# Options for sustainability - strategic gold chain assessment

## Report prepared for the Dutch Ministry of Foreign Affairs

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## Report prepared for the Dutch Ministry of Foreign Affairs

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# Summary


## Objective and approach

The gold mining sector, including large-scale industrial mines (LSM) as well as artisanal and small-scale (ASM), has to deal with a number of serious sustainability challenges. These include issues around governance, smuggling and the sharing of benefits; water management, pollution and health issues; impacts on the livelihoods of local communities and local economic development and impacts on landscapes and biodiversity. While there are encouraging examples and initiatives in different parts of the gold supply chain, considerable efforts are needed across the board to deal with the significant sustainability challenges which this sector is facing.

The government of the Netherlands aims to make a significant contribution to improve sustainability in the global gold supply chain. The aim of the present work is to develop policy options through which the Dutch government, in collaboration with Dutch companies, civil society organizations and international partners, can most effectively work towards this goal.

The present report is the result of literature study and interviews with 20 key informants. It analyses global gold supply and demand patterns and the role of the Netherlands in the global gold supply chain. The main sustainability issues in this chain are described and standards and initiatives to address them are listed. Using all these inputs, a number of policy options are formulated. The policy options will be discussed during the Dutch Roundtable on Gold, on 9th June, 2015, in The Hague.

## Global gold supply

Gold occurs within a wide spectrum of geological settings around the world, in deposits that were formed over an impressive range of time. Recovery mostly occurs through hard rock mining, placer mining or as by-product mining. Generally, a distinction between artisanal and small-scale mining (ASM) on the one hand, and industrial, large-scale mining (LSM) on the other hand has to be made, involving different mining and processing techniques.

Annual global gold supply stood at 4,278 tonnes in 2014, with approximately 3,100 tonnes sourced from newly mined gold and the remainder from recycling. Gold has a very efficient product cycle as reprocessing does generally not lead to degradation in quality. Current aboveground stocks of gold, that is gold which has been produced over time, are estimated at approximately 170,000 tonnes. However, only a small proportion of these stocks can be considered to be recyclable, due to the sentimental and religious value of ornamental gold, the long-term storage of gold by central banks and poor recycling percentages from consumer electronics.

Gold production from mining increased by about 6% year-on-year between 2012 and 2013, and by another 3% between 2013 and 2014. Increase in mine supply is mostly attributable to the development and operationalization of new mines in recent years. Growth in supply from such projects has reached its peak and is expected to diminish in 2015.
The growth in mine supply was offset by shrinking volumes and shares of recycling in recent years, contracting to a seven-year low in 2014. In the short term, gold recycling responds quickly to changes in the gold price and to economic shocks.

By far the most important producing country of gold from mining is China, accounting for 14% of global production in 2013. It is followed by Australia with 9% and Russia and the United States with about 8% each. Peru held a 6% share. The top 20 countries contributed about 83% of global production. The Democratic Republic of Congo (DRC), which is of key concern in relation to conflict minerals, is officially not among the top 20 producers; the country's large scale production reached approximately 4 tonnes in 2013 and was set to grow considerably to 16 to 18 tonnes in 2014, largely due to the operation of new mines. ASM gold from the DRC is excluded from this figure, as it is largely smuggled.

The gold mines in the world's top 15 producing countries are estimated to have generated US$ 78.4 billion of direct gross value added (GVA) in 2012. The GVA of global gold recycling is estimated to be between US$ 23.4 billion and US$ 27.6 billion. The contribution and significance of gold mining to different national economies varies considerably, due to a variety of factors, including different labour costs and levels of productivity, as well as the degree to which the gold mining sector is integrated and governed appropriately.
In economies with a dominance of low or lower middle incomes and a low human development index where large-scale gold mining has been established relatively recently, the significance in terms of contribution to the economy expressed as a share of the gross domestic product (GDP) is highest. This includes countries like Papua New Guinea, Ghana and Tanzania. Gold mining is a significant source of exports and through this, foreign exchange earnings for these countries. China shows the largest economic contribution from gold mining by value, however, this only makes up for a small portion of the total output of this large economy.

The top 10 leading gold mining companies in 2013 accounted for about 32% of world production. Significant mining operations are concentrated in North and South America, Africa and the Australia-Pacific region. In terms of the largest gold deposits based on estimated in-situ resource, Russia, South Africa and the United States are standing out, each with three mines and deposits among the top-20. However, some of the highest grade deposits can be found in Africa. Very large gold discoveries with more than 10 million ounces are rare, accounting only for 15% of all deposits. The majority (69%) contain less than 5 million ounces.

### Global gold trade

Mining companies send so-called doré (or bullion) bars with typically about 80% gold (but varying greatly) to a refinery, where gold (and other metals, like silver) is produced in different forms and purities. The gold refining process includes remelting, cold rolling, manufacturing, and testing. By far the largest capacity can be found in Switzerland, where four out of nine leading gold refineries are based, accounting for the refining of an estimated 70% of world gold in 2012. The general distribution of refining capacity is expected to change soon, with one of the biggest gold refineries in the world expected to become operational in Dubai during 2015.

Gold trade figures are difficult to ascertain. Trade statistics are generally prone to uncertainties, and additional uncertainties for a commodity like gold are caused by various reasons, including:

- Some countries do not publish detailed trade figures, and smuggling or unregistered border transfers are commonly occurring and obscuring the true origins and destination of gold.
- The global trade in gold is characterized by the fact that physical trading hubs as well as countries with a higher concentration of refining capacity are located between the producing and consuming countries, making the tracing of gold back to the source difficult. These hubs include for example Switzerland, Dubai (United Arab Emirates), Singapore, Shanghai and Miami (United States).
- Export destinations reported in statistical sources refer to the physical destination of the gold, which may not necessarily be the home country of the buyer, since investors may hold gold in another country.

- Trade and consumption figures for China reported by different sources are particularly controversial; while China's role as a leading consumer of gold is undisputed this is also leading to uncertainties about global gold trade.

The top 5 countries for physical gold demand (coin, bar and jewellery, excluding bank activity) are led by China and India, together accounting for more than half of global demand in 2013. Other important consumers are the United States, Turkey and Thailand.

Illicit activities in gold trade refer to financial as well as well as physical diversions. Illicit financial flows include money generated by corruption, illegal resource exploitation, and tax evasion. Illicit gold from illegal gold mining, physically entering into formal trade channels, is one of the main distorting factors in gold trade statistics. Gold is seen as relatively easy to smuggle and to be traded into the global precious metal pipeline, mixing with legally mined metal. Countries where illegal mining, illicit gold trading and tax evasion are prevalent include South Africa, the Democratic Republic of Congo (DRC) and Peru.

### Key applications of gold

The production of jewellery (48%) and investment demand (36%) are the two main markets for gold, together accounting for about 84% of total global consumption in 2013. By far the two largest gold jewellery consuming countries are India and China, accounting for about 31% each of total demand for gold in jewellery. This is followed by the United States with 6% and Turkey with 3%. The European Union member states together accounted for an estimated 2%.

Investment demand is comprised of direct ownership of bars and coins as well as indirect ownership via investment in exchange-traded funds (ETFs) and comparable products. About 21% of bar and coin investments were accounted for by the European Union, 18% by China and 17% by India.

Central bank purchases accounted for 8% of global consumption in 2013. Gold is kept as a reserve asset, as it is one of the few assets that are universally permitted by the investment guidelines of the world's central banks due to the depth and liquidity of the market. Central banks absorbed 477 tonnes of gold in 2014, a 17% increase from the previous year's 409 tonnes and the second highest year of central bank net purchases for 50 years. Purchases were dominated by institutions in former Soviet Republics (CIS) as a way to diversify investments away from their US Dollar holdings. Sales of gold by central banks were limited. By far the largest reserves of treasury-owned gold can be found in the United States with more than 8,100 tonnes. The Dutch Central Bank with its roughly 615 tonnes is the tenth largest holder.

Another 8% of global gold consumption is accounted for by industrial applications. It is used in a wide range of technological and manufacturing applications due to its electrical conductivity, malleability and resistance to corrosion. Applications include electronic goods and equipment, telecommunications devices and household appliances. Electronics are consuming the largest share, accounting for about 5% of global consumption in 2013. Gold is also used in healthcare services and pharmaceutical products due to its 'biocompatibility' and resistance to bacterial colonisation.

Finally, dental and medical applications took a 1% share of global gold consumption in 2013. Key countries for dentistry gold production in 2013 were Japan accounting for almost 20%, the United States with approximately 8% and Germany with approximately 3%.

## Gold consumption in the Netherlands

On the international level, the Netherlands is a comparatively small consumer of gold. In 2013, domestic fabrication demand (for jewellery, electronics, official coins and other uses) was estimated at 2.4 tonnes, only 0.07% of global fabrication demand (3,238 tonnes). Larger gold volumes are moving through the Netherlands due to transformation activities taking place and the country's role as an important re-exporter of goods. Gold purchases by the Dutch central bank do not contribute to Dutch gold imports, as the central bank (DNB) has rather sold a share of its gold reserves in recent years.
Actual domestic gold consumption in the Netherlands, including bars, is difficult to ascertain due to inconsistent trade statistics and 'hidden' use of gold in electronics products, imported mainly from Asia. Due to the highly complex supply chains in the electronics sector, with often hundreds of components and suppliers along the chain, it is hardly possible to estimate the volumes and origins of these imports.

The rapidly increasing consumption of consumer electronics means that also in the Netherlands the amounts of e-scrap have rapidly increased over the years. Each inhabitant of the Netherlands produces on average 23.4 kg of e-waste per year, leading to an annual e-waste volume of 394,000 tonnes for the country in 2014. Less than one-third of this is actually collected and fed into the recycling stream.
Part of the generated e-waste is still making its way from Europe and North America to Asia and Africa, despite a ban on the dumping of hazardous waste in developing nations under the Basel Convention and EU Directives.

## Gold and the Dutch finance sector

The role of the Dutch finance sector in financing gold mining is relatively more significant than Dutch gold imports. One bank was found to have participated in a number of syndicated loans to globally leading gold mining companies over the past five years, making it a moderately important financier of the gold mining sector.

Many Dutch pension funds and insurance companies invest in the shares and bonds of major gold mining companies. While the individual shareholdings of pension funds in companies are never very high in terms of the percentage of outstanding shares, they are significant enough to open the door for Dutch pension funds - especially when they operate collectively and together with foreign peers - to discuss sustainability issues with the management of gold mining companies.

Finally, the fact that many gold mining companies have established shell companies in the Netherlands, indicates that the country could also play a role in facilitating tax avoidance structures for gold producers. Whether tax avoidance is actually taking place, and the possible significance of this, needs to be researched further.

## Sustainability issues

A variety of environmental, social and supply chain issues affect the gold supply chain. Important issues include deforestation, physical land alteration, biodiversity impacts, mining waste issues, water and chemical management, health and safety issues, labour conditions, and impacts on local communities.

The magnitude of these issues varies between large-scale mining companies (LSM) and artisanal and small-scale miners (ASM). LSM miners are by their nature legal entities, they have both the financial and technical capacity to mitigate negative impacts, and they are incentivized to do so through legal obligations and self-imposed, voluntary initiatives such as those of the International Council on Mining and Metals. This does not mean that all issues mentioned are addressed sufficiently, though, partly depending on the efficacy of government monitoring and law enforcement. Environmental issues tend to be addressed more

comprehensively by LSM than the socio-economic impacts on local communities.
ASM miners are by their nature informal, and not always legal. ASM miners tend to not have the required financial and technical capacities to mitigate negative impacts, or the appropriate incentives to do so. Nevertheless, ASM mining is, in many places, considered a vital driver for socio-economic development due to the high levels of employment it creates. It is often considered to be an alternative and/or seasonal employment for agricultural workers, and does result in the development of an ancillary economy.
In contrast, LSM companies do not generate the same levels of direct employment or supporting industries and economies. Furthermore, due to the nature of contracts and agreements with governments and accounting practices by mining companies the financial contributions to host country governments often are below their potential.

Further downstream in the gold supply chain other important issues include the lack of traceability of gold. This is of particular concern as gold is also mined in conflict-affected areas, where its extraction, trade, (illegal) taxation, and control can contribute to or benefit from armed conflict. It is thus considered a “conflict-mineral” alongside tin, tantalum and tungsten, together known as “3TG”.
Gold is a high-value-low-volume commodity that is relatively easy to smuggle, making illicit trade very lucrative and the risks comparatively low. In addition to smuggling, gold from illegal sources is often laundered into official channels through falsification of documents and misreporting. Due to corruption and vested interests, insufficient efforts have been made by the governments of the DRC, Uganda, and the United Arab Emirates, the most significant actors in the illicit gold supply chain, to improve traceability and due diligence.

While big differences in the occurrence and importance of different sustainability issues exist between different mining areas, industry experts interviewed for this study identified three sustainability issues as most important:

- **Governance**: The degree of host country governance over the (gold) mining sector is of overriding importance when considering the sustainability of mining activities, notwithstanding the voluntary standards adhered to by mining companies. Governance issues relate both to the host country national government capacity to govern and enforce legislation, as well as to local and sub-national government capacities.

- **Water**: Gold mining creates various water-related impacts. Mining operations may severely affect surface water bodies, increasing their acidity and releasing unacceptably high levels of metals or metalloids into the water. Acid rock drainage (ARD) is most visible in the LSM sector, due to the exposure of sulphidic ores. Mercury contamination is largely linked to ASM. LSM companies may need to lower the water table to allow for deep, open pit mining, thereby removing the traditional water supply for local communities. Stagnant ponds that develop in old open pits or in numerous shallow excavations left behind by ASM operators, may become breeding places for diseases, particularly mosquito-borne diseases like malaria.

- **Socio-economic impacts**: The benefits of both LSM and ASM for the local and national economies in which they are operating, are usually falling behind their potential. These benefits include the creation of direct, local employment with decent wages, the advancement of local spin-off and value creation through sourcing of goods and services, further processing, as well fiscal benefits to the host country. Gold mining operations generally fail to operate as “engines for development”, on the local and national level.

## Standards and initiatives

A wide variety of initiatives has been launched worldwide in order to address sustainability issues in the gold supply chain. These initiatives include government regulations, such as the US Dodd-Frank Act and the proposed EU conflict-free minerals regulation, designed to address sustainability issues related to gold and other conflict minerals. They also include broad international voluntary guidelines such as the Equator Principles, IFC Performance Standards, the UN Guiding Principles on Business and Human Rights and the Voluntary Principles on Security and Human Rights. These guidelines were not designed specifically for gold mining, but issues covered by these initiatives, such as human rights, are also relevant to the gold mining sector.

Other initiatives are more sector specific, such as that of the International Council on Mining and Metals, the International Cyanide Management Code, the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, Minamata Convention on Mercury and the OECD Due Diligence Guidance on Responsible Supply Chains of Minerals from Conflict Affected and High Risk Areas supplement on gold.
Yet other initiatives have focussed on traceability in the gold supply chain, such as the Conflict-Free Smelter Program, the International Conference on the Great Lakes Region Regional Certification Mechanism, and the Responsible Jewellery Council's Chain-of-Custody Certification Program. Similarly, there are a number of sustainability standards for gold, such as Fairmined Gold, Conflict-Free Gold, LBMA Responsible Gold Guidance and the Initiative for Responsible Mining Assurance Standard for Responsible Mining. Finally, there are also initiatives targeting ASM mining in particular, including the Artisanal Gold Council and the Better Gold Initiative.

While an evaluation and impact assessment of this multitude of standards and initiatives was beyond the scope of this study, industry experts interviewed for this study mostly agreed that there is no need to create a new initiative to further sustainability in the gold supply chain. Rather, existing initiatives should be strengthened and aligned.

## Dutch policy context

In response to the EU Raw Materials Initiative - launched in 2008 - the Dutch government launched its own raw materials policy in 2011 through the *Grondstoffennotitie*. The *Grondstoffennotitie* has three pillars, reflecting similar pillars of the EU Raw Materials Initiative:

- Secure and increase supply of raw materials and make supply more sustainable;
- Reduce demand and make demand more sustainable;
- Improve the efficiency of the usage of raw materials and make usage more sustainable.

The Netherlands' list of critical raw materials is based on that of the EU, with the addition of three raw materials: tin, phosphate and gold.

In 2013, the Dutch Ministry of Foreign Affairs laid out its new agenda for aid, trade and investment, recognizing a number of key issues. Firstly, the government is no longer able to solely use aid to exert an influence on poverty and equity issues, as recipients are increasingly operating on an equal footing with the Dutch government, given that they are no longer merely aid recipients but also trade partners. Secondly, the private sector plays an increasing role in fostering development, since aid budgets have been decreasing.

In line with the Dutch government's emphasis on increasing the role of the private sector in its aid, trade and investment agenda, Dutch Minister for Foreign Trade and Development Cooperation, Lilianne Ploumen, and Minister of Economic Affairs, Henk Kamp also outlined the importance of corporate social responsibility for Dutch businesses in their policy letter to parliament entitled *MVO Loont* (CSR Rewards). Following on from this, the Dutch government has been making efforts to develop sector agreements with private sector players on international corporate social responsibility (ICSR). Many Dutch companies have trade and

investment links with sectors and countries that are more at risk from negative environmental and social impacts. The government thus expects these companies to apply the appropriate levels of due diligence. The sector agreements on ICSR have two goals:

- Take substantial steps to improving the situation for those afflicted by specific risks within 3-5 years;
- Offer a collective solution to problems that companies cannot solve fully on their own.

### Considerations on a Dutch gold policy

To select the most promising policy options for the Dutch government to collaborate with Dutch companies and civil society to stimulate sustainability in the global gold supply chain, the following considerations were taken into account:

- Various companies in the Netherlands are involved in consuming gold, especially in the jewellery sector. Other Dutch companies are involved in producing or sourcing electronic products, which contain gold, in/from Asia;
- Various Dutch companies operate in the electronics recycling sector and recover precious metals (including gold) from scrapped products;
- Many Dutch financial institutions invest in a range of companies active in the global gold mining sector, while many gold mining companies have set up mailbox companies in the Netherlands;
- Dutch companies and organisations have considerable expertise relevant to the gold mining sector, in the fields of water management, occupational health & safety, recycling, taxation and governance issues;
- While the economic role of the Netherlands in the global gold chain is comparatively small, it might be an advance that the country has no strong vested interests in the mining sector, is not a former colonial power of many mining countries and has a track record in promoting sustainability in other commodity chains, for example for tin. These points strengthen the Dutch ability to bring together relevant actors in a neutral setting to facilitate dialogue and action;
- Possible initiatives of the Dutch government to improve sustainability in the gold supply chain should be well-grounded in the Dutch policy context and could therefore best be synchronized with the Dutch efforts to develop sector agreements on international corporate social responsibility;
- The Dutch government has strong relations with some gold mining host countries which could be interested in collaborative efforts to increase sustainability, such as Ghana, the DRC and Colombia. Similarly, some Dutch organisations also have strong links with counterparts in host countries;
- Given the large number of existing sustainability standards and initiatives in the global gold sector, it seems most useful to help integrate and strengthen existing sustainability schemes, exchanging lessons learned and best practices and facilitating improvements in relevant governance schemes, legislation and environmental management efforts;
- Even if initially only related to a relatively small share of the global gold consumption, a strong pilot project can subsequently serve as a role model for broader change in the global gold sector;
- Pilot projects should preferably focus on the three sustainability issues identified as most critical in the gold mining sector: governance, water and the socio-economic impact.

### Dutch policy options with regard to gold

Based on the considerations discussed above, the following policy options for Dutch public-private cooperation projects which could effectively contribute to creating a more sustainable gold supply chain were selected:

- **Colombia: formalization and governance**
  In collaboration with private sector players, the Dutch government could set up a pilot project to improve formalisation and governance of the gold mining sector (ASM and LSM) in Colombia. The Dutch government in May 2015 signed a MoU with the Colombian authorities to improve conditions in the mining sector with a clear focus on private sector involvement.
  Moreover, the Dutch contribution to the Strategic Community Investment fund administered by the International Finance Corporation (IFC), could potentially be used for this purpose. Collaboration could also be sought with the Better Gold Initiative set up by the Swiss government, as this initiative sees 'formalization' as a key issue to tackle, especially on a cross-country/regional level in Latin America.

- **Conflict Free Gold Initiative in the Great Lakes Region**
  Gold is particularly susceptible to smuggling as it is a high-value, low-volume commodity, and easily mixed with gold from formal channels at various points in the supply chain. Traceability is a key issue for Dutch and European companies to meet their obligations under the EU draft regulation for self-certification for 3TG importers, but also to prevent gold financing violence and conflicts - especially in the Great Lakes Region in Africa.
  The Dutch government could strengthen cooperation with the Dutch and European private sector to fund initiatives and technologies aimed at the responsible sourcing of gold from the Great Lakes Region. Philips is already active on this front, and could thus be an important partner in such a public-private partnership. Dutch organisations such as PAX are also involved.

- **Ghana: gold mining as engine for development**
  Addressing the negative impacts of gold mining is important, but it is even more challenging to try to turn (ASM and LSM) gold mining operations into an 'engine for development'. This means facilitating the training of local people and the development of local industries, to create lasting and wider socio-economic benefits. A pilot project could focus on Ghana, a country with a long history of gold mining which still lacks sufficient skilled workers and suppliers of mining companies.
  The Dutch Sustainable Trade Initiative (IDH) is already focusing on Ghana and Ivory Coast in the new Initiative for Sustainable Landscapes, which is clearly related to the "engine for development" concept. For Dutch trade organizations of jewellers and electronics producers, this could be an interesting pilot to participate in through contributing advice, commitments and possibly financial assistance. MVO Nederland and Solidaridad could play an important role as well, while the Dutch financial sector could possibly be involved in an investment fund for SME companies in the gold mining sector.

- **Water management assistance in mining legacy areas**
  In collaboration with Dutch engineering and consulting firms and knowledge centres, the Dutch government could provide or facilitate technical assistance to host governments on water management issues. This could focus on the remediation of old mining areas, but could also look at setting up better water and waste management systems and processes for ongoing mining operations - large-scale as well as small-scale.
  As several Dutch *Waterschappen* (Water Authorities) are already collaborating with South African water authorities, also on water catchment areas impacted by gold mining, this collaboration could be the starting point to develop a larger pilot project involving Dutch engineering and consulting firms and knowledge centres.

- **Gold recycling in the Netherlands and abroad**
  When gold is recycled, the quality stays equal and losses are minimal. To mine one gramme of gold, an average LSM company operating an open pit mine may move and process a tonne of ore. The same amount of gold can be recovered with much less effort from 41 mobile phones. Increasing the recycling of e-waste would therefore make sense, especially when the conditions under which some of the recycling steps take place can be improved.
  Despite the dumping of hazardous waste in developing nations having been banned for years under the Basel Convention and EU Directives, large volumes of e-scrap are still making their way from Europe and North America to Asia and Africa. In these countries recycling is mostly taking place in the informal sector, under desperate working conditions, often involving child labour and with massive impacts on health and the environment.
  The Dutch Ministries of Foreign Affairs and Infrastructure and Environment could support the introduction of sustainable e-waste management systems and the implementation of high environmental and social standards in recycling. Cooperation is possible with Dutch recycling and electronics companies and initiatives such as FairPhone, Closing the Loop and the StEP Initiative.

- **Financing, tax and the gold sector**
  A Dutch bank and many Dutch pension funds and insurance companies act as financiers of many of the biggest gold mining companies in the world. These investors could use their influence to help turn gold mining operations in developing countries into real engines for development, by stimulating them to set up or invest in local businesses in the field of processing, transport, etc. In that way, they could become investors in the larger economy, rather than only in the mining component.
  Various Dutch trust offices, accountants and tax advisers are involved in helping major gold mining companies establish shell companies in the Netherlands. They could use their influence and expertise to ensure that gold mining companies pay their fair share of taxes to the governments of host countries and do not avoid taxation through overseas shell companies.

# Introduction

The Dutch government aims to contribute to the sustainable supply of raw materials, as explained in the *Raw Materials Policy Note* sent to the Parliament in 2011. The *Raw Materials Policy Note* also introduces the function of the *Special Envoy for Natural Resources*. This function is currently held by Dr. Dirk Jan Koch, and in consultation with the current Minister for Trade and Development Cooperation, Lilianne Ploumen, gold has been identified as one of the raw materials where an extra effort in promoting sustainability of the value chain (people, planet, profit) should be made.

The gold mining sector, including large-scale industrial mines (LSM) and small-scale and artisanal miners (ASM), has to deal with a number of serious sustainability challenges. These include issues around governance, smuggling and the sharing of benefits; water management, pollution and health issues; impacts on the livelihoods of local communities and local economic development and impacts on landscapes and biodiversity. While there are encouraging examples and initiatives in different parts of the gold supply chain, considerable efforts are needed across the board to deal with the significant sustainability challenges which the gold sector is facing.

The government of the Netherlands aims to make a significant contribution to promote sustainability issues in the gold chain. The *Raw Materials Policy Note* mentions three realms of intervention, and is currently the guiding document for policy interventions in this domain:

- Agenda 1: secure supply, increase supply and seek sustained supply
- Agenda 2: reduce demand and where possible promote sustainable use
- Agenda 3: using raw materials more efficiently and more sustainably.

The aim of the present research is to develop proposals on how the Dutch government, in collaboration with private enterprises and international partners, can most effectively work on these three agendas related to the gold sector, with a focus on the first two agendas of the Raw Materials Policy Note.
Another starting point for this study is the policy note *A world to gain* of minister Ploumen, since some of the key themes identified in that policy note, such as water and sexual and reproductive health rights, are for instance of particular importance in the context of mining.

Based on the outcomes of the present strategic study, the Netherlands aims to make a significant contribution to promote sustainability issues in the gold chain, with a focus on the first two agendas of the *Raw Materials Policy Note*. Sustainability is viewed from environmental, social and economic perspectives. Since there are two types of trading chains in the gold sector (large scale industrial and small scale artisanal mining), the proposals cover both the industrial supply chain and the artisanal trade chain. For both trading chains, the study explores whether and how to build on existing standards for sustainability in the gold supply chain and what alternative approaches are possible to most effectively help achieve sustainability.

The contents of this report are as follows:

- Chapter 1 describes the objectives and approach of this research project;
- Chapter 2 provides and overview of the global gold chain;
- Chapter 3 discusses the role of the Netherlands in the global gold chain;
- Chapter 4 analyses sustainability issues in the gold sector;
- Chapter 5 describes the relevant policy context and current initiatives to increase sustainability; and

- Chapter 6 provides a strategic framework from which policy options for the Dutch government are drawn.

A summary of the findings can be found on the first pages of this report.

# Chapter 1 Objectives and approach

## 1.1 Background

The gold mining sector, including large-scale industrial mines (LSM) and small-scale and artisanal miners (ASM), has to deal with a number of serious sustainability challenges. These include issues around governance, smuggling and the sharing of benefits; water management, pollution and health issues; impacts on the livelihoods of local communities and local economic development and impacts on landscapes and biodiversity. While there are encouraging examples and initiatives in different parts of the gold supply chain, considerable efforts are needed across the board to deal with the significant sustainability challenges which the gold sector is facing.

The Dutch government aims to contribute to the sustainable supply of raw materials, as explained in the *Raw Materials Policy Note* sent to the Parliament in 2011. The *Raw Materials Policy Note* also introduces the function of the *Special Envoy for Natural Resources*. This function is currently held by Dr. Dirk Jan Koch, and in consultation with the current Minister for Trade and Development Cooperation, Lilianne Ploumen, gold has been identified as one of the raw materials where an extra effort in promoting sustainability of the value chain (people, planet, profit) should be made.
This is also in line with the policy note *A world to gain* of Minister Ploumen, as some of the key themes identified in that policy note, such as water and sexual and reproductive health rights, are for instance of particular importance in the context of mining.

## 1.2 Objectives

The government of the Netherlands aims to make a significant contribution to promote sustainability issues in the gold chain, The *Raw Materials Policy Note* mentions three realms of intervention, and is currently the guiding document for policy interventions in this domain:

- Agenda 1: secure supply, increase supply and seek sustained supply
- Agenda 2: reduce demand and where possible promote sustainable use
- Agenda 3: using raw materials more efficiently and more sustainably.

The aim of the present research is to develop proposals on how the Dutch government, in collaboration with private enterprises and international partners, can most effectively work on these three agendas related to the gold sector, with a focus on the first two agendas of the *Raw Materials Policy Note*.
Since there are two types of trading chains in the gold sector (large scale industrial and small scale artisanal mining), the proposals should cover both the industrial supply chain and the artisanal trade chain. For both trading chains, the study has to explore whether and how to build on existing standards for sustainability in the gold supply chain and what alternative approaches are possible to most effectively help achieve sustainability.

## 1.3 Approach

To meet the objectives of this study, the research was split into three phases:

- Literature research and statistical data analysis
- Interviews with key informants
- Roundtables with relevant stakeholders

Each phase is described shortly in the following sub-sections.

### 1.3.1 Literature research

In the literature research phase, a large number of written and Internet sources was studied: government policy documents (of the Netherlands, EU and other relevant countries), production and trade statistics, market studies, trade databases, annual reports and other publications of companies active in the gold chain, publications of industry organizations and initiatives, scientific studies, NGO reports, media reports and other relevant sources. Based on these sources, a draft report is produced, covering the following topics:

- Overview of the global gold chain
  - Global gold production statistics
  - Main forms of gold production
  - Leading industrial gold mining companies
  - Gold trade
  - Key applications of gold
- The Netherlands and the global gold chain
  - Gold import and trade
  - Trade statistics
  - Key gold traders and wholesale buyers
  - Gold from electronics recycling
  - Processing and use of gold
  - Financiers and investors
  - Shell companies and tax planning
- Sustainability issues in the gold sector
  - Sustainability issues in industrial gold mining
  - Sustainability issues in artisanal gold mining
  - Sustainability issues in gold trade, consumption and recycling
- Policy context and current initiatives
  - International sustainability initiatives in the gold sector
  - Relevant EU policy context
  - Relevant Dutch policy context
  - Knowledge providers and NGOs
- Conclusions and proposal for follow-up
  - Possible intervention points for the Dutch government
  - Proposal for follow-up

At the start of the literature research phase an inception report was drafted, which listed the topics to be covered in more detail and also listed the sources which would be used to discuss each topic. The inception report was discussed with the ministry, after an external reference group had commented on it, to ensure that the right approach was chosen for the literature research.

The literature research phase resulted in a draft report and a separate list of key informants suggested for interviews. Both documents were discussed with the ministry, after an external reference group had commented on them. After agreement was reached, the second phase was started.

### 1.3.2 Interviews with key informants

In the second phase of the research project, 14 key informants were interviewed. The key informants were selected to cover as much as possible all relevant groups of international stakeholders in the Dutch and international gold sectors.

The interviews were intended to identify complementary or missing information, so as to strengthen the draft report written in the first research phase. Moreover, the interviews were to collect opinions on the possible intervention points for the Dutch government, as identified in the draft report: which intervention point should be given priority, are alternative intervention points missing?

An overview of the key informants interviewed and full reports of each interview can be found in Appendix 2 . Relevant quotes from the interviews, with additional or complementary information or relevant opinions, were integrated in the main text of the draft report. The chapter with conclusions and proposals for follow-up was intensively rewritten to reflect the opinions gathered in the interviews.

Comments were sought on the expanded draft report, including the interview reports, from the external reference group. The report was then discussed with the ministry to find agreement on the exact approach to be taken in the third phase of the research project.

### 1.3.3 Roundtable discussions

The third phase of the research project will start after this report is finished. The proposals developed in the report on how the Dutch government, in collaboration with private enterprises and international partners, can most effectively work on furthering improved sustainability in the gold sector will be discussed with a wider group of stakeholders. Three roundtable discussions will be organized with a number of representatives of various groups of stakeholders engaged with the gold sector, in the Netherlands and globally. During the roundtables the proposals will be discussed, amended and refined. A report summarizing the conclusions of the roundtables will be submitted separately to the Ministry.

# Chapter 2 Overview of the global gold chain

This chapter provides an overview of the global gold chain. Covered are the key types of deposits occurring in section 2.1 and the main forms of gold production in section 2.2. Section 2.3 looks at production statistics including the role of gold mining in national economies. The leading gold mining companies as well as the largest known and operating gold deposits are described in section 2.4. Section 2.5 aims to map the major gold trading streams and provides short profiles of the key physical trading hubs. Finally, section 2.6 gives an overview of the key applications of gold.

## 2.1 Gold deposit types

Gold occurs within a wide spectrum of geological settings locations around the world, in deposits that were formed over an impressive range of time. This report is not intended to provide a detailed scientific discussion of deposit types or their origins. As the geological and mineralogical settings of gold deposits have different characteristics with direct impacts on sustainability, a very simplified overview is warranted.

There is a wide range of hard-rock gold deposits, differing greatly in terms of shape, size and gold grade. Deposits associated with shear zones, often in so-called 'greenstone belts' like in the Canadian Abitibi or in Ghana and other West African countries, tend to occur in steep quartz veins, or closely associated with them. Gold grades can be relatively high: sometimes above 10 g/t in high-grade veins, probably less than half that in the associated disseminated mineralisation zones.

