



# Verisk Maplecroft's Conflict Minerals Risk Analysis

Verisk Maplecroft's conflict minerals analysis quantifies 20 political, social and environmental risk related to the production of tantalum, tin, tungsten and gold (3TG) in the largest global producers of the minerals. The focus of the risk assessment is at the mine level of the value chain, though risk issues present across the wider value chains of the assessed commodities are also incorporated.

Identifying conflict-afflicted regions using the Conflict and Political Violence Risk Index			
Tin	Tantalum	Tungsten	Gold
China	Rwanda	China	China
Indonesia	DR Congo	Russia	Russia
Peru	Brazil	Canada	Australia
Bolivia	Mozambique	Vietnam	USA
Brazil	China	Bolivia	Peru
Myanmar	Nigeria	Austria	South Africa
Australia	Ethiopia	DR Congo	Canada
Vietnam	Burundi	Portugal	Mexico
Malaysia		Rwanda	Indonesia
DR Congo		Australia	Ghana

**Legend:**
■ Extreme risk 0 - 2.50 
 ■ High risk >2.50 - 5.00 
 ■ Medium risk >5.00 - 7.50 
 ■ Low risk >7.50 - 10.00 
 ■ No data

Source: Verisk Maplecroft

## Conflict Minerals

Gold, tin, tantalum and tungsten originating in DR Congo are referred to as 'conflict minerals', and their procurement is subject to a number of existing and proposed regulations. The four minerals are widely acknowledged by human rights campaigners as having significantly prolonged and intensified two periods of war in DR Congo between 1996 and 2003, which left up to up to five million people dead. Conflict minerals continue to exacerbate instability in the country's eastern Kivu provinces where armed groups are engaged in a power struggle over control of the region's mineral wealth. Sexual violence, including rape, genital mutilation and sexual slavery has been a pervasive characteristic of instability in DR Congo, but is particularly associated with armed factions and commonly used to intimidate local communities.

Conflict mineral regulations require that businesses sourcing 3TG conduct due diligence on their suppliers in order to avoid utilising those minerals produced in mines controlled by armed groups. Section 1502 of the Dodd Frank Act was passed in the US in 2014, while the proposed EU regulation on conflict minerals will likely be adopted by 2021. Furthermore, the OECD framework on conflict minerals provides guidance to businesses sourcing minerals from conflict-affected regions, and underpinned the Chinese Due Diligence Guidance for Responsible Mineral Supply Chains adopted in 2015.

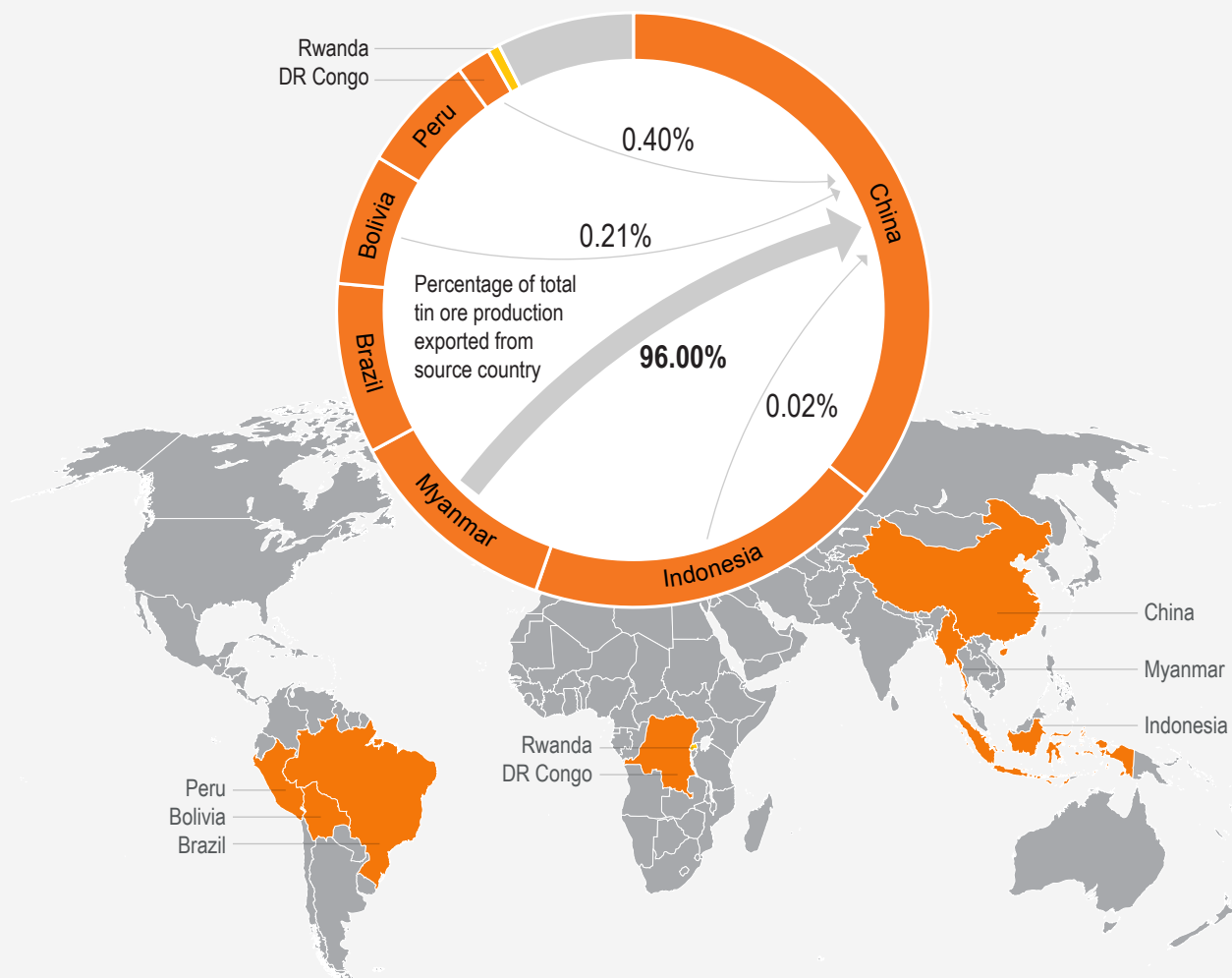
Verisk Maplecroft's conflict minerals assessment has identified a multitude of political, social and environmental risk issues associated with the production of the four minerals outside of DR Congo. This further muddies supply chain transparency efforts for businesses committed to utilising conflict-free raw materials in their product that are also not linked to issues such as human rights violations or environmental degradation.

