourcing initiatives related to gold, especially those related to the electronics industry. By giving examples of some policies and practices of individual companies we want to describe current due diligence efforts directed towards responsible sourcing of gold, including current initiatives to reduce child labour in gold mining.

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194 United Nations Human Rights Council, "Guiding Principles on Business and Human Rights; Implementing the United Nations "Protect, Respect and Remedy Framework", March 2011, <http://business-humanrights.org/sites/default/files/media/documents/ruggie/ruggie-guiding-principles-21-mar-2011.pdf> (24-10-2015).

195 OECD, "OECD Guidelines for Multinational Enterprises", 2011, <http://www.oecd.org/daf/inv/mne/48004323.pdf> (24-10-2015).

196 OECD, "Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas", 20 March 2013, <http://www.oecd.org/corporate/mne/GuidanceEdition2.pdf> (24-10-2015).

197 SOMO, 'There is more than 3TG', 2015, [http://www.somo.nl/publications-en/Publication\\_4167](http://www.somo.nl/publications-en/Publication_4167) (24-10-2015).

198 See for the CSO demands: <https://www.globalwitness.org/campaigns/conflict-minerals/conflict-minerals-europe-brief/more-150-civil-rights-groups-call-meps-strengthen-eu-conflict-minerals-regulation/> (24-10-2015).

## 7.2 Responsible gold sourcing initiatives

**Table 10: Short descriptions of responsible sourcing initiatives focused on gold or 3TG**

Name of initiative	Country HQ	Metal focus
The conflict Free Smelter Initiative (CFSI)	This project is founded by the ICT companies and electronics brands (EICC and GeSI members) and they designed the Conflict Free Smelter Program. The program aims to enable companies to source conflict-free minerals. <a href="http://www.conflictreesourcing.org">http://www.conflictreesourcing.org</a>	3TG
The Better Sourcing Program	The program is designed to implement the OECD Due Diligence Guidance, in collaboration with local operators, traceability systems providers and local implementation partners for monitoring and consultation. <a href="http://bsp-assurance.com/">http://bsp-assurance.com/</a>	3TG
Public-Private Alliance for Responsible Minerals Trade (PPA)	A multi-sector and multi-stakeholder initiative to support supply chain solutions to conflict minerals challenges, active in the DRC and Rwanda, focus on compliance with OECD Due Diligence Guidance. Coordinated by Resolve. <a href="http://www.resolve.org/site-ppa/resources/">http://www.resolve.org/site-ppa/resources/</a>	3TG
The Artisanal Gold Council	A Canadian NGO dedicated to improving the opportunities, environment, and health of people involved in ASGM in the developing world. Focus on mercury use and implementation of the Minamata Convention. <a href="http://www.artisanalgold.org/about-us">http://www.artisanalgold.org/about-us</a>	Gold (ASM)
Partnership Africa-Canada (PAC)	A Canadian NGO, they worked on the Regional Certification Mechanism (RCM) within the framework of the International Conference on the Great Lakes Region (ICGLR) to track four minerals contributing to ongoing conflict in eastern DRC, leading to the ICGLR Certification Manual.	3TG
Responsible Jewellery Council (RJC)*	Industry initiative, the RJC launched its Chain-of-Custody (CoC) standard applicable to gold and platinum group metals (platinum, palladium and rhodium) and defines responsible sourced as conflict-free as a minimum, and responsibly produced (human rights, labour standards, environmental impact, and business ethics) <a href="http://www.responsiblejewellery.com">http://www.responsiblejewellery.com</a>	Gold and platinum group
The World Gold Council (WGC)	Association of many of the world's leading gold mining companies. It released a Conflict-Free Gold Standard applying to LSM gold mining sites. Gold producers would demonstrate that their gold has been extracted in a manner that does not fuel conflict.	metals
The London Bullion Market Association (LBMA)	LBMA has setup a Responsible Gold Guidance in order to avoid contributing to conflict, human rights abuses, terrorist financing practices, and in order to comply with standards of anti-money laundering. This framework is mandatory for all refiners wishing to sell into the London Bullion Market, and is intended to assure that all London gold stocks are conflict-free due to compliance with an audited, conflict-free process. <a href="http://www.lbma.org.uk/responsible-gold">http://www.lbma.org.uk/responsible-gold</a>	Gold (LSM)
OECD	The OECD has launched a gold implementation program for the Supplement on Gold in May 2013. The program includes the possible design of innovative market opportunities for responsibly sourced gold from conflict-affected and high risk areas, in particular from artisanal and small-scale sources.**	Gold (LSM)
Fairtrade and Fairmined Standard	The Alliance for Responsible Mining (ARM) and Fairtrade International (FLO) developed this standard with the aim to promote the formalisation of the ASM sector, to improve working conditions for producers, to strengthen producer organizations, to improve environmental management (including mitigation of the use of mercury and ecological restoration), gender equality, progressive elimination of child labour in mining, fairer market access, benefits to local communities in mineral rich ecosystems, and improved governance to this sector.	gold

n.b. This table is not exhaustive; we have only mentioned responsible gold sourcing initiatives that can be relevant in relation to child labour and industry partners in the electronics sector. There are various other initiatives for governments (the ICGLR Certification) or related to environmental issues (the use of mercury and cyanide).

\* The founding organisations were ABN AMRO, BHP Billiton Diamonds, Cartier (part of Richemont), World Jewellery Confederation, Diamond Trading Company (part of De Beers), Diarough, Jewelers of America, National Association of Goldsmiths (UK), Newmont Mining, Rio Tinto, Rosy Blue, Signet Group, Tiffany & Co., and Zale Corporation.