In areas with tropical weathering, the action of groundwater has distributed the gold into a wider zone, creating mushrooming shapes with lower gold grades near the surface. Mineralisation may include small particles of native, 'free gold', but often also gold intergrown with sulphide minerals, including arsenopyrite. The type of mineralisation affects the extraction method and also the waste products that end up in the environment.[1]

A very large proportion of the world's gold production comes from another type of deposit. Quartz-pebble conglomerates ('palaeoplacers', essentially solidified gravel beds on old braided river plains), like those of the Witwatersrand orebodies in South Africa and the Tarkwaian in Ghana, range from very narrow, high-grade reefs, to very wide, lower-grade ones, often with shallow dips into the earth. These reefs were initially mined on surface, but the ore has been followed along dip, underground, extending to more than 3,500m at one mine in South Africa. An estimated 40% of all the gold ever mined on earth, was extracted from these mines on the South African Witwatersrand.[2] There are still extensive reserves and many decades of mine life remaining in the very large operations there. A number of these orebodies also contain uranium as a by-product.[3]

So-called 'copper porphyry' orebodies, which are basically very large intrusions of magma generated above semi-linear zones where crustal rocks are subducted and remelted, are another important source of gold. Though porphyry orebodies are currently the world's most important source of copper, they exhibit mineral zoning and often contain other metals like gold and molybdenum. The Grasberg mine in West Papua, Indonesia, for instance, is currently one of the world's largest gold and copper mines (see Table 3). The mine produced 1.1 million ounces (Moz) (some 34,214 kg) of gold in 2013. There are high-grade and low-grade zones, but average gold grades are very low at less than 1 g/t.[4]

Gold is also a by-product from mining of many other metals. For instance, the Kansanshi mine in Zambia, operated by First Quantum Minerals, produced 270,724 tonnes of copper in 2013, and 167,395 oz (some 5,200 kg) of gold.[5]

Much of the gold mined by artisanal miners occurs in alluvial orebodies. Gold weathered from hardrock sources (or from tailings and rock dumps on mine sites) are flushed downstream by rivers and streams, with the heavy gold particles settling between pebbles, gravel and coarse sand along with other heavy mineral particles. These deposits occur in riverbeds or alongside, on higher terraces that once existed within streams.[6]

## 2.2 Gold production

### 2.2.1 Types of mining

The different ways in which deposits were formed have resulted in different orebody geometries and grades, which in turn have resulted in a variety of mine types and sizes. The most obvious distinction is between underground mining and surface mining:

- Underground gold mines have historically produced most of the world's gold, since the low grades that are currently being extracted from surface orebodies, were not economic in earlier years. As noted above, an estimated 40% of all the gold ever mined on earth, was extracted from the underground mines on the South African Witwatersrand.[7]
- In recent decades, there have been increasing quantities of gold mined from open pits, exploiting surface orebodies. Mining at surface implies lower operating costs, and the oxidisation of the ores should have the same effect if simpler processing techniques can be used. Grades tend to be much lower than for surface orebodies, however, and the reason for open-pit mining lies more in the wider shape of orebodies than in lower costs.

### 2.2.2 Processing

Historically, the most common method of extracting gold has involved gravity methods. Alluvial workers have just washed river muds with pans or over sluice boxes, so that gravity concentrates gold particles, along with other heavy minerals. Amalgamation with mercury has been used to help extract gold particles from the heavy mineral concentrate. In some countries (e.g. Colombia) there are reports of mercury being used in the sluice boxes, located in streams or on the banks, but mercury is also used in ball mills where the ore is milled.[8] Even in industrial-scale operations gravity methods (Knelson concentrators, shaking tables, spirals, etc.) are still used to separate gold or a heavy mineral concentrate from ore that has been crushed and milled. (See section 4.1 and section 4.2 for sustainability issues related to industrial-scale and artisanal scale gold mining)

For ores where gold particles are included within other minerals (for instance, where gold is included within sulphide minerals like arsenopyrite), more advanced, chemical techniques are needed. There are many varieties, but they all involve fine milling (to expose as much of each gold particle as possible), followed by techniques to oxidise the sulphide minerals (to assist in liberation of the gold) and finally, leaching to dissolve the contained gold. The oxidising may be done by way of roasting of the ore or concentrate, or even with specially-engineered bacteria. Once the gold is accessible, it is typically leached in a process involving cyanide (CN), which preferentially dissolves gold. Thereafter, gold may be adsorbed onto activated carbon particles (with carbon-in leach (CIL) or carbon-in-pulp (CIP) processes). Once the carbon is saturated, the gold is dissolved yet again, and extracted from the solution by electrolysis.

For low-grade orebodies, all of this may be too expensive, and one of the options to extract at least a proportion of the contained gold is heap leaching. This involves crushing the ore (possibly agglomerating it, depending on the clay content) and then stacking the ore onto carefully-designed 'heaps', constructed onto a base of impermeable clay and plastic, and layers of drainage pipes. A cyanide solution is then sprayed or dripped onto these heaps. The cyanide dissolves any gold that is available, and percolates through the heaps into the drainage system, and drains into ponds and tanks from where the gold can also be extracted by electro-winning.

Recovery percentages can be quite variable (depending on other ore characteristics), but are much lower than for other techniques; this is why heap leaching is only sensible for low-grade ores. It should be noted that the cyanide solution (NaCN) breaks down in the presence of sunlight, into the constituent components carbon (C) and nitrogen (N) within a few days. Even though low concentrations of NaCN are used, and even if the solution breaks down in sunlight, cyanide solutions are lethal and should be handled with great care. The International Cyanide Management Code, to which all respectable mining companies subscribe, therefore governs not only the uses and storage of the chemical, but also its transport to a mine.[9]

### 2.2.3 Recycling

Only a tiny amount - an estimated 3,600 tons or about 2% - of all the gold that has been mined to date has been lost. The remaining 172,500 tonnes are still available as aboveground stock, about half of which has been incorporated into jewellery and the rest is treasury-owned, held by private investors or used in products such as electronics and dental fillings (see section 4.4.3 for details on the sustainability issues related to recycling gold). Gold from recycling accounts for about one third of total global supply, sourced from existing jewellery and other products.[10]

The figures indicate that as yet, only a small portion of old products is collected and directed into state-of-the art recycling chains.[11] Also referred to as 'urban mining', recovering the comparatively small amounts used in single products can nevertheless supply significant amounts if efficiently collected. If the world had reused or recycled less than 3% of the existing gold supplies in 2012, it could have satisfied 100% of global demand. The same could have been achieved by recycling about 5% of existing gold jewellery.[12] It has been estimated that about half (49%) of above-ground stocks are kept in Asia, 27% in Europe, 12% in North America, 6% in Africa, 5% in South America and 1% in Oceania.[13] Recent studies also suggest that significant amounts of gold and other precious metals may be retrievable from sewage sludges as another form of future urban mining.[14]

Gold has a very efficient product cycle as recycling does generally not lead to degradation in quality.[15] However, gold found in scrap products occurs in combination with other metals and materials, very different from those in conventional gold ores, requiring specialised, more resource-intensive metallurgical processes to recover gold and other metals cost effectively and in an environmentally sound way.[16]

Moreover, it should be noted that while the entire aboveground stock of gold could potentially be recycled, only a small share can be seen as near-market supply. This is for example caused by sentimental and religious value of ornamental gold, central banks storing gold for the long-term and ignorance of the recycling possibilities for consumer electronics.[17]

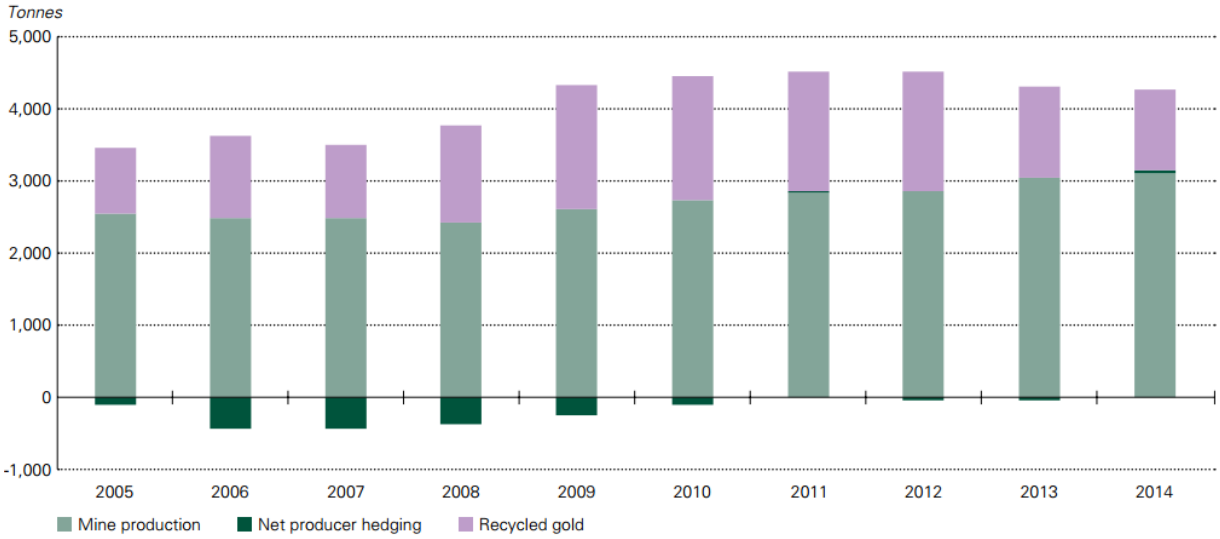
## 2.3 Global gold production statistics

### 2.3.1 Development of gold supply

Different sources provide different figures on the global aboveground stock of gold; this consists of all of the gold supply that exists as the vast majority of all the gold mined throughout history still exists. Generally these estimates range between 161,000 tonnes and 176,000 tonnes as of the end of 2013.[18]

A breakdown of annual global gold supply by source in recent years is provided in Figure 1. The supply from different sources reached 4,278.2 tonnes in 2014.[19] On average, approximately two thirds of new gold supply comes from mining, while another third is sourced from the recycling of gold.[20]

**Figure 1 Development of global gold supply, 2005-2014**




Source: Thomson Reuters and World Gold Council, in: World Gold Council (2015, February), *Gold demand trends – full year 2014*.

Gold production from mining increased by about 6% year-on-year between 2012 and 2013 to 3,022 tonnes.[21] For 2014, another slight increase by about 3% to 3,114.4 tonnes has been reported for mining production. Increase in mine supply is mostly attributable to the development and operationalization of new mines in recent years. Growth in supply from such projects has reached its peak and is expected to diminish in 2015. As lower gold prices have led to a decrease in investments in developing new projects in recent years, it is expected that growth in mine production will level out in the coming years.[22]

The growth in mine supply in 2014 was offset by shrinking volumes and shares of recycling in recent years. The vast majority of recycled gold is originating from old jewellery. Recycling contracted to a seven-year low, while annual mine production grew for the sixth year in a row. Further cuts in recycling activity in developing as well as industrial countries are mentioned as reasons, with recycling only supplying 1,121.7 tonnes (26.2%) or 11% less than in 2013, and expected to remain low also in 2015.[23]
In the short term, gold recycling responds quickly to changes in the gold price and to economic shocks. Some experts expect gold recycling to increase again in the long-term.[24] The GFMS, however, doubts that scrap supply will reach peak levels comparable to 2009 again even if gold prices rally, largely due to a shortage of near market stocks. These were already put on the market between 2008 and 2012, leading to an overall reduced availability of scrap volumes.[25]

Table 1 shows a detailed breakdown of the top-20 gold mining countries in 2012 and 2013 (detailed 2014 data is not yet available at the time of writing). By far the most important producer of gold from mining is China, accounting for 14% of global production in 2013. This is followed by Australia with 9% and Russia and the United States with about 8% each. Peru held a 6% share. The top-5 countries contributed about 45% of global production, while the top-20 together accounted for about 83% of global production.[26]

The Democratic Republic of Congo (DRC), which is of key concern in relation to conflict minerals (see section 4.2), is not among these top producers. According to government sources, production in the country reached approximately 4 tonnes in 2013 and was set to grow considerably to 16 to 18 tonnes in 2014. This growth is largely due to the operation of new mines.[27]

**Table 1 Top-20 gold mining countries 2013**

| Rank | | Country | Production | | Share in global production 2013 |
|---|---|---|---|---|---|
| 2013 | 2012 | | 2012 | 2013 | |
| 1 | 1 | China | 413.1 | 438.2 | 14.5% |
| 2 | 2 | Australia | 251.4 | 266.1 | 8.8% |
| 3 | 4 | Russia | 229.7 | 248.8 | 8.2% |
| 4 | 3 | United States | 231.3 | 228.9 | 7.6% |
| 5 | 5 | Peru | 180.4 | 181.6 | 6.0% |
| 6 | 6 | South Africa | 177.3 | 174.2 | 5.8% |
| 7 | 7 | Canada | 108.0 | 133.1 | 4.4% |
| 8 | 9 | Ghana | 95.8 | 107.9 | 3.6% |
| 9 | 8 | Mexico | 102.8 | 103.8 | 3.4% |
| 10 | 10 | Indonesia | 89.0 | 99.2 | 3.3% |
| 11 | 12 | Brazil | 67.3 | 79.9 | 2.6% |
| 12 | 11 | Uzbekistan | 73.3 | 77.4 | 2.6% |
| 13 | 13 | Papua New Guinea | 57.2 | 63.3 | 2.1% |
| 14 | 14 | Argentina | 54.6 | 50.1 | 1.7% |
| 15 | 17 | Chile | 48.6 | 48.6 | 1.6% |
| 16 | 15 | Mali | 50.3 | 47.1 | 1.6% |
| 17 | 16 | Tanzania | 49.1 | 46.6 | 1.5% |
| 18 | 19 | Kazakhstan | 40.0 | 42.4 | 1.4% |
| 19 | 18 | Philippines | 41.0 | 40.6 | 1.3% |
| 20 | 20 | Colombia | 39.1 | 40.4 | 1.3% |
| - | - | Other countries | 461.7 | 504.0 | 16.7% |
| | | **World production** | **2,860.9** | **3,022.1** | |

Source: O'Connell, R. et al. (2014, April), *GFMS Gold Survey 2014*, London, United Kingdom: Thomson Reuters, p.33; own calculations.

### 2.3.2 Contribution of gold mining to national economies

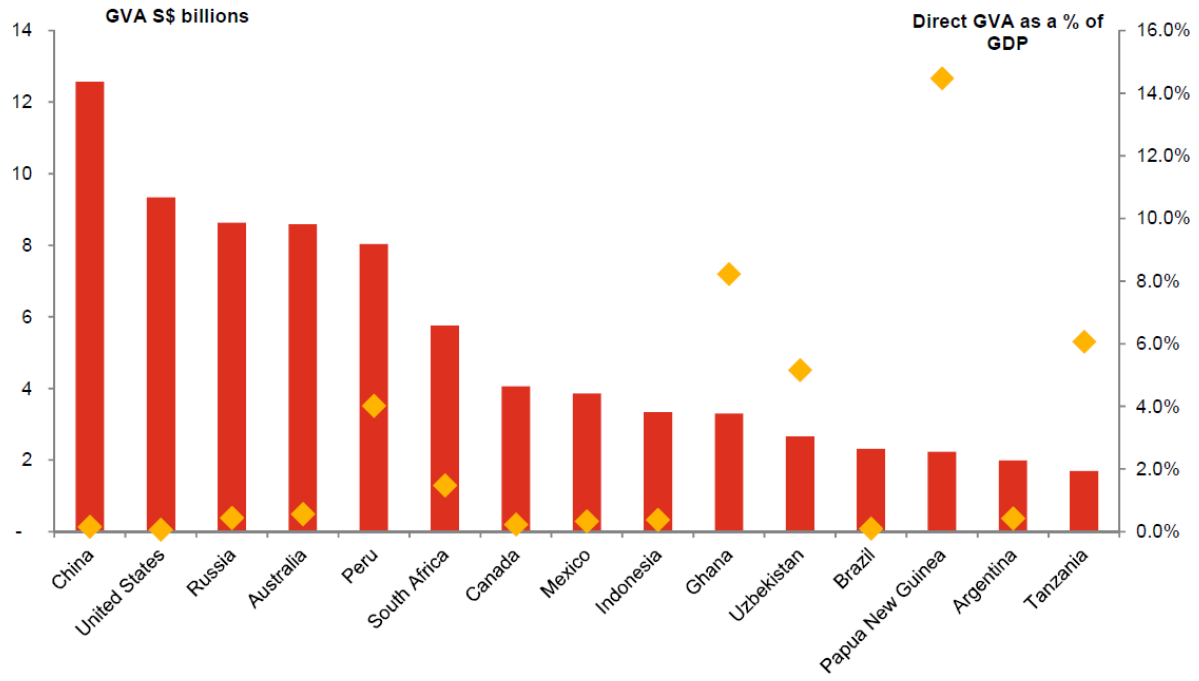
Estimations have been made for the contribution of gold mining to national economies. These estimations are made by comparing the total royalties and taxes paid by mines, mineworkers and suppliers. However, these figures have to be interpreted with caution as gaps in available data required to measure an economic impact are filled by estimates and extrapolations. Especially the additional economic impact of artisanal and small-scale mining is difficult to ascertain.

The gold mines in the world's top 15 producing countries are estimated to have generated US$ 78.4 billion of direct gross value added (GVA) in 2012. This is roughly equal to the GDP of Oman or about 10% of the Dutch GDP. In comparison, the GVA of global gold recycling is estimated between US$ 23.4 billion and US$ 27.6 billion.[28] This reflects the volume distribution between new and recovered supplies of gold.

The contribution and significance of gold mining to different national economies varies considerably. Looking at the direct economic impacts - excluding the wider indirect and induced impacts - the average amount of economic value added per ounce of gold was estimated at US$ 1,139, ranging between US$ 946 in China and US$1,352 in Peru in 2012. These distinctions are a result of a variety of factors, including different labour costs and levels of productivity.[29]

However, this ranking changes when looking at the significance in terms of contribution to the economy expressed as a share of the gross domestic product (GDP), which is estimated to be greatest in Papua New Guinea (15% of GDP), Ghana (8% of GDP) and Tanzania (6% of GDP) (see Figure 2).[30] These are typically countries where large-scale gold mining has been established more recently, with a dominance of low or lower middle incomes and a low human development index.[31] Gold mining is a significant source of exports and through this, foreign exchange earnings for these countries, accounting for approximately 36% of Tanzanian exports and 26% of the exports of Ghana and Papua Guinea in 2012.[32] China shows the largest economic contribution from gold mining by value, however, this only makes up for a small portion of the total output of this large economy.

**Figure 2 Direct gross value added by gold mining and its share in national GDPs (2012)**




Source: PwC analysis based data from the London Bullion Market Association (LBMA), Thomson Reuters GFMS Mine Economics and Gold Survey 2013, InternationalMonetary Fund, in: Ogier, T., Ambler, M. and Yong Jing Teow (2013, October), *The direct economic impact of gold*, London, UK: PriceWaterhouseCooper.

## 2.4 Leading industry players worldwide

### 2.4.1 Top gold producers from industrial mining

Table 2 lists the top-10 leading gold producing companies from industrial mining in 2013. Based on a total global production of 3,022 tonnes, these ten players accounted for about 32% of world production.

**Table 2 Top-10 gold producers globally, 2013**

| Rank | | Company | Country of origin | Owner-ship[a] | Output (tonnes) | | Global market share 2013[c] | Controlled reserves (mt)[d] | Significant mining operations and/or assets | Sources |
|---|---|---|---|---|---|---|---|---|---|---|
| 2013 | 2012 | | | | 2012 | 2013 | | | | |
| 1 | 1 | Barrick Gold | Canada | Public | 231 | 223 | 7.4% | 3,236 | Canada, U.S., Peru, Argentina, Australia, Dominican Republic, Papua New Guinea | 33 |
| 2 | 2 | Newmont Mining | United States | Public | 155 | 158 | 5.2% | 2,748 | U.S., Australia, Peru, Indonesia, Ghana, New Zealand, Mexico | 34 |
| 3 | 3 | AngloGold Ashanti | South Africa | Public | 123 | 128 | 4.2% | 2,113 | South Africa, DRC, Ghana, Mali, Namibia, Tanzania, Argentina, Brazil, U.S., Australia | 35 |
| 4 | 6 | Goldcorp | Canada | Public | 75 | 83 | 2.7% | 1,542 | Argentina, Canada, Chile, Dominican Republic, Mexico, U.S. | 36 |
| 5 | 5 | Kinross Gold | Canada | Public | 75 | 78 | 2.6% | 1,071 | Brazil, Chile, Ghana, Mauritania, Russia, U.S. | 37 |
| 6 | 8 | Newcrest Mining | Australia | Public | 65 | 74 | 2.4% | 2,333 | Australia, Papua New Guinea, Indonesia, Côte d'Ivoire, Fiji | 38 |
| 7 | 7 | Navoi MMC[b] | Uzbekistan | Private | 68 | 71 | 2.3% | ~2,400 | Uzbekistan | 39 |
| 8 | 4 | Gold Fields | South Africa | Public | 96 | 58 | 1.9% | 1,512 | Australia, Ghana, Peru, South Africa | 40 |
| 9 | 9 | Polyus Gold International | United Kingdom | Public | 52 | 51 | 1.7% | 2,585 | Russia | 41 |
| 10 | n/a | Sibanye Gold | South Africa | Public | n/a | 45 | 1.5% | 1,017 | South Africa | 42 |
| | | Other companies | | | 1,921 | 2,053 | 68.1% | | | |
| | | **World production** | | | **2,861** | **3,022** | | | | |

[a]Public companies are traded at a stock exchange; [b] estimates, lack of transparency on reserves; [c] based on global annual production of 3,022.1 tonnes in 2013; d proven and probable reserves, 2013/2014;
Source: see table; Ranking taken from: O'Connell, R. et al. (2014, April), *GMFS Gold Survey 2014*, London, United Kingdom: Thomson Reuters.

### 2.4.2 Largest gold deposits and their owners

Table 3 lists the largest gold deposits worldwide based on estimated in-situ resource in 2013. Among these, Russia, South Africa and the United States are standing out with each three mines and deposits among the top-20. However, some of the highest grade deposits can be found in Africa. The size and grade of deposits are of major importance for the economic viability of a mining project. A sizeable ore body is needed to acquire the necessary economies of scale. In addition, a sufficiently high grade and thus gold content per processed tonne of ore is needed to make development and production feasible.[43]

Very large gold discoveries with more than 10 million ounces (311 tonnes) are rare, accounting only for 15% of all deposits. The majority (69%) contain less than 5 million ounces (156 tonnes).[44] Deposits in China, the largest gold mining country in the world, are only showing up from rank 97. This is caused by the lack of transparency in China regarding its mineral reserves.

**Table 3 Top-20 largest gold mines and deposits (undeveloped & producing)**

| Deposit name | Tonnes | Grade | In-situ oz ('000)[a] | Location | Ownership | Country of origin | Producing |
|---|---|---|---|---|---|---|---|
| Pebble Deposit | 10,776 | 0.31 | 107,269 | U.S. | Northern Dynasty | Canada | |
| Natalka | 1,693 | 1.68 | 91,179 | Russia | Polyus Gold | United Kingdom | |
| Grasberg | 4,765 | 0.56 | 85,800 | Indonesia | Freeport McMoRan | U.S. | ⚙ |
| South Deep | 415 | 6.10 | 81,331 | South Africa | Gold Fields | South Africa | ⚙ |
| Olimpiada | 748 | 3.22 | 77,435 | Russia | Polyus Gold | United Kingdom | ⚙ |
| Lihir | 1,020 | 1.69 | 55,347 | Papua New Guinea | Newcrest Mining | Australia | ⚙ |
| Mponeng | 111 | 14.24 | 50,832 | South Africa | AngloGold Ashanti | South Africa | ⚙ |
| Muruntau | 625 | 2.49 | 50,000 | Uzbekistan | Government of Uzbekistan | Uzbekistan | ⚙ |
| KSM Deposit | 2,895 | 0.52 | 48,592 | Canada | Seabridge Gold | Canada | |
| Cadia Valley | 3,630 | 0.41 | 48,117 | Australia | Newcrest Mining | Australia | ⚙ |
| Oyu Tolgoi | 3,755 | 0.38 | 46,071 | Mongolia | Turquoise Hill Resources | Canada | ⚙ |
| Donlin Creek | 634 | 2.20 | 44,854 | U.S. | Barrick Gold / NovaGold | Canada | |
| Blyvoor | 548 | 2.43 | 42,912 | South Africa | Village Main Reef | South Africa | |
| Pueblo Viejo | 493 | 2.53 | 40,114 | Dominican Republic | Barrick Gold / Goldcorp | Canada | ⚙ |
| Snowfield | 2,203 | 0.49 | 34,983 | Canada | Pretium Resources | Canada | |
| Sukhoi Log | 384 | 2.67 | 33,000 | Russia | Government of Russia | Russia | |
| Cerro Casale | 1,995 | 0.50 | 32,236 | Chile | Barrick Gold / Kinross Gold | Canada | |
| Hycroft | 3,024 | 0.32 | 31,245 | U.S. | Allied Nevada Gold | U.S. | ⚙ |
| Las Cristinas | 1,116 | 0.86 | 30,804 | Venezuela | Government of Venezuela | Venezuela | |
| Obuasi | 173 | 5.35 | 29,840 | Ghana | AngloGold Ashanti | South Africa | ⚙ |

[a]1,000 troy ounces (oz) equal 31.103 kg;
Source: Natural Resource Holdings (2013, November), *Global Gold Mine and Deposit Rankings 2013,* p.19.

### 2.4.3 Leading gold refiners

Table 4 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.

**Table 4 Leading gold refineries worldwide, by capacity**

| Company | Country | Parent | Country | Annual capacity (tonnes) | Sources |
|---|---|---|---|---|---|
| Valcambi | Switzerland | Newmont Mining (60.6%)[a] | United States | 1,400 | 45 |
| Metalor | Switzerland | - | - | 650 | 46 |
| Rand Refinery | South Africa | AngloGold Ashanti (42.4%), Gold Fields (2.8%), DRDGOLD (11.3%), Harmony Gold Mining (10.4%). | South Africa | 600 | 47 |
| Tanaka Kikinzoku Kogyo | Japan | Tanaka Holdings | Japan | 540 | 48 |
| PAMP | Italy | MKS | Switzerland | 450 | 49 |
| Heraeus | Germany | Heraeus Holding | Germany | 450 | 50 |
| Argor Heraeus | Switzerland | Heraeus Holding | Germany | 400 | 51 |
| Perth Mint | Australia | Government of Western Australia | Australia | 300 | 52 |
| Asahi Refining[b] | United States | Asahi Holdings | Japan | 250 | 53 |

[a] Valcambi is 100% owned by European Gold Refineries (EGR), which in turn is 60.6% owned by Newmont Mining and 39.4% by private equity; [b] Asahi completed the acquisition of Johnson Matthey´s gold and silver refinery business in March 2015; Source: see table; The Real Asset Company (2013, May), "Largest gold refiners by capacity (tonnes per year)", online: http://therealasset.co.uk/gold-refinery-list/, viewed in March 2015; Gold Bars Worldwide (2014), "Major gold refiners & brands", online: http://www.goldbarsworldwide.com/section03/HTML_2_MajorGoldRefiners.html, viewed in March 2015; Mariana, D. (2012, October 12), "Switzerland - The world's gold hub", *Swissinfo*, online: http://www.swissinfo.ch/eng/switzerland--the-world-s-gold-hub/33706126, viewed in March 2015.

By far the largest capacity can be found in Switzerland, where four out of nine leading gold refineries are based. According to industry estimates, about 70% of world gold was refined in Switzerland in 2012.[54] Rand Refinery, based in South Africa, states to refine 100% of the newly mined gold and silver in South Africa and 75% of all the gold mined in Africa.[55] However, the general distribution of refining capacity is expected to change soon, as Kaloti Precious Metals is planning to bring one of the biggest gold refineries in the world into operation in Dubai in 2015. The facility will have an annual capacity of 1,400 tonnes of gold, facilitating a significant increase from the current capacity of about 800 tonnes in the United Arab Emirates.[56]

A longer list of gold refineries is available from the London Bullion Market Association (LBMA), which has set up a so-called "Good delivery list" of LBMA-accredited refiners.[57]

The gold refining process includes melting, cold rolling, manufacturing, and testing. Different from steel mills, the scale is much smaller in precious-metal refining and the economics are different. Due to the high value of the raw material, the cost of gold inventories is also very high. This means that economies-of-scale are less important than "economies-of-speed".[58]

## 2.5 Gold trade

### 2.5.1 Global gold trade

Gold is firstly sold from mining companies to refineries as *bullion* (also known as *doré*, almost pure, but still contains some silver and other metals). This is the *unrefined gold*. Refineries then produce *refined gold*, which is traded to different sectors: investment, jewellery, electronics, etc. Gold trade figures are difficult to ascertain. Trade statistics are generally prone to uncertainties, and carry additional uncertainties for a commodity like gold where some countries, for example China, do not publish detailed trade figures, and smuggling or unregistered border transfers are commonly occurring and obscuring the true origin and destination of gold. In addition, the global trade in gold is characterized by the fact that physical trading hubs as well as countries with higher concentration of refining capacity are located in between the producing and consuming countries, making the tracing of gold to the source difficult (see also section 4.4 on the traceability issues related to gold).
Figures can also get distorted by countries applying different approaches of recording trade. For example, until 2013 Switzerland did not include physical gold sales in its trade statistics, while the European Statistical Office Eurostat did. This led to significant discrepancies in statistics in 2013, when private investors from the UK sold 1,464 tonnes of physical gold to Switzerland.[59] Trade and consumption figures for China reported by different sources are particularly controversial; while China's role as a leading consumer of gold is undisputed this is also leading to uncertainties about global gold trade.[60]

For the purpose of this study, it is aimed to provide broad overview figures of key trading links for gold, excluding bank demand. Central bank purchases are covered in section 2.6.3. The figures are based on best available data but are certainly not flawless; they should thus be seen as indications on key supplying and consuming countries rather than as precise figures.

Based on 2013 figures, Table 5 lists the top producing countries for gold accounting for more than 5% of global production each, and indications on the most important exporting destinations as reported by a UN database. Countries like the United States or South Africa not only have own production, but are also important transit countries, meaning that exports can be higher than production. The figures do not account for recovery of gold from scrap. Export destinations are referring to the physical destination of the gold, which may not necessarily be also the home-country of the buyer as investors may hold gold in another country.

**Table 5 Leading gold producers from mining and key export destinations, 2013[a]**

| Country | Production 2013 (tonnes) | Total exports (tonnes) | Key export destinations | Gold exports 2013 (tonnes) |
|---|---|---|---|---|
| China | 438 | n/a | n/a | n/a |
| Australia | 266 | 316 | China | 181 |
| | | | India | 30 |
| | | | Thailand | 24 |
| | | | Singapore | 21 |
| | | | Others | 60 |
| Russia | 249 | 128 | Switzerland | 69 |
| | | | Hong Kong | 43 |
| | | | United Arab Emirates | 11 |
| | | | Thailand | 3 |
| | | | Others | 2 |
| United States | 229 | 711 | Switzerland | 285 |

| Country | Production 2013 (tonnes) | Total exports (tonnes) | Key export destinations | Gold exports 2013 (tonnes) |
|---|---|---|---|---|
| | | | Hong Kong | 217 |
| | | | United Arab Emirates | 35 |
| | | | India | 35 |
| | | | Others | 139 |
| Peru[b] | 182 | 290 | Switzerland | 126 |
| | | | United States | 76 |
| | | | Canada | 49 |
| | | | Italy | 15 |
| | | | Others | 24 |
| South Africa | 174 | 189 | India | 81 |
| | | | Thailand | 35 |
| | | | United Kingdom | 27 |
| | | | Italy | 19 |
| | | | Others | 27 |

[a]including gold powder, unwrought gold, and gold in semi-manufactured forms; partly based on mirror data; [b]the large difference in production and export of gold from Peru cannot be fully explained, but may be due to widespread illegal production of gold; since 2014, the Peruvian government started to crack-down on these operations (see e.g. Mathew, J. (2014, February 12), "Illegal Gold Exports From Peru to Decline due to Government Crackdown", International Business Times, online: http://www.ibtimes.co.uk/illegal-gold-exports-peru-decline-due-government-crackdown-1436050, viewed in May 2015; Source: *International Trade Centre of the United Nations (ITC)*, "List of importing markets for a product exported by a country (Mirror)Metadata - Product: 7108 Gold unwrought or in semi-manuf forms", online: http://www.trademap.org/, viewed in March 2015.

When looking at top exporters of gold, the role of the major trading hubs for gold comes into play, with Hong Kong, United Arab Emirates, Germany and Italy among the top-10 countries by value exported, even though these countries do not have gold mining operations.[61]

China is a major producer as well as a large consumer of gold. Trade data is difficult to obtain, but most sources suggest that China is not exporting sizeable amounts of gold.

The largest consumers of gold are India and China.[62] Table 6 provides on the one hand an overview of the top-5 countries for physical consumption of gold in the form of coin and bar demand and demand in the form of jewellery, excluding the activity of banks; and on the other hand indications of key sourcing countries for unfinished gold, that is in the form of gold powder, unwrought gold, and gold in semi-manufactured forms. It is difficult to ascertain how much of the gold consumed in a country is sourced from own production (including recycling) and how much is being imported. Trade in jewellery is certainly also taking place, but due to a lack in detailed data availability, this could not be included in the table.

Again, trading hubs like Hong Kong, Switzerland and the United Arab Emirates are playing an important role, not allowing to draw direct conclusions on the actual production location of gold. As before, these uncertainties and the gaps in data mean that the provided figures should only be used as rough indications on key trading relationships.