3TG production occurring in mines controlled by armed groups also occurs outside of DR Congo. In Colombia, FARC rebels have been heavily involved in illegal gold production in departments including Antioquia, with police sources reporting in 2013 that illegal gold mining was five times as lucrative as cocaine production for rebel groups operating in the country. While the FARC signed a widely publicised peace deal with the Colombian government in 2016, reporting suggests that illegal gold mining will continue under the control of other rebel groups including the ELN, which has reportedly attracted former FARC members since the peace deal was signed and is also involved in illegal tungsten production.

Furthermore, the United Wa State Army (UWSA) is involved in tin production in the unrecognised Wa State in north-eastern Myanmar. Tin produced in the rebel-controlled Man Maw mine is exported to neighbouring China, and was linked to the supply chains of over 500 companies via Chinese suppliers who source tin from Myanmar. The UWSA was sanctioned by the US government in 2003 following allegations of widespread narcotics trafficking, and increases the potential for the 500 companies linked to Man Maw mine of violating international sanctions.

### 3TG sourcing scenarios: Verisk Maplecroft datasets expose 'hidden' supply chain risks

Transfer of ore from major tin producers to smelters based in Geiju, Yunnan in China



	China	Indonesia	Myanmar	Brazil	Bolivia	Peru	DR Congo	Rwanda
Global mine production 2016 (%)	35.71	19.64	11.79	9.29	7.14	6.43	1.86	0.64
Political risk								
Cross-cutting supply chain risk								
Social risk								
Environmental risk								
Aggregate risk score	5.00	3.60	3.10	4.30	4.80	4.50	2.90	6.10

**Legend:** ■ Extreme risk 0 - 2.50 ■ High risk >2.50 - 5.00 ■ Medium risk >5.00 - 7.50 ■ Low risk >7.50 - 10.00

Source: Verisk Maplecroft 2017, USGS

## Interpreting the map

Index values are divided into four risk categories to aid interpretation: extreme (0.0-2.5), high (>2.5-5.0), medium (>5.0-7.5) and low (>7.5-10.0). Each of these categories is shown on the map in a different shade. Countries are also assigned a rank, based on their relative position in each index, where the country ranked 1 is the highest risk.

## Risk results and scoring

Risk results are presented in two formats:

- On a zero to 10 scale (with zero being the highest risk and 10 being lowest risk) to a single decimal degree;
- According to four risk categories:
  - Extreme risk 0 - 2.50
  - High risk >2.50 - 5.00
  - Medium risk >5.00 - 7.50
  - Low risk >7.50 - 10.00

Risk results are presented for the following:

- Overall commodity risk: this is the risk score and category assigned to the commodity. A weighted average approach is used drawing on commodity production data for the countries included in the assessment.
- Country-commodity risk: this is the risk score and category assigned to the commodity for each country included in the assessment. The results are based on an average of the 20 risk issues assessed.
- Country-commodity-issue risk: this is the risk score and category assigned to each issue for the commodity in each country.