\*\* OECD, 'Implementing the OECD Due Diligence Guidance', no date, <http://www.oecd.org/corporate/mne/implementingtheguidance.htm>, (27-10-2015).

Source: SOMO

In 2008, the members of the Electronic Industry Citizenship Coalition (EICC) and the Global e-Sustainability Initiative (GeSI) founded the Conflict-Free Sourcing Initiative (CFSI). EICC and GeSI are both sustainability initiatives set up by ICT companies and electronics brands. The CFSI is the most important initiative that involves responsible (gold) sourcing in relation to electronics companies, although not only electronics companies participate; currently over 200 companies and associations from seven different industries are part of the CFSI. Therefore this initiative will be examined more closely while other initiatives will only be shortly addressed.

### **The Conflict-Free Sourcing Initiative (CFSI)**

The Conflict-Free Smelter Program (CFSP) is the flagship program of the CFSI, launched in 2010. The aim of the program was to provide information about smelters and refiners in the metals supply chain to enable ICT companies to source responsibly and reduce the risk that 'conflict minerals' might make their way into their products. Nowadays the program actually helps companies to comply with the requirements of the Dodd-Frank Act, including the reporting requirements to the SEC. Every company listed on the US Stock Exchange has to publicly file a Specialised Disclosure (SD) Report on conflict minerals each year by 31 May.

CFSP aims to identify smelters and refiners that produce conflict-free materials. In order to confirm this status, third-party auditors verify that these smelters and refiners can be deemed conflict-free. A list of smelters and refiners that meet the standards of the audit is published online, this list currently includes 76 compliant gold refiners.<sup>199</sup>

The gold refiners that are compliant with the Responsible Jewellery Council's (RJC) Chain-of-Custody Certification Program (2012), or with the London Bullion Market Association's (LBMA) Responsible Gold Programme (2012) are also considered to be compliant with the CFSP standards as they have developed audit and certification programs on conflict-free gold, and are included in the CFSP list of conflict-free gold refineries.

If we look at how the CSFP and the cross-recognized certification programs of LBMA and RJC deal with child labour in gold mines, we see that CSFP is focusing all efforts on being conflict free and not on addressing child labour in the mining phase. The focus of LBMA is broader and more in line with the OECD Due Diligence Guidance, as there are references to human rights abuses (but not child labour specifically). The RCJ is even more broadly formulated and defines responsibly sourced as: conflict-free as a minimum, and responsibly produced at each step of the supply chain. Under the RJC Code of Practices, members should have systems in place to prevent the employment of children.<sup>200</sup>

The Conflict Minerals Reporting Template (CMRT) is an important tool developed by the CFSP that helps all participating companies to gather and share information about their 3TG supply chain.

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199 Conflict-Free Sourcing Initiative, "Conflict-Free Smelters & Refiners", no date, <http://www.conflictreesourcing.org/conflict-free-smelter-refiner-lists/> (18-10-2015).

200 Responsible Jewellery Council, "Responsible Jewellery Practices", no date, <http://www.responsiblejewellery.com/responsible-jewellery-practices/> (24-10-2015).

The mandatory information on the gold supply chain that needs to be collected by the CMRT<sup>201</sup> is the name of the smelter (refiner) and the indication whether this refiner is already on the conflict-free smelter list, and the country location of the smelter. The name of the mines, and even the country location of the mines are voluntary fields.<sup>202</sup> If the refiner does source from the DRC or adjoining countries, the auditing process will check whether the gold is conflict free. At this point auditors do know the country of origin and the mines, but this information can be kept confidential.

The audit standards for gold refiners of the CFSP are based on the OECD Due Diligence Guidance (and the Dodd-Frank Act). Child labour is addressed in the guidance; “While sourcing from, [...], conflict-affected and high-risk areas, we will neither tolerate nor by any means profit from, contribute to, assist with or facilitate the commission by any party of: [...] the worst forms of child labour; [...] Mining belongs to the worst forms of child labour according to the definition of the International Labour Organisation, convention 182.”<sup>203</sup> This means that child labour is only addressed if it occurs in conflict-affected and high-risk areas. The CFSP audit standards and instruction, however, do not mention child labour in any way,<sup>204</sup> seeing as all efforts are focused on conflict-free and not on child labour free sourcing. We can thus conclude that according to the OECD Guidance, companies should not source from gold mines with child labour in conflict-affected and high-risk areas. But the efforts of the CFSP draw a line at the point where gold is determined to be sourced or not from a conflict-free smelter. Children mining gold anywhere other than conflict affected areas, fall outside the scope of both the OECD Guidance and the CFSP.

The CFSI programme regularly collaborates with other programmes that address conflict minerals issues from an industry perspective. Some key complementary programs to the CFSI include: The Better Sourcing Program, iTSCi (only 3T)<sup>205</sup>, Public-Private Alliance for Responsible Minerals Trade (PPA), Solutions for Hope (tin and tantalum)<sup>206</sup> and Pact. Interesting to mention as well in this regard is the conflict free tin initiative (restricted to tin), which establishes an end-to-end conflict free supply chain from a mine in South Kivu to the end product<sup>207</sup>. These programs are also called ‘in-region’ certification or sourcing Initiatives, meaning that the efforts are directed to organizations working within the region to develop verifiable conflict-free supply chains. A second initiative that is interesting to mention around tin is the Sustainable Tin Mining project in Indonesia where interna-

201 We refer here to the smelter list tab in the excel format of the Conflict Minerals Reporting Template, which can be found here: <http://www.conflictreesourcing.org/conflict-minerals-reporting-template/>.