## Table 6 Top-5 countries for physical gold demand (excluding bank activity) and key sourcing countries, 2013[a]

| | Consumption of processed gold | | | Sources of unfinished gold imports[b] | |
|---|---|---|---|---|---|
| Country | Coin & bar demand 2013 (tonnes) | Jewellery demand 2013 (tonnes) | Total demand 2013 (tonnes) | Key sourcing countries | Gold imports 2013 (tonnes) |
| China[c] | 384 | 928 | 1,312 | Hong Kong | 1,158 |
| | | | | Switzerland | 250 |
| | | | | unknown | unknown |
| India | 362 | 613 | 975 | Switzerland | 484 |
| | | | | United Arab Emirates | 162 |
| | | | | South Africa | 80 |
| | | | | United States | 36 |
| | | | | Australia | 31 |
| | | | | Other | 43 |
| United States | 68 | 122 | 190 | Mexico | 84 |
| | | | | Canada | 81 |
| | | | | Peru | 58 |
| | | | | Colombia | 52 |
| | | | | Bolivia | 11 |
| | | | | Other | 56 |
| Turkey | 102 | 73 | 175 | Switzerland | 167 |
| | | | | United Arab Emirates | 111 |
| | | | | Australia | 21 |
| | | | | South Africa | 13 |
| | | | | Germany | 11 |
| | | | | Other | 27 |
| Thailand | 158 | 7 | 165 | Switzerland | 166 |
| | | | | South Africa | 35 |
| | | | | United States | 30 |
| | | | | Australia | 28 |
| | | | | Japan | 24 |
| | | | | Other | 56 |
| Others | 691 | 642 | 1,333 | | |
| **Total** | **1,765** | **2,385** | **4,150** | | |

[a]The global Gold Council already published 2014 figures, however, trade figures for 2014 are not yet fully available;
[b]including gold powder, unwrought gold, and gold in semi-manufactured forms;
[c]it is likely that a considerable part of the gold entering China via Hong Kong also originates from Switzerland;
Source: World Gold Council (2015, February), *Gold demand trends – Full year 2014*; *International Trade Centre of the United Nations (ITC)*, "List of importing markets for a product exported by a country (Mirror)Metadata - Product: 7108 Gold unwrought or in semi-manuf forms", online: http://www.trademap.org/, viewed in March 2015;
Swiss Customs Administration (2015, March 3), "*Swiss foreign trade in gold, silver and coins 1982-2013, annual country-based data*";
Serapio, M. (2015, February 26), "China gold imports from Hong Kong rebound in January", Reuters, online: http://in.reuters.com/article/2015/02/26/gold-china-imports-idINKBN0LU0UO20150226,viewed in April 2015.

### 2.5.2 Illicit gold trading

Illicit activities in gold trade are referring to financial as well as well as physical diversions. Illicit financial flows (IFF) are referring to money ending up benefiting local and foreign elites rather than the general population. This is money generated by corruption, illegal resource exploitation, and tax evasion.[63] For example, a recent study on Ghana estimated illicit financial flows from illegal gold mining in 2013 at about US$1.7 billion.[64]
Apart from these illicit financial flows, there is also the illicit gold which is physically entering into formal trade channels: this is one of the main distorting factors in gold trade statistics. The problem of unlawful gold mining and trade has come under increasing scrutiny in the recent past. In 2014, the United Nations Interregional Crime and Justice Research Institute launched a global study on the role of organized crime in the production and distribution of precious metals, including gold (see also section 4.2.2).[65]

Gold is seen as relatively easy to smuggle and illegally mined gold is traded into the global precious metal pipeline mixing with legally mined metal.[66] However, the specifics of that trade route remain obscure and controlling such unofficial supplies is seen as difficult (see section 4.4).[67]

Countries where illegal mining, illicit gold trading and tax evasion is prevalent include South Africa, the Democratic Republic of Congo (DRC) and Peru.[68] In February 2014, Global Witness released a report exposing how conflict gold from the DRC entered the supply chain in Dubai.[69] Much of the gold from the DRC is finding its way to Dubai via Uganda (see also section 4.4.2). Up until 2011, Kampala-based traders could easily obscure the origin of smuggled gold they were openly trading. Since then, the relevant Ugandan authorities require gold traders to produce supporting documentation in order to prove the origin of their gold. However, according to OECD research this "*[…] apparently positive modification of the regulatory framework has reduced Uganda's legal gold exports, but has not stopped the trade in smuggled Congo gold. The main difference is that the gold is now smuggled from Uganda rather than declared.*"[70]

### 2.5.3 Dubai / United Arab Emirates

Dubai has established itself as a leading gold and precious metals trading hub in recent years.[71] The country has a considerable refining capacity with currently about 800 tonnes per year and an expected increase by 75% in the course of 2015 (see section 2.4.3).[72]

In 2011, Dubai imported a total of 745 tonnes of gold, including scrap, at a value of US$ 33.0 billion and exported 451 tonnes with a value of US$ 22.9 billion.[73] Industry experts reported an increase to a value of US$ 75 billion worth of gold, or about 40% of the world's physical bullion exchange, being traded through Dubai in 2013. In 2003, when the Dubai Multi Commodities Centre (DMCC) commenced its operations, it only traded US$ 6 billion worth of gold.[74] The UAE's most important export markets for gold are India, Malaysia, Turkey, Switzerland and Nepal.[75]

The tax-free status of Dubai has contributed to making it one of the cheapest places in the world to buy gold. Imports of unwrought gold (including gold powder, coins, bars and bullion) are exempted from the 5% customs duty, which applies to most imported goods as well as gold in semi-manufactured form. In addition, there is no VAT or direct tax.[76] A considerable share of gold is entering the country hand-carried. Documentary requirements for hand-carried exist but checks of the consignee, the (authenticity of) certificate of origin or export permit are described as minimal.[77]

### 2.5.4 Miami / United States

Miami district is the major transhipment point for gold in the U.S., most of it entering the country via the international airport. Miami is a hub for bullion trading as well as proving, refining, and financing operations. The majority of the gold originates from mines in Central and South America, with middlemen predominantly located in Bolivia, Colombia, Mexico, Peru and the gold trading center of Curacao; from Miami it continues to key destinations in Switzerland and Dubai. Republic Metals, one of the largest precious metal refineries in North America is located close to Miami.[78] In 2013, Miami district imported gold with a value of US$6.75 billion and exports reached a value of US$ 4.88 billion.[79]

Among the key players is Kaloti Metals & Logistics, a gold and precious metals trading house active in melting, forming into bars, assaying and shipping out. It is a subsidiary of Kaloti Precious Metals from the United Arab Emirates (see section 2.4.3), and nearly all the gold processed at Kaloti Metals is sent via air to associates in Dubai.[80]

### 2.5.5 Shanghai / China

In autumn 2014, the Shanghai Gold Exchange (SGE), the largest physical gold trading centre worldwide, launched a free trade zone in combination with the start of trade at the Shanghai International Gold Exchange (SGEI).[81] Even though gold trade figures for China were non-transparent before, this was seen to further obscure the level of buying by the world's top gold consumer. Previously, the bulk of gold bought by China used to flow through Hong Kong, which allowed using its export data as a proxy for Chinese demand, as data about gold imports to the mainland are treated as a state secret.[82] However, the SGE and SGEI are technically separate exchanges, as a free trade zone is a separate country from China mainland when it comes to trade.[83]
The strict regulation of the gold trade in China makes the import and tracing very complex. All import and trade of gold must go through the SGE. Manufacturers using gold in production processes are regularly audited by Chinese governmental agencies and companies need to be accredited by the SGE to be eligible to import gold and auditors need to verify whether figures are matching and the gold used was purchased through the gold exchange. As gold is mixed at the SGE it is not possible to for producers to trace the gold they use back to its source of origin.[84]

The primary objectives pursued with the SGEI were to facilitate gold trading in renminbi, to improve price discovery in renminbi and to internationalize the currency.[85]

### 2.5.6 Singapore

In its aim to make the city-state Asia's gold-trading hub, its export-promotion agency states as its objective to raise the city-state's share in the global precious-metals market from the current 2% to 10-15% within less than a decade. As part of that plan, in October 2012 the government exempted investment-grade precious metals from the 7% goods & services tax (a sales tax similar to VAT). Singapore hopes to out-compete Asian rivals Dubai and Hong Kong by offering efficient infrastructure and air connectivity and political and economic stability.[86] The tax removal resulted in an increase in physical gold trade by 94% year-on-year to US$ 28 billion.[87]
What it was lacking until recently was refining capacity. However, in June 2014 Switzerland's Metalor opened its gold refinery and bullion manufacturing plant in Singapore, with support from Singapore's Economic Development Board.[88]

Singapore launched a physical gold contract in October 2014 for 25 kilograms of 99.99 percent purity gold. It introduces centralized trading and clearing of physically-delivered gold kilobars.[89] This move is also inspired by the fact that Asian countries consume the largest share of gold on the market.[90]

### 2.5.7 Switzerland

Switzerland is playing a key role in the global gold market, being a major refiner as well as trading hub. Mining companies and gold recyclers export to Switzerland; the gold is subsequently purified to the highest levels and exported to the whole world to jewellers, investors, central banks and other customers. Switzerland also has a reputation to be the home of top precious metals storage and safekeeping companies. Important upcoming competitors are Dubai (see section 2.5.3) and Singapore (see section 2.5.6).[91] The country thus faces the challenge of maintaining and strengthening the conditions that contribute to its status of an attractive business location, including its competitive tax regime and efficient financial centres.[92]

Easy access to high-quality precious metals is also an important factor for the Swiss watch industry, which dominates the upper segment in this sector.[93]

The Swiss Customs Administration for the first time published detailed, country-level trade data for gold in 2014, subsequently also adding historical data.[94] Table 7 shows the key trading partners in gold for Switzerland in 2014, including gold in powder, unwrought and semi-manufactured forms. Of the total imports of 2,218 tonnes in that year, the largest quantity was sourced from the United Kingdom accounting for almost 30% of total imports, followed by the United States with about 10%. The difference in value per tonne is caused by different forms and qualities of gold being included in the overview. The most important export destinations include India accounting for a 26%-share of overall exports, followed by Hong Kong with a 21%-share. Net imports totalled 393 tonnes.[95]

**Table 7 Key Swiss gold trading partners (unfinished gold), 2014**

| Gold imports*, 2014 | | Gold exports*, 2014 | |
|---|---|---|---|
| **Partner** | **Quantity (tonnes)** | **Partner** | **Quantity (tonnes)** |
| United Kingdom | 652.8 | India | 471.2 |
| United States | 211.9 | Hong Kong | 377.4 |
| Chile | 202.1 | China | 213.3 |
| Argentina | 137.1 | Singapore | 135.4 |
| Peru | 117.3 | Germany | 104.8 |
| Germany | 78.9 | United Arab Emirates | 75.3 |
| Italy | 70.4 | Turkey | 69.1 |
| United Arab Emirates | 64.1 | Saudi Arabia | 60.6 |
| Russian Federation | 58.3 | Italy | 50.0 |
| Turkey | 52.6 | Thailand | 44.4 |
| Other countries | 572.4 | Other countries | 223.9 |
| **Total** | **2,217.9** | **Total** | **1,825.4** |

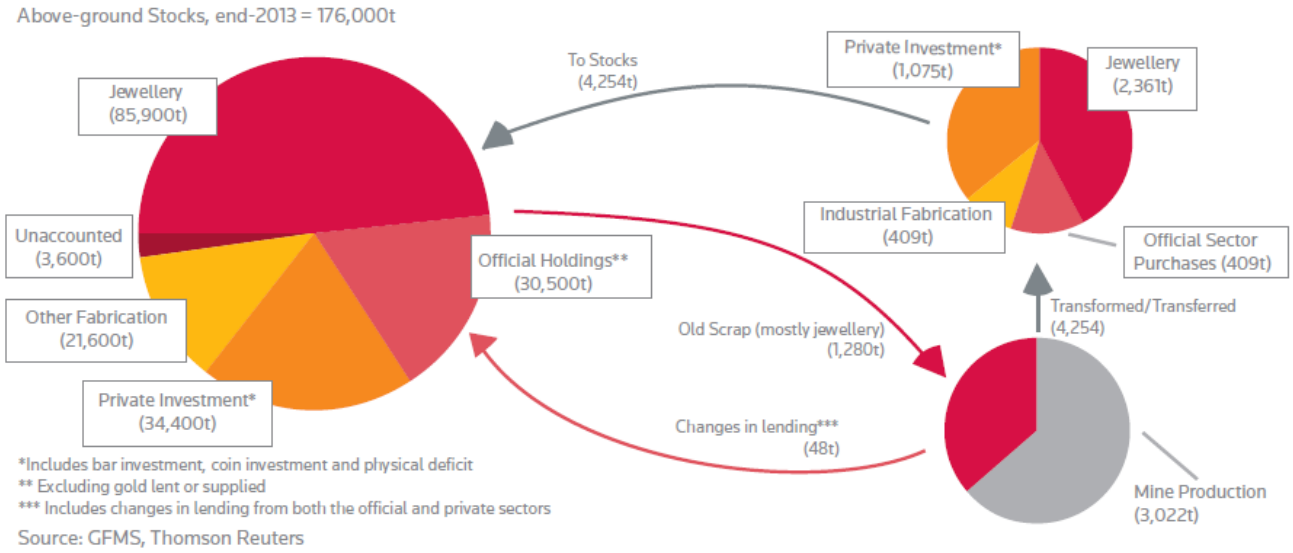
*includes gold in powder form (HS code 7108.11); unwrought gold (HS code 7801.12); and gold in semi-manufactured forms (HS code 7801.13); excluding monetary gold.
Source: *Swiss Federal Customs Administration*, "Swiss Impex", online: https://www.swiss-impex.admin.ch/index.xhtml, viewed in March 2015.

In addition to the trade in various forms of gold in unfinished forms, Switzerland also plays an important role in the trade in gold jewellery. In 2014, the total value of gold jewellery imported into Switzerland reached € 6.9 billion for an amount of 45.3 tonnes, the export had a value of € 8.1 billion for 35.2 tonnes. The largest quantity was imported from Italy with 15.1 tonnes for a value of € 991 million. Hong Kong and China were the most important destinations for exports of gold jewellery from Switzerland, reaching a total value of € 1.5 billion for a total of 9 tonnes. However, the value of exports to Hong Kong was significantly higher with € 267 million per tonne, compared to € 40 million per tonne for exports to China.[96]

## 2.6 Key applications of gold

Figure 3 illustrates the overall development of gold stocks from mine production (see section 2.3.1) and recycling (see section 2.2.3), major uses of gold and the resulting above-ground stocks in 2013.

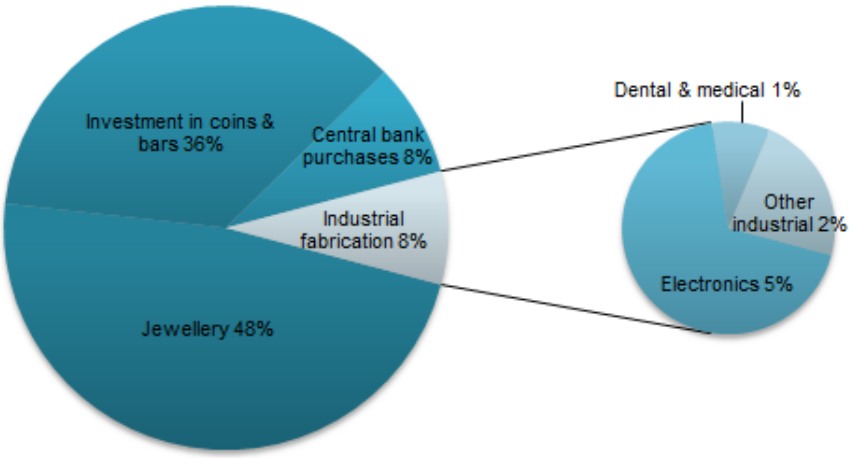
**Figure 3 Gold transfers (net) to and from global above-ground stocks, 2013**




Source: O'Connell, R. et al. (2014, April), *GFMS Gold Survey 2014*, London, United Kingdom: Thomson Reuters, p.53.

The production of jewellery and investment demand are the two main markets for gold, together accounting for about 84% of total consumption.[97] With central banks also accounting for an important role in the market, it is characterized by the interplay of a number of complex forces related to ever-changing individual tastes as well as macroeconomic conditions.[98] Figure 4 illustrates the estimated shares of the main uses of gold in 2013.

**Figure 4 Major uses of gold, 2013**




Source: O'Connell, R. et al. (2014, April), *GFMS Gold Survey 2014*, London, United Kingdom: Thomson Reuters.

### 2.6.1 Jewellery demand

Jewellery accounts for the largest share in gold demand, on average taking up around 50% of total use of gold in recent years. Gold demand for jewellery reached 2,385 tonnes in 2013, decreasing to 2,153 tonnes in 2014.[99] By far the two largest gold jewellery consuming countries are India and China, accounting for about 31% each of total demand for gold in jewellery. This is followed by the United States with 6% and Turkey with 3%. The European Union member states together accounted for an estimated 2%.[100]

### 2.6.2 Investment demand

Investment demand is made up of direct ownership of bars and coins as well as indirect ownership via investment in exchange-traded funds (ETFs)[a] and comparable products.[101] Bar and coin investments totalled 1,064 tonnes in 2014, a drop by about 40% from the previous year (1,765 tonnes). Of these, about 220 tonnes or 21% were accounted for by the European Union, 18% by China and 17% by India.[102]

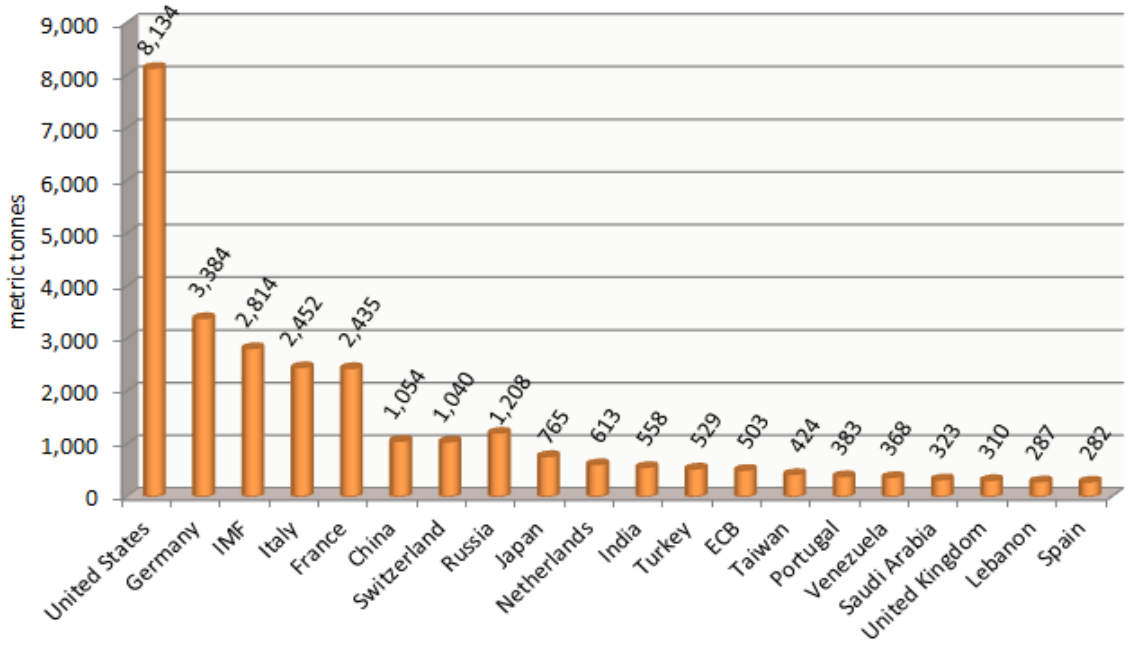
### 2.6.3 Central bank purchases

Central banks keep gold as a reserve asset, as it is one of the few assets that are universally permitted by the investment guidelines of the world's central banks due to the depth and liquidity of the market.[103] Central banks absorbed 477 tonnes of gold in 2014, a 17% increase from the previous year's 409 tonnes and the second highest year of central bank net purchases for 50 years.[104] Purchasers were dominated by institutions in former Soviet Republics (CIS) as a way to diversify investments away from the US Dollar holdings. The leading purchaser was the Russian central bank with 173 tonnes, increasing its total stocks to over 1,200 tonnes. Other important purchasers were Kazakhstan, Azerbaijan and Iraq. Conversely, sales of gold by central banks were limited.[105]

[a] Gold ETFs can be composed of contracts and derivatives not providing physical ownership of coins or bullion bars, or Physical Gold ETFs offering physical storage of gold.

Figure 5 illustrates the top holders of gold reserves among the central banks worldwide as of January 2014, including the IMF. By far the largest reserves of treasury-owned gold can be found in the United States with more than 8,100 tonnes. The Dutch Central Bank with its roughly 615 tonnes is the tenth largest holder.[106] The figure for China is uncertain though as the real amounts of gold consumed in the country as well as the true state of the gold reserves are uncertain. Based on the gap of 500 tonnes between Chinese production, imports and consumption it is being speculated that the China's central bank, the People's Bank of China, has been clandestinely buying gold.[107]

**Figure 5 Top-15 gold reserves in central banks, January 2014**




Source: World Gold Council (2015, February), *Gold demand trends – Full year 2014*.

### 2.6.4 Industrial applications

Gold is used in a wide range of technological and manufacturing applications because of its electrical conductivity, malleability and resistance to corrosion. Applications include electronic goods and equipment, telecommunications devices and household appliances. Gold is also used in healthcare services and pharmaceutical products due to its 'biocompatibility' and resistance to bacterial colonisation.[108]

In the industrial sector, electronics are consuming the largest share of gold, accounting for about 5% of global consumption in 2013. Fine gold is primarily used in the production of bonding wires for semiconductors. Other gold applications in the electronics sector are in computer memory, optoelectronics and analogue applications. However, demand has decreased in recent years due to increased replacement of gold in bonding wires through copper. Chip fabricators invested in these alternative technologies due to rising gold prices. [109] While gold made up 90% of bonding wires in 2008, this share fell to an estimated 50% in 2014. The gold share in printed circuit boards fell by about 40% per tonne.[110]

Other industrial and decorative uses include gold potassium cyanide (GPC), which is widely used for the electroplating of luxury goods and accessories like belt buckles, watches and sunglasses.[111]

Table 8 shows the gold demand for electronics fabrication by country based on 2013 figures. These are including new as well as gold from scrap. Total consumption of this sector was 279 tonnes. Japan was the largest consumer of gold for electronics production, followed by the United States and China. These three countries together accounted for close to 70% of the total world use in this sector.[112]

**Table 8 Electronics fabrication gold demand by country, 2013**

| Country | Gold use for electronics* (tonnes) | Share in global gold use for electronics |
|---|---|---|
| Japan | 85.7 | 31% |
| United States | 55.4 | 20% |
| China | 49.0 | 18% |
| South Korea | 23.5 | 8% |
| Taiwan | 16.2 | 6% |
| Russia | 12.7 | 5% |
| Germany | 12.5 | 4% |
| Singapore | 9.9 | 4% |
| Switzerland | 5.3 | 2% |
| India | 2.4 | 1% |
| Other | 6.3 | 2% |
| **World total** | **278.9** | |

Note: *including scrap;
Source: Thomson Reuters (2014, April), *GFMS Gold Survey 2014*, London, UK; own calculations.

### 2.6.5 Dental gold and medical applications

Dental and medical applications took a 1% share of global gold consumption in 2013. Key countries for dentistry gold production in 2013 were Japan accounting for almost 20%, the United States with approximately 8% and Germany with approximately 3%. The market for dental gold showed a continuous, albeit decreasing, fall in recent years. The key reason is substitution by base metals and, to a lesser extent, ceramic materials due to gold being more expensive.[113]
A new application of gold is the use of gold nanoparticles in medical research.[114]

# Chapter 3 The Netherlands and the global gold chain

This chapter takes a closer look at the role of the Netherlands in the global gold chain. Section 3.1 provides data on trade statistics and countries of origin of gold imported into the Netherlands. The section also covers the historical development of the Dutch central bank gold reserve and lists a number of gold traders and wholesale buyers active on the Dutch market. Players in the field of electronics recycling are included in section 3.2, while section 3.3.1 looks at companies in the consumer electronics and jewellery sector which consume gold. Dutch investors in physical gold, gold stocks and gold commodity contracts are included in section 3.4. Section 3.5 focuses on the financial sector, briefly describing the role of Dutch financial institutions in financing leading gold mining companies. Finally, section 3.6 looks at shell companies registered by leading gold mining companies and the role of the Netherlands in tax planning.

## 3.1 Gold trade and consumption

### 3.1.1 Gold imports and exports

Table 9 lists Dutch gold imports and key countries of origin in reporting year 2013 based on statistical data. 0 lists the key countries to which the Netherlands reported exports of gold and gold products in 2013. Unfinished gold in the form of powder, unwrought gold and semi-manufactured forms of gold have been summarized in one category. Further listed are coins and jewellery. For coins, different statistical sources provide different definitions of the selected HS code. According to the Dutch Statistical Office, the code covers gold coins and coins which are valid for payment. Gold bullion coins are a way of investing into gold; they are bought and sold via precious metals dealers.[115] The jewellery category also includes other precious metals (with the exemption of silver). Similarly, scrap is not referring to pure gold, but mostly waste containing gold or gold compounds.

Based on the figures presented in Table 9 and Table 10, net gold imports can be estimated (imports minus exports). In 2013, net imports add up to 3,035 kg of unfinished gold and 1,748 kg of jewellery. For gold coins there would been a net export of 652 kg. With 52.6 tonnes of scrap metal containing gold being imported and 52.0 tonnes exported, the net imported volume for this category is about 590 kg.
These figures do not yet consider gold that is used in the production of electronic products like mobile phones or computers which are produced in other countries (see section 3.2).

The figures have been included here (in Table 9 and Table 10) in order to give an impression of the trade in gold in which the Netherlands is involved. However, it is important to use and interpret them very cautiously. Discussions with experts on the issue led to the conclusion that several of the volumes recorded in the statistics are unlikely to match reality.
This refers, for example, to the following cases:

- Exports to the UK seem too high;
- Trade with Spain is too low;
- Imports of coins from, for example, China, Mexico and Poland seem too high;
- The overall jewellery figures seem very high, and here especially the imports from Austria, Denmark and the United Arab Emirates.

The fact that trade with Germany is playing such a prominent role can be explained with the fact that there are close business relationships between the two countries in the area of recasting gold. However, comparing the figures reported by Dutch authorities with those reported by the German statistical office also leads to differences. Similarly, figures reported by the UK authorities differ from the ones reported by the Netherlands.

There are many possible explanations for shortcomings in trade data. These include the threshold system handled in the Intrastat System in the European Union, which means that smaller businesses are exempt from statistical formalities for trade within the European Union. While trade of these companies as well as reporting-failures are considered through estimates, this may lead to discrepancies, especially in the reporting of different member states.
Another possible source of error in gold trade is so-called triangular trade, referring to cases where invoicing and physical goods movement are not taking place between the same countries: a trader in one country sells gold which is held in a second country to a buyer in a third country.
Also detailed figures for specific products are not published in cases where there are very few or even only one reporter in a certain country. In those cases data is summarized under higher, more generic trading codes. [116]

Due to these inconsistent trade statistics as well as the 'hidden' use of gold in electronics products, actual domestic gold consumption in the Netherlands, including bars, is difficult to ascertain. It is not possible within the scope of this research to identify the exact sources of error and verify the figures with the various involved parties.

**Table 9 Dutch gold imports and key countries of origin (2013)**

| Country or origin | Gold unwrought / semi-manufactured forms (kg) | Scrap* (kg) | Gold coins (kg) | Jewellery (kg) |
|---|---|---|---|---|
| Germany | 31,540 | 2,156 | 1,751 | 266 |
| China | 2 | - | 1,019 | 410 |
| United Kingdom | 1,139 | - | 24 | 43 |
| Austria | 0 | 39 | 59 | 283 |
| Denmark | - | - | - | 319 |
| Poland | - | 16,333 | 291 | - |
| Belgium | 88 | 306 | 99 | 98 |
| Cuba | 284 | - | - | - |
| Italy | - | - | 37 | 213 |
| Mexico | - | - | 236 | 0 |
| United States | 73 | 5 | 95 | 52 |
| South Korea | 0 | - | 209 | 0 |
| United Arab Emirates | - | - | 0 | 207 |
| Thailand | - | - | - | 196 |
| Switzerland | 5 | - | 158 | 6 |
| Other countries | 342 | 33,757 | 439 | 516 |
| **Total** | **33,474** | **52,596** | **4,417** | **2,610** |

*including waste and scrap of gold, including metal clad with gold and other scrap and waste containing gold or gold compounds; more than 99% of the reported volume under 'other countries' in this category is refering to 'not further disclosed countries'.

Source: *CBS StatLine*, "Goederensoorten naar land; hout, textiel, edelstenen en metaal", online: http://statline.cbs.nl/, viewed in April 2015.

**Table 10 Dutch gold exports and key countries of destination (2013)**

| Country or destination | Gold unwrought / semi-manufactured forms (kg) | Scrap* (kg) | Gold coins (kg) | Jewellery (kg) |
|---|---|---|---|---|
| Germany | 26,270 | 46,644 | 2,874 | 359 |
| United Kingdom | 2,364 | 602 | 24 | 9 |
| Belgium | 945 | 3 | 283 | 55 |
| Poland | - | - | 480 | - |
| France | 16 | - | 282 | 118 |
| Sweden | 340 | - | - | 29 |
| United States | - | 845 | 330 | 14 |
| Austria | 3 | 257 | 203 | 22 |
| Armenia | - | - | 194 | 0 |
| United Arab Emirates | 145 | - | - | 36 |
| Spain | - | 1,088 | 106 | 51 |
| Sri Lanka | - | - | 78 | 0 |
| Turkey | 77 | 5 | - | 0 |
| Bulgaria | - | - | 55 | 0 |
| Slovakia | - | - | 1 | 49 |
| Other countries | 278 | 2,561 | 159 | 117 |
| **Total** | **30,439** | **52,005** | **5,069** | **862** |

*including waste and scrap of gold, including metal clad with gold and other scrap and waste containing gold or gold compounds;

Source: *CBS StatLine*, "Goederensoorten naar land; hout, textiel, edelstenen en metaal", online: http://statline.cbs.nl/, viewed in April 2015.

### 3.1.2 Gold fabrication use

Another way to look at gold statistics is the so-called fabrication demand. This excludes the official sector and gold bars. In 2013, domestic fabrication demand for jewellery, electronics, official coins and other uses including the use of scrap totalled an estimated 2.4 tonnes, representing 0.07% of global fabrication demand (3,238 tonnes).[117]
This figure does not allow direct conclusions on domestic gold consumption though as the products may be exported, while at the same time gold-containing products manufactured in other countries are imported into the Netherlands. Larger amounts of gold are certainly moving through the Netherlands due to transformation activities taking place and the country's role as an important re-exporter of goods.

### 3.1.3 Dutch central bank gold reserves

The Dutch central bank (DNB) has a stock of 615 tonnes, of which the largest share is kept in other countries. In 2014, the Dutch Central Bank (DNB) brought 122.5 tonnes, or half of the gold stored in New York back to Amsterdam. This gold has a value of about four billion Euros. This move increased the amount of gold physically held in the DNB to 190 tonnes, an increase from 11% to 31% of its total gold stock. Another 31% remains in New York, 20% is stored in Ottawa and 18% in London.[118]

The gold reserve of the DNB has continuously decreased in the last decennia, from a peak of 1,750 tonnes between 1971 and 1992 to the 615 tonnes of today. 400 tonnes were sold in 1992, another 300 tonnes in 1996, smaller amounts in the following period.[119]

No statistics on trade in monetary gold outside of the activities of the DNB are available.

### 3.1.4 Gold inspection

Gold jewellery and appliances imported into and destined for the Dutch market or produced in the Netherlands have to be presented to a so-called hallmarking or 'waarborg' institution by the producer and/or importer. These institutions test goods on the content of precious metal. If the product is in line with the statutory requirements it is marked with a hallmark. [120] The inspection is regulated in the 'Hallmarking Act' (*Waarborgwet 1986*) and the related 'Guarantee Scheme' (*Waarborgregeling*).[121] The main aim of the law is to protect consumers against fraud and entrepreneurs against unfair competition.[122]

The Dutch government has appointed two inspection bodies which are allowed to approve precious metal articles:

- **Waarborg Holland**
  Gouda
  www.waarborg.nl/
  Tel: +31-182-58 93 00
  Waarborg Holland also offers processing of scrap gold for businesses (WaarborgHolland Edelmetaalsmelterij (WHES).[123]

- **Edelmetaal Waarborg Nederland**
  Joure
  www.ewnederland.nl
  Tel: +31-513-46 81 11

### 3.1.5 Key gold traders and wholesale buyers

The following companies are some important players in the physical trade of bullion gold in the Netherlands. Amounts of gold handled by the companies are not known.

- **AmsterdamGold / The Silver Mountain**
  See section 3.4.