Risk scores for each issue are based on indicators which assess probability and/or impact magnitude. There are two types of indicators: 'Country' and 'Commodity' indicators. Indicators are evaluated against four possible criteria and assigned a score of 0, 1, 2 and 3. To generate the score for the risk issue, the results are then transformed onto the zero to 10 scale with a 50:50 weighting given to country and commodity indicators.

Risk issues assessed:	
Political	Political instability, Corruption, Land grabs
Cross-Cutting Supply Chain	Certified sustainable production, Wider value chain risks
Social	Child labour, Forced labour, Human trafficking, Wages, Working hours, Occupational health and safety, Discrimination, Freedom of association and collective bargaining, Migrant labour
Environmental	Water pollution, Deforestation, Water stress, Natural hazards, Climate change vulnerability, GHG emissions

## **3TG Commodity profiles**

### **Gold overview:**

Gold is a precious metal with a wide range of industrial uses, including in the manufacturing of consumer electronics – including cellphones, GPS units and computers – and in the aerospace and medical industries and in nanotechnology. Global production of gold in 2015 was 3,000 tons, of which 490 tons (16.3%) was produced in China, the world's largest producer. Other globally significant producers included Australia (10% of global production), Russia (8%), the United States (6.6%) and Peru (5%). The producer profile varies significantly between countries and regions. In China, Australia and Russia, gold production is dominated by large-scale formal mines. In Latin America and Africa – including major producing countries such as Peru and South Africa – a significant share of production occurs at artisanal and small-scale operations, most of which operate on an informal basis.

### **Tantalum overview:**

Tantalum is a corrosion-resistant transition metal, commonly used in high-temperature applications, such as aircraft engines; electrical devices, such as capacitors; surgical implants; and for handling corrosive chemicals. A significant proportion of tantalum production occurs in the African Great Lakes region, with China and Brazil other notable exporters. In Rwanda, production is undertaken by a mixture of artisanal, small-scale, semi-industrial and large-scale mines, while in neighbouring DR Congo, coltan production, from which tantalum is derived, is largely undertaken by artisanal miners working in small-scale mines. The largest global importers of tantalum include China, the United States, Spain and Thailand.

### **Tin overview:**

Tin is used across a range of industries and is typically used in alloying with other metals or for coating harder metals such as iron and steel. Due to its use in solder, tin is also crucial for the production of tablet computers, smartphones and other electronic equipment. The metal has to be extracted from cassiterite ore deposits which are mined both in artisanal and mechanised open pit and underground mines. The top four producers of tin by mined tonnage - China, Indonesia, Peru and Bolivia - together account for over 85% of global production.

### **Tungsten overview:**

Tungsten is a hard transition metal, and is an essential ingredient in many industrial applications, including in the medical devices, electronics and aerospace and defence sectors. According to the US Geological Survey (USGS), five countries accounted for more than 92% of global tungsten production in 2015, with China (81.60%) the top producer, followed by Vietnam (5.75%), Russia (2.87%), Bolivia (1.38%) and Rwanda (1.15%). The majority of tungsten production in China is undertaken by large commercial operators; however, their forced absorption of smaller mining companies in recent years could result in more informal practices entering the industry. The largest global importers of tungsten include the United States, Vietnam, China and the Netherlands.

---

## **Verisk Maplecroft's Commodity Risk Service**

Verisk Maplecroft's Commodity Risk Service helps responsible sourcing, procurement and CSR professionals gain a transparent view of global sourcing risks at the farm or mine level.

The service currently covers 50+ commodities produced in 70+ countries, and assesses 20 environmental, social and governance (ESG) issues associated with the production of the raw materials in each sourcing geography. By quantifying these 20 commodity-specific risk issues, the service allows users to pinpoint the risk issues which are the most relevant to their supply chains, including corruption, land grabs, certified sustainable production, modern slavery, child labour or water stress.

By blending company specific data with Maplecroft's commodity scores, clients can segment suppliers by category, spend, and materiality, while custom-weighting the indices means users can focus in on specific issues that align with their code of conduct.

A growing body of investors utilising ESG data to inform responsible investment decisions can also utilise Verisk Maplecroft's data to assess the exposure of companies to a range of risks associated with the sourcing raw materials, including cocoa, palm oil and the 3TG conflict minerals.

---

For more information please contact:

 [info@maplecroft.com](mailto:info@maplecroft.com)

 [twitter.com/maplecroft](https://twitter.com/maplecroft)

 [linkedin.com/maplecroft](https://linkedin.com/maplecroft)