202 Regarding the reporting of the identities of the mines of origin in the Conflict Minerals Reporting Template the CFSI states that the Dodd-Frank Act only requires to report on *the efforts* to determine the location of origin [...]. The Conflict-Free Sourcing Initiative, “Mine Identification FAQ”, December 2013, [http://www.conflictreesourcing.org/media/docs/CFSI\\_DD\\_MineIdentification\\_FAQ\\_Dec2013.pdf](http://www.conflictreesourcing.org/media/docs/CFSI_DD_MineIdentification_FAQ_Dec2013.pdf) (24-10-2015).

203 OECD, “OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas”, 20 March 2013, <http://dx.doi.org/10.1787/9789264185050-en>, (25-10-2015).

204 The Conflict-Free Sourcing Initiative, Conflict-Free Smelter Program: Gold Supply Chain Transparency Smelter Audit Standard and Instruction, 12 June 2012, [http://www.conflictreesourcing.org/media/docs/CFSI\\_CFSP\\_StandardandInstruction\\_Au\\_ENG.pdf](http://www.conflictreesourcing.org/media/docs/CFSI_CFSP_StandardandInstruction_Au_ENG.pdf) (24-10-2015).

205 ITRI, “Home”, no date, <https://www.itri.co.uk/> (24-10-2015).

206 Solutions for Hope, “Home”, no date, <http://solutions-network.org/site-solutionsforhope/> (24-10-2015).

207 Conflict-Free Tin Initiative, “Home”, no date, <http://solutions-network.org/site-cfti/> (24-10-2015).





13-year old girl washing gold in Kola mining site, Bougouni District, Mali

tional electronics companies work with local mining companies on sustainable improvements such as implementation of international standards, including on child labour.<sup>208</sup>

### 7.3 Current due diligence efforts of electronics companies

In this paragraph we present a number of examples of how several large electronics brands deal with responsible sourcing (Samsung and Philips), as well as a component manufacturer (NXP, making semiconductors) and a supplier for component manufacturers (ASML, manufacturing the machines to make semiconductors). These examples, taken from different points in a supply chain – from brands to a component manufacturer, and from a supplier to a component manufacturer – provide an insight into the activities developed by companies in the electronics sector. These companies are part of the research because they have developed initiative(s) for example on improving transparency in their supply chains and were willing to provide details to SOMO.

#### Philips

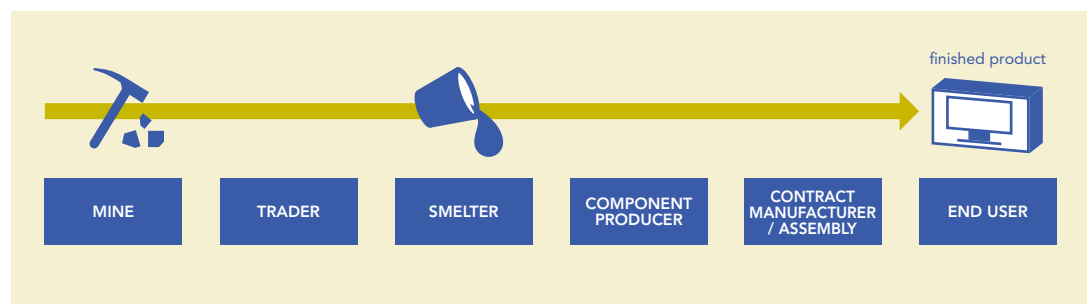
Philips is traded on the stock exchange of New York, and is consequently required to comply with the Dodd-Frank Act. In its Specialized Disclosure Form on conflict minerals (SD report) over 2014

208 M.Jacobs, Philips, 12 November 2015, email to author.



Philips mentions that its chain has 10,000 first tier suppliers. These first tier suppliers in turn select their suppliers (second tier suppliers), which likewise have their own group of suppliers (third tier), and so on. In a typical case, there may be seven or more tiers in the supply chain between a 3TG mine and Philips' first tier suppliers.<sup>209</sup>

**Figure 21: Simplified supply chain for Philips products**



Source Graphic: Philips Conflict Minerals Report, 2015.

Before reaching Philips' direct suppliers, 3TG will typically go from mines to traders, exporters, smelters or refiners, alloy producers and component manufacturers, and sometimes intermediate suppliers.

Philips is a member of the Conflict-Free Sourcing Initiative (CFSI). To report on conflict minerals as required by the Dodd-Frank Act, Philips makes use of the country of origin information for refining facilities that are validated through the Conflict-Free Smelter Program. This information is the result of the independent third-party audits available to CFSI member companies only.

**Tabel 11: Results RCOI (Reasonable Country of Origin Inquiry)**

Smelters	Gold
Smelters known to source from the <i>DRC</i>	0
Smelters known to source from the <i>DRC adjoining countries</i> (not from the DRC itself)	0
Smelters known to process only <i>recycled or scrap</i> materials	3
Smelters known to source from <i>outside the DRC</i> or adjoining countries	8
Smelters that disclosed mineral country of origin to auditors only	50
Smelters with <i>unknown</i> mineral origin	47
<b>Total</b>	<b>108</b>

Source: Philips Conflict Minerals Report, 2015.

209 Philips, "Philips Conflict Minerals Report", 12 May 2015, <http://www.philips.com/shared/assets/sustainability/Philips-Conflict-Minerals-Report.pdf> (25-10-2015).