- **Bijou Moderne**
  Bleiswijk
  www.bijoumoderne.nl
  Tel: +31-10-529 66 00
  Bijou Moderne is a wholesaler for jewelleries, gold- and silversmiths in the Netherlands. The company has entered a partnership with Max Havelaar to offer Fairtrade-certified gold from South America, also making it available to small jewellers and goldsmiths.[124]

- **Cookson Drijfhout**
  Amsterdam Zuidoost
  www.cookson-drijfhout.nl
  Tel: +31-20-564 85 20

Drijfhout, established in 1827, states to be one of the oldest companies active in the recycling of precious metals in the Netherlands. Since 2013 the company is part of German Heimerle + Meule, the oldest gold and silver refinery in Germany, which in turn is owned by German company L. Possehl & Co.[125] Drijfhout buys and recycles gold and also offers investment products like coins, bullion and new so-called combi bars which make it possible to sell precious metal in parts.[126]
Cookson Drijfhout is a member of the Responsible Jewellery Council.

- **De Koninklijke Nederlandse Munt**
  Utrecht
  www.knm.nl
  Tel: +31-30-291 04 10
  De Koninklijke Nederlandse Munt (KNM) is the official producer of the Dutch coins. It also offers precious gold coins in various categories, mostly historical coins.[127]

- **Doijer & Kalff**
  Hilersum
  www.doijerkalff.nl
  Tel: +31-10-254 00 80
  Doijer & Kalff mainly acts as a wholesaler for other suppliers of precious metals, but also caters for the private market. The company states to be one of the largest suppliers of physical gold, supplying asset managers, banks and institutional investors in Western Europe.[128]

- **Dutch Bullion**
  Kollum
  www.dutchbullion.nl
  Tel: +31-85-40 11 577
  Dutch Bullion, operating since 2011, is engaged in the sale of precious metals in the form of coins and bullion. The company claims to have the biggest assortment in the Netherlands, sourced directly from certified producers on the LBMA Good Delivery list, including Umicore, Heraeus and UBS.[129]

- **Elephant Dental**
  Hoorn
  www.elephant-dental.com
  Tel: +31-229-259010
  Elephant Dental, part of Dentsply International, supplies dental laboratories. Elephant Refinery refines used dental gold; the results of the recycling process are than used in new dental products.[130]

- **Modern Numismatics International**
  Huizen
  www.mnint.eu
  +31-35-751 13 00
  Modern Numismatics International (MNI), established in 2007, claims to be the leading European wholesale company for collector coins.[131] This includes modern collector coins as well as bullion coins.

- **Schöne Edelmetaal**
  Amsterdam
  www.schone.nl
  Tel: +31-20-435 02 22

Schöne Edelmetaal is active in production, trading and recycling of precious metals. It offers gold bars and plates for trading as well as a broad range of products for industrial and goldsmith purposes.[132] It is part of the Belgian Umicore Group, which operates one of the world's largest precious metals recycling facilities in Belgium.[133] Schöne is the only company in the Benelux with Good Delivery Status of the LBMA.

- **Tov Hazel Precious Metals**
  Rotterdam
  Tel:+31-10-215 00 09
  www.tov-hazel.com
  Tov Hazel is active in trade, analysis, processing, financing and delivery of precious metals needed for private or institutional investors, industrial producers and banks worldwide.[134] It buys doré bars of gold and silver for processing and refining from mining and export traders in Europe, Central Asia, Africa and South America.[135] Its physical delivery capacity of gold is 11 tonnes per month.[136]

- **Waarborg Holland**
  See section 3.1.4.

## 3.2 Gold from electronics recycling

Most recycled gold is originating from jewellery.[137] However, these volumes are difficult to quantify. Another source for recycling are the metals remaining after cremation. Here a Dutch company, OrthMetals (Meppel)) is a leading player in Europe, cooperating with more than 500 crematoria in Europe and beyond.[138]

Another, even though smaller source, is electronics products. Almost all electronic devices contain small amounts of gold; this refers, for example, to small devices like mobile phones, calculators, global positioning system units and large appliances like TVs (see section 2.6.4). As an indication, 41 mobile phones contain approximately one gram of gold. To mine an equivalent amount of gold, a mining company may need to mine and process a tonne of ore.[139] E-waste has become the fastest growing waste stream in the world due to the rapidly increasing number of electronics products being sold, and these becoming obsolete at an accelerating rate. Each inhabitant of the Netherlands produces on average 23.4 kg of e-waste per year, leading to an annual e-waste volume of 394,000 tonnes for the country in 2014.[140]

According to figures for 2013, a total of 133,578 tonnes of e-waste have been collected in the Netherlands, representing about 8.0 kg per inhabitant.[141] This is somewhat more than the 7.5 kg per inhabitant documented for 2010.[142] These figures show that not all of the obsolete products are fed into the recycling stream. Many broken products are stored by households, and part of the generated e-waste is still making its way from Europe and North America to Asia and Africa, despite a ban on the dumping of hazardous waste in developing nations under the Basel Convention and EU Directives.[143]

Based on 2010 data, a detailed study aiming to map the e-waste flows for the Netherlands was conducted by the United Nations University (UNU) together with Statistics Netherlands. It managed to document approximately 80% of all WEEE-flows (19.1 kg per inhabitant, 316,000 tonnes). Even though the figures will have somewhat changed since then, it gives a good impression of the different streams. Table 11 provides an overview of the results. Not considering the exported volumes, this means that approximately 67% of generated WEEE was collected and recycled.[144] Considering that the collected volume increased somewhat it can be assumed that this percentage also went up since then, however, there is certainly still room for improvement.

**Table 11 E-waste flows in the Netherlands**

| 2010 (kg/inh) | LHA | C&F | SHA | IT | MON | Lamps | Prof | Total (kg/inh) | Total (1,000 tonnes) |
|---|---|---|---|---|---|---|---|---|---|
| EEE POM 2010 | 7.88 | 3.88 | 7.50 | 3.03 | 2.50 | 0.27 | 1.46 | 26.5 | 440 |
| WEEE & used EEE generated | 6.39 | 2.95 | 6.44 | 3.00 | 3.65 | 0.22 | 1.03 | 23.7 | 392 |
| Export used EEE | 0.26 | 0.60 | 0.24 | 0.60 | 0.75 | 0.00 | 0.20 | 2.7 | 44 |
| E-waste collection | 1.86 | 1.53 | 1.60 | 0.61 | 1.86 | 0.10 | 0.00 | 7.5 | 125 |
| Complementary recycling | 2.81 | 0.39 | 1.45 | 0.70 | 0.61 | 0.01 | 0.63 | 6.6 | 110 |
| Waste/incineration | 0.00 | 0.00 | 1.64 | 0.54 | 0.00 | 0.11 | 0.00 | 2.3 | 38 |
| Undocumented waste | 1.46 | 0.43 | 1.51 | 0.55 | 0.43 | 0.00 | 0.20 | 4.6 | 75 |

Note: POM=Products on Market; inh=inhabitant; LHA=Large Household Appliances; C&F=Cooling and Freezing; SHA=Small Household Appliances; IT=IT and Telecom Appliances; MON=Monitors & Screens; Prof=Professional Appliances;
Source: Huisman, J., van der Maesen, M., Eijsbouts, R.J.J., Wang., F., Baldé, C.P. and C.A. Wielenga (2012), *The Dutch WEEE Flows,* United Nations University, ISP – SCYCLE, Bonn, Germany, March 15, p.40.

The following companies are important players in the Dutch market for electronics and precious metals recycling.[145] It has to be noted that there is some overlap between gold traders and wholesale buyers and gold recycling companies. Data availability on capacities and processed volumes is very limited.

- **Coolrec**
  Eindhoven
  www.coolrec.nl
  Tel:+31-40-851 73 00
  Coolrec is part of the Dutch Van Gansewinkel Group. It is processing about 0.8 million TVs and almost 35,000 tonnes of electric goods, consumer electronics and ICT on an annual basis.[146] Coolrec has in total eight locations, in the Netherlands, Belgium, Germany and France.[147]

- **HKS Metals**
  's-Gravendeel
  www.hks.nl
  Tel:+31-88-606 50 00
  HKS Metals has six locations in the Netherlands. It is part of the German Thyssen Sonnenberg Recycling (TSR), which in turn is 80%-owned by Remondis (Germany).[148] TSR claims to be the market leader in metals recycling in Europe.[149] HKS is processing more than 1 million tonnes of ferrous and non-ferrous scrap per year.[150]

- **Jacomij Electronics Recycling**
  Wijk bij Duurstede
  electronics.jacomij.nl
  Tel:+31-343-574 714
  Jacomij Electronics Recycling claims to be one of the largest electronics recyclers in the Benelux, located on the Amsterdam-Rhine canal. It is part of Jacomij Group, which also includes Jacomij Metalen, involved in the trade in and processing of nonferrous (precious) metals and Jacomij Metalle und Edelmetalle in Germany, dealing in the recycling of nonferrous metals and the recycling of electronics.[151]

- **Remondis**
  Moerdijk
  www.remondis.nl/
  Tel: +31-168-385 555
  Remondis Argentia, a subsidiary of German Remondis, is recycling about 500 tonnes annually of materials containing precious metals.[152]

- **Sims Recycling Solutions**
  Eindhoven
  simsrecycling.nl/
  Tel:+31-40-250 88 00
  Sims Recycling Solutions is part of Sims Recycling Solutions (UK), which claims to be the largest international electronics recycler. [153] It is specialised in the processing of consumer and business appliances, processing approximately 75,000 tonnes of electronics annually in the Netherlands.[154]

## 3.3 Gold consuming sectors

### 3.3.1 Electronics products

As explained in 2.6.4, electronics products are the key industrial application of gold, accounting for about 5% of global gold consumption. Even though individual products only contain tiny amounts of gold, the consumption is due to the sheer volume of electronics being produced nowadays. Gold is primarily used as a surface coating on the printed circuit board (PCB) and on connectors.[155]
Overall, the Netherlands are not playing a key role among the leading electronics producers globally; however, some important players are headquartered in the country. As is typical with electronics though, production is for the largest part not taking place domestically, but predominantly in Asian countries. It is also important to note the highly complex supply chains in this sector, with often hundreds of components and suppliers along the chain. For gold this means that the supply chain is often linked to large numbers of gold smelters.

In the following, some important Dutch players active in different sub-sectors of the electronics industry are briefly profiled.

- **ASML**
  Veldhoven
  www.asml.com
  +31-40-268 30 00
  ASML is a public company traded on both Euronext Amsterdam and NASDAQ stock exchanges.
  ASML is the world's leading provider of lithography systems for the semiconductor industry.[156] The company focuses on lithography systems for 200- and 300-millimeter diameter wafers and on immersion lithography systems mainly for manufacturing complex integrated circuits.[157] Its customers include many of the major global semiconductor manufacturers that in turn provide the chips used in a wide range of electronic, communications and information technology products.[158] Among the customers are Samsung, Intel and TSMC. 73% of all products go to customers in Asia, 24% to customers in the U.S. and 3% to customers in Europe.[159]

  The company has over 70 locations in 16 countries around the world, including:
  - R&D and manufacturing facilities in the Netherlands, the US and Taiwan;
  - Customer support centres in China, France, Germany, Ireland, Italy, Japan, Korea, Malaysia, Singapore, Taiwan, the UK and the US;

- Training facilities in Asia and Europe.[160]

ASML outsources the design and manufacturing of the majority of components and subassemblies that make up its lithography products. Up to 90% of the total system costs are supplied externally. Consequently ASML has several hundred suppliers.[161]

In May 2014, ASML filed a conflict minerals report with the U.S. Security and Exchange Commission (SEC), providing details on the use of 3TG minerals[a] in its production process. In this report, the company states that "*gold is used in coating critical electronic connectors to enhance connectivity performance, totaling approximately 250 grams per TWINSCAN system. […] All 3TG minerals included in our systems are sourced as prefabricated component parts. ASML does not directly source 3TG minerals as raw material. As a result, we are only able to determine whether the 3TG included in our systems is derived from a Covered Country through information provided to us by our suppliers*."[162] These units are produced in comparatively small numbers; in the five years from 2010 to 2014 on average 280 lithography units have been shipped by the industry as a whole, which includes ASM, Nikon and Canon.[163]

- **BE Semiconductor Industries (Besi)**
  Duiven
  www.besi.com
  +31-26-319 45 00
  Besi is a public company listed on Euronext Amsterdam and OTCQX International.
  The company is a leading supplier of semiconductor assembly equipment for the global semiconductor and electronics industries. Besi develops processes and equipment for leadframe, substrate and wafer level packaging applications in a wide range of end-user markets including electronics, mobile internet, computer, automotive, industrial, LED and solar energy. Customers are primarily leading semiconductor manufacturers, assembly subcontractors and electronics and industrial companies, including ASE, Amkor, Infineon, Micron, Nantong Fujitsu, Osram, Skyworks, SPIL, Stats ChipPAC and STMicroelectronics.[164]

  Manufacturing and/or sales and service facilities are located in the Netherlands, Austria, Malaysia, Korea, Hong Kong, Singapore, China, the Philippines, Taiwan, Switzerland and the United States.[165]

  In its 2014 annual report, the company states that "*as a consequence of increasing client demand and ethical considerations, Besi is exploring the opportunity to formally implement a due diligence structure to comply with so called 'conflict minerals' legislation and international guidelines. Currently, risks concerning conflict minerals have not been formally identified. In general, risks related to conflict minerals have been estimated to be minimal. […] At present, the highest potential risks related to the use of conflict minerals are associated with printed circuit boards and certain other electronics. Besi is committed to utilizing suppliers which use conflict free smelters. At present, we do not believe that any of our suppliers acquire their Tantalum, Tin, Tungsten and Gold (3T+G) from smelters directly and that there are only two or three supply chain steps in between Besi and the smelters. In its investigation, Besi will identify and separate all smelters from their suppliers, using the standardized EICC method. To date, Besi has completed due diligence on 35% of its suppliers. It is expected that significant progress will be made in 2015 and that the goal of conflict free suppliers may be realistic by 2017*."[166]

[a] The term 'conflict minerals' is usually referring to the minerals Tungsten, Tantalum, Tin and Gold, which are mined in the Eastern region of the Democratic Republic of Congo (DRC) (see section 4.4.1).

- **Fairphone**
  Amsterdam
  www.fairphone.com
  +31 20 788 4401
  Fairphone is a new player on the mobile phone market. It has been set up as a social enterprise in 2010 by Waag Society, Action Aid and Schrijf-Schrijf. The project was started in order to to raise awareness about conflict minerals in electronics and the wars that they fuel and fund in the DRC. The company is concerned about creating fair and transparent supply chains, especially in sourcing, production, distribution and recycling of electronics.[167]

  Fairphone has developed a roadmap for mining, involving responsibly sourcing minerals, starting the 3T+G minerals. Starting with tin and tantalum, sourcing gold from more responsible sources is one of the key goals. It cooperates with organizations like Fairtrade International and the Alliance for Responsible Mining (ARM). While fair trade gold is available in South America, the gold has to go to China as the majority of components that contain gold are produced in China. This is seen as a major bottleneck in fulfilling Fairphone's traceability requirement (see section 2.5.5). It is not certain yet if the next production line of Fairphone will already include fair trade gold, "*[…] due to the fact that it seems almost impossible to import fair trade gold through the Shanghai Gold Exchange and subsequently be able to trace it through the SGE all the way up to the component manufacturer"*.[168]

- **NXP Semiconductors**
  Eindhoven
  www.nxp.com
  +31 24 353 9111
  NXP is a public company listed on the NASDAQ.
  NXP has operations in more than 25 countries, producing for OEM customers including Apple, Bosch, Continental, Gemalto, Huawei, Nokia, Siemens Network, Samsung and ZTE.[169] It produces "High Performance Mixed Signal" and "Standard Product" semiconductors that are used in a wide range of applications, including automotive, identification, wireless infrastructure, lighting, industrial, mobile, consumer and computing. Most of these products contain gold.[170]
  NXP has Wafer fabrication in Germany, China, United Kingdom, Netherlands and Singapore. Test assembly sites are located in Thailand, Philippines, China, Taiwan and Malaysia.[171]

  According to its statement on conflict minerals, "*NXP suppliers, including contractors and external manufacturers, are required to comply with NXP's Supplier Code of Conduct, which includes requirements relating to conflict minerals and responsible sourcing. NXP suppliers shall have a policy to reasonably assure that the tantalum, tin, tungsten and gold in the products they manufacture do not directly or indirectly finance or benefit armed groups that are perpetrators of serious human rights abuses in the Democratic Republic of Congo or an adjoining country. NXP suppliers shall exercise due diligence on the source and chain of custody of these minerals and shall make their due diligence measures available to NXP upon NXP's request*."[172]

  The company lists 68 gold smelters or refiners as being part of their supply chain as of May 2014. Of these, 63 are on the list of the Conflict-Free Sourcing Initiative's (CFSI) certified conflict free smelters (CFS) and considered to be conflict free. However, information on the gold supply chain is not complete and the company cannot determine whether these potentially finance or otherwise benefit armed groups in the DRC or neighboring countries.[173] Gold is also among the 'substances of concern in products and packaging' prepared as part of the company's corporate social responsibility activities.[174]

- **Philips**
  Amsterdam
  www.philips.com
  +3120 59 77777
  Philips is a publically listed company on the stock exchanges of Amsterdam and New York. It is a diversified technology company, claiming to be a leader in cardiac care, acute care and home healthcare, energy efficient lighting solutions and new lighting applications, as well as male shaving and grooming and oral healthcare.[175]

  As applies for many other consumer electronics producers, the company is located far down the supply chain of gold, which moves from mines to traders, exporters, smelters, refiners, alloy producers and component manufacturers, before reaching the company's direct suppliers.[176] Philips has about 100 gold smelters/refiners in its supply chain. It does not know the minerals' country of origin information for each smelter identified by its suppliers, thus is not able to verify yet whether gold is sourced from controversial countries.[177] Philips plans to direct its suppliers to use Conflict-Free Smelters.[178]

  In May 2015, Philips published an updated position on responsible sourcing in relation to Conflict Minerals. Besides its "*[…]commitment to sustainable development compels us to address these concerns, even though Philips does not directly source minerals from mines or smelters as these companies are typically several tiers removed from our direct suppliers. In addition, we recognize that we may also be able to play a role in addressing other minerals related conflicts, provided we can address these in a multi-stakeholder setting facilitated by an international governmental body*."[179]

### 3.3.2 Jewellery sector

Jewellery is for the largest part imported and distributed via wholesalers. Overall, the Dutch jewellery market generated sales worth € 850 million in 2014. The Dutch sector is highly fragmented, with many small players. Large players, each accounting for around 10% of the market, include Lucardi and Siebel.[180] None of the Dutch jewellers are members of the Responsible Jewellery Council (section 5.1.4).[181]
The relevant industry federation is the 'Federatie Goud en Silver' (FGZ), which in turn consists of three associations: the 'Vereniging Goud- en Zilversmeden' (VGZ) of the gold- and silversmiths, the 'Vereniging Industrie en Groothandel in Sieraden, horloges e.a.a.' (VIGROS) of the wholesalers in jewellery, watches and similar products, and the 'Nederlandse Juweliers- en Uurwerkenbranche (NJU)' representing jewellers, watch repairers and appraisers.[182]

No figures on the share of gold in the jewellery market are available. Some important players in the Dutch jewellery wholesale and retail market are:

- **Cookson Drijfhout**
  Jewellery wholesaler. See section 3.1.5

- **Kasius Sieraden**
  Ridderkerk
  www.l-kasius.nl
  Tel: +31-180-46 27 00
  Kasius Sieraden is a jewellery wholesaler supplying jewelleries with gold, silver and steel jewellery.[183]

- **Lucardi**
  Den Haag
  www.lucardi.nl

Tel:+31-070-376 63 61
Lucardi claims to be the largest jewellery chain in the Netherlands. The company exists since 1988, known then under the name Luigi Lucardi. In May 2006, Lucardi was taken over by Swedish company Axcent of Scandinavia (known under the name Klockgrossisten i Norden AB until 2011). Lucardi has more than 90 shops throughout the country.[184]

- **Siebel**
  Amsterdam
  www.siebeljuweliers.nl
  Tel: +31- 88-6550399
  Siebel is since early 2014 part of the Russian Jewelry Factory.[185] With 37 shops throughout the Netherlands and a partnership with mail-order firm Wehkamp, the company claims to be the largest jewellery chain in the medium- and upmarket segments. It also claims to be the market leader in wedding rings.[186]

- **Van Leeuwen**
  Wassenaar
  www.gvanleeuwen.nl
  Tel: +31-70-512 29 29
  Van Leeuwen is a wholesaler in jewellery and jewellery concepts, with a focus on gold and silver jewellery.[187]

## 3.4 Investors in gold, gold stocks and gold commodity contracts

A number of niche investors provide serves in the Netherlands to invest in physical gold, gold stocks and gold commodity contracts. Important players include:

- **Amsterdam Gold / The Silver Mountain (part of Value8 (Netherlands))**
  Schiphol
  Tel: +31-20-658 9555
  AmsterdamGold, The Silver Mountain, Inkoop Edelmetaal and AmsterdamSafe are all trade names of the AmsterdamGold Group. AmsterdamGold, 51%-owned by private equity form Value8, is a market leader in the physical sale and storage of precious metals like gold, platinum and silver for private individuals. The focus is on physical ownership of precious metals as a safeguard against depreciation and international financial stability.[188] All bullion delivered by AmsterdamGold is new cast supplied by LBMA accredited producers.[189]

- **Commodity Discovery Fund (Commodity Discovery Management (Netherlands))**
  Aerdenhout
  Tel: +31-23-80 09 970
  The Commodity Discovery Fund (CDF) is managed by Commodity Discovery Management and administrated by Circle Investment Support Services. It is a commodity fund with a strong focus on companies active in the exploration and mining of precious metals (75%). As of April 2013, gold accounted for 60% of the portfolio.[190] Besides that, the fund invests in base metals and energy-related stocks and companies active in the exploration and mining of rare earth elements as well as the fertilizer ingredients potash and phosphate. The fund does not have physical bullion holdings, however, it often has a position in physical gold and / or silver-backed exchange traded funds (ETFs).[191]

- **Goudstandaard**
  Heerhugowaard
  Tel.: +31-23-763 0404

Goudstandaard offers physical investment in gold and silver. It states to have grown into one of the largest players in the Dutch precious metals market within a short time. It was the first precious metals trader to receive an AFM-license in June 2012.[192]

## 3.5 Financing of gold mining companies

Mining companies have financing needs for the funding of new projects, acquisitions and ongoing business operations. Financing obtained by the top-10 industrial gold mining companies (as identified in Table 2) since January 2010 until February 2015 has been analysed for involvement of Dutch banks. This includes the participation in loans and credits as well as the provision of underwriting services for the issuance of shares or bonds. During this period of time, ING Bank was the only Dutch bank providing financial services to gold mining companies. ING Bank participated in six loan syndicates, providing financing to three different companies among the top-10 gold miners globally.[193]

Apart from providing loans and underwriting services, financial institutions can also invest in gold mining companies through buying their shares. Much more Dutch financial institutions are involved in financing gold mining companies as shareholders.
Table 12 provides an overview of the number of publicly traded top-10 industrial gold mining companies (as identified in Table 2) in which Dutch institutional investors have invested at the latest available filing dates. The analysed investments also include investments by international subsidiaries of these financial institutions. As there is no complete register of shareholdings there may be more investments than these. Also this overview is only looking at the leading gold mining companies, while there are many more publicly-traded gold mining companies in which Dutch financial institutions may have invested.

**Table 12 Dutch financial institutions investing in shares of gold mining companies, latest filing date**

| Investor name | Number of companies (n=10) |
|---|---|
| ABN Amro | 4 |
| ABP | 8 |
| Aegon | 7 |
| Bedrijfspensioenfonds voor de landbouw (BPL) | 1 |
| BPF Bouw | 8 |
| Delta Lloyd | 5 |
| NN Group | 4 |
| Pensioenfonds DSM Nederland | 3 |
| Pensioenfonds Metaal & Techniek | 8 |
| Pensioenfonds Openbaar Vervoer | 8 |
| Pensioenfonds PNO Media | 1 |
| Pensioenfonds SABIC | 1 |
| Pensioenfonds van de Metalelektro | 4 |
| Pensioenfonds Vervoer | 4 |
| Pensioenfonds voor de grafische bedrijven | 5 |
| Pensioenfonds voor de Woningcorporaties | 8 |

| Investor name | Number of companies (n=10) |
|---|---|
| Pensioenfonds Zorg en Welzijn | 9 |
| Rabobank | 3 |
| Shell Asset Management | 3 |
| Spoorwegpensioenfonds | 8 |
| SNS Reaal | 4 |
| Theodoor Gilissen Bankiers | 3 |

Source: *ThomsonONE Banker*, "Share ownership", viewed in March 2015; Bedrijspensioenfonds voor de Landbouw (2012, December 31), *Transparantie beleggingen*; BPF Bouw (2014, September 30), *Aandelenportefeuille bpfBOUW per 30 september 2014*; Pensioenfonds Zorg en Welzijn (PFZW), "Transparantilijst aandelen -(In)directe beleggingen in beursgenoteerde aandelen per 31-12-2013 ", online: http://www.pfzw.nl/over-ons/beleggingen/Paginas/Transparantielijst-Aandelen.aspx, viewed in March 2015; Stichting Pensioenfonds Openbaar Vervoer (2014, December 31), *Fondsenoverzicht Stichting Pensioenfonds Openbaar Vervoer d.d. 31-12-2014*; Stichting Pensioenfonds SABIC (2014, December 31), *Overzicht beleggingen*; *Pensioenfonds Vervoer*, "Vermogensbeheer aandelen", online: https://www.pfvervoer.nl/aandelen, viewed in March 2015; Pensioenfonds van de Metalelektro (PME) (2014, June 30), *Aandelenoverzicht PME*; Pensioenfonds Metaal & Techniek (2014, June 30), *Uitgevende instellingen Staatsobligaties, Bedrijfsobligaties en Aandelen, per 30-06-2014* ; *Pensioenfonds PNO Media*, "Holdings", online: http://pnomediaverantwoordbeleggen.nl/investment-policy/holdings/?lang=en, viewed in March 2015; Stichting Pensioenfonds voor de Woningcorporaties (2013, June 30), *Aandelenportefeuille SPW per 30 juni 2013*; Spoorwegpensioenfonds (2014, December 31), *Fondsenoverzicht Stichting Spoorwegpensioenfonds d.d. 31-12-2014*;

## 3.6 Shell companies and tax planning

The Netherlands plays an important role in the tax avoidance structures set up by many internationally operating companies. The Netherlands is not a classic tax haven such as the Cayman Islands, which is usually situated at the end of a tax avoidance structure. Companies use the Netherlands more as a transit route.

The reason for the popularity of the tax jurisdiction of the Netherlands among companies operating internationally is based on several factors:

- The Netherlands has 90 bilateral tax treaties. These treaties do reduce the withholding taxes companies have to pay on:[194]
  - Royalties: companies located in the Netherlands have to pay less withholding taxes on royalty income they receive from foreign subsidiaries, and foreign parents have to pay less withholding taxes on the royalties received from their subsidiaries in the Netherlands;
  - Dividend: taxation treaties make sure foreign companies do not have to pay withholding taxes on the profits of foreign subsidiaries when the cash flows through the Netherlands;
  - Interest: for loans provided by a Dutch company to a foreign subsidiary, no withholding tax has to be paid on the interest income received. Similarly, the foreign parent does not have to pay withholding tax on the interest received on loans provided to a subsidiary in the Netherlands.
- In the Netherlands the *participation exemption* applies, implying that all benefits gained from shareholdings are exempt from corporate income taxes, covering both profits (dividends and hidden profit distributions) and losses. Profits realised on the sale of a participation are also exempt from taxes. The Dutch participation exemption applies to shareholdings in which there is an interest of at least 5% of the nominal paid up capital.[195]
- The Netherlands offers the possibility to make an agreement with the Dutch tax authorities in advance on how the Dutch tax base of the company will be calculated (called 'advanced tax ruling' or 'prior tax agreement').[196] This offers companies a security in advance on its tax payments.

The Netherlands has very low 'substance' requirements. This makes it easy for companies that want to make use of the favourable rules to settle in the Netherlands. Often, registration with

the company register managed by the Chambers of Commerce is enough. Companies are often managed by a trust office, which ensures that companies comply with the minimum requirements to qualify for the tax benefits in the Netherlands.[197] The Netherlands has about 23,500 letterbox companies, of which about 11,500 are managed by trust offices.

Although the Netherlands is certainly not the only country offering such tax and investment incentives, it is one of the biggest players in facilitating tax avoidance. The Netherlands is the biggest investor in the world, owing to the fact that mailbox companies account for roughly 75% of total Dutch direct investment.[198]

Also the leading gold mining companies identified in section 2.4.1 have a large number of shell companies registered in the Netherlands. Often these have no or a very small number of employees. Table 13 provides examples of the number of subsidiaries registered by these and some other relevant gold mining companies in the Netherlands. Included are companies in which the mining company has at least a 50%-share.

**Table 13 Dutch shell companies registered by leading industrial gold mining companies**

| Parent company | Country of origin | # of Dutch subsidiaries |
|---|---|---|
| Barrick Gold | Canada | 2 |
| Eldorado Gold | Canada | 8 |
| Goldcorp | Canada | 2 |
| Newmont Mining | United States | 8 |
| Gold Fields | South Africa | 5 |
| Kinross Gold | Canada | 3 |
| Polymetal International* | Jersey / United Kingdom | 1 |
| Turquoise Hill Resources** | Canada | 2 |

* Polymetal International, registered in Jersey and listed on the London stock exchange, is a gold and silver producer part-owned by Russian billionaire Alexander Nesis. It bought the Bakyrchik and Bolshevik gold deposits, forming the Kyzyl gold project in Uzbekistan, from Sumeru Gold in 2014;
** ultimately owned by Rio Tinto (UK/Australia) with 51%.
Source: *Kamer van Koophandel*, "Zoeken in Handelsregister", online: http://www.kvk.nl/zoeken/, viewed in March 2015; Newmont Mining (2015), *Form 10-K - Annual report to the United States Securities and Exchange Commission*, p.181-182; *Reuters* (2014, August 1), "ArcelorMittal to buy stake in Guinea iron ore project"; Eldorado Gold (2014, March), *Annual Report 2013*, p.7,15; McGauran, K., Römgens, I., Hartlief, I. and R. van Os (2014, October), *Eldorado Gold - The role of Dutch mailbox companies in tax avoidance and human rights violations in Greece*, Draft discussion paper, Amsterdam, The Netherlands: Stichting Onderzoek Multinationale Ondernemingen (SOMO).

Further research would be need to determine what the roles of these shell companies might be in the financial and tax planning structures of the gold mining companies mentioned. The shell companies might be intermediate holdings, fund raising conduits, conduits for trade transactions, head offices that operate gold mines as foreign branches, or just small inactive entities.

## 3.7 Conclusions

While detailed data on the different sectors is missing, it can be assumed that similar distribution patterns as found internationally apply, with the majority of consumption taking place via investments in coins and bars, and in the jewellery sector. On the international level, the Netherlands is a comparatively small consumer of gold.

However, besides direct consumption of gold, the precious metal is also being imported as a ‘hidden’ component of electronic products. These hidden imports can hardly be quantified. Physical electronics production in the Netherlands is small as production and external suppliers of Dutch companies for the largest part are located in Asia. However, the rapidly increasing consumption of consumer electronics means that also in the Netherlands the amounts of e-scrap have rapidly increased over the years. As recycling of gold can be done without loss of quality, there is a large potential for retrieving gold from end-of-life products.

Gold purchases by the Dutch central bank do not contribute to Dutch gold imports, as the DNB has rather sold a share of its gold reserves in recent years. However, various private sector financial institutions are investing in the gold mining sector through providing loans to, or investing in shares of, leading gold mining companies. One bank was found to have participated in syndicated loans to globally leading gold mining companies in the past five years, making it a moderately important financier of the gold mining sector.
Many Dutch financial institutions, especially pension funds, have been found to invest in the shares of in a number of major gold companies. While the individual shareholdings of pension funds in companies are never very high in terms of the percentage of outstanding shares, they are significant enough to open the door for Dutch pension funds - especially when they operate collectively and together with foreign peers - to discuss sustainability issues with the management of gold mining companies.

Finally, the fact that many gold mining companies have set-up shell companies in the Netherlands indicates that the country could also play a role in enabling the set-up of tax avoidance structures of gold producers. If tax avoidance is actually taken place, and the possible significance of this, need to be researched further.

# Chapter 4 Sustainability issues in the gold sector

This chapter outlines a number sustainability issues related to the gold sector. Section 4.1 outlines sustainability issues in industrial scale gold mining. Section 4.2 outlines sustainability issues in artisanal and small-scale gold mining. Section 4.3 compares the impacts of industrial scale mining with artisanal and small scale mining. Section 4.4 will describe sustainability issues related to gold trade, consumption and recycling.

## 4.1 Sustainability issues in industrial scale gold mining

This section describes a number of sustainability issues related to industrial-scale (or large-scale) gold mining (LSM). Section 4.1.1 outlines environmental issues. Section 4.1.2 outlines a number of social issues. Section 4.1.3 outlines supply chain issues. The majority of the described issues are related mining in general. Where the issue is related to gold specifically, this will be emphasized in the description. It is important to recognise that the potential impacts of mining are likely to extend over a long period of time, in all probability until well after a mine has ceased operations. May Hermanus (South Africa's Council for Scientific and Industrial Research) notes that "*Many of the environmental impacts are here today due to decisions made decades ago, resulting in great remediation costs for society today*."[199]

### 4.1.1 Environmental issues

A number of environmental issues can affect industrial scale gold mining. A brief outline of the main issues is provided below.