*Gold miners camp in Kola, Bougouni District, Mali*

Philips identified 108 gold refiners (they call them smelters), but it must be noted that 47 refiners source gold from unknown origin. Fifty refiners disclose the origin of the gold to the auditors only, and not to Philips.<sup>210</sup> Philips explained to SOMO that for example the Shanghai Gold Exchange forms a potential bottleneck in the collection of credible upstream information; it is possible to trace gold back until the Shanghai Gold Exchange, from there it is almost impossible to identify the origin of the gold, because the Shanghai Gold Exchange isn't required by any regulation to provide transparency about the origin of the gold. Philips has addressed this issue within the CFSI working group.<sup>211</sup>

## **NXP**

NXP is a first tier supplier of Philips and of almost all other major electronics brands; they are a key supplier of semiconductors that are used in billions of passports, mobile phones, tablets and cars. Among others they buy very fine gold wire for their semiconductors. NXP says to be able to trace the gold back to their smelters and refiners. NXP provided SOMO with a list of the identified gold smelters. NXP does not buy directly from these smelters, they buy from material suppliers that obtain their gold from these smelters and refiners.<sup>212</sup>

<sup>210</sup> Philips (12 May 2015).

<sup>211</sup> M. Jacobs, Philips, 5 June 2015, telephone call with author.

<sup>212</sup> E.P. Schat, NXP, June 5, 2015, telephone call with author.

NXP must also comply with the Dodd-Frank Act as a US listed company. In its Specialised Disclosure form the company states to have identified 60 gold smelters and refiners of which 54 are conflict free certified and 3 are in the process of becoming certified<sup>213</sup> (54 of these suppliers are on the CFSI conflict free smelter list). NXP is a member of the CFSI.

## ASML

ASML produces machines to make chips, and supplies chipmakers such as NXP. Their efforts to report on their gold supply chain also originate from complying with the Dodd-Frank Act. They use gold in the coatings of the connectors on the printed circuit boards of the machines they make. These machines are not yet seen as part of the supply chain, because the gold that ASML uses will not make its way into end-products.

One machine will use about 250 grams of gold. ASML produces about a 100 machines a year, meaning that their total yearly use will be roughly 25 kg of gold. The gold is not sourced by ASML seeing as it is already processed in the components they buy; it is therefore their component suppliers who directly source the gold. ASML has drawn up a list of suppliers who are delivering components in which gold is processed. These suppliers have in turn traced the gold until the level of the smelter.<sup>214</sup>

ASML is a member of the CFSI, and uses the methodology of the Conflict Free Smelter program. In their Specialised Disclosure Report on Conflict Minerals, ASML mentions a response rate of 98% among the 55 suppliers they surveyed in 2014. A majority of the suppliers surveyed were not able to map and trace their supply chains back to the smelters used or to otherwise identify smelters supplying 3TG minerals. Of the 278 smelters that are identified by ASML, 141 are certified as conflict free by the CFSI (this is not only gold but all conflict minerals).<sup>215</sup>

## Submissions of the Specialized Disclosure Reports

A study evaluating the 2014 SEC submissions of the Specialized Disclosure Report on Conflict Minerals<sup>216</sup> looked at the following parameters; Assessing Exposure and Responding to Risk; Policies and Management Systems; Transparency and Reporting; Promoting a Conflict-Free Minerals Trade. They concluded that “companies in the information technology and industrials sector set the bar higher” and “have shown innovation and good faith in reporting”.<sup>217</sup>

Rather than avoid entirely sourcing in Central Africa (imposing a boycott), Apple for example wants “to expand the number of verified sources in this region, so that more people can earn a good living, in better conditions”. Several companies work with partners on the ground . Apple and Motorola

213 NXP, “Form SD”, 29 May 2015, [http://www.nxp.com/wcm\\_documents/about/corporate-social-responsibility/nxp-semiconductors-conflict-minerals-report-2013.pdf](http://www.nxp.com/wcm_documents/about/corporate-social-responsibility/nxp-semiconductors-conflict-minerals-report-2013.pdf) (25-10-2015).

214 F.van Bakel, 3 July 2015, interview by author.

215 ASML Holding, “Form SD”, no date, <http://www.sec.gov/Archives/edgar/data/937966/000119312515203845/d933503dex101.htm> (25-10-2015).

216 A. Arriaga & P. Jurewicz, “Mining the Disclosures. An Investors Guide to Conflict Minerals Reporting”, 2015 <http://static1.1.sqspcdn.com/static/f/432032/26314376/1434388831653/mining-the-disclosures-2014.pdf?token=%2FXouhEU8kQCK05PckjLhwc9Cs4%3D> (13-11-2015).

217 A. Arriaga & P. Jurewicz (2015), p. 4.

Solutions work with Solution for Hope and Apple supports the work of Partnership Africa Canada to track, certify, and export artisanal gold from eastern DRC, creating economic incentives for local miners and traders to sell via legal sales channels.<sup>218</sup>

There are also electronics brands that are not bound by the Dodd-Frank Act but are members of the CFSI and follow the methodology of the Conflict Free Smelter Program. For example, Dell is not listed, and Samsung is a listed company but not on a US Stock Exchange. We have detailed the practices of Samsung.

### **Due diligence efforts by Samsung Electronics**

Samsung is probably the biggest user of gold in the sector, given the enormous amounts of electronics it produces. What are Samsung's current due diligence efforts on conflict minerals? Samsung's aim with regard to responsible sourcing of gold is 'compliance' and 'to ban the use of conflict minerals'. Samsung mentions that they are "seeking ways to eliminate the use of conflict minerals in all of its products".<sup>219</sup> To this end, Samsung follows the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, and uses the Conflict Minerals Reporting Template developed by the Conflict Free Smelter Initiative.

Samsung has also developed its own internal compliance system: the Internal Trade Compliance System (TCS), with which the company monitors its own use of conflict minerals and their origin.<sup>220</sup>

Samsung wants to achieve 100% CFSP certified gold.<sup>221</sup> The company asks all its suppliers to sign a compliance agreement to adhere to Samsung's policy for avoidance of conflict minerals. Samsung is currently in the process of requiring about 2,800 supplier companies in their chain to sign such a compliance agreement.

Further, as of 2015, Samsung has identified 109 gold refineries through an investigation of their gold supply chain and indicates that it will be very difficult to identify all refiners.<sup>222</sup> The investigation revealed that 99 refiners were providing Samsung Electronics' critical suppliers with gold potentially sourced from conflict areas.

Of those 99 refiners identified, 74 have been verified as conflict-free, and an additional 7 have begun the CFSP audit process, 18 refiners have provided a declaration of conflict-free with source of origin.<sup>223</sup> Samsung will not publish or provide its list of gold refiners voluntarily, as they regard this as sensitive information.<sup>224</sup>

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218 Responsible Sourcing Network (20 March 2015).

219 W.van Tol, Director of Sustainability and Citizenship, Samsung, 10 November 2015, email to author.

220 Samsung, "Sustainability Report 2015", no date, [http://www.samsung.com/us/aboutsamsung/sustainability/sustainability-reports/download/2015/SAMSUNG\\_SUSTAINABILITY\\_REPORT\\_2015\\_ENG.pdf](http://www.samsung.com/us/aboutsamsung/sustainability/sustainability-reports/download/2015/SAMSUNG_SUSTAINABILITY_REPORT_2015_ENG.pdf), (24-10-2015).

221 W. van Tol, Director of Sustainability and Citizenship, Samsung, 2 October 2015, interview by author.

222 Samsung, "Sustainability Report 2015", no date, [http://www.samsung.com/us/aboutsamsung/sustainability/sustainability-reports/download/2015/SAMSUNG\\_SUSTAINABILITY\\_REPORT\\_2015\\_ENG.pdf](http://www.samsung.com/us/aboutsamsung/sustainability/sustainability-reports/download/2015/SAMSUNG_SUSTAINABILITY_REPORT_2015_ENG.pdf), (24-10-2015).

223 Corporate Sustainability Management Office, Samsung, letter to SOMO 12 October 2015.

224 W. van Tol, Samsung, 2 October 2015, interview by author.

Samsung mentions that “(...) digging this deep into the global supply chain has not been easy, and Samsung will continue to be presented with challenges in fully identifying where minerals in their products are being sourced”. They do “understand (...) the moral and ethical responsibility the company has to their consumers and the environment. Samsung remains committed to proactively participating in conversations and will support a number of (refiners) to get certified through a capacity-building trajectory”.<sup>225</sup> The company’s efforts are focused on ‘traceability’ to the level of the smelters (not to the level of mines). The suppliers must approach their smelters and establish whether they are sourcing from conflict affected areas. If this is indeed the case and it cannot be determined if the particular refiner is conflict free then supplier will be asked to change to a CSFP certified refiner

The case of Samsung is representative of many electronics brands; all efforts are focused on being conflict free, following the methodology of the Conflict Free Smelter Program. But child labour in the mining of gold is not addressed and the Codes of Conduct of the electronics companies which all include a ban on child labour in their supply chains do not reach to the gold mines.<sup>226</sup>

### Fairphone

The small, ethics-focused, smartphone producer Fairphone follows a different path: they want to integrate ‘fair trade / fair mined’ gold into the new Fairphone. They first tried to emulate bottom-up approaches like those that have been set up for tin and tantalum by the Conflict-Free Tin Initiative and Solutions for Hope. But they soon understood that the infrastructure necessary for a closed supply chain of conflict-free gold from the DRC is not yet there. Neither could such a closed supply chain from the DRC be established in time for the production planning of the next Fairphone, scheduled for the end of 2015. Fairphone therefore decided to look at existing fair trade initiatives in South America which are focused on more favourable trading and working conditions, better wages, worker representation and reduced environmental impact. Soon they started to collaborate with Fairtrade International and the Alliance for Responsible Mining (ARM).<sup>227</sup>

Fairphone then arranged to buy fairtrade gold from South America, and has now found a printed circuit board (PCB) manufacturer in China that is prepared to use this fairtrade gold in the production of the PCB’s for the Fairphone 2. There are still some hurdles ahead; Fairphone needs to find a fairtrade certified refiner who is capable of refining this small amount of gold separately from gold from other sources. Another hurdle is how to import this gold into China in a traceable way, since you would lose traceability of the Fairtrade gold if traded through the SGE.<sup>228</sup>

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225 W. van Tol, Samsung, 10 November 2015, email to author.

226 Samsung mentioned in correspondence specifically that “Samsung’s Supplier Code of Conduct aims to create ethical and responsible supply chain at all levels. Our CoC encourages our suppliers to go beyond the management of ethical compliance at their own facilities to reach their own suppliers. While the CFSI program and our conflict minerals policy does not mention child labor or gold mines, the company’s Supplier CoC enforces Samsung’s zero tolerance policy on child labor, which addresses this issue even at the company’s sub-supplier level.”, W. van Tol, Samsung, 10 November 2015, email to author.

227 Fairphone, “The search for responsibly sourced gold for the Fairphone”, 11 March 2015, <https://www.fairphone.com/2015/03/11/the-search-for-responsibly-sourced-gold-for-the-fairphone/> (25-10-2015).