- **Accidents and incidents related to chemicals**
  Many industrial scale gold mining operations do use dangerous chemical compounds like cyanide within the gold recovery process, but it must be noted that this increasingly rarely results in environmental problems. Many responsible companies are signatories to the International Cyanide Management Code (ICMC) which was developed under the guidance of UNEP.[200] Dirk de Kramer (Witteveen+Bos) notes that "*the ICMC, currently implemented by a large sector of industry, appears to be working.*"[201] Nevertheless, there are still instances when spillages of cyanide from certain ponds and/or pipelines on mine sites result in dead fish and other wildlife downstream. Fortunately cyanide (CN) breaks down to its constituents carbon (C) and nitrogen (N) rather rapidly in the presence of sunlight.

- **Surface water impacts**
  The pure volume of water required by a mining operation can create problems, certainly arid conditions, where a local population may require the limited water resources for farming. Conversely, there are also cases where the construction of open pit mines in high rainfall areas, require the lowering of the water table to avoid flooding of the pit. This, too, may result in a removal of water supply for nearby villages and communities. Even though large scale operations in such cases propose to relocate villages and/or provide alternative sources of water, people frequently prefer the water sources that they were used to, irrespective of the quality of the replacement water.

Another common impact on surface water results when large mines (either underground or open pit mines) in high-rainfall areas, have to pump water from their operations into nearby streams or rivers. As much as possible, mines are required to recirculate all their water within their system, and this is actually beneficial for their own recoveries, and the retention of process chemicals, etc. However, in high rainfall areas, the possibly thousands of litres of water pumped out of a mining operation just cannot be retained in storage areas long enough to evaporate, and these volumes then end up in local waterways, including their loads of process chemicals and/or natural minerals and metals that were liberated from the bedrock. According to Håkan Tarras-Wahlberg (Swedish Geological AB), "*The most important environmental challenge to sustainability is the fact that many gold ores are closely associated with sulphide minerals. Mining and extraction of the gold therefore releases these minerals and the contained metals into the environment, often resulting in major problems, including Acid Mine Drainage (AMD) and the release of toxins like Arsenic into downstream surface water bodies. This is the most important issue to address.*"[202] Describing the impacts of such problems in South Africa, Hermanus (CSIR) notes that "*Water is the chief issue in a water-stressed country. Acid Rock Drainage (ARD) or Acid Mine Drainage (AMD) are causing great and expensive problems in South Africa today, with extremely expensive remediation required.*"[203]

- **Physical land alteration**
  The physical alteration of the landscape is certainly the most obvious effect of large-scale gold mining, whether this is done by way of open pit, or underground mining methods. It is of course difficult to value objectively the cost of this effect, since it is based largely on visual impressions. Whereas it may be uneconomic to reshape every landscape to its original condition (or at least the shape it was in before mining started), mining companies are generally encouraged (or required) to minimise effects. This includes the mining of open pits in such a way that waste rock from one part of the pit is utilised to fill another, mined-out part, whenever possible. It is also very typical that waste rock dumps are required to be covered by well-preserved and seeded topsoil, after the slopes of the dumps have been reduced to a stable angle. Companies often attempt to provide an alternative use for redundant pits (like the creation of fish ponds) or tailings storage facilities (like the planting of crops on the levelled-out areas on top). Such measures are not always successful, however.

- **Deforestation**
  The construction of gold mines in forested areas generally does result in a degree of deforestation. The primary effect is of course when an open pit or tailings dam is placed in a forest, requiring the removal of trees. Usually, however, the actual area that needs to be stripped of trees is a small percentage of the mine's licence area. The secondary loss of forest can be a much larger effect and is due to the increased amount of human traffic in the forest, the wish for workers and their communities to build houses in the area, to obtain fuel (wood) and so on. There are cases where mining companies have (either voluntarily or otherwise) agreed to replace hectare for hectare (or even more) removed forest with newly-planted trees, and to manage the new forest for a number of years.

- **Biodiversity impacts**
  The biodiversity impacts of mining are, similarly to the deforestation issue described above, largely due to the secondary effects of increased human traffic, and the sounds and smells emanating from a mining operation and the human movement and habitation around it. We are aware of one case where a mine has actively limited or controlled access to a forest reserve within or on its boundaries, so as to limit the decrease in biodiversity that results from illegal hunting, traffic, etc. Estelle Levin (ELL) says that "*in some few cases, mining companies can in fact be better conservationists than under-resourced authorities if incentivized properly: they might have better control over an area, have more resources, more skills, and retention of access to the resource may rest upon environmental management measures, etc.*"[204] It must be noted, however, that this is an ongoing struggle and that the creation of a mine in a more or less pristine area, and the resulting introduction of lots of people into the area, is likely to always affect biodiversity.

- **Mining waste**
  The extraction of gold ore generally requires the mining of larger quantities of waste rock that needs to be stacked somewhere. This may be done by filling parts of an open pit (if possible in the mining sequence) or alternatively on waste rock dumps. Such dumps need to be reshaped (slopes reduced), covered with well-preserved topsoil, and seeded with vegetation that will stabilise the slopes and finally return the new hill to some type of indigenous vegetation.

  The extraction of gold from the ore results in tailings (generally a fine sand or silt) that also needs to be stored somewhere. There are operations in the world (typically large underground operations, like in South Africa) where this material may be mixed with cement and pumped back underground to create necessary support next to areas still being mined out. Often, these large tailings storage facilities (typically called tailings dams or mine dumps) remain as unsightly flat-topped hills. A number of such dams around Johannesburg, South Africa, are a case in point. Many efforts have been made to vegetate these structures, but this is always difficult in the absence of good topsoil, since hardly anything grows on clean sand, which is then easily eroded by wind and water.

  These tailings dams are shaped by pumping slurry onto a 'beach' within the 'dam' which is built up from the same mining waste. It is essential to maintain and manage such a facility, by appropriate pumping, to ensure that the edges (walls) of the dam stay dry, in order to avoid slumping and possible liquefaction of the entire structure. Such failures have in the past led to severe and catastrophic flooding of mining towns and even loss of life.[205] This type of management of a tailings dam may be required for many years after a mine is closed. As noted by De Kramer (Witteveen+Bos), in the context of their "Smart Tailings" concept, "*Legacy issues (polluted water, tailings dumps, etc.) offer possibilities and opportunities for good business as well as environmental clean-up.*"[206]

- **Non-mining waste**
  Any economic activity that results in an increased level of human presence or activity (including large-scale mining) results in an increase of various types of waste. This includes waste associated with households, with increased number of vehicles, and so on. Within large-scale mining operations, it is very typical that such 'non-mining' waste is treated separately from the mining waste materials described above. The different types of waste materials have very different negative impacts, due to different chemistries and even biological contents.

- **Impact on groundwater**
  It is possible that the quality of groundwater can be affected my mining operations, but such effects tend to be more likely due to increased habitation surrounding a mine site, with resulting contamination of wells and boreholes with nitrates and biological materials. There is however great potential for the loss of groundwater resources due to the lowering of the water table as a result of mining (or required to enable mining in the first place).

- **Post-closure maintenance**
  Mining operations, since they exploit non-renewable resources, have a finite life. The effects of mines on the natural environment, however, may extend for much longer, and some possibly for ever. One of these long-term issues is the maintenance of structures like the tailings dams described above. The walls of these need to be kept in good condition (and dry) so as to avoid slumping and the possible catastrophic spilling of the tailings into nearby watercourses or even villages.
  There is a perception that over time, due to the hardening and cementing of the tailings material, and with the addition of vegetation, the risks will be reduced. However, in many cases the tailings are very fine, very clean sand, which does not tend to cake together over time, so that a risk of liquefaction in days of high rainfall (and of dust when it's dry) remains.

  Mining companies under strong governance jurisdictions, or subject to their own industry association pressures, need to follow guidelines to cater for post-closure maintenance of these large structures. This should include financial assurance mechanisms that the maintenance will be done in the long run, even if the company itself may no longer exist.

  The ICMM has produced a toolkit for integrated mine closure, as a way for their member companies (and any others) to ensure that mine closure issues are considered and addressed during the life of the mine.[207]

### 4.1.2 Social issues

A number of social issues can affect industrial scale gold mining. A brief outline of a number of these issues is provided below.

- **Land rights and contested land (free, prior and informed consent)**
  The UN Declaration on the Rights of Indigenous Peoples (UNDRIP) states that
  "*Indigenous peoples shall not be forcibly removed from their lands or territories. No relocation shall take place without the free, prior and informed consent of the indigenous peoples concerned and after agreement on just and fair compensation and, where possible, with the option of return.*"[208]

  This is the Free, Prior and Informed Consent (FPIC) principle also strongly supported by the World Bank and IFC. In practice, however, the mining legislation of various countries has often ignored FPIC. Requiring that explorers notify local inhabitants in advance of starting operations, is not the same as obtaining consent. According to J. Chris Anderson (Yirri LLC), "*IFC standards are a 'done deal' with respect to large-scale mining, meaning that most majors have the full intention to comply with them. However, the reality of (say) obtaining Free, Prior and Informed Consent (FPIC) from a fractured community is not easy.*"[209]

  Mineral rights do not automatically extend to surface rights or ownership, and a mineral rights owner has to negotiate access to land, the use of land, and the purchase of land, with the landowner. This process can be difficult and ponderous, especially when land is owned by a community or held in trust by traditional leaders. In such cases, a country's mining authority may be required to assist in the negotiations.

The issue of choices related to land use was raised by May Hermanus (CSIR). Referring to the situation in South Africa where there are a number of existing gold mines (including many old ones), leaving large areas disturbed and sterilised, she says that "*We now need to start thinking about land use choices when new mines are considered: Is mining the right activity for a particular area? What about critical ecosystems? Or do we need this land for agriculture? Can we really afford to mine in all these areas?*"[210] Claude Kabemba (Southern Africa Resource Watch) echoes this opinion, "*The company and the government in particular should do a cost-benefit analysis that considers where it is more profitable to extract the resources or to leave them in the ground. Is it beneficial for the country in the long-term or not. The government must be able to make this analysis.*"[211]

- **Impacts on local communities**
  The impacts of exploration and mining operations on local communities are varied in nature, change over the lifecycle of a project, and have positive and negative aspects. Prior to starting exploration, companies tend to mention employment opportunities (and minimal environmental impacts), during mine construction there is an employment peak (but with the use of foreign workers with specialist skills) and during a mine's long operational phase, employment settles to a lower level, while this is the time when environmental impacts become more noticeable.

  In addition to these employment issues, communities are mostly affected by loss of access to land (for farming, etc.) and by price inflation in the cost of local goods and services.

  J. Chris Anderson (Yirri LLC) mentions that "*Mining operations are primarily technical, companies find it relatively easy to solve technical problems, but for the socio-economic and community health – related issues, the only way to go is to make the people part of the solution. This is more difficult, but can be done if communities are appropriately engaged and especially through an external scientific body, or responsible local NGO, though it takes time.*"[212]

- **Resettlement**
  The relocation or resettlement of communities is often essential for a mining operation. This may be required to gain access to land for construction of open pits or other mining infrastructure, and to ensure that community health and safety is not directly affected by operations. While mining legislation in many jurisdictions does cater for the resettlement of communities, in practice this is a process that requires negotiation between the company and the community. This can be a difficult process, but if carried out successfully, adds significantly to the social licence of the mining company.[213]

- **Health and safety issues**
  Mining operations feature a range of working conditions, from normal office environments, to extreme working conditions, characterised by heat, dust and noise. Such conditions are perhaps not unique to the mining industry, with the exception of underground places of work. Hazards are therefore also not unique, but the employment of large numbers of people, some of them unskilled or semi-skilled, in these environments, does create challenges for mining companies. Even though large mining companies expend a lot of effort on the improvement of health and safety, work-related fatalities remain a fact of life in an industry that employs so many people.[214] Referring to South Africa, Hermanus (CSIR) explains that "*Even in a country with relatively strong health and safety standards, health epidemics are associated with mines: TB, silicosis, HIV, etc. These diseases are associated with life in hostels and working in vast, artificially-ventilated areas underground. Health issues are therefore indirectly due to the nature of the large, tabular orebodies, and directly affected by the nature of worker accommodation.*"[215]

The inhabitants of local communities surrounding mine areas are often also exposed to health and safety risks, due to the levels of airborne dust, polluted water sources, increased traffic on local roads, and so on. Companies may well assist with the mitigation of these factors, but this tends to fall under their voluntary corporate social responsibility (CSR) initiatives. The Fraser Institute has reported on the efforts made by various mining companies in this respect.[216]

- **Labour conditions**
  LSGM, particularly in developing countries, is often associated with poor labour conditions, including long hours, low compensation and poor health and safety. These conditions have, in some cases, resulted in social unrest, for example in South Africa and Chile.[217] In South Africa, for example, policy instruments are developed to keep the cost of labour low and keep the labour force controllable in order to attract investors.[218]

- **Social instability/conflict**
  When communities are not consulted sufficiently, or have grievances regarding land rights, access to land, resettlement, health and safety issues, and labour conditions that they believe are not adequately addressed by the mining companies, these communities will protest. Occasionally, these protests turn violent. Particularly in countries with poor governance structures, security forces (both private and state) employed by multinational mining companies have employed violence in order to respond to these protests in mining areas. Protestors are also intimidated with the threat of violence and actual violence, occasionally resulting in the death of protestors and their family members. Examples include the use of violence in response to protests at Barrick Gold's Pierina mine in Peru, use violence by police forces in Tarime district in Tanzania reportedly linked to the presence of Barrick Gold, and even the use of force against protests against Eldorado Gold in Greece.[219]

- **Unemployment and related social impacts**
  When mines close this often leads to unemployment, which could lead to social conflict.[220] Additionally, mining sites can also be the cause of unemployment as productive agricultural lands are lost. Furthermore, LSM is capital-intensive and highly mechanised, using highly skilled workforce, not generally found in the vicinity of the mine site.[221] Anderson (Yirri LLC) notes, for instance that "*Increasing local sourcing of labour, supplies, services, is essential, but difficult if there are insufficient skills or capacities. However, this can be addressed.*"[222]

### 4.1.3 Supply chain issues

A number of supply chain issues can affect industrial scale gold mining. A brief outline of a number of these issues is provided below.

- **Domination of LSM**
  LSM mining companies, and particularly, multinationals, dominate the gold mining sector.[223] They produce approximately 80% of the gold produced annually.[224] LSM companies have access to the financial resources and prerequisite relations with the government in order to secure exploration and mining permits.

  In a list of clashes between ASM and LSM compiled in 2008, six of the eight identified conflicts were regarding gold. The relationship between the two actors is inherently conflictual as they compete for the same resources or they perceive the other as a threat.[225]

When LSM companies explore or mine previous ASM area conflict with the ASM communities might occur because the ASM communities were not consulted, they are considered a threat to the same resources (although ASM miners might not actually have the technology to access the deposits of interest to the LSM companies), or the ASM communities might claim to have discovered the deposit rather than the LSM company. This latter is particularly problematic as ASM miners tend to not to have acquired the required mineral rights. This means that LSM companies are able to make the "discoverer right" claim and acquire the relevant land title.[226] Levin (ELL) notes that such denial of a livelihood for ASM is a major issue: "*they're not legal, so why should they get compensation?*"[227]

ASM miners also often start mining on LSM leases. They are attracted by LSM prospecting activities and gather from neighbouring areas to start production almost immediately. On occasion this can threaten the LSM permit continuity of tenure as the ASM community might claim precedence and be granted the right to mine. Whatever the situation, LSM companies might pull out as ASM interference poses a liability for planning and implementation, or incur high costs for security and site invasions pose a danger for both parties.[228] Andor Lips (ING), states that "*artisanal miners can encroach into the concession areas of LSM, potentially creating safety issues. Big mines often attract artisanal miners. How to deal with that safety issue in a way which is respecting human rights, is not straightforward. Companies we [ING] are working with tell us that they do not attempt to relocate the artisanal miners in any way. The only thing they do is confiscating the equipment of the artisanal miners (e.g. their bicycles and shovels) when they encroach into their concession area. As artisanal miners have to invest in replacing this equipment, they do not like to lose it and will decide to try their luck elsewhere.*"[229]

According to Levin (ELL), "*Governments tends to see ASM as a lost opportunity to earn taxes, they should rather focus on economic benefits that can follow from the linkages to other industries.*"[230]

In many countries there has tended to be relatively little local content, or spill-over into the local economy from LSM. Often large scale miners will hire personnel and procure goods and services from abroad. This causes an over reliance on international supply chains while not developing local skills and industry. One response has been for governments to develop local content requirement legislation.[231] However, often local content is still limited to low critical products such as food and beverages.[232] Better linkages with the local and national economy will allow the benefits of mining to be shared by local communities, facilitating poverty reduction and economic development.[233]

- **Financial contribution to host country budgets**
  Another important issue related to LSM is that there are insufficient financial returns for host country. This is largely due governments signing contracts meant to attract investors. A study in Tanzania found that although it had become one of the largest producers of gold in Africa, government revenues from gold mining totalled on 5 percent of what the country receives in foreign aid.[234]

  The government revenues generated from gold mining, can be divided in two main income streams:

- Mining royalties, which are a compensation to the nation for the resources that are lost. Idea is that the state should invest such royalties into developmental projects, so that a country and its peoples can gain something as a trade-off for the resources lost. Royalties are calculated as a percentage of the value of production and have to be paid irrespective whether companies make a loss or a profit. Royalties are easier to calculate than taxes and are paid in-country to the host government. There are not many opportunities to avoid these royalty payments, but mining companies can sometimes negotiate lower royalty payments or to defer payments to a later date.
- Taxes, which every company has to pay. Taxes are based on profits made by the mining companies, which can be manipulated by transfer pricing, inter-company loans and royalty payments, etc. This can result in the avoidance of taxes. There are several cases documented of mining companies involved in such practices.[235]

## 4.2 Sustainability issues in artisanal gold mining

This section describes a number of sustainability issues related to artisanal and small-scale gold mining. Section 4.2.1 outlines environmental issues. Section 4.2.2 outlines a number of social issues. Section 4.2.3 outlines supply chain issues. Note that, for the purpose of this report, it is useful to discuss all artisanal and/or small-scale mining, whether legal or illegal, collectively, under the acronym ASM.

### 4.2.1 Environmental issues

A number of environmental issues affect artisanal and small-scale gold mining. Tarras-Wahlberg (SGAB) notes that "*ASM operations with no environmental impact, have not yet been seen.*"[236] Hermanus (CSIR) therefore says that *"… the impacts are enormous, including working women and children, environmental and health impacts. Rather than being promoted and strengthened, the activity should rather be tolerated and ameliorated.*"[237]

A brief outline of the main issues is provided below.

- **Land use change/biodiversity loss**
  For ASM vegetation is cleared and timber is harvested. The vegetation is cleared to expose the substrate for mining. The timber is harvested as firewood, or used for the camp and mineshafts. Bark is often removed from trees to use as pans for washing the minerals, and plants are cut to making carrying basked for medicinal purposes.[238]

  As a result of these activities: the food sources for indigenous fauna are decreased; mining camps block the habitat and migration routes of animals; there is general habitat loss due to deforestation; and invasive species of animals and plants brought in by miners and their families increase the vulnerability of the forest ecosystem. Additionally, as the substrate is exposed there is increased soil erosion and degradation, sedimentation and siltation. The increased use of tracks by pedestrians and motor vehicles leads to increased habitat loss, migration disruption, and increased likelihood of commercial bush-meat trade. The establishment of settlements around mining activities can alter animal habitats and migration patterns and increase the resource and territorial competition among animals. Due to population density increases, the human-wildlife conflict also increases. Diseases are spread from animals to human, such as Ebola and anthrax, and from humans to animals, such as flu and harmful parasites.[239]

In addition to the removal of vegetation, often soil and rock need to be removed to access deposits. Manual tools, such as spades and pick axes are often used. However, high power hoses, medium and large backhoes and dredges are also used. There are multiple ecological impacts associated with the removal of soil and rock. These include: increased vulnerability to erosion; reduced ability for the area to recover the native ecosystem; introduction of non-native vegetation; release and dispersal of corrosive dusts; as mineralized rocks are exposed sulphide minerals become oxidized releasing toxic metal ions ("acid rock drainage" – ARD) which can impact ground and surface water quality, and; air-borne and water-borne toxic substances can impact human health, vegetation, soil and water quality. [240]

Claude Kabemba (Southern Africa Resource Watch – SARW) states that "*Because they have no expertise they are just guessing, through trial and error they try to locate minerals. So they dig everywhere. As such, this is the first most negative impact on the environment. The other problem is that they don't rehabilitate.*"[241]

When mining pits are not refilled they often become stagnant pools of water which are breeding grounds for malaria-carrying mosquitoes and water-borne diseases. These pits also pose a risk to children and livestock. Furthermore, empty mine sites are often unusable for agriculture, meaning that farmers are forced into other habitats.[242]

In situations where deposits are located in riverbanks and riverbeds, aquatic ecologies and hydrological systems will be affected. Habitats are destroyed, siltation reduces light penetration needed for aquatic plants, and as a result oxygen levels needed by fish are depleted. Sedimentation can alter the structure of rivers and streams affecting habitats of aquatic life and potentially blocking or diverting river flow. The impacts on aquatic ecologies and hydrological systems can continue far downstream.[243]

- **Waste management**
  Poor household waste management leads to ground, soil, water and air pollution.[244]

- **Illegal land use**
  ASM is generally considered an informal or illegal activity. [245] This is predominantly because artisanal miners have not obtained the relevant mining licenses and land use permits. The costs of licensing, fees, rents, taxes and royalties are usually reported as obstacles for informal miners. These miners will only make the effort to obtain a licence if they have the financial, technical and personal capacity, if there are sufficient incentives to do so.[246]
  In Ghana, for example, artisanal miners report that obtaining permits is costly and time consuming, and they are deterred by the fact that registered miners are taxed. [247] Levin (ELL) suggests that "*Royalties should be reduced drastically (for ASM), allowing the linkages into other sectors of the economy to generate the economic growth (which would be more local) and even taxes*."[248]

- **Illegal chemical use**
  Cyanide and mercury are used in processes respectively called cyanidation and amalgamation in order to extract gold from ore. It must be noted that the use of mercury is much more common with ASM, than cyanide. Kabemba (SARW) says "*The other major issue is the use of mercury in ore extraction in or near rivers. This is a danger for the communities, but also the people who use it who often don't understand its properties and dangers.*"[249]

These chemicals are often released into waterways or not disposed of appropriately in other ways. Unmanaged cyanide releases can cause the localized and immediate death of fauna. Mercury emissions into water and the air can cause humans and animals to be exposed to it. Drinking water for animals and humans can be polluted. Additionally, both local and distant carnivorous fish and other animals, can bio-accumulate mercury from the consumption of polluted species. These fish and other animals are potentially also consumed by people. The added danger of mercury, as opposed to cyanide, is that as cyanide is a chemical compound it decomposes when exposed to oxygen and sunlight, however, mercury is an element and does not decompose and thus persists indefinitely, allowing it to bio-accumulate.[250]

Mercury is linked to substantial health problems. It may have toxic effects on the nervous, digestive and immune systems, and on lungs, kidneys, skin and eyes. The impacts can be neurological and behavioural, and can result from inhalation, ingestion or dermal exposure. Observed symptoms include tremors, insomnia, memory loss, neuromuscular effects, headaches and cognitive and motor dysfunction. Reported effects on the kidney have ranged from increased protein in the urine to kidney failure.[251]

### 4.2.2 Social issues

A number of social issues can affect artisanal and small-scale gold mining. Tarras-Wahlberg (SGAB) says that "*ASM is driven by poverty, and in developing country scenarios usually involves rather desperate people, for whom survival is more important than environmental or social issues.*"[252] A brief outline of a number of these issues is provided below.

- **Health and safety issues**
  As described in sections 4.1.1 and 4.2.1 cyanide or mercury are often used in the production of gold to extract gold from the ore. Mercury is most commonly used in ASM. The use of mercury in ASM accounts for 37% of global mercury emissions. The use of either substance can result in the pollution of drinking water if not properly managed. Mercury emissions into the air are also dangerous. As described in section 4.2.1 exposure to these substances through water or air can have serious implications to health, including effects on the nervous, digestive and immune systems, and on lungs, kidneys, skin and eyes. These impacts can be neurological and behavioural. Artisanal miners and local communities often lack sufficient information regarding the dangers of cyanide and mercury, and sufficient education regarding the proper handling, management and disposal of these chemicals.[253]

- **Labour exploitation**
  Child labour is common in artisanal and small-scale gold mining. Of the approximately 13 million people engaged in ASM worldwide, 1-1.5 million are children. Many are driven to work in gold mining due to poverty and lack of education, and as it is capital and technology light meaning that it is relatively easy for children to work in this sector. The International Labour Organization (ILO) categorizes gold mining as one of the worst forms of child labour. Children as young as five work under dangerous conditions such as flying rocks and rock dust. They are exposed to dangerous chemicals, engage in hard physical labour and are at risk of mine collapses and mudslides. Some children are trafficked or are trapped in debt bondage. Those working in mining full-time are usually unable to improve their situation through education and continue life as low-paid, unskilled labourers.[254]

Women play a significant role in ASM. It is estimated globally they compose approximately 30% of the ASM workforce, though this proportion varies per region. In Asian countries account for between 10% and 50% of the ASM workforce, in Latin American between 10% and 30%, and in Africa between 40% and 100% of the ASM workforce at different sites. Women play a more significant role in ASM than in LSM, with their participation decreasing as mechanization increases.[255]

Women sometimes work directly in mining however many will work part time at the mining operation and also carry out ancillary roles as cooks and service providers. Frequently women's work is carried out at home, in the case of processing, for example. These activities are carried out in addition to other domestic responsibilities.[256]

Evidence suggests that although women play a significant role in ASM, men control the ownership of assets, including land and income, and in some cases children. Even where women carry out the same activities as men they often earn less money. [257]

As the role of women is usually invisible since it is carried out in the domestic sphere and concurrently with ancillary activities, they are often not considered miners. As such, they are often not sufficiently acknowledged or considered in programs meant to improve the situation for artisanal miners.[258]

- **Potential driver for rural poverty reduction**
  ASM usually operates in the informal economy. As such, contributions to the economy are difficult to measure, and are not always apparent to policy makers. A major contribution of ASM is as an alternative source of rural employment and income. It is a low-skilled and capital light occupation, making access to the sector comparatively easy. It can be carried out seasonally as an alternative to agriculture, fishing or another seasonal activity. It can also be carried out on a more full-time basis. Incomes are used to support families and are often reinvested in other activities, such as agriculture or small businesses.[259]

  Artisanal mining is an important source of employment in areas where there are few other opportunities. Some have even argued that ASM can be considered a productive employment option for youth, contributing the Millennium Development Goal 9 (MDG 8 – Community Driven Development).[260] In 2005 it was estimated there were approximately 15 million artisanal gold miners, among the total 30 million artisanal miners.[261]

  In many instances, mining ASM is conducted as a means of subsistence.[262] It is conducted as an alternative to agriculture, or as a seasonal alternative to agriculture.[263] Levin (ELL) says that "*ASM operators generally do it because it's the best economic choice (by far) to provide cash, higher income (10 times the farming income or GDP/capita in many rural areas), and people are motivated by aspiration for respect.*"[264]

  Artisanal gold mining is important source of secondary employment. In Tanzania, for example, 1 million people are engaged in ASM. The World Bank estimates that in terms of direct and secondary employment, 7 million Tanzanians are supported by ASM. This accounts for 31.5 percent of the country's working-age population. Similar proportional relations are found for ASGM specifically.[265]

- **Social instability/conflict**
  Corruption is a rampant issue in ASM. Artisanal miners are often expected to pay government officials, army officers, and rebels bribes. Sometimes this is considered a form of illegal taxation as the government officials, army officers, and rebels promise to provide security and other services in return. However, in the case of government officials and army officers this should already be provided without the need for further "taxation" on top of the legitimate fees and taxes the artisanal miners pay.[266]

Additionally, mining, also at the ASM scale, can attract people from far and wide. These immigrant communities can cause unrest as land use is altered and there is competition with the agricultural or forestry activities of local inhabitants.[267]

- **Poor security**
  Global Witness reports that in South Kivu, DRC, in 2012, 71 percent of the participants they surveyed in local communities stated that their sustained or increased poverty over the last two years was the result of insecurity. Insecurity restricted the movement of their goods and obstructed their access to markets.[268]

- **Violence**
  While the causes of conflict are many, there is a strong correlation between natural resources and conflict. Bannon and Collier, reviewing the Collier-Hoeffler model, find that there is a strong correlation between natural resource dependence and risk of conflict. If primary commodity exports account for 5% of GDP, the risk of conflict is 6%. However, if primary commodity exports account of 25% of GDP then the risk of conflict is 30%. Bannon and Collier argue that since the end of the cold war fewer national governments are financing rebels groups. These rebel groups seek other sources of financing and natural resources are a very lucrative source of income.[269] In 2001, approximately 50 armed conflicts had links to resource exploitation. These conflicts were either triggered by competition for access or were intensified or sustained by access to natural resources.[270]

  Mineral trade is one of the factors fuelling continued violence and unrest in the eastern Democratic Republic of Congo. Minerals, such as gold, tantalum, tin and tungsten, are not the root cause of the war themselves. However, competition for these resources as a source of income has been an incentive to continue fighting.[271] Brechtje Klandermans (Ministry of Foreign Affairs, BuZa) notes that "*In DRC armed groups sustain their activities through gold (more and more now that the 3Ts are being certified more and more). But if they cannot use gold, they will use other means, such as simple taxation/extortion of the population, wood, charcoal, fisheries.*"[272]

  Armed groups force civilian miners to pay "taxes" to gain access to mine site or require them to hand over a proportion of their production. Moreover, communities are displaced and subjected to abuse as the result of clashes between armed groups fighting for control of mineral-rich areas. These armed groups include the DRC national army, former rebels that have been integrated into the DRC national army and rebel groups.[273]

- **Organized crime**
  Governments can be financed by illicit commodities, but so too can rebel groups, terrorist groups, and criminal networks.[274] Corrupt officials and rebel groups often get involved with organized criminal networks in order to collect rents from natural resources. These links have been documented in Angola, DRC, Kosovo and the Philippines.[275]
  There are a number of bottlenecks and restrictions along international commodity chains that allow for organized criminal networks to evade or circumvent commodity-specific tracking regimes, for example, by smuggling natural resources across borders and evading other check points.[276]

### 4.2.3 Supply chain issues

A number of supply chain issues can affect artisanal and small-scale gold mining. Lack of traceability is the most important, as gold is a high-value/low-volume commodity. It lacks a formal trading chain, making it especially prone to transparency issues, and difficult to carry out due dilligence. Some influential middlemen have ties to politicians who are able to maintain the marginal and informal status of ASM. This allows these middlemen and the corrupt officials to continue generate great profits from and launder money through natural resources.[277]

In areas where there is a lack of government oversight, gold mining inputs, mining goods and gold are sold on the black market. In some instances, armed groups may sell gold which they receive as payment from artisanal miners on the black market.[278]

## 4.3 Comparison of LSM and ASM impacts

Table 14 provides an overview of a comparison between the impacts of LSM and ASM in Ghana, where gold mining dominates the mining sector. The findings of this comparison may therefore be generalised to the gold mining industry in that country. It shows that in terms of most issues, the negative impact of ASM is greater than that of LSM, at least in Ghana. ASM negative impact is largely due to the informality of the sector, and the technical capacities of the actors involved. However, it should be emphasized here that the benefits to local communities of ASM may exceed those of LSM. ASM employs far greater workforces, as noted in section 4.2.2, has more financial spill over into local communities, and is often considered a potential driver of economic development.
The relatively high levels of employment, however, do exist in extremely poor working conditions, and the informal and cash-driven nature of the economic activity around ASM, means that any real economic benefit is very short-term and does not add to the development of the country.
Formalizing the ASM sector is therefore important, it could mitigate the negative impacts, while improving the benefits to communities and the state.

For example, in Colombia gold is the biggest mineral export, 72% of all of Colombia´s mining operations are classified as ASM, and 63% as informal. Only 1% of all mining operations in Colombia are classified as LSM, the remainder is medium-scale mining (MSM). More than 340,000 Colombians depend directly on ASM. As the sector is dominated by informal mining, the state is deprived of important financial resources. Additionally, the informal nature of the sector has led to poor environmental, social, health and safety, labour, technical and trading conditions. This has prevented the generation of formal employment, improving quality of life in mining communities, and other social objectives. Aware of this, the government has made many attempts to formalize the sector, most recently in 2013 with the National Formalization Policy.[279]

In a strategic assessment of the Ethiopian mineral sector, World Bank consultants have reported that "*Government efforts to encourage individual miners to come together to form mining associations, and then jointly apply for mining certificates has met with some success. Encouragement to form mining cooperatives should be associated with the provision of training on technical, financial and environmental issues*". The same publication importantly notes that "*Efforts to support ASM must be accompanied with a strengthened commitment and capacity by the authorities to supervise, control and enforce existing laws and regulations*."[280]

The Swiss Agency for Development and Cooperation (SDC) has reported that SDC-supported projects, featuring formalisation with an empowerment approach, have "*contributed to create or improve legal frameworks for ASM in Bolivia, Peru and Mongolia, which in consequence has enabled ASGM communities to later progress and adapt to international social and environmental standards. By the end of 2011, all Fairtrade and Fairmined certified ASM communities in Bolivia and Peru have been former pilot sites of SDC projects*."[281]

**Table 14 Comparison on impacts of active LSM and ASM in Ghana (2008)**

| Impact | Active LSM | ASM |
|---|---|---|
| *Impact on nature* | | |
| Impact on landscape | 5 | 3 |
| Arsenic contamination | 4 | 2 |
| ARD contamination | 1 | 0 |
| Cyanide contamination | 1 | 0 |
| Mercury contamination | 0 | 3 |
| Suspended solids contamination | 3 | 3 |
| Dusting | 1 | 1 |
| *Environmental management* | | |
| Risks for dam/dump/pit failures | 3 | 3 |
| Legislation; non-compliance | 1 | 5 |
| Deficient handling general waste | 2 | 3 |
| Rehabilitation; non-compliance | 2 | 5 |
| *Occupational safety and health* | | |
| Legislation; non-compliance | 0 | 5 |
| Shortcomings regarding health | 1 | 5 |
| *Socio-economic issues* | | |
| Community liaison; non-compliance | 1 | 4 |
| Community programs; non-compliance | 1 | 5 |

Source: Hifab, Golder Associates, AY & A Consult and SGS (2008, June), *Environmental Impact Assessment: Stage 2 – Final Report: Impact Analysis*, Mining Sector Support Programme National EIA & SEA Project, p. 16.