228 L. Gerritsen, Impact and Development, Fairphone, 1 October, 2015, telephone call with author.

## 8 Conclusions

Artisanal gold mining is extremely dangerous; miners descend deep into the ground without proper safety measures; in Tanzania, children climb down into 8-15 meter shafts using their feet to put pressure on the walls or holding onto a rope. Mines are often not safe; there have been numerous reports of mines collapsing, killing the adults and children who were working inside. Mines can lack ventilation, suffocating adults and children at work. The dust can cause lung diseases, also for children working in the vicinity of mineshafts. Children are not only involved in the actual mining of soil that contains ore, but also participate in tasks such as pulling up sacks which are carried to a processing area, crushing and grounding soil, washing or panning gold. All of this is often physical, strenuous labour. They might use highly toxic materials such as mercury or cyanide to separate the gold from all other material. Children can also be found working on other chores near the mining sites such as selling water and cooking and selling food. The research conducted by SOMO in Mali once again illustrated why gold mining is categorized by the ILO under the worst forms of child labour.

There are about 10-15 million artisanal gold workers worldwide, including at least 1 million children, who extract about 15 to 20% of the global annual gold production.

The electronics industry is the third largest user of gold, mostly for printed circuit boards and electrical connectors. The electronics companies that we all know, Apple, Sony, Philips, and Samsung, are at the top of the electronics production chain. This chain is rather an extensive network of all kinds of suppliers including mining companies, smelters and refiners, components manufacturers, and contract manufacturers.

Many electronics companies have accepted the EICC code or have specified their own code of conduct. These codes of conduct that describe the labour, human rights and environmental conditions for all the products in the supply chains of these companies, are supposed to cascade down this production chain, each tier imposing conditions on the next tier, up to and including the minerals. Efforts so far, though, have concentrated on the first production tier, in several instances the second or even third tier. The codes of conducts of companies – all of which include, without exception, a ban on child labour – do not however reach the mining sites. Neither are any efforts taken by electronics companies to combat child labour in artisanal gold mines.

The larger brands, and a substantial amount of manufacturers are organised in the Electronics Industry Citizen Coalition (EICC) and the Global e-Sustainability Initiative (GeSI). Through these business initiatives they also become involved in several sustainability efforts. Electronics companies have taken very specific efforts around conflict-free minerals, spurred by consumer campaigns and legislation such as the Dodd-Frank Act and the upcoming EU regulation. These initiatives show that the electronics industry is capable, especially when pushed by (upcoming) regulation, to take initiatives that concern the far end of the production chain. With the Conflict Free Smelter Program, the sector has positioned itself as a front runner, providing proof for other industries that it is possible to identify and source from conflict-free smelters. Next to this, other initiatives such as the in-region programs Solutions for Hope and the Public-Private Alliance for responsible Minerals trade (PPA),

show that some companies even take further steps and start their own projects in mining areas to improve working conditions and clean the local minerals trade.

The tracing and tracking of artisanal gold is extremely difficult, as the gold supply chain is plagued with major obstacles. Although significant progress has been made in the formal gold industry with the London Bullion Market Association (LBMA) – making it for example mandatory for gold refiners to undergo audits – the problems with the gold supply chain grow with the increasing artisanal production. One of the main obstacles is the mass smuggling of artisanal gold to neighbouring countries, both for tax avoidance and to sidestep the risk of having it labelled as conflict gold. It then enters such countries as Dubai, where it can be refined and sold on to the international market without providing information on the origin. Falsification of documents, failure to request documentation (Dubai) or to file the relevant paperwork (Shanghai Gold Exchange) makes it impossible to track the country of origin of artisanal gold. Given that gold refineries occupy a key position in this gold supply chain, they should be more forthcoming about where they buy their gold.

In this report SOMO has accomplished an overview of several supply chains, linking artisanal gold mining that involves child labour across several countries to the international refineries from which electronics companies source. This has been done by collecting local gold supply chains from different reports on child-mined gold and linking them with data submitted by electronics companies, such as the Specialized Disclosure Reports on conflict minerals, which companies listed in the US must file at the Securities and Exchange Commission for public disclosure. In these reports, companies will list the names of the gold refiners they can identify as suppliers in their production chain through data obtained from their component manufacturers. SOMO concludes that artisanal gold produced with the involvement of children ends up in the electronics supply chain, in commodities such as smartphones, tablets, cars, fridges.

Based on chapter 7 we can conclude that according to the OECD Due Diligence Guidance, which the electronics sector used as a basis for their Conflict Free Smelter Program (CFSP), companies should not source from gold mines in conflict-affected and high-risk areas where child labour occurs. However, the audit instructions developed by the CFSP show that its efforts only go as far as determining whether the gold is sourced from a conflict-free smelter. The possible occurrence of child labour is not an issue, and is therefore not receiving any attention. The children who mine for gold outside conflict affected areas fall squarely outside the scope of both the OECD Guidance and the CFSP.

As the origin of gold disappears inside the cogs of the Shanghai Gold Exchange, travels incognito through Dubai, and becomes blended in Switzerland and Miami refiners, it remains impossible for brand companies and consumers alike to tell exactly where the gold in a specific phone, laptop or washing machine comes from, and whether child labour was involved in its making. To date there are no initiatives from the electronics industry, the third largest buyer of gold, on child labour in the gold mining industry.

There are, however, possibilities for change. Current efforts on conflict-free minerals offer an interesting starting point of disclosure. The close relationship between a substantial amount of brands and component manufacturers, and joint sustainability efforts – both current and past – open up possibilities that could pan out further. In the recommendations we set the first steps towards sketching future opportunities.



## 9 Recommendations

### 9.1 Principles

Our point of departure is that policies and practices should be aiming at eliminating child labour in the mining of gold, but should not be directed at eliminating artisanal gold mining. Artisanal gold mining is providing income for 10-15 million artisanal miners and their families and communities, therefore eliminating this form of livelihood would have an enormous impact. It is important to take measures that will make the elimination of child labour an integral part of all efforts to improve the overall artisanal mining and labour conditions for (adult) workers. Part and parcel of such an improvement at artisanal mining sites are measures that are focused on ensuring internationally accepted labour rights as defined by the ILO and by the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas. Apart from eliminating child labour, these are: ensuring safe working conditions, banning of forced and compulsory labour; any forms of torture, cruel, inhuman and degrading treatment; other gross human rights violations and abuses such as widespread sexual violence and accompanying measures focused on reaching a stable family income as well as sustainable communities.

### 9.2 Recommendations for electronics companies and their business associations

- ❑ Acknowledge that your responsibility also applies to the mining phase, including the (artisanal) mining of gold, that the gold you use might come from mines where child labour occurs and where working conditions do not comply with ILO Conventions.
- ❑ Improve current due diligence efforts related to conflict minerals and stimulate refiners to take up an active role in these efforts too; integrate internationally accepted labour rights, including child labour, in the Conflict Free Smelter Program, following the OECD Due Diligence Guidelines for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Area.
- ❑ Move beyond the area of conflict minerals in your due diligence with regard to the gold used in your products; do not focus solely on gold sourced from the DRC and neighbouring countries but extend your policies to all countries producing (artisanal) gold.
- ❑ As the production of (artisanal) gold is related to child labour and other forms of human rights violations, electronics companies should – in line with the UN Guiding Principles on Business and Human Rights and the OECD Guidelines – stimulate and support their suppliers to engage in prevention and implement effective remediation measures.

- Go beyond mere mapping and transparency to develop and join in-region programmes or initiatives together with your suppliers and local stakeholders in order to improve the situation in gold mining regions, including the working conditions in artisanal mining.
- Collaborate with other companies in the sector and with other sectors (jewellery, investment etc.) in order to strengthen ongoing efforts and develop larger and more effective remediation programmes.
- Industry organisations within the electronics sector should stimulate learning and knowledge exchange concerning sustainability efforts in gold mining, and request continuous improvements from their members in this respect.

### 9.3 To make the above more concrete:

- Companies must map – if possible, jointly – their entire gold supply chains including the artisanal gold supply, and share this information publicly.
- Companies have to know which countries, specific regions and suppliers they source gold from, carry out a risk assessment of all the countries and regions involved, and identify in which supply chains and at what specific points the company can use its influence to achieve a positive impact. The risks identified have to be mitigated through initiatives taken by companies together with other stakeholders. It is crucial to involve local organisations and initiatives in both risk assessment and remediation efforts.
- An engagement with actors within the supply chain, as well as other local actors, to work towards progressive improvement in the artisanal and small scale mining, is to be preferred over avoidance of artisanal mining.
- Work with and/or support local initiatives to get children from gold mine areas to school and to make sure that all children receive full-time quality education.
- Industry organisations within the electronics sector should support the companies in their (joint) risk assessments and require member companies to adhere to internationally accepted standards and improve performance, both individually and within joint programmes.

## 9.4 Recommendations for gold refiners

- Gold refiners should strengthen their due diligence in line with the UN Guiding Principles on Business and Human Rights; start procedures to identify and remediate international accepted labour rights including child labour in the gold supply chain up to the gold mining sites, and annually publish independent reports on its supply chain due diligence.
- Increase traceability and transparency in the countries they source from, and publicly share the information.
- Improve current due diligence efforts related to conflict minerals: integrate international accepted labour rights – including provisions against child labour – in the Conflict Free Smelter Program, following the OECD due diligence guidelines on conflict minerals.
- As international gold refiners hold significant power in the supply chain, they should acknowledge their responsibility and take the lead in introducing and promoting a stringent standard. They should likewise promote practices and joint interventions to eradicate child labour from their full supply chains and remediate any violations encountered.

## 9.5 Recommendations to African governments

- Work with local stakeholders (local government, companies, mining cooperatives, mine owners, NGOs, unions, local child rights groups, etc.) to raise awareness about child labour, and set up programmes to prevent and remedy both this and other labour rights violations found in mining sites.
- Work with pan-African and/or regional African organizations (e.g. ECOWAS) to develop programmes that tackle child labour and improve working conditions for adult workers in gold-producing communities. Wherever possible, channel these efforts into the context of regularising illegal mining.
- Ensure an effective control of mines operating within the bounds of legality, and take action to tackle both money-laundering and the smuggling of gold to other countries.
- Improve the education infrastructure and make sure that all children in mining areas receive full-time quality education.

## 9.6 Recommendations to governments of importing countries

- Develop a programme to monitor the use of child labour and other human rights violations in all gold currently imported in any form, and develop remedial plans of action specific to each country/region and to each type of importer and end-user.
- Engage countries that have a substantial gold sector in a dialogue on tackling child labour and human rights violations; find ways to co-operate with them on solutions and develop jointly with those countries effective programmes that involve companies and civil society.
- To the government of The Netherlands: Develop a covenant with all relevant stakeholders based on all three pillars of the UN Guiding Principles on Business and Human Rights; seek international co-operation to implement a robust programme with a commitment from all actors to tackle child labour and to implement international accepted labour rights in gold supply chains. Include an independent complaint mechanism to ensure remedy in case of violations.