## 4.4 Sustainability issues in gold trade and recycling

This section describes a number of sustainability issues related to gold trade and recycling. Section 4.4.1 outlines issues related to traceability. Section 4.4.2 outlines issues related to money laundering the gold sector. Section 4.4.3 outlines issues related to the recycling process in the gold value chain.

### 4.4.1 Traceability

Minerals tend to lose their traceability as they move through the supply chain from mine to product. Loss of traceability can occur at various stages and be caused by various factors. During trading and prior to smelting ores are often mixed. During the smelting or refining process, where the target mineral is obtained, the smelter or refiner often draws from different sources. Loss of traceability also occurs at the re-melting, re-processing and recycling of metals stage for similar reasons.[282]

In terms of artisanal gold mining in the DRC, trading and export is often carried out by people and companies that do not have relevant trade and export licences for gold. Additionally, these individuals and companies often underreport or do not report their gold exports.[283]

Laura Gerritsen (Fairphone) states: "*Traceability of gold is a challenge as it is used in many components but in extremely small amounts. Production of Fairphone is located in China. The Shanghai Gold Exchange as the agency controlling all import, export, trading of gold is a hurdle in the attempt to trace the gold supply chain as the agency is not completely transparent itself; this makes it very challenging to get a good insight in where the gold used in components comes from and to get gold from responsible sources into China. This is also a problem for other electronics manufacturers in China.*
*Role of government or industry associations could be to help establish a transparent supply chain into China. China is cooperating with the OECD on the Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas but no full implementation yet.*"[284]

- **Gold from conflict affected areas**
  The term "conflict minerals" refers to tin (cassiterite), tantalum (tantalite), tungsten (wolfram), and gold (3TG), and their derivatives where these are mined by artisanal or small-scale means anywhere in the world and their exploitation makes a substantial contribution to financing, sustaining and perpetuating conflict. Other minerals might be labelled conflict minerals when exploitation, trade, (illegal) taxation, and control either contribute to or benefit from armed conflict. Currently the term "conflict minerals" generally applies to 3TG minerals mined in the eastern DRC, as these are mined in poor conditions with a high occurrence of human rights abuses, they are a source of income to armed groups, and they are illegally smuggled across borders to neighbouring countries.[285]

  In 2004 and 2005 and the UN Security Council imposed sanctions under resolutions 1533 and 1596 that effectively banned the trade in gold extracted in regions of the DRC under the control of armed groups. However, South Africa Resource Watch argues that many of these groups have now disbanded and the primary concern is in fact DRC national army, police and intelligence organizations who continue to extort gold miners and assist gold smugglers.[286]

  Klandermans (BuZa) has expressed some relevant concerns: *"…certified production has the potential to contribute to employment creation. At the same time, we should not forget that non-certified gold exploitation also provides a means of living for many people (feeding into the value chain of the armed groups) and therefore certification can be perceived as a threat by some."*[287]

- **Smuggling**
  Gold is a high-value and low-volume commodity. This makes it particularly easy to transport and hide, making illicit trade very lucrative and the risks comparatively low. Given the complexity of gold supply chains which are transcontinental, and relative ease with which it can be smuggled, gold from conflict zones is particularly hard to trace. Gold, and other minerals, are often smuggled from conflict regions to neighbouring countries and even further afield.[288] Reports state that neighbouring countries sometimes incentivize smuggling, as was the case with Burundi and Uganda.[289]

  One report argues that 100% of artisanal-mined gold in the DRC is smuggled across borders, and enters international gold trading and refining networks. [290] Other estimates suggest that more than 98% of artisanal gold is smuggled out of the country.[291] Border control officials and internal security agencies turn a blind eye or are even complicit in gold smuggling across DRC's borders.[292]

  Not only gold from conflict-affected regions is smuggled, but also gold from unlicensed miners. Gold from Guinea and Burkina Faso, for example, is smuggled into Mali. Gold from Mali is also smuggled into other neighbouring countries. In Ghana, however, smuggling is a less significant problem because the main exporter, the state-owned Precious Minerals Marketing Company Limited (PMMC), does not evaluate the legal status of the gold it purchases. This means that there is little need to smuggle gold for transit.[293]

### 4.4.2 Money laundering and gold laundering

Two forms of laundering affect the gold sector. The first is money laundering.[294] For example, earlier this year, it was reported that a Mexican drug cartel was laundering its drug profits through gold refineries. The cartel would use the money gained through the sale of narcotics to purchase scrap and fine gold which it then sold to refineries in California and Florida. These refineries sometimes transferred payments for this gold directly to Mexico.[295] Similar schemes have been used in the past, such as Colombian drug dealers in 2003 and 2014.[296]

Another form of laundering that affects the gold sector is sometimes termed gold laundering. This is describes the process of mixing illegally mined or illegal obtained gold with legal gold. Processes include smuggling, falsification of documents, and over-reporting legal production, among others (see section 2.5). Such gold laundering affects many countries globally. It has been reported by a UN expert group on the DRC that while improvements have been made to the traceability and due diligence for other minerals, there was little evidence that the government the DRC, Uganda, and the United Arab Emirates had sufficient interest in traceability or carried out appropriate due diligence of the gold traded through their countries.[297] Illegally mined gold in other countries, such as Peru, is also laundered into the formal market.[298] Kabemba (SARW) states "*The problem with gold is its lack of traceability. Initiatives have been focused on diamonds, coltan, tin and other minerals, but less on gold.*" [299]

One result of this, Kabemba (SARW) adds, is that gold from conflict areas or other dubious channels enters the supply chain, "*Everybody knows that Dubai gold comes from dubious sources*."[300]
Even in a country like South Africa, according to Hermanus (CSIR), "*Smuggling is a big problem … there are also sophisticated crime syndicates, sometimes grafted onto the formal sector, so that 'dirty' smuggled gold ends up in the regular large-scale trade. There must have been a lot of collusion to enable it all to work.*"[301]
Referring to the recycling of metals like gold, Filip Delalieux (Schone Edelmetaal) says that "*In recycling the problem is the leakage of conflict minerals (or fenced metals) into regular, legal material flows. Due diligence on gold supply chains is impeded (even in the EU) by a lack of classification or formal [*registration*] of refiners.*"[302]

### 4.4.3 Recycling

Gold can be recycled without any degradation. It can therefore be recycled and repurposed with no need for new mining (see section 2.2.3 and section 3.2). In 2012, approximately 36 percent of the gold supply was met with recycled gold from jewellery and other products including electronics.[303] In 2012, worldwide almost 50 million tons of e-waste was produced. These electronic devices contain hundreds of different materials, including toxic substances, and recyclable minerals.[304]

In 2013, it was reported that almost one in three containers leaving the EU contained illegal e-waste. Waste can be exported if it can be reused or refurbished. However, much of the illegal waste that is being exported is non-functioning. This waste is exported to developing countries in Asia and West Africa in particular. In these countries waste is recycled in the informal sector, often in dangerous and inappropriate conditions, potentially harming the health of local people and damaging the environment.[305] Although the conditions are terrible, and often involve child labour, it is seen by some in West Africa as a financial lifeline used to support poor families in impoverished regions.[306]

Only in recent years has there come a realisation that recycling of e-scrap can be done much more profitably and sustainably, and that the previously-discarded components like printed circuit boards contain relatively high grades of precious metals like gold. There have since been attempts to interest European recycling companies in establishing more sustainable recycling operations in countries like Ghana, facilitating export of valuable fractions to Europe for smelting and final recovery of metals.[307]

## 4.5 Summary and analysis of issues

The previous sections have provided a broad overview of the main sustainability issues affecting the gold supply chain. On the basis of the analysis above, and interviews with relevant experts, this section highlights the key issues identified as affecting the gold supply chain.

### 4.5.1 Governance

The degree of host country governance over the (gold) mining sector is of overriding importance when considering the sustainability of the mining process or lack thereof. A number of commentators have mentioned this in different ways: De Kramer (Witteveen+Bos) says that "*Social and health problems are a direct result of the environmental problems, all of which are due to a lack of sufficient governance."* He also notes that *"In large-scale operations, emissions of pollutants into waterbodies are due to substandard environmental practices, but in ASM operations (like in Suriname and Guyana), the situation is worse, with no environmental consideration at all, everything ripped open, no closure planning.*"[308]

Referring to the industrial-scale mining operations, Anderson (Yirri LLC) says that "*Majors are generally dealing well with environmental (technical) issues, but the lack of trust between government, companies and local communities is often a problem, largely around the socio-economic issues.*"[309] Notwithstanding the efforts of mining companies and industry organisations like the ICMM, it is therefore clear that host country governance remains a crucial issue: "*We have never seen a situation where the host government leaves the field and where industry itself operates perfectly*", in the words of Tarras-Wahlberg (SGAB).[310]

De Kramer (Witteveen+Bos) says that mining companies should all *"… be able to deal with sustainability issues. They do so in varying degrees, depending on the company policy and to a certain degree on the governance in the host country: some companies simply follow the (inadequate) laws to the letter, claiming that any problems caused by their operations are regarded as 'acceptable' as per local legislation."*[311]

Local, in addition to national-level engagement is also critical. Anderson (Yirri LLC) notes that "*National government capacity to govern, and enforce legislation, is important, but interaction with local, sub-national government, is also crucial."*[312]

### 4.5.2 Water related impacts

Notwithstanding all the other abovementioned physical impacts of mining, whether LSM, or ASM, many important issues mentioned by many commentators all relate in some way to water: ARD or AMD may severely affect surface water bodies, increasing their acidity and releasing unacceptably high levels of metals or metalloids into the water. LSM companies may need to lower the water table to allow for deep, open pit mining, thereby removing the traditional water supply for local communities. Stagnant ponds that develop in old open pits or in numerous shallow excavations left behind by ASM operators, may become breeding places for diseases, particularly mosquito-borne diseases like malaria.

Additionally, Andor Lips (ING) observes "*For both LSM and ASM the social-economic impacts are most important, especially conflicts around water and power usage between local communities and mining companies. The challenge for LSM is to create local added value, to catalyse local investments and regional development based on their presence.*
*Many LSM companies do realize this, they know they cannot exclusively claim the available water sources and they do not do that anymore. Mining companies facilitate development of infrastructure, as they are key buyers of water and power. Water management is optimized in modern mining operations.*
*Therefore LSM can become catalysts for large-scale power or water desalination development where local communities can also profit from. But problems can occur when these developments are across borders, as governments of different countries looking at each other.*
*In some old mining areas with "orphan mines", abandoned mines which do not have an owner anymore, water pollution can be a problem. Waste streams can pollute water sources, while nobody takes responsibility for those streams. For the modern mining operations which ING Bank is financing, this is not an issue."*[313]

### 4.5.3 Socio-economic impacts

Numerous socio-economic impacts are prevalent in the mining sector, and according to Tarras-Wahlberg (SGAB), *"… the scale of these problems generally increases with decreasing host government governance over the sector. Poorly-functioning states are therefore a major factor: They allow companies (even ICMM members seen as responsible companies) to operate differently from the way they would in their home countries."*[314]
The issue that mining operations tend to be isolated from the general economy, and do not maximise economic value for the larger economy, was mentioned by a number of persons interviewed. Levin (ELL) states that "*Mines are never totally integrated 'engines for real development', delivering shared value. They are not thought of as social enterprises, but they should be!*" She goes on to say that "*Mines should not just generate short-term profits (for shareholders), income (for current employees) and taxes (for central governments), but should create local legacies of expanded economy – the basis for creating resilient societies."*[315]

In order to address social problems around mine sites, many LSM companies have adopted extensive Corporate Social Responsibility (CSR) programmes, but this approach is not necessarily sustainable: who owns the facilities provided by the company, who will maintain

and staff these in the long run? Anderson (Yirri LLC) comments that "*Mines, working with CSR, often have the capacity to take on some responsibilities (build local schools, clinics, etc.) but these are generally government responsibilities and there is a risk of weakening government, or even 'becoming' some sort of parallel local government.*" He adds that "*One needs to avoid just throwing money at the community.*", concluding that "*The 'CSR mindset' is a barrier, local capacity building is much more important.*"[316]
Agreeing with that point of view, Levin (ELL) mentions that "*More local content is needed, it's being talked about much more often, but there are limitations (skills levels, business standards, access to capital, etc.)*"[317]

The related issue of adding value locally, is important. In the words of Hermanus (CSIR), "*There is an imbalance between real mining input costs (including the externalities) and what value may be achieved by mineral sales. In that context the local added value is particularly important for developing countries. Note that most gold is exported as bullion, allowing other countries to add the value into jewellery, etc.*"[318]

Ramdoo (2015) mentions that there is increasing recognition that extractive resources (which include gold mines) have not been sufficiently translated into benefits overall and have not created opportunities for local businesses. There is mounting pressure to ensure more benefits from extractives, through more and better jobs and more value creation locally. There is no sustainable development path without (local) industries, and local content policies are key to stimulate entrepreneurship and development.[319]

In order to improve the sustainability of the gold supply chain, it is clearly not enough to merely remediate environmental and social problems, but rather to facilitate a process whereby gold mining operations create more value for the broader economy.

# Chapter 5 Policy context and current initiatives

This chapter describes the policy context and current initiatives with relation to the gold supply chain. Section 5.1 discusses various standards and initiatives aimed at dealing with sustainability issues in the gold supply chain. Section 5.2 provides an overview of the relevant EU policy context. Section 5.3 provides an over of the relevant Dutch policy context. Section 5.4 provides an overview of a number of knowledge providers and NGOS working on the topic of sustainability in the gold supply chain.

## 5.1 Sustainability initiatives, guidelines, regulations, and standards

This section discusses various initiatives, guidelines, regulations and standards which aim to deal with the sustainability issues in the industrial and artisanal gold sectors. In 2011 a benchmark study of a number of environmental and social standards in industrialized precious metal mining was carried out for Solidaridad.[320] This current study includes additionally a number of other initiatives, guidelines, and standards. Moreover, the standards, initiatives, and guidelines in the Solidaridad study might have been updated since their study, as is the case for the IFC Performance Standards and the Equator Principles, for example. Therefore no meaningful comparison can be drawn. However, more importantly, the effectiveness of initiatives, guidelines, standards, and regulations cannot be adequately evaluated through desk research. Such an evaluation requires more extensive research, including field research.

### 5.1.1 Regulations

This section discusses two regulations which aim to deal with the sustainability issues in the mining sector, particularly with regard to conflict-minerals.

- **Dodd-Frank Act (US)**
  The Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) came into effect in 2010. Section 1502 describes legal obligations for due diligence by companies trading on US stock exchanges that are active in supply chains that contain conflict-prone minerals (tin, tantalum, tungsten and gold). Section 1502 is titled 'Conflict Minerals'. The section requires companies to disclose whether there are minerals originating in the DRC or neighbouring countries in their supply chain. It further obligates companies to disclose their due diligence procedures, including an independent audit.[a, 321]

[a] A recent study by Amnesty International and Global Witness found that almost 80% of the companies they analyzed failed to meet the minimum requirements of the Dodd-Frank Act. (Amnesty International and Global Witness (2015, April), *Digging for Transparency: How US Companies are Only Scratching the Surface of Conflict Minerals Reporting*, London: Global Witness and Amnesty International, p. 5). Additionally, Charles Chaussepied (personal capacity) notes "US Dodd-Frank Act gold supplement is a catastrophe! As it developed the smuggling in Central Africa." (written response to interview questions, 3 May 2015).

- **Proposed regulation for EU system of self-certification for 3TG importers**
  The European Commission has proposed a draft regulation to set up an EU system of self-certification for importers of tin, tantalum, tungsten and gold (3TG). The self-certification process would require EU importers of these minerals to carry out appropriate due diligence to ensure that their purchases and sales are in line with the five steps of the OECD Due Diligence Guidance. The focus of the proposed EU regulation is on the EU importers of gold and smelters located in the EU, rather than companies which might import gold in parts of products and companies which further process the gold in consumer products - as is the case with the American Dodd-Frank regulation. Voting on the proposed regulation will take place in June 2015.[322]

### 5.1.2 General international voluntary guidelines

This section discusses a number of general international voluntary guidelines that are relevant to the gold mining sector.

- **Equator Principles**
  The Equator Principles is a risk management framework, adopted by member financial institutions, for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making. The Equator Principles apply to four financial products:
  - Project Finance Advisory Services where total Project capital costs are US$10 million or more.
  - Project Finance with total Project capital costs of US$10 million or more.
  - Project-Related Corporate Loans (including Export Finance in the form of Buyer Credit) where all four of the following criteria are met:
    - The majority of the loan is related to a single Project over which the client has Effective Operational Control (either direct or indirect).
    - The total aggregate loan amount is at least US$100 million.
    - The EPFI's individual commitment (before syndication or sell down) is at least US$50 million.
    - The loan tenor is at least two years.
  - Bridge Loans with a tenor of less than two years that are intended to be refinanced by Project Finance or a Project-Related Corporate Loan that is anticipated to meet the relevant criteria described above.[323]

  Assessments carried out under the Equator Principles utilize the IFC Performance Standards, described below.

- **IFC Performance Standards**
  Since 2012, the International Finance Corporation – the part of the World Banking Group that focuses on private sector investments – uses a new sustainability framework to assess the social and environmental impact of its investments. The Performance Standards, which include guidelines for specific themes and industries, are an essential part of this environmental and social risk assessment. The performance standards are the following:

  - Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
  - Performance Standard 2: Labour and Working Conditions
  - Performance Standard 3: Resource Efficiency and Pollution Prevention
  - Performance Standard 4: Community Health, Safety, and Security
  - Performance Standard 5: Land Acquisition and Involuntary Resettlement
  - Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

- Performance Standard 7: Indigenous Peoples
- Performance Standard 8: Cultural Heritage[324]

The IFC Performance Standards are also utilized by financial institutions that are signatory Equator Principles when providing financial services meet the criteria of the Equator Principles.

- **UN Guiding Principles on Business and Human Rights**
  The UN Guiding Principles on Business and Human Rights were proposed by UN Special Representative on business and human rights John Ruggie. They are therefore also known as the Ruggie Principles. The Guiding Principles were endorsed by the UN Human Rights Council in 2011. They are the first initiative integrating corporate human rights responsibility endorsed by the United Nations.[325]

  The Guiding Principles consists of three pillars:
  - State duty to protect human rights
  - Corporate responsibility to respect human rights
  - Access to remedy[326]

  Each of these pillars is built up by foundational and operational principles. With regard to corporate responsibility, the Guiding Principles state that the responsibility to respect human rights is a global standard of the expected conduct of all business enterprises. This responsibility requires internationally recognized human rights standards as enshrined in the International Bill of Human Rights and the International Labour Organization's Declaration on Fundamental Principles and Rights at Work. The Guiding Principles state that companies should have in place policies and processes that allow them to adequately meet this objective. [327]

- **Voluntary Principles on Security and Human Rights**
  The Voluntary Principles on Security and Human Rights (VPs) were established in 2000. It is a multi-stakeholder initiative which includes 28 companies, 9 national governments (including the Netherlands), and 10 non-governmental organizations.[328] They are specifically designed for companies active in the extractive sector.[329] The VPs are designed to guide companies in the extractive sector in maintaining the safety and security of their operations within an operating framework that encourages respect for human rights.[330]

  The VPs were developed in response to reports of human rights abuses allegedly committed by security providers contracted by the extractive industry. The principles apply to interactions with both public and private security forces, however, they do not require independent assurance.[331]
  The VPs include provisions on:
  - regular consultations between companies and host governments & local communities;
  - issues of proportionality and use of force;
  - improved company engagement for protection of human rights by their security contractors;
  - monitoring of progress of investigations into alleged abuses;
  - inclusion of appropriate provisions in contracts;
  - review of the background of private security that companies intend to employ. [332]

### 5.1.3 Sector specific voluntary initiatives

This section discusses a number of sector specific international voluntary guidelines that are relevant to the both mining and gold mining specifically.

- **Extractive Industry Transparency Initiative (EITI)**
  The Extractive Industry Transparency Initiative (EITI) launched in 2002, sets a standard for transparency. It requires participants to disclose revenues generated in the extractives sector, i.e. oil, gas and mining. This includes revenues generated by governments through the extractives sector, and payments by companies in the extractives industry to governments. These two figures can then be compared, with discrepancies indicating corruption or graft. The EITI thus intends to remove the financial obscurity that allows corruption to flourish in the sector. Through the EITI Board the Dutch government is a member of the multi-stakeholder coalition of governments, companies, investors, civil society organization and partner organizations that oversees the EITI processes in implementing countries and internationally.[333] Additionally, alternate members of the EITI International Board include representatives from Dutch development NGO Cordaid and institutional investor Actiam.[334]

- **International Council on Mining and Metals**
  The International Council on Mining and Metals (ICMM) was founded in 2001 to improve sustainable development performance in the mining and metals industry. Currently, 21 mining and metals companies and 35 national and regional mining associations and global commodity associations are members of ICMM.[335] Through the 35 associations, ICMM is connected to a further 1,500 companies in the mining sector. Members of ICMM account for 26.8% of the global gold market.[336]

  ICMM requires member companies to make a public commitment to improve their sustainability performance and report against their progress on an annual basis. Additionally, ICMM engages with a broad range of stakeholders (governments, international organizations, communities and indigenous peoples, civil society and academia) to build strategic partnerships.[337]

- **International Cyanide Management Code**
  The International Cyanide Management Code was developed by a multi-stakeholder committee under the guidance of the United Nations Environmental Program (UNEP) and the International Council on Mining and Metals.

  The Code is a voluntary industry program for gold mining companies. It focuses exclusively on the safe management of cyanide and cyanidation mill tailings and leach solutions. If companies adopt the Code they must have their mining operations using cyanide to recover gold audited by an independent third party in order to determine the status of Code implementation. When operations meet the Code requirements they are certified. This certified operation can then use a unique trademark symbol. The results of the audit are made public.[a]

  The objective is to improve the management of cyanide used in gold mining and assist in the protection of human health and the reduction of environmental impacts.[338]

[a] In general auditors can be accountants or consultancies that have received accreditation from the relevant certification or standards bodies. Such companies have to meet specific criteria in order to receive accreditation.

- **Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development**
  Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) emerged from a number of countries who, at the World Summit on Sustainable Development in 2002, decided to demonstrate the mining sector can be a significant driver of development. In 2005 the IGF was inaugurated. It is open to all UN member states with an interest in effectively managing their mining sector for development. The IGF currently has 50 members. The Netherlands is not a member.[339]
  At the 19th Session of the UN Commission for Sustainable Development in 2011, the IGF presented the Mining Policy Framework (MPF). The MPF is a collection of best practices for good environmental, social and economic governance in the mining sector, and the generation and equitable distribution of benefits to foster sustainable development.[340]

- **Minamata Convention on mercury**
  The Minamata Convention on Mercury is a global treaty to protect human health and the environment from the adverse effects of mercury. The convention was agreed in 2013. The Minamata Convention on Mercury includes a ban on new mercury mines, the phase-out of existing mercury, control measures on air emissions, and the international regulation of the informal sector for artisanal and small-scale gold mining. Controlling the anthropogenic releases of mercury throughout its lifecycle has been a key factor in shaping the obligations under the convention.[341] The Netherlands is a signatory to the Minamata Convention.[342] It also provided financing to support the early implementation of the Minamata Convention.[343]

- **OECD Due Diligence Guidance on Responsible Supply Chains of Minerals from Conflict Affected and High Risk Areas – supplement on gold**
  OECD Due Diligence Guidance on Responsible Supply Chains of Minerals from Conflict Affected and High Risk Areas (the Guidance) is a collaborative government-backed multi-stakeholder initiative to foster responsible supply chain management of minerals from conflict-affected areas. The goal of the Guidance is to help companies respect human rights and avoid contributing to conflict through their supply chains. The Guidance further intends to promote transparent mineral supply chains and sustainable corporate engagement in the mineral sector from mine to end user. OECD Due Diligence Guidance is voluntary, however, utilizing the Guidance generates the relevant information required to meet the US Dodd-Frank Act requirements regarding conflict minerals and similar EU legislation which is currently under development. The Guidance was adopted in 2011 by 42 OECD countries and non-OECD that pledged that they would ensure companies operating or based within their borders would apply the Guidance.

  The Guidance contains a five-step framework for risk based due diligence in the mineral supply chain:
  - Establish strong company management systems
  - Identify and assess risks in the supply chain
  - Design and implement a strategy to respond to identified risks
  - Carry out independent third-party audit of supply chain due diligence at identified points in the supply chain
  - Report on supply chain due diligence

  The gold supplement of the Guidance includes special consideration for artisanal and small-scale mining. This intends to formalize and legalize these actors, and to support legitimate ASM miners.[344]

- **Public-Private Alliance for Responsible Minerals Trade**
  The Public-Private Alliance for Responsible Minerals Trade (PPA) is a multi-sector and multi-stakeholder initiative. It was developed to support supply chain solutions to conflict minerals challenges in the Great Lakes Region. PPA provides funding and coordination support to organizations working in the region. [345] Partnership Africa Canada was partially funded by the PPA. The project attempted to create the first traceable conflict-free mineral chain for artisanal gold from the DRC.[346] PPA also funds other organizations that work to develop verifiable conflict-free supply chains; align chain-of-custody programs and practices; encourage responsible sourcing from the region; promote transparency; and bolster in-region civil society and governmental capacity. PPA also maintains a website that is designed as a resource for companies with reporting requirements mandated by the Dodd-Frank legislation. PPA also provides a platform for dialogue among government, industry and civil society. [347]
  Current participants include the International Conference of the Great Lakes Region; US Agency for International Development; US Department of State; industry associations such as the World Gold Council and the Electronics Industry Citizenship Coalition; civil society organizations such as Enough Project, Resolve and Global Witness; and private sector companies such as Acer, Apple, Dell, HP and Sony.[348]

### 5.1.4 Traceability initiatives

This section discusses a number of international initiatives aimed at improving traceability in the gold mining sector.

- **Certified Trading Chains (CTC)**
  The Certified Trading Chains (CTC) scheme was developed by the German Federal Institute for Geosciences and Natural Resources (BGR) in 2008 and piloted at a number of large mines in Rwanda in 2009. The scheme is currently only being implemented in Rwanda and the DRC. CTC focuses on both environmental and social considerations of the OECD Due Diligence Guidance, and aims to improve “supply chain due diligence and good governance in the artisanal and small-scale mining sector” in Rwanda and DRC. There are twenty certification standards on mineral origin and traceability, mining conditions, and supply chain due diligence elements in the CTC scheme.[349]

  The BGR has also developed technology called the Analytical Fingerprint (AFP) technology. This technology is able to identify to within 100 meters the mine where a mineral is being extracted from. AFP is currently only available for tantalum, and the costs are still too high for the technology to be more widely used. [350]

- **Conflict-free Smelter Program**
  The Conflict-Free Smelter Program (CFSP) is the flagship program of the Conflict-Free Sourcing Initiative (CFSI). CFSI was founded in 2008 by members of the Electronic Industry Citizenship Coalition (EICC) and the Global e-Sustainability Initiatives (GeSI). [351] Currently over 200 companies and associations from seven different industries participate in CFSI.[352] CFSI regularly collaborates with complementary programs, including the Better Sourcing Program, iTSCi, Public-Private Alliance for Responsible Minerals Trade (PPA) and Solutions for Hope.[353]

The CFSP uses an independent third-party audit to identify smelters and refiners that have systems in place to ensure that they only source conflict-free materials. This audit is carried out according to a number of global standards, including the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, and the US Dodd-Frank Wall Street Reform and Consumer Protection Act. [354] A list of smelters and refiners that meet the requirements of the audit are published on the CFSP website. In February 2015 65 gold smelters and refiners were considered compliant. The CFSP allows downstream companies to identify and source from conflict-free smelters in order to improve sustainability in their supply chains.[355]

Participation in the CFSP is voluntary. Audits of smelters and refiners are required. The public disclosure of these audits is also required.

- **International Conference on the Great Lakes Region Regional Certification Mechanism**
  Partnership Africa Canada proposed a Regional Certification Mechanism for the four so-called conflict minerals (tin, tungsten, tantalum, gold), encompassing all 11 nations of the ICGLR region addressing ending the connection between minerals and conflict in 2011. PAC had first conducted wide-ranging research in the region, consulting with government, mineral buyers and exporters, miners, NGOs and others to determine what was practical, what kind of oversight local stakeholders would accept, and what level of scrutiny the international marketplace would require. The proposal drew on PAC experience with the Kimberley Process for diamonds. It outlined a certification scheme that was practical, rigorous and addressed to the problems of human rights and conflict financing.[356]

  Within four months of its first presentation the Regional Certification Mechanism had been endorsed by the Steering Committee of the ICGLR. Within a year, the RCM had been adopted by the 11 heads of state of the ICGLR at an extraordinary Special Summit. The first four Third Party Auditors were accredited in August 2014, preparing the way to rolling out the certification scheme.[357]

  The Regional Certification Mechanism will ensure that neither mine site nor channels of trade within the country as well the region are in predatory control of armed groups or criminal networks.[358]

- **Responsible Jewellery Council Chain-of-Custody Certification Program**
  The Chain-of-Custody Certification Program developed by the Responsible Jewellery Council seeks to operationalize the OECD Due Diligence Guidance for miners, refiners, and other supply chain actors. The Chain of Custody Certification is voluntary. Those who apply for certification must undergo audits and the results of these audits must be publicly disclosed. The goal of the Responsible Jewellery Council Chain-of-Custody Certification Program is to certify systems that can identify and track responsibly produced and conflict-free gold in every step of the gold supply chain from mine to retail. The program differentiates between mined, recycled and mixed gold with so called transfer chain-of-custody documentation.[359]

- **USAID Responsible Minerals Trade Program**
  USAID's Responsible Minerals Trade (RMT) Program is designed to create a pilot conflict-free supply chain, promote civilian control of the minerals sector through regulatory reforms, and ensure vulnerable populations are protected. It further supports Great Lakes regional auditing and monitoring of conflict-free minerals (gold, tantalum, tin, and tungsten). USAID works with the U.S. Department of State and private sector organizations to implement the Public-Private Alliance for Responsible Minerals Trade (PPA) (see section 5.1.3). The program is focused on the Democratic Republic of Congo. It consists of five core activities:
  - Start conflict-free supply chain infrastructure and regulatory reform
  - PPA support to promote in-region traceability
  - Community reconciliation and economic development through trade opportunities in the mineral sector
  - Protection of artisanal mining communities: reduce child and adult trafficking in mining
  - Institutional and human capacity building for responsible minerals trade.[360]

### 5.1.5 Artisanal mining development initiatives

This section discusses a number of international initiatives aimed at developing the artisanal gold mining sector

- **Artisanal Gold Council**
  The Artisanal Gold Council (AGC) is a not-for-profit organization based in Canada. It is dedicated to fostering the sustainable development of artisanal and small-scale gold mining (ASGM) communities in the developing world. They work directly with ASGM communities and local experts to find solutions that address the unique circumstances in different locations. The core of their primary activities is their field based programs focus on sharing and encouraging better practices in ASGM. In addition to their field activities, the AGC works on the policy level, ensuring that ASGM communities are given a voice within national and international policy circles.[361]

- **Better Gold Initiative**
  The Better Gold Initiative (BGI) is a public-private partnership between the Swiss Better Gold Association (SBGA) and the Swiss State Secretariat for Economic Affairs (SECO). SBGA is a non-profit organization composed of different stakeholders from the Swiss gold value chain that want to support development in mining communities through linkages to finance and markets. SECO is the Swiss agency responsible for economic development cooperation. It objectives include promoting sustainable exports, strengthening export economy competitiveness, and promoting sustainable supply chains. SECO is a donor to the BGI. The initiative was developed in the context of the OECD Guidelines appendix on ASM.[362]

  The main objective of the BGI is to generate development in mining communities through market driven incentive payments and enabling transparency/traceability to ensure future fair prices for ASM gold in the market. It builds on previous experience and existing initiatives (such as FairTrade, Fair Mined, and Responsible Jewellery Council), strengthens the supply chain by creating demand in Switzerland and links certified or certified willing producers with the Swiss market.[363]

  Peru was chosen as the pilot country given the prevalence of ASM in the country, and the fact that ASM is a political priority of the Peruvian government.[364]

- **UNEP Global Mercury Partnership**
  UNEP Governing Council called for mercury partnerships between governments and other stakeholders as an approach to reducing risks to health and the environment of the release of mercury and its compounds to the environment. Five partnership areas have been identified in 2005. These are mercury release from coal combustion, artisanal and small scale gold mining, mercury cell chlor alkali production, mercury in products, and mercury air transport and fate research.[365]

  In light of the priority areas, UNEP Global Mercury Partnership developed the Artisanal and Small-Scale Gold Mining (ASGM) Program. The program has three partnership priority actions:
  - Support government efforts in setting national objectives/reduction targets for ASGM.
  - Eliminate the worst practices in ASGM.
  - Explore innovative market-based approaches to enable the transition away from mercury.[366]

### 5.1.6 International gold sustainability standards

This section discusses the various standards which aim to deal with the sustainability issues in the industrial and artisanal gold sectors.