*Gold dust from artisanal gold mine, Kola mining site*

## Annex 1

# Child labour in artisanal gold mining worldwide

Country	Child labour in ASGM	Estimation of total ASGM	Estimation of child labour	Year of estimation and source
Bolivia	Yes	No estimate available	65,000 in Bolivia, Peru and Ecuador likely a low estimate if 61 thousand in Peru alone.	2006 <sup>1</sup>
		No estimate available	120,000 (all minerals)	2001 <sup>2</sup>
Burkina Faso and Niger	Yes	200,000 - 500,000	60,000 - 250,000	2006 <sup>3</sup>
Burkina Faso	Yes		20,000	2010 <sup>4</sup>
		ASGM benefits at least 650,000		2013 <sup>5</sup>
		200,000	30 - 50% minors, amounting to 60 - 100 thousand children in ASGM.	2015 <sup>6</sup>
Cameroon	Yes	from 5000 to 50,000 ASM	Children in mining camps and participation in ASGM is a common occurrence.	2014 <sup>7</sup>
Colombia	Yes	200,000	No estimate available	2011 <sup>8</sup>
		No estimate available	At least 5,000 (all minerals)	No date <sup>9</sup>
DRC	Yes	No estimate available	40% of ASGM estimated to be children	2013 <sup>10</sup>
		At least 500,000 (all minerals) in east DRC alone	As many as 40% of workers in artisanal mining in the DRC are children (2013 <sup>11</sup> ). This would make 200,000 child miners for all minerals. For gold mining: Children constituted 30 - 35% of the total labour force in the mine. <sup>12</sup>	2010 <sup>13</sup>
Ecuador	Yes	90,000	No estimate available	2012 <sup>14</sup>
		No estimate available	65,000 in Bolivia, Peru and Ecuador likely a low estimate if 61 thousand in Peru alone.	2006 <sup>15</sup>
Ethiopia	Yes	500,000 – 1 million (mostly ASM workers)	No estimate available	2013 <sup>16</sup>
Ghana	Yes	500,000 - 1 million	At least 7,000 (7,428 says govt (alleged to be inaccurate by Human Rights Watch)).	2013 <sup>17</sup>
			10,000	2006 <sup>18</sup>
Guinea	Yes	At least 40,000	No estimate available	No date <sup>19</sup>
Indonesia	Yes	No estimate available	No estimates available; UN IDO state child labor can be very commonplace in ASGM in Indonesia.	2014 <sup>20</sup> and 2004 <sup>21</sup>

Country	Child labour in ASGM	Estimation of total ASGM	Estimation of child labour	Year of estimation and source
Ivory Coast	Yes	No estimation available	Thousands of children between the ages 8 to 16 are in plantations and gold mine as employees (Edmonds, 2008; Ikejiaku, B. V., 2009).	2008, 2009 <sup>22</sup>
Mali	Yes	100.000 - 200.000	20.000 - 40.000	2011
		1.000000 <sup>23</sup>	And estimation of 200,000 by the Mali chamber of commerce. It is estimated that 20% of the ASGM miners are children. <sup>24</sup>	2015 <sup>25</sup>
Mongolia	Yes	61,000		2012 <sup>26</sup>
		100,000	10,000 – 15,000	2005 <sup>27</sup>
Mozambique	Yes	60,000 ASM	“Children between the ages of 6 and 10 are involved in activities similar to those of the women.”	2001 <sup>28</sup>
Nicaragua	Yes	No estimate available	At least 400	2006 <sup>29</sup>
Niger	Yes	50,000	Up to 22,000	2014 <sup>30</sup>
Peru	Yes	100,000 – 500,000	50,000	2010 <sup>31</sup>
Philippines	Yes	500,000	No estimate available	2006 <sup>32</sup>
		200,000 – 300,000	18,000 “women and children”	2011 <sup>33</sup>
		No estimate available	Survey of total child labour (3.03 million), of which 0.7% work in “Mines and office[s]” (all minerals), thus 21210.	2011 <sup>34</sup>
		200,000 – 300,000	18,000 (all minerals)	2015 <sup>35</sup>
Burundi	Yes	An estimated 10,000 artisanal miners (with ca. two thirds of these engaged in gold mining) 6,600 ASGM.	No estimation	2015 <sup>36</sup>
Senegal	Yes	No estimate available	No estimate available	
Sudan (South)	Yes	About 60,000 people mine for gold in South Sudan.	No estimation. “The back-breaking labour is even carried out by women, children and elderly people who are driven to work because of widespread hunger.”	2013 <sup>37</sup>
Suriname	Yes	No estimate available	At least 167 (based on three mines only).	2012 <sup>38</sup>
		20,00 - 25,000	No estimate available	2013 <sup>39</sup>
Tanzania	Yes	there are between an estimated 300,000 and 550,000 people engaging in ASM in Tanzania.		J. Childs/ Geoforum 57 (2014) 129–137
		800,000 (government estimate)	“Thousands” (Human Rights Watch estimate).	2012 <sup>40</sup>
Uganda	Yes	28,000 <sup>41</sup> 18,000 in region Karamoja (this number includes men, women and children) <sup>42</sup> 80.000 in Karamoja region. <sup>43</sup> If in one region 80,000 then estimation of 100,000 for total country is realistic.	12.000 (mining in general, including gold)	2011 - 2012, number of children in mining <sup>44</sup>

Country	Child labour in ASGM	Estimation of total ASGM	Estimation of child labour	Year of estimation and source
Zambia	Yes	ASM 30,000	No estimation	2001 <sup>45</sup>
Zimbabwe	Yes	No estimate available	Govt. survey of total child labour (168,760) of which 0.37% in mining and quarrying, thus 624 (all minerals)	2014 <sup>46</sup>
		500,000 ASM, off these 70% are into gold mining, which makes 350,000 ASGM	153,000 "women and children", 70% makes 107,100 women and children in ASGM.	2015 <sup>47, 48</sup>
		300,000 – 400,000 ASGM	No estimate available	2007 <sup>49</sup>
		300,000 artisanal gold miners	at least 50% (i.e. more than 150,000) are believed to be women and children	2001 <sup>50</sup>

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