- **Conflict-Free Gold standard**
  The World Gold Council has sought to operationalize the OECD Due Diligence Guidance for miners by developing the Conflict-Free Gold standard. Participation is voluntary. Participants are required to submit to an audit, the results of which must be publicly disclosed. The Conflict-Free Gold standard establishes a common approach through which gold producers can assess and provide assurance that their gold has been extracted in a responsible manner. This is considered to be a manner that does not cause, support or benefit unlawful armed conflict or contribute to serious human rights abuses or breaches of international humanitarian law. The standard is endorsed by the LBMA and aligns with the LBMA Responsible Gold Guidance.[367]

- **Dubai Multi Commodities Centre (DMCC) Practical Guidance**
  This program requires that all DMCC accredited members implement OECD Due Diligence Guidance. The practical guidance is mandatory for all *Dubai Good Delivery (DGD), Market Deliverable Brand (MDB)* accredited refiners and for *Responsible Market Participant (RMP)* members. Audits are required, and public disclosure is also required.[368]

- **Fairtrade Gold and Precious Metals**
  Fairtrade International has developed a certification scheme that follows the principles of Appendix 1 of the OECD Due Diligence Guidance Supplement on Gold. In 2014, the standards were revised to align with OECD Due Diligence Guidance. Fairtrade Gold and Precious Metals is a certification scheme for responsibly sourced gold and precious metals from artisanal and small-scale sources that comply with social, environmental, labour and traceability requirements. Certification is voluntary, however, those applying for certification must submit to an audit, and the results of the audit must be publicly disclosed.[369]

- **Fairmined Gold**
  This is a third party assurance scheme developed by the Alliance for Responsible Mining (ARM). The standard is voluntary. Parties that take part voluntarily must be audited and the results of these audits must be publicly disclosed. The standard is an assurance that gold is sourced from formalized artisanal mines with responsible social, environmental and labour practices. It seeks to operationalize the OECD Due Diligence Guidance for artisanal and small-scale miners. It enables Appendix 1 of the OECD Due Diligence Guidance Supplement on Gold.[370]

- **Initiative for Responsible Mining Assurance**
  The IRMA Standard for Responsible Mining is currently under development. They have completed the first draft of the Standard in July 2014 and are seeking stakeholder input.[371] The draft standard currently outlines requirements on business integrity, social responsibility, environmental responsibility, reclamation and closure and management systems. The Standard contains a broad range of specific elements under these requirements, for example with regard to free, prior and informed consent, fair labour, and mining in conflict-affected or high risk areas, to name a few. The Standard includes an independent audit requirement.[372]

- **International Conference on the Great Lakes Region (ICGLR) Regional Certification Mechanism**
  The ICGLR has set the standards for traceability and certification of minerals in the conflict-prone Great Lakes region. These standards are compliant with the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas. The ICGLR's standards and procedures are harmonized with the Certified Trading Chains scheme (German Federal Institute for Geosciences and Natural Resources, BGR), the DRC Certification Manual and have accommodated traceability schemes such as ITRI's Tin Supply Chain Initiative (iTSCi).[373]

  The key element of the ICGLR scheme is the verification and monitoring process. This consists of both third-party audits and an overarching Mineral Chain Auditor. Minerals are tracked from the mine site to export. Together, these provide independent oversight of the system. It further enables the industry to meet its requirements under the Dodd-Frank legislation. [374]

- **London Bullion Market Association (LBMA) Responsible Gold Guidance**
  Utilization of the LBMA Responsible Gold Guidance is mandatory for all LBMA accredited refiners. Audits and the public disclosure of these are required. The Guidance seeks to operationalize the OECD Due Diligence Guidance for refiners. It ensures that all gold feed stock and all gold produced by refiners are conflict-free. The LBMA Good Delivery List includes 63 globally important LBMA Gold Refiners located in 31 countries. It accounts for 85-90% of annual global gold production.[375]

## 5.2 Relevant EU policy context

This section includes a brief discussion of relevant existing EU policies and policy initiatives.

### 5.2.1 Raw Materials Initiative

The EU Raw Materials Initiative was launched in 2008. Access to and the affordability of mineral raw materials was seen as crucial for the sound functioning of the EU economy. A number of sectors, such as construction, chemicals, automotive, aerospace, and machinery and equipment, all rely heavily on raw materials. These sectors, in 2008, also provided employment for 30 million people and provided a total value added of € 1,324 billion to the EU economy. Having reliable and undistorted access to raw materials is seen as an important factor for the EU's competitiveness.[376]

The Raw Materials Initiative has three pillars. These are:

- Ensuring a fair and sustainable supply of raw materials from global markets;
- Ensuring a sustainable supply of raw materials within the EU;
- Boosting resource efficiency and increasing the amount of recycling.[377]

As part of the Raw Materials Initiative a list of 'critical' raw materials is drawn up. 'Critical' is understood as raw materials that have a high supply-risk and a high economic importance. This list is reviewed and updated every three years. The purpose of the list is to coordinate EU and national level industrial policies in support of these raw materials and to incentivize EU production of these raw materials. The list is currently being used to prioritize needs and actions, is used as a supporting element in trade agreements, challenging trade distortions measures and to promote relevant research and innovation.[378]

The 2014 updated list of critical minerals does not include gold. [379] In fact, in the 2014 report on raw material critical to the EU, gold was classified as a non-critical raw material.[380] This implies that it is not considered to be subject to high supply risk or of significant economic importance. [381]

### 5.2.2 Directive 2013/34/EU

Directive 2013/34/EU states that large - listed and non-listed - companies active in natural resources, in particular minerals, oil, natural gas and primary forests, are now required to disclose material payments made to governments in the countries in which they operate in a separate report, on an annual basis. Large companies are defined as meeting two of the following three criteria:

- balance sheet total above € 20 million;
- net turnover above € 40 million;
- average number of employees above 250.

When reporting on these payments, companies should include "types of payments comparable to those disclosed by members of the Extractive Industries Transparency Initiative (EITI), the Forest Law Enforcement, Governance and Trade Action Plan of the European Union (EU FLEGT) and the provisions of Regulation (EU) No 995/2010 of the European Parliament and of the Council of 20 October 2010".
In terms of transparency and content the report should serve to help governments of resource-rich countries to implement the EITI principles and criteria. It should also make these governments more accountable to their citizens for these payments. The Directive requires that the report should incorporate disclosures on a country and project basis. Projects are defined as the operational activities governed by a single contract, license, lease, concession or similar legal agreements. The Directive provides further details, also concerning issues such tax and dividend payments.

### 5.2.3 Directive on disclosure of non-financial information

On 15 April 2014, the European Parliament adopted a proposal for a *Directive on disclosure of non-financial and diversity information by large companies and groups*.[382] However, in order to become law, the proposal for a directive needs to also be adopted by the EU Member States in the Council.[383] This Directive has already been adopted and has also been adopted in Dutch legislation.

This Directive amends Directive 2013/34/EU described in section 5.2.2. Directive 2013/34/EU (and the directives which were repealed by this directive) had addressed the issue of disclosure of non-financial information, however, the requirements were considered unclear and ineffective, and were being applied in different ways throughout Member States.[384] Only 10% of the largest EU companies were disclosing non-financial information regularly. To tackle this issue the recent proposal for a directive has been adopted.

The requirements apply to big listed and unlisted companies with more than 500 employees, in total approximately 6,000 large companies and groups across the EU. These will have to disclose in their management reports relevant and material information on policies, outcomes and risks, including due diligence procedures that they implement. They will also have to disclose information on relevant non-financial key performance indicators regarding environmental, social and employee related issues, including human rights, anti-corruption and bribery matters, and diversity of their boards of directors. However, the companies are free to choose the format they use to disclose the relevant information. The may use international, European or national guidelines they believe are appropriate for their circumstance. They may choose, for example, from the UN Global Compact, ISO 26000, or the German Sustainability Code.[385]

The European Parliament's proposal for a Directive requires the European Commission to prepare non-binding guidelines for how companies should report on their social and environmental performance. This includes the development of general and sectoral key performance indicators. Relevant stakeholders will be consulted in this process. As yet it is not clear when this Directive will come into force. However, many observers believe that EU Member States will have to work many years to transpose the Directive into national legislation.[386]

### 5.2.4 Directive 2012/19/EU

In 2005 the EU produced approximately 9 million tonnes of waste electrical and electronic equipment (WEEE). This included computers, TVs, cell phones, refrigerators, and similar products. It is expected that WEEE generated in EU will reach 12 million tonnes by 2020. In order to improve environmental management and contribute to the circular economy the first WEEE Directive (Directive 2002/96/EC) entered into force in 2003. This was since been updated in 2008 and 2012 (Directive 2012/19/EU). This Directive partly aligns with the Raw Materials Initiative in that it calls for the recycling of WEEE in order to acquire the scarce and expensive natural resources they contain. This aligns with pillar three of the Raw Materials Initiative, i.e. to boost resource efficiency and increasing the amount of recycling. [387]

## 5.3 Relevant Dutch policy context

This section provides an outline of elements of the Dutch policy context that are relevant to the study of improving sustainability in the gold supply chain.

### 5.3.1 Dutch agenda for aid, trade and investment

In 2013, the Dutch Ministry of Foreign Affairs laid out its new agenda for aid, trade and investment. The government's new agenda recognizes a number of key issues. Firstly, the government recognizes that it is no longer able to solely use aid to exert an influence on poverty and equity issues, as recipients are increasingly operating on an equal footing with the Dutch government given that they are no longer merely aid recipients but also trade partners. Secondly, the government recognizes the increasing role of the private sector in fostering development. The role of the private sector has gained added significance since aid budgets have been decreasing. [388]

The new government agenda realizes that the market is not perfect, but is still an indispensable tool in fighting poverty. It therefore encourages investment and trade activities that benefit people and the environment, creates employment opportunities, and preferably also foster knowledge and skills transfer. The government states that the Netherlands is failing to fully take advantage of the economic growth in Asia, Africa and South America, focusing too much on trade with neighbouring countries. It believes that longstanding aid relationships with these regions can be converted into investment and trade opportunities.[389]

The Dutch government thus has three important aims at the international level:

- eradicate extreme poverty ('getting to zero') in a single generation;
- sustainable, inclusive growth all over the world;
- success for Dutch companies abroad.[390]

The government identifies three types of bilateral relationships in the field of aid and trade:

- Aid relationships
- Transitional relationships
- Trade relationships[391]

Under the guiding principle of sustainable and inclusive growth, the new Dutch agenda for aid, trade and investment operates under the following slogan: "We fight extreme poverty out of solidarity with people. We encourage trade and investment mainly in our own interests. Where aid and trade meet, we will act out of both solidarity and enlightened self-interest."[392]

*Aid relationships* are focused on the current partner countries. This category includes conflict-affected and post-conflict countries, fragile states and countries with insufficient capacity to reduce poverty without assistance. Partner countries include Afghanistan, Burundi, Mali, the Palestinian Territories, Rwanda, South Sudan and Yemen. A regional approach will be taken in the Great Lakes Region and the Horn of Africa where possible.[393]

*Transitional relationships* are focused on low- and middle-incomes countries with steadily developing economies. In these bilateral relationships, a combination of aid and trade can be beneficial to both the developing country and the Netherlands. In addition to poverty reduction programs, the Dutch government will also assist these partner countries in increasing their market access and improving their business climate. It will do so through concluding partial agreements with the Doha Development Round and providing support to entrepreneurs through the Dutch Good Growth Fund. The Dutch Good Growth Fund is intended for entrepreneurs in low- and middle-incomes countries, and Dutch entrepreneurs seeking to invest in or export from these countries. The government will work towards equal opportunities and sustainable values. It will do so, for example, through promoting international corporate social responsibility.[394]

This strategy will be used specifically for Bangladesh, Benin, Ethiopia, Ghana, Indonesia, Kenya, Mozambique and Uganda. However, the government will remain active in other low- and middle incomes countries through, for example, private sector programmes, economic diplomacy, or aid through the European Union and multilateral institutions such as the World Bank.[395]

*Trade relationships* focus on Australia, Belgium, Brazil, Canada, China, Colombia, France, Germany, the Gulf States, India, Iraq, Japan, Malaysia, Mexico, Nigeria, Poland, Romania, Russia, Singapore, South Africa, South Korea, Turkey, the UK, Ukraine, the US and Vietnam. The main aim in these relationships is to promote trade and investment, with activities that contribute to economic growth and employment in the Netherlands. [396]
The government will seek to conclude free trade agreements with an increasing number of countries, and work to create a level playing field for international finance, attracting foreign investors and protecting Dutch investors abroad. The Dutch private sector and small- and medium-sized enterprises in particular will be encouraged to internationalize. Procedures will be streamlined, and Dutch companies will be supported in international tenders. [397]

International public goods are an important element in every part of new Dutch agenda for aid, trade and investment. The government will focus on areas where it believe the Netherlands can a significant contribution, namely, trade, security, food security, water, climate and migration. In international organizations the government will seek to represent both Dutch interests and call for low- and middle-income countries to be treated as full members at the negotiating table. [398]

In the new agenda, the government seeks to establish new coalitions and partnerships with various actors. The European Union, the private sector and research institutions will major partners, and civil society will continue to be indispensable. However, the focus will be on strategic partnerships that are important to the government's policy priorities, and emphasize the non-governmental nature of civil society organizations.[399]

### 5.3.2 MVO Loont

In June 2013 Dutch Minister for Foreign Trade and Development Cooperation, Lilianne Ploumen, and Minister of Economic Affairs, Henk Kamp, sent a policy letter entitled *MVO Loont* (CSR Rewards) to the Dutch parliament. In this letter they argue that CSR is a business case, stating that corporate that conduct their business in a socially responsible way are more innovative, future-oriented, and are more competitive. The ministers describe the growing trend among Dutch companies to adopt socially responsible business practices. They further describe the roles the Dutch government can play:[400]

- Ensure that the frameworks for CSR as clear as possible and that companies are informed of these;
- Foster a level playing field for Dutch entrepreneurs;
- Address foreign governments about their responsibilities, for example, through economic diplomacy;
- Promote transparency and stakeholder dialogues;
- Set a positive example through, for example, sustainable government procurement.[401]

In light of increased globalization, and the activities of Dutch multinationals minsters Ploumen and Kamp emphasize the need for sector agreements on international corporate social responsibility (see section 5.3.3). [402]

### 5.3.3 Sector agreements on international corporate social responsibility (ICSR)

Sector agreements on international corporate social responsibility in the Netherlands have developed from the efforts of Dutch Minister for Foreign Trade and Development Cooperation, Lilianne Ploumen, and Minister of Economic Affairs, Henk Kamp, in the context of their policy letter *MVO Loont* (see section 5.3.2). Globalization has allowed Dutch manufacturing to shift from traditional centers in the Netherlands to countries where the costs are lower. This has the advantage for both manufacturers and consumers of reducing the costs of production. However, investments in developing countries expose Dutch companies to a number of risks, including transgressions with regard to social and environmental issues, either directly or indirectly through the supply chain. The Dutch government, representatives of employer and employee organizations, consumers, and civil society, all expect Dutch companies to respect human rights and the environment. Companies are encouraged to do so through the OECD Due Diligence Guidelines and the UN Guiding Principles on Business and Human Rights. These guidelines encourage to companies to identify, prevent and mitigate identified risks through their due diligence procedures.[403]

Although many companies are already making positive efforts with regard to ICSR and sustainable supply chains, globally negative environmental and social impacts of companies are still regularly reported. Many Dutch companies operate in sectors with high social and environmental risks. This does not necessarily imply that transgressions are taking place, however, it does have implications for the expected due diligence.[404]

Sector agreements on international corporate social responsibility offer companies the opportunity to work with the government and other parties at a sector level to address related complex issues in a structured manner, thereby increasing their leverage. This relates to agreements made between numerous parties that oblige them to meet certain tangible results based on international norms. The sector agreements have two goals:

- Take substantial steps to improving the situation for those afflicted by specific risks with 3-5 years.
- Offer a collective solution to problems that companies cannot solve fully on their own.[405]

To be most effective it is important that the sector initiatives originate as far as possible from the corporate sector. Where this is not possible, other parties will take the initiative. A collective engagement aimed at structural change through ICSR sector agreements allows for a shift in strategies from ‘naming and shaming’ to ‘knowing and showing’.[406]

Evaluations of other similar initiatives in line with the OECD Guidelines and the UN Guiding Principles have identified a number of key elements that should be included in ICSR sector agreements:

- Meaningful stakeholder dialogues.
- Parties agree beforehand what governance structure is desirable. Experience has shown that independent and equal representation of parties delivers better results for parties how may have been afflicted by negative impacts.
- Agreements are based on risks identified in the due diligence process. Where necessary this is will include a prioritization of action points.
- Analysis of the levels at which problems can best be solved (e.g. sector, subsector, national, EU or international).
- When designing solutions, the possibilities of combining them with sustainable growth and innovation are investigated.
- Sector agreements build on existing initiatives and identified strategies to address potential gaps in these existing initiatives.
- Work towards structure change, including agreements regarding the costs of improving, remedying and restoring dangerous situations.

- The UN Guiding principles require processes to enable the remediation of any adverse human rights impacts companies cause or to which they contribute.
- As far as possible, agreements are designed according to the SMART (specific, measurable, assignable, realistic, time-related) objective setting protocol.
- Transparency regarding progress through regular reports.
- Mutual trust and a constructive approach from the starting point. Agreements are made regarding monitoring and public statements during the process.
- Agreements are made regarding how to deal with possible differences regarding progress and/or results.[407]

The Dutch government can contribute to effective ICSR sector agreements in a number of ways:

- Have a consistent policy with regard to other CSR, sustainable development, trade and development cooperation and sustainable procurement.
- Have dedicated process support to establish ICSR sector agreements.
- To be party to ICSR sector agreements. The role of the government is such situations could be to find solutions only possible through government, capacity building, facilitate access to remediation, to make existing initiatives 'OECD- and UNGP-proof' and scale up relevant agreements to the international level. [408]

### 5.3.4 Grondstoffennotitie

In line with the EU Raw Materials Initiative (see section 5.2.1), and given the importance to the economy and security of the Netherlands of raw materials supply, the Dutch government implemented the *Grondstoffennotitie* or raw materials policy in July 2011. The goal is to adjust and implement the Raw Materials Initiative at the national level. Both abiotic and biotic raw materials are taken into consideration, and the primary focus is supply to the Dutch economy. Long-term sustainability is explicitly emphasized. Sustainability is defined within the slogan 'people, planet, profit'. [409]

The *Grondstoffennotitie* has three pillars. These reflect the same pillars as the EU Raw Materials Initiative. The three pillars in the Dutch policy are:

- Secure and increase supply and make supply more sustainable;
- Reduce demand and make demand more sustainable;
- Improve the efficiency of the use of raw materials and make use more sustainable.[410]

The government believes that private sector will take the lead and the role of the government is to facilitate, stimulate, and coordinate.[411]

The Netherlands provides financial support to EITI, the Kimberley Process, the International Conference on the Great Lakes Region, and other certification and tracing initiatives. In cooperation with the German Federal Institute for Geosciences and Natural Resources, the DRC Ministry of Mining, and the private sector, the Dutch government has established a conflict-free tin supply chain in South Kivu in the DRC.[412]

The Netherlands' list of critical raw materials is based on that of the EU (see section 5.2.1) with three additional abiotic raw materials. These are tin, phosphate and gold.[413]

## 5.4 Knowledge providers and NGOs

This section provides a short description of a number of knowledge providers and NGOs working on gold supply chain sustainability. The list is not exhaustive, but includes a number of important organizations, in addition to the organizations mentioned in section 5.1.

- **Alliance for Responsible Mining**
  Alliance for Responsible Mining (ARM) was established in 2004. It works together with a worldwide network of experts and partners for the sustainable development of ASM. [414] As described in section 5.1.6 ARM developed the Fairmined Standard for gold. In addition to standard setting, ARM engages in strategic alliances with organizations that support miners, provides training and consultancy, advocates for the rights of ASM miners and for them to be included as legitimate players in the mining industry, as well as working with key market players in the gold supply to develop fair market access, and recognition of Fairmined certified ASM.[415]

- **Global Witness**
  Global Witness is an international civil society organization. For more than 20 years it has been campaigning for full transparency in the mining, logging, oil and gas sectors, in order to allow local populations who own those resources can benefit fairly from them. One core Global Witness campaign focuses on conflict minerals. The campaign has worked to break the link between minerals and conflict.[416]

- **Gomiam**
  GOMIAM is a knowledge network headquartered in the Netherlands dedicated to gold mining and small-scale social conflicts in the Amazon. These conflicts include border issues such as smuggling, and environmental problems. GOMIAM compare states, environments, local populations and miners.[417]

- **The Sustainable Trade Initiative (IDH)**
  IDH accelerates and up-scales sustainable trade by building impact oriented coalitions of front running multinationals, civil society organizations, governments and other stakeholders. Through convening public and private interests, strengths and knowledge, IDH programs help create shared value for all partners. IDH works on the basis of a public-private partnership model. Programs are implemented, after initiation scoping and development, when private sector partners at minimum match the funding provided by IDH. IDH has 17 programs covering a broad range of sectors. It currently does not have a gold program. However, it has an electronic program focused on China, and a tin program focused on Indonesia. Both programs are supported by international private sector partners including Philips, Dell, Apple, Hewlett Packard and Microsoft.

- **Knowledge Platform Sustainable Resource Management**
  The Knowledge Platform Sustainable Resource Management promotes an open and broad mind toward sustainable resource management. The platform works with knowledge partners including universities and think tanks, businesses and governments. The platform gathers knowledge input from its members, and discusses and analyses these. The platform further follows the latest developments in the European parliament, searches for the latest developments and news in the resource market, and gathers information to share it with its members.[418]

- **MVO Nederland**
  MVO Nederland was established by the Dutch Ministry of Economic Affairs in 2004. It works to connect and strengthen companies and sectors in developing in the field of corporate social responsibility. MVO Nederland has developed a large network of foundations associations, companies, NGOs, research institutions, and public authorities. As an independent platform MVO Nederland helps members to work together to translate CSR into market opportunities in the sector, region, and supply chain.[419]

- **Partnership Africa Canada**
  Partnership Africa Canada (PAC) is a registered non-profit organization. It carries out investigative research, advocacy and policy dialogue on issues relating to conflict, natural resource governance and human rights in Africa. PAC is internationally recognized for its efforts to halt the trade in conflict diamonds, being nominated in 2003 together with Global Witness for the Nobel Peace Prize for their work exposing links between conflict and diamonds in several African countries.

  PAC works on a number of global initiatives aimed at regulating the trade of high value and conflict prone resources. It is currently helping the International Conference on the Great Lakes Region (ICGLR) in its efforts to create a tracking and certification scheme for 3TG.[420]

- **Raw Materials Supply Platform**
  The Raw Materials Supply Platform is a think tank. Its purpose is to raise awareness among stakeholders in the Netherlands in terms of causes, effects, and possible solutions to raw mineral scarcity. The platforms further helps to set up (policy) instruments which facilitate social change and technological innovation, allowing Dutch policies and initiatives to align with an international context.[421]

- **Solidaridad**
  Solidaridad is an international civil society organization. It has more than 45 years of global experience in facilitating the development of socially responsible, ecologically sound, and profitable supply chains. Solidaridad focuses on 12 supply chains and operates through 10 regional offices on 5 continents.[422] One of these supply chains is the gold supply chain. Solidaridad works on increasing consumer awareness of the option to purchase “Good Gold”, as well as assisting gold mines in Ghana to become certified. The program is the largest in the world with over 5,000 miners and approximately 35,000 mining community members already benefiting Solidaridad’s work. Currently, Solidaridad is working with 26 mining communities in eight countries.[423]

- **WWF-Estelle Levin: Artisanal Small Scale Mining in and around Protected Areas and Critical Ecosystems**
  ASM-PACE is a partnership program between Estelle Levin Limited and the World Wide Fund for Nature. It was established to address the environmental impacts of artisanal and small scale mining (ASM) in some of the world's most important ecosystems. The program has been active since 2010. It is focused exclusively on addressing the impacts of Artisanal and Small-scale Mining (ASM) occurring in protected areas and critical ecosystems ("PACE").The program aims to find workable, sustainable, win-win solutions that balance environmental concerns with the economic development potential of ASM. The program involves all stakeholders, including miners and their communities, governments, conservationists, corporations, and others.[424]

# Chapter 6 Strategic framework and policy options

## 6.1 Strategic framework

### 6.1.1 Introduction

This section aims to map out the strategic framework on which a future initiative by the Dutch Ministry of Foreign Affairs should be based. Based on the outcomes of this framework mapping exercise, section 6.2 will describe a number of suggestions for intervention initiatives which seem promising in achieving the envisaged objectives.
In this section consideration is given to the long-term goals of a change initiative (section 6.1.2), the steps needed in achieving these objectives, and challenges and restrictions coming into play based on market conditions and specific areas of expertise (section 6.1.3). Feedback from various stakeholders in the sector has provided valuable input and insights, which are integrated into the text.

### 6.1.2 Long-term goals

Applying the key objectives of the *Raw Materials Policy Note* of the Dutch government to the gold chain, a change initiative in this sector should aim to secure a sustained supply of gold as well as reduce demand and, where possible, promote sustainable use of gold, as well as a more efficient and sustainable use of the precious metal. Proposals for a relevant change initiative in the gold chain should aim to utilize the power of cooperation, considering private enterprises and international partners as collaborators.

Since there are three types of trading chains in the global gold sector in the form of large scale industrial and small scale artisanal mining as well as recovery of gold through recycling, proposals should include approaches for these different supply chains, considering and building on existing standards for sustainability in the gold chain and exploring alternative approaches to most effectively help achieve sustainability.

### 6.1.3 Framework for achieving long-term outcomes

In achieving the long-term goals of the Dutch engagement with the global gold chain, it is important to consider the most promising intervention points based on the country's role in the global supply chain:

- As gold **buyers**, various companies in the Netherlands are involved. While detailed figures per market sector are missing, it can be assumed that also in the Netherlands the largest part of gold consumption is going into jewellery and investments, and smaller amounts are consumed in different industrial applications. In the latter market most of the physical consumption of companies headquartered in the Netherlands will not be covered by domestic statistics though, as it takes place in key production countries for electronic products, namely in Asia, and is part of complex supply chains with many different globally operating suppliers. However, the increasing requirements for traceability and supply chain monitoring especially in the case of conflict minerals means those companies have an increasingly better idea about where the gold used in their supply chain is refined, even though full traceability back to the actual country of origin remains problematic.

- Besides mining of new gold, **recycling** contributes significantly to the global gold supply, which can be a sustainable option due to the minimal loss of quality during recovery in the case of gold. Various Dutch companies operate in the electronics recycling sector and recover precious metals from old products, including gold. These domestic operations are not connected to serious sustainability issues.

This is of more concern for recycling operations in developing countries, namely in West Africa. These have made headlines in recent years as recipients of illegally exported electronic waste from industrialized nations being dismantled under degrading conditions, with massive negative impacts on health and environment in these countries. Controlling such exports and ensuring that end-of-life consumer products are not leading to pollution in countries with little oversight and regulation also has to be seen as a responsibility of the Netherlands.

- As an **investor** in the gold mining sector, the Netherlands is also playing a role. Dutch financial institutions are investing in a range of companies active in the global gold production sector, giving them a responsibility for influencing the social and environmental conduct of mining companies. At the same time, many of the global players in the gold production sector are using the favourable jurisdiction in the Netherlands by setting up tax avoidance structures in the form of shell companies.

Overall, the role of the Netherlands in the global gold chain is comparatively small. However, this could actually provide an important advantage. As put by Andor Lips, Director Natural Resources of ING Bank, the Dutch government can play a role in "*[…] offering technical and legal assistance to host countries, on water management, health, taxation, to build governance capacity* […]", for which the country is well placed as it "*[…] has no strong vested interests in the mining sector, is not a former colonial power of many mining countries and has a lot of expertise on some relevant topics*."[425]
In aiming to foster sustainability in the gold sector, the Netherlands can profit from its track record of promoting sustainability in other commodity chains, for example for tin, its specific technical areas of expertise and its ability to bring together relevant actors in a neutral setting to facilitate dialogue and action.

In developing an approach for a Dutch engagement in the gold sector, careful consideration should be given to the most meaningful and effective entry points. Though varying in breadth and effectivity of their activities, there are already a large number of existing initiatives in the global gold sector aiming, to make the different steps of the gold supply chain more responsible. As was confirmed by most stakeholders during interviews, it would not be meaningful to add yet another standard. It seems more useful and resource efficient to engage in helping to integrate and expand existing sustainability schemes, exchanging lessons learned and best practices and facilitating improvements in relevant governance schemes, legislation and environmental management efforts.

Long-term relationships of the Netherlands with producing nations and possibilities to cooperate with existing initiatives should be used in order to amplify the impact of a Dutch engagement in the gold chain and to achieve effective and lasting change. Even if initially only related to a relatively small share of the global gold consumption, developing a strong pilot project which can help to make the gold consumption of the Dutch industry more responsible can subsequently serve as a role model for more extensive change in the broader gold sector or other raw material supply chains.

Based on the preconditions under which a Dutch engagement would take place, considering the priorities of the Dutch government and possibilities to involve the private sector, in the following section a number of interventions are explored in more detail which could effectively contribute to create a more sustainable gold supply chain.

## 6.2 Policy options

The findings of the literature study and stakeholder inputs from interviewees have led to the suggestion of six concrete policy options through which the Dutch Ministry of Foreign Affairs could make a significant contribution to promote sustainability issues in the gold chain. These proposals should be further discussed, developed and evaluated during the upcoming roundtable with key stakeholders.

### 6.2.1 Colombia: formalization and governance of gold mining

Proper governance of the gold mining sector, both ASM and LSM, is first precondition to avoid gold mining to contribute to conflicts as well as other strong negative impacts on society and the environment. This hold true especially for ASM operations, which are characterised by a wide range of environmental, health and socio-economic issues. Artisanal miners often only earn a subsistence income and in many cases are only a small step removed from slave labour. Many are migrants from neighbouring countries or other areas, not original inhabitants of the mining area. They are forced to sell their gold for very low prices to local middlemen, while the real profits are made by a small number of people, often powerful players in business or politics, far away from the dirt and the mud.

Respondents note that the ASM sub-sector should be formalised as much as possible, to pull it closer towards the larger mining sector, and to make full use of the potential for socio-economic development of local communities. Claude Kabemba (Southern Africa Resource Watch) states that "*the biggest challenge is to organize artisanal mining. Right now it is so haphazardly done that the risks are amplified. Where artisanal gold mining is legalized, it can have good economic impacts. The problem is how do you make sure that these people draw maximum benefit? How do you make regulations that help them to be protected? Help them to ensure that their livelihood is well supported by the work they do?*"[426]
Laura Gerritsen (Fairphone) adds that "*formalization would help to improve the situation in the ASM sector and for local communities, ensure that they: are not pushed into illegality; participate in the value chain; can profit from capacity building; have a formal outlet to sell their gold.*"[427]

From the authorities' point of view, it would make governance easier, and from the operators' point of view, it should allow for better access to funding, better recoveries, and better economics if the artisanal mining sector was pulled towards the larger mining sector. It has been suggested that the linkages to supporting businesses (suppliers of equipment like pumps and generators, transport, food, etc.) are very important, and that governments should focus on those economic benefits (including taxation of these) rather than trying to tax ASM itself as much as is done with LSM. Moreover, Lips (ING Bank) argues, "*ASM are often dependent on local middlemen, which leaves them with only limited benefits. ASM gold mining can contribute to regional development, but legislation needs to play a role to achieve this.*"[428]

To take up this challenge, the Dutch Ministry could collaborate with one country to set up a pilot to explore options to make this formalisation and mineral governance happen. As the Netherlands is a world leader both in environmental governance and in taxation consultancy, the Ministry could take the initiative to involve Dutch expertise in a governance assistance for host country governments with which the Netherlands has good relationships. Better governance by the government will result in improved environmental management, reduced socio-economic problems, etc., so there is a wide potential positive impact. The pilot could become a showcase which sets an example for other countries and the broader gold supply chain.

This pilot could focus on Colombia, a country which is interested to tackle sustainability issues linked to mining in the broader sense. At the same time the Netherlands have built a close relationship with the country in recent years, with Colombia being the most important recipient of Dutch investments in Latin America after Brazil and Mexico. Within the EU, the Netherlands are the second foreign investor in the country after Spain.[429] Existing contacts would be beneficial in implementing such an initiative and achieving tangible results within a manageable timeframe. In addition, the Dutch contribution to the Strategic Community Investment fund administered by the International Finance Corporation (IFC), could maybe be used for this purpose.

Focussing on Colombia would also be politically important, as the Dutch government showed concern about the social and environmental conditions in Colombian coal mines in the mining region Cesar in the recent past. During a visit in November 2014, the Dutch Minister for Trade and Development Cooperation announced that the efforts to improve conditions in the mining sector in cooperation with the Colombian authorities would be formalized through a Memorandum of Understanding (MoU). This agreement was signed on May 6th of 2015 and focuses on international corporate social responsibility and technical cooperation, with a clear focus on private sector involvement.

While Colombia is among the smaller gold producers when looking at the global gold sector, this should not pose a problem considering that the Netherlands is only a small consumer. The possibility of building on existing initiatives, contacts and knowledge gathered from the coal mining sector, and the advantage of a relatively stable, democratic system, could make the Colombian gold sector an interesting pilot for involvement of the Dutch government as well as Dutch private sector players. Additionally, there is political will in Colombia to improve issues linked with mining in a good way.[430] Furthermore, Colombia is considered as a trade partner country in the new aid and trade policy of the Netherlands. Therefore, fostering sustainable trade in gold fits its policy framework.

Collaboration could be sought in this respect with the Better Gold Initiative set up by the Swiss government, as this initiative sees 'formalization' as a key issue to tackle, especially on a cross-country/regional level. The Swiss Better Gold Initiative was piloted in Peru. It is now seeking to expand into other countries. Colombia is among the countries that are being considered. Ton Boon von Ochsseé and Peter Veenhoven noted the potential for collaboration with the Better Gold Initiative, stating that "*collaboration with Switzerland, which has set up the Better Gold Initiative, could be a very good choice.*"[431] Industry expert Charles Chaussepied (personal capacity) encouraged these researchers to "*look at the Swiss Better Gold Initiative which is efficient*".[432]

For Dutch trade organizations of companies operating in the gold supply chain, especially jewellers and electronics producers, this could be an interesting pilot to participate in through contributing advice, commitments and possibly financial assistance. It could be a pilot in which the Dutch industry is working to ensure that (the volume of) its gold supplies are produced in a responsible way. Given the lack of transparency in the global gold supply chain and the continuous mixture of gold from different sources, the Colombia pilot seems a viable route to go. Expansion to other countries could follow at a later stage. But the options to set up a separate, sustainable supply chain between Colombia and the Netherlands could be researched further.

### 6.2.2 Conflict Free Gold Initiative in the Great Lakes Region

As described in the report, the European Commission has proposed a draft regulation to set up an EU-system of self-certification for importers of tin, tantalum, tungsten and gold (3TG). The self-certification process would require EU importers of these minerals to carry out appropriate due diligence to ensure that their purchases and sales are in line with the five steps of the OECD Due Diligence Guidance. Central to this regulation is that companies can ensure that minerals are responsibly sourced and do not contribute to violence and conflict. In many ways the draft regulation is similar to the U.S. Dodd-Frank Act.
As noted in the report, two key issues still persist with the implementation of the Dodd-Frank Act. Firstly, approximately 80% of companies analysed by Global Witness and Amnesty International failed to meet the relevant minimum requirements. Secondly, and possibly more urgently, as emphasized by Charles Chaussepied (personal opinion) the "*U.S. Dodd-Frank Act gold supplement is a catastrophe! As it developed the smuggling in Central Africa [sic]*."[433]

Gold is particularly susceptible to smuggling as it is a high-value, low-volume commodity, and easily mixed with gold from formal channels at various points in the supply chain. This makes it difficult for companies to source sustainably even though they might have a strong motivation to do so, as noted by Laura Gerritsen (Fairphone). Additionally, it impedes companies' efforts to fulfil their obligations under the U.S. Dodd-Frank Act and the EU draft regulation for self-certification for 3TG importers.

As such, traceability is a key issue that needs to be addressed for two reasons, as identified by the report and the informants. Firstly, traceability is a key issue for Dutch and European companies to meet their obligations under the draft regulation for self-certification for 3TG importers. Secondly, traceability is an issue that needs to be addressed in order to prevent gold financing violence and conflict. Traceability as the central element in achieving conflict-free gold, however, is part of a complex picture that includes corruption, vested-interests, and lack of (government) capacity, among other things.

There are already numerous initiatives aiming to achieve conflict-free gold, as described in the report. These include, but are not limited to:

- London Bullion Market Association (LBMA) Responsible Gold Guidance
- World Gold Council Conflict-Free Gold standard
- Responsible Jewellery Council Chain-of-Custody Certification Program
- Conflict-Free Sourcing Initiative (CFSI) Conflict-Free Smelter Program (CFSP)
- Public-Private Alliance for Responsible Minerals Trade (PPA)
- USAID Responsible Minerals Trade Program
- German Federal Institute for Geosciences and Natural Resources (BGR) Certified Trading Chains (CTC)
- International Conference on the Great Lakes Region (ICGLR) Regional Certification Mechanism (RCM).

The first four initiatives are industry-led, PPA is a multi-sector multi-stakeholder initiative to support supply chain solutions to conflict minerals challenges in the Great Lakes Region (see section 5.1.3), while the latter three target mining and trading on the ground. The ICGLR Regional Certification Mechanism standards are compliant with the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas. It further enables the industry to meet its requirements under the Dodd-Frank legislation, and by implication would allow Dutch and European importers to meet their obligations under the draft regulation for the self-certification of 3TG imports. [434]

The RCM had been adopted by the 11 heads of state of the ICGLR at an extraordinary Special Summit. This meets one key requirement of initiatives if they are to succeed, as identified by Hentschel (Better Gold Initiative) stating that "*policy issues should best be approached via governments, regional authorities […] through the creation of solid framework conditions.*"[435] This indicates an essential element for the chances of the initiative to succeed, namely regional government support.

The first four Third Party Auditors were accredited in August 2014, preparing the way to rolling out the certification scheme.[436] The standards and procedures are harmonized with the Certified Trading Chains scheme (German Federal Institute for Geosciences and Natural Resources, BGR), the DRC Certification Manual and have accommodated traceability schemes such as ITRI's Tin Supply Chain Initiative (iTSCi). The key element of the ICGLR scheme is the verification and monitoring process. This consists of both third-party audits and an overarching Mineral Chain Auditor. Minerals are tracked from the mine site to export. Together, these provide independent oversight of the system.[437] The Regional Certification Mechanism will ensure that neither mine site nor channels of trade within the country as well the region are in predatory control of armed groups or criminal networks.[438]

The German Federal Institute for Geosciences and Natural Resources (BGR) has developed technology called the Analytical Fingerprint (AFP) technology. This technology is able to identify the mine where a mineral is being extracted from with an accuracy of 100 meters. AFP is currently only available for tantalum.[439] While this technology cannot be applied to gold for technical reasons, the BGR is exploring alternative approaches such as plausibility evaluations to identify the mine of origin for gold supplies.

In 2013, the Dutch Ministry of Foreign Affairs laid out its new agenda for aid, trade and investment. The government identified three types of bilateral relationships in the fields of aid and trade, namely, aid relationships, transitional relationships and trade relationships. The Dutch government stated that it would take a regional approach to the Great Lakes Region in its aid program.[440]
The Netherlands provides financial support to EITI, the Kimberley Process, the International Conference on the Great Lakes Region, and other certification and tracing initiatives. In cooperation with the German Federal Institute for Geosciences and Natural Resources (BGR), the DRC Ministry of Mining, and the private sector (including Philips), the Dutch government has established a conflict-free tin supply chain in South Kivu in the DRC.[441]

Further support for the ICGLR Regional Certification Mechanism and further cooperation with BGR in their Certified Trading Chains (CTC) scheme (see section 5.1.4), would thus be building on existing relations and expanding them to include gold. It would allow the Dutch private sector to ensure that its gold is sourced, meeting the pillar 1 objectives of the Netherlands' *Grondstoffennotitie* and the *EU Raw Minerals Initiative* and future requirements of the proposed regulation for EU system of self-certification for 3TG importers.
To strengthen cooperation with the Dutch and European private sector to fund initiatives aimed at the responsible sourcing of gold, the Dutch government could work together with other EU governments to set up a public-private partnership which follows the example of the Public-Private Alliance for Responsible Minerals Trade in the United States (see section 5.1.3).

Philips is already active on this front, and could thus be an important partner in such a public-private partnership. It encourages the development on an EU initiative that encourages companies to use their leverage.[442] Philips is a member of the Electronic Industry Citizenship Coalition and the Conflict Free Sourcing Initiative, for example, which developed the Conflict Free Smelter Program. Philips states "*Our commitment to sustainable development compels us to address these concerns, even though Philips does not directly source minerals from mines or smelters as these companies are typically several tiers removed from our direct suppliers. In addition, we recognize that we may also be able to play a role in addressing other minerals related conflicts, provided we can address these in a multi-stakeholder setting facilitated by an international governmental body."*[443]

### 6.2.3 Ghana: gold mining as engine for development

The production of gold is associated with conflicts, bad labour conditions, health issues and environmental destruction. Addressing these negative impacts is important, but very difficult. Formalization of the ASM gold mining sector (as proposed in section 6.2.1) and improving certification and traceability (as proposed in section 6.2.2) are necessary steps to reduce the negative impacts which gold mining can have on local communities and the wider society.

However, it is even more challenging to try to create a positive impact through gold mining. Both for large scale and artisanal gold mining areas, one of the biggest challenges is to turn the gold mining operations into an 'engine for development', bringing real and lasting socio-economic benefits for the local communities in the area and for the wider society.

Large-scale mines, especially the highly mechanised open-pit operations in developing countries, tend to create enclaves with imported equipment and labour. The risk is that after the mineral resources are exhausted, there will be only few tangible benefits for the local communities.
Respondents have noted that mining should not be seen in isolation, merely creating employment and paying taxes for the duration of the mining operation, but that the activity should form part of a larger economic development process. In this context 'good mineral governance' is an important topic that needs more attention. As Thomas Hentschel from the Better Gold Initiative pointed out, "*revenues are generated, but what is being done with them? Mining income should also lead to useful investments for the local population or region*".[444]

A mining operation should be used as an 'engine for development', facilitating training of local people and the development of local industries. Not only to serve the mine itself, but also to help create industries and diversified supply chains that should extend beyond the geographical area of the mine and beyond its lifetime. Consultant Estelle Levin argues that "*Mines are almost never totally integrated ´engines for real development', delivering shared value. They are not thought of as social enterprises, but they should be!"* The reason is seen to be the gap between mining company (including ASM) and government perceptions and skills, especially related to business opportunities, business acumen, making public-private partnerships work, etc. Mines should not just generate short-term profits (for shareholders), income (for current employees) and taxes (for central governments), but should create local legacies of expanded economy – the basis for creating resilient societies.[445]
An important precondition to take initiatives to develop the gold mining sector, both ASM and LSM, into an "engine for development" is that gold mining is not closely related to financing conflicts, as it still is in Colombia (section 6.2.1) and the Great Lakes Region (section 6.2.2). A pilot project which focuses on turning the gold mining sector in an "engine for development", which could serve as an example for other countries, is therefore suggested to focus on Ghana.

Ghana is a country with a long history of gold mining, the industry is quite developed. To a large extent this industry still relies on technical people (e.g. welders, diesel mechanics, drilling machine operators) from abroad, as such skilled workers are lacking in Ghana. An important contribution to turning gold mining in an engine for development could therefore come by raising the levels of technical training, as well as the technical and commercial skills of the potential suppliers of mining companies.

The Dutch government has good relationships with Ghana and the Dutch Sustainable Trade Initiative (IDH) - set up by the Dutch government to make international commodity supply chains more sustainable - is active in the country. In the new *Initiative for Sustainable Landscapes* of IDH, Ivory Coast and Ghana together are selected as one of the cases. In this programme an integrated approach for sustainable landscape development, involving all economic activities in the area, is strived for. In this case these are cocoa farming, forest management and ASM mining. Such a landscape approach is clearly related to the "engine for development" concept, as the central question is how mining can be imbedded in, and contribute to, sustainable development of the entire region. By combining the IDH programme with the work done by Solidaridad, which has been active in Ghana for a long time already, and others, this approach can be further developed.

For Dutch trade organizations of companies operating in the gold supply chain, especially jewellers and electronics producers, this could be an interesting pilot to participate in through contributing advice, commitments and possibly financial assistance. Considering the comparatively small volume of gold consumed in the Netherlands, the industry stakeholders could achieve an important step in making their supply chain more sustainable and being able to communicate this to their customers by participating in an "engine for development" approach for the gold mining sector in Ghana. MVO Nederland (see section 5.4) could play a facilitating role as independent platform that aims to foster CSR in the private sector in the Netherlands.

The Dutch financial sector could possibly be involved as well, as Solidaridad has flagged the need to set an investment fund for SME companies in the gold mining sector. The fund could invest equity or loans in SME companies, to enable investments in more sustainable operations.

### 6.2.4 Water management assistance in mining legacy areas

Many respondents have referred to water-related issues as being very significant for the gold mining sector, both in large-scale and in artisanal and small-scale mining. The main topics mentioned are on the one hand acid rock drainage (ARD) and other types of water pollution impacting on ground and surface water quality, and on the other hand depletion of water resources in dry countries or in watershed and water collection areas. ARD contamination is most visible in the large-scale mining sector, where exposure of sulphidic ores is more common than with small-scale mines. Mercury contamination is linked to artisanal and small-scale gold mining. In addition, conflicts can arise from LSM and ASM competing over water resources.

Current mining operations face challenges with water management in areas of very high (or very low) rainfall, but the issue is most critical in old mining areas where the original companies are no longer present (or ceased to exist). Such 'legacy' issues become the responsibility of the host country governments who often lack the resources to effectively tackle them. Relevant examples include large amounts of water with dissolved arsenic being pumped from old underground mines in Ghana; and severe and increasing problems with ARD around Johannesburg (South Africa). As Prof. May Hermanus from CSIR (South Africa) explains, "*Acid Rock Drainage (ARD) or Acid Mine Drainage (AMD) are causing great and expensive problems in South Africa today, with extremely expensive remediation required*."[446] Dr. Håkan Tarras-Wahlberg, from Swedish Geological AB, sees ARD and contamination from chemicals like arsenic as "*[…] the most important issue to address*" when looking at sustainability issues in the gold mining sector.[447]

International public goods are an important element in the new Dutch agenda for aid, trade and investment. Among the areas where the government believes the Netherlands can make a significant contribution is also water.[448] In line with this, respondents have suggested that the Dutch government could provide or facilitate technical assistance to host governments. At the same time Dutch engineering and environmental firms with strong expertise in water management could contribute to such an effort. The technical assistance could focus on the remediation of old mining areas, but could also look at setting up better water and waste management systems and processes for ongoing mining operations - large-scale as well as small-scale.

Effective water and waste management are directly related to issues of weak governance in many leading mining countries. As stated by Dirk de Kramer from Witteveen+Bos, "*in large-scale operations, emissions of pollutants into waterbodies are due to substandard environmental practices, but in ASM operations (like in Suriname and Guyana), the situation is worse, with no environmental consideration at all, "everything ripped open", no closure planning. Social and health problems are a direct result of the environmental problems, all of which are due to a lack of sufficient governance*."[449] However, as De Kramer continues, "*legacy issues (polluted water, tailings dumps, etc.) offer possibilities and opportunities for good business as well as environmental clean-up. […] Even if a business case has a financial net-zero result, this would still be net-positive for society*."[450]

In conclusion, engagement in the water management sector can be an important contribution of the Netherlands to limit the environmental and social impacts of gold mining, both in existing as well as abandoned mining areas. Such an initiative requires the involvement of Dutch industry experts, building on the strong expertise in the (water management) sector. At the same time this should ideally not stand alone, but go along with a programme for governance support, helping to implement effective guidelines and management systems to prevent future water contamination from mining, aiming to better protect precious water sources as well as inhibiting the need for extremely expensive remediation measures.

Netherlands Water Partnership (NWP) is already looking to mining areas in Colombia. The UNESCO Institute for Water Education (UNESCO-IHE) based in Delft (Netherlands) could be also be a potential cooperation partner. It is focussing on providing training to water professionals predominantly from developing and transition countries and covering relevant issues in its research activities. Besides expert knowledge, it may be able to help establish contact with water professionals on the ground.[451]

Several Dutch *Waterschappen* (water management boards) have already signed a Memorandum of Understanding with South African water authorities on a ministerial level, aiming to set up 'Catchment Management Agencies' (CMAs) for a number of water catchment areas in South Africa, among them areas impacted by gold mining. As Paula Dobbelaar from Waterschap Aa en Maas points out, "*The cooperation with the South African authorities is on an equal basis with both parties learning from each other*."[452]

With reference to South Africa, Dobbelaar underlines that "*Proposed policy and action options for the Ministry of Foreign Affairs, should include:*

- *Utilising the existing cooperation between the Dutch Waterschappen and the South African CMA's, to facilitate capacity building and water monitoring and management systems. It is possible that existing funding (from the Waterschapsbank) may be tapped for such work.*
- *Facilitate cooperation between Dutch engineering and consulting firms (DHV Haskoning and Witteveen+Bos, for instance), and South African authorities like the CMA's, the CSIR, etc., to investigate opportunities to extrapolate current water treatment activities into old mining areas where there is no longer a large-scale mining operator, but where mining waste and AMD is a problem."*[453]

Apart from South Africa, such initiatives could also be relevant in several countries with significant gold mining operations which are also among the partners in the Dutch international development cooperation, namely Ghana, Indonesia and Colombia. While Ghana and Indonesia are part of the transitional relationships combining aid and trade, the relation with Colombia has changed to a trade relationship focussing on trade and investment.[454] An involvement of specialised Dutch companies could contribute to the goal of activities also generating economic growth in the Netherlands. Colombia and Indonesia are also among the focus countries of the *Waterschappen* for further cooperation projects.[455] Upcoming gold mining countries in the Sahel region, such as Burkina Faso, could also be interesting options as the distribution of scarce water resources is one of the main challenges there.

### 6.2.5 Gold recycling in the Netherlands and abroad

Gold can be recycled with very small losses, for instance from electronics. This option fits the objective of promoting the sustainable use and reuse of resources which is part Pillars 1 and 3 of the *Raw Materials Initiative* and the Dutch *Grondstoffennotitie*. According to Filip Delalieux, General Manager at Schöne Edelmetaal and representative of the Association of the Dutch Metallurgical Industry (VNMI), "*the stimulation of the circular economy deserves all the political attention that it can get, not only limited to the gold supply chain.*"[456] Saskia van den Dool-Gietman from PGGM Investments states that "*as part of its policy focus on stimulating the circular economy, the Dutch government could also step up efforts to promote gold recycling*." According to van den Dool-Gietman, "*recycling is mining of the future, also for gold*."[457]

E-waste is now the fastest growing waste stream in the world due to the rapidly increasing number of electronics products being sold, and these becoming obsolete at an accelerating rate. In the Netherlands alone, each inhabitant produces 23.4 kg of e-waste per year, leading to an annual e-waste volume of 394,000 tonnes for the country.[458] 'Urban mining' from the ever growing global amount of end-of-life computers, phones and other electronic products could be a treasure trove for recovering gold and other precious metals. To mine one gram of gold, a mining company may have to move a tonne of ore. The same amount can be recovered with much less effort from 41 mobile phones.[459]
Even though recycling processes have not yet reached their full potential, extraction of gold and other elements from e-waste is being done in industrialized nations like the Netherlands without major sustainability issues.

Despite the dumping of hazardous waste in developing nations having been banned for years under the Basel Convention and EU Directives, large volumes of e-scrap are still making their way from Europe and North America to Asia and Africa. At the same time local production of e-waste in developing and emerging nations can also be expected to continuously grow in the future – be it from growing numbers of newly purchased consumer electronics or imports of second-hand products quickly reaching their end-of-life. In these countries recycling is mostly taking place in the informal sector, under desperate working conditions often involving child labour and with massive impacts on health and the environment.

Many of the interview partners stressed the importance of recycling and the urgent need to tackle the social and environmental issues connected to it in Asian and African nations. As Dr. Håkan Tarras-Wahlberg from Swedish Geological AB stated, "*recycling is naturally important and this should be increased as much as possible. It is likely that the biggest loss of gold is in the recycling of electronic scrap, since a lot of scrap is exported (illegally) from Europe and imperfectly recycled in developing countries before it makes its way into Europe or China. This is probably the most important recycling issue to tackle*."[460]

The Basel Convention and EU regulations clearly prohibit the export of non-functioning products; their recycling should be dealt with in the consuming countries. However, in recent years also a reverse trend in e-waste exports can be observed, with developing and emerging countries shipping more e-waste by weight to developed countries than the other way around. This is partly caused by a lack of recycling capacity while volume of waste is increasingly also driven by growing domestic consumption. At the same time there is a lack of advanced technologies in developing countries to also recycle the most precious electronic components like printed circuit boards in order to efficiently and sustainably recover gold, silver and other highly-valuable materials. These constitute the most hazardous and potentially polluting steps in the recycling process.[461]

In countries like Ghana or Uganda, which are among the transitional relationships of the Dutch development cooperation, the potential in the form of sufficient material is thus given, but technical provisions and qualifications are poor, and environmental legislation is weak or not efficiently enforced. As Dirk de Kramer from Witteveen+Bos points out with reference to the poorly managed e-waste dumps in Ghana, "*our efforts should go more towards recovering gold from e.g. e-waste than exploiting the final 'high investment' / 'hard to get' gold deposits*."[462]

The bilateral relationships with these countries envisage a combination of aid and trade for mutual benefit. As part of its international development cooperation, a Dutch initiative could provide support to the implementation and enforcement of e-waste policies. The countries are at different stages of drafting and implementing policies as well as setting up pilot initiatives for e-waste collection and management. At the same time, dumping of e-waste from industrialized nations is a persisting problem whose consequences need to be dealt with on the ground despite being illegal.
Engagement possibilities would have to be researched in more detail depending on the individual country status.[463] It would certainly be important to cooperate with existing initiatives like the ones initiated in Uganda, aiming to achieve faster success from joint efforts.[464] Existing engagement of Dutch players in Ghana include Fairphone's cooperation with the *Closing the Loop* foundation to facilitate e-waste recycling in countries lacking efficient recycling programs. The objective is to set up collection programs and awareness-raising projects in cooperation with local partners, ultimately aiming to re-use some of the recycled materials for future production.[465]
An organisation more broadly engaged in the e-waste discussion and a potentially interesting partner is the 'StEP Initiative' initiated by the United Nations University. It aims to research the facts and finding solutions, publishes reports, oversees training programmes and workshops and provides advice to governments. Dutch members are Delft University of Technology, Philips Consumer Lifestyle Sustainability Center and Sims Recycling Solutions.[466]

The Dutch Ministry of Foreign Affiairs, possibly in cooperation with the Ministry of Infrastructure and Environment with its *Van Afval Naar Grondstof (VANG)* programme and the Global Green Deals, could support the introduction of sustainable e-waste management systems and the implementation of high environmental and social standards in recycling. This requires the connection of the informal and formal sectors. A key challenge to overcome is how to incentivise also the responsible recycling of the less valuable, yet also hazardous materials.[467] Lessons learned may be available from the 'E-waste African Alliance' active in Kenya, which sees potential in e-waste management to hold "*opportunities in skills transfer and revenue generation that can be turned into drivers for incorporating Africa's informal recycling networks into economically, ethically and environmentally sustainable systems*."[468] Philips is one of the alliance partners.

Technically advanced recycling companies which could invest in this are likely concerned about competing with a black market. Through the provision of assistance in enforcing legislation to reduce the environmental and social impact of recycling activities and creating a level playing field, the Dutch government could help alleviate such concerns. It could consider providing loans or grants to investors to cover start-up costs supporting the creation of jobs under sound working conditions. Dutch companies are active and experienced in this market and could be interested to participate in such a programme.

This option would fit well into Dutch and EU policy initiatives, helping to secure a sustained supply of gold and to promote a more efficient and sustainable use of the precious metal. On the Dutch market, jewellers as well as electronics companies like Fairphone and Philips may be interested to cooperate in the effort. For gold consuming companies it offers the possibility to tap into a socially and environmentally sustainable and traceable source of recovered gold.

### 6.2.6 Financing, tax and the gold sector

The Dutch financial sector is related in two ways to the gold mining sector. On the one hand, one Dutch bank and many Dutch pension funds act as financiers of many of the biggest gold mining companies in the world. On the other hand, various Dutch trust offices, accountants and tax advisers are involved in helping major gold mining companies to set up shell companies in the Netherlands.
As a consequence of this dual involvement, the Dutch financial sector could follow two tracks to use their influence to help turn gold mining operations in developing countries into engines for development (see also section 6.2.1 for this concept):

1. Dutch banks and pension funds investing in gold mining companies, could use their influence to help turn gold mining operations in developing countries into engines for development, by stimulating them to set up or invest in local businesses in the field of processing, transport, etc.

   At the moment the Ministry of Foreign Affairs is working towards an International CSR sector agreement for the Dutch financial sector, which will be guided by the Social-Economic Council (SER). Ton Boon von Ochsseé and Peter Veenhoven (Dutch Ministry of Foreign Affairs) suggest that "t*his agreement can offer banks and other financial institutions the advantage to improve their reputation and show leadership with regard to the other sector agreements. By the nature of their operations, financial institutions have links with all the different sectors. This does not mean that banks should be at the table when other sector agreements are discussed. Banks could for instance draft a standard clause on their contribution, which could be included in each sector agreement. In such cases the government can act as a clearinghouse, by giving support to cross-sectoral initiatives.*"[469]

Andor Lips (ING Bank) also recognizes the potential role financial institutions as "*banks of course also have a responsibility for stimulating responsible mining practices.*"[470] He emphasizes that ING Bank already has a good sustainability screening implemented for gold mining companies, but that it would help if the Dutch government "*could play a role in creating a level playing field for banks in the mining sector, by working together with other governments to stimulate all banks to set high standards for mining companies.*"[471]

Apart from ING Bank - the only Dutch bank providing loans to gold mining companies - various Dutch pension funds finance gold mining companies by investing in their shares and bonds. All these financial institutions can attach preconditions to their investments in this sector. This could mean that the financial institution requires, among other things, for the company to be a member of the International Council on Mining and Metals, signatory to the International Cyanide Management Code, implement the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, be part of or utilize the conflict-free smelter program, and/or require ICGLR regional certification.
Additionally, financial institutions can encourage gold mining companies to cooperate with artisanal gold miners in order to assist in drawing them into more formal channels. This would help to foster the socio-economic development of these actors in often impoverished communities. Such requirements are usually developed into sector policies. Sector policies are common for banks providing credit to sectors prone to environmental, social and governance risks, e.g. forestry, palm oil, weapons, oil & gas, and mining.

Financial institutions are motivated to develop such sector policies for a number of reasons. Firstly, it helps to single out companies during the due diligence process which pose significant ESG risks which might imply reputational risks for the financial institution or, more importantly, inhibit the ability of the company to repay the credit it has obtained. Secondly, can improve the business practices of its existing and potential clients. Companies which are more environmentally and socially sustainable are less likely to be fined for environmental damage or involved in costly legal disputes related to environmental and social issues. They are, therefore, in a better position to repay credit they receive.

While ING Bank has no specific sector policy for the gold mining sector specifically, it is collaborating with other banks in the Equator Principles. According to these Principles, all project-related financing, including the financing of gold mines, is checked against the IFC Performance Standards. These standards include most of the criteria mentioned above. Many banks have signed the Equator Principles, but not all of them apply the standards in the same rigorous manner.

None of the Dutch pension funds have developed a specific gold mining sector policy either, but several pension funds have included relevant criteria on human rights and environmental issues in their responsible investment policies. As pension funds invest in the shares of a company they are, in fact, co-owners of the company and they are in a position to engage with the company to encourage it to improve its business practices. Investors are motivated to do so in order to improve the financial performance of a company. Companies not implicated in legal disputes, for example, related to their environmental and social performance, will perform better financially.

This can result in important improvements. Saskia van den Dool-Gietman (PGGM) for example, states that "*in our engagement with mining companies we have given most attention to the relationships with communities, such as conflicts on land, conflicts on water and expectations on employment offered by the mine. The 'licence to operate' of a mining company is very dependent on how it deals with these relationships with communities. For investors this is therefore also a very important issue, because if mining projects do not get off the ground because they lack a "licence to operate" the financial health of the company can be impacted significantly.*"[472]

This research project found that Dutch institutional investors, in particular pension funds, had numerous investments in the top-10 global industrial-scale gold mining companies. More than a third had investments in more than half of the top-10 industrial-scale gold mining companies. This attests to the significant role that Dutch institutional investors can play in fostering better business practices in the gold sector. Individually the proportion of their ownership of any given company is usually not significant enough to push for change in corporate practices. However, as a voting bloc the institutional investors have much more leverage.

Dirk de Kramer (Witteveen+Bos) argues that "*banks and pension funds "are waking up", but not exerting enough influence yet.*"[473] Estelle Levin (ELL) adds that "*financial institutions, pension funds, banks can play a much larger role. Not just applying the IFC's Equator Principles, but also more engagement with mines and investors. This should include setting terms and conditions, providing better rates or better returns for operations with better risk management (e.g. membership in standard-setting organisations, e.g. RJC), and so on.*"[474]

Van den Dool-Gietman (PGGM) has noted the chances of success of encouraging the financial sector to promote more sustainable corporate business practices in the mining sector. She reports that "*pressure by banks and pension funds on mining companies has proved to be effective in some cases. The Indian company Vedanta Resources was forced by banks to deal with several of its conflicts with local communities. We are not there yet, but something has been set in motion. Similarly, pension funds were able to force Goldcorp to make a human rights impact assessment of its activities in Guatemala.*"[475]

But more is needed than trying to avoid or mitigate negative impacts. A mining operation should have a positive impact on the local economy, it should be used as an 'engine for development'. This is possible by facilitating training of local people and the development of local industries. Not only to serve the mine itself, but also to help create industries and diversified supply chains that should extend beyond the geographical area of the mine and beyond its lifetime. Dutch banks and pension funds could use their influence on the companies they finance, by stimulating this development.

2. Dutch trust offices, accountants and tax advisers, who have helped major gold mining companies to set up shell companies in the Netherlands, could use their influence and expertise to ensure that gold mining companies pay their fair share of taxes to the governments of host countries and do not avoid taxation through overseas shell companies. The fact that many gold mining companies have set-up shell companies in the Netherlands indicates that the country could also play a role in enabling the set-up of tax avoidance structures of gold producers. If tax avoidance is actually taken place, and the possible significance of this, need to be researched further. Possibly, this could affect the government budgets of countries where the Dutch government is spending money in the form of development cooperation, which seems to be an example of an incoherent policy.

It would therefore set an important precedent if the Dutch financial services companies which facilitate the operations of gold mining companies in the Netherlands, would actively address this possible inconsistency. With their expertise and contacts with the mining companies, they could ensure that Dutch shell companies are only used by the global gold mining companies for legitimate purposes and not for tax avoidance strategies.

## Appendix 1 Questions for interviews with key informants

The questions are intentionally worded in such a way that the respondents should have freedom to use their own words, which should generate some of the quotable quotes that have been asked for.

1. Determine if respondent sees him/herself as a representative or a critic of the gold mining industry, as a consumer or user of gold, and whether s/he considers him/herself as neutral.

2. What aspects do you believe determine the concept of sustainability, specifically for gold mining?

3. Do you believe that the gold industry (mining, processing, trading, etc.) is less sustainable than other mining, or other industries? Why?

4. Is there a trend of improving sustainability, are things static, or worsening?

5. Is this the same for all companies, or do some perform better or worse than others? What about small-scale versus industrial-scale mining companies?

6. For better-performing companies, what do you believe is the factor that drives them to improve? Is it internal and altruistic, is it affected by external pressures?

7. Of the potential external pressures on a company, which do you believe to be the most successful to change company behaviour for the better: host country legislation, stock exchange rules, shareholder attitudes and pressures, peer pressure from within associations like ICMM, etc.?

8. Which do you believe are the major challenges to sustainability:
    a. Environmental impacts (water, landscape issues, dust, etc.);
    b. Socio-economic impacts (land take, price inflation of local goods, etc.);
    c. Health impacts (occupational health, community health, issues icw water, air quality, noise pollution, process chemicals like cyanide or mercury, liberated elements like arsenic, sulphur, etc.);
    d. Any others?

9. Which do you believe present the major opportunities to improve the sustainability of the gold mining industry:
    a. Royalty and tax take of the host government;
    b. CSR initiatives: mining companies to construct infrastructure in the areas where they operate (roads, schools, hospitals, etc.);
    c. Employment of local people and procurement of local goods;
    d. Enhancing the skills base of the local community and the population in the host country?

10. It is accepted that all mining, if carried out appropriately, can be an ‘engine for growth’ by leveraging the value of mineral resources to add value not only to shareholders, but also to other stakeholders like company employees, local communities and nationals of a host country. Do you agree? In your view, can this best be achieved by stronger

legislation (in host or home countries) or by 'best practice' and the following of 'voluntary principles', etc.?

11. Do you believe that additional initiatives are needed to improve the sustainability of the gold industry? If so, where would you suggest the focus of attention should be:
    a. Advocacy within local communities and host country populations to lobby and pressure their governments in countries where mining takes place;
    b. Working with international NGO's to support the publication of transgressions by companies;
    c. Supporting NGO's and think tanks that aim to access balanced information about the gold industry (unbiased information of all types: good, bad, environmental, social, economic, etc.);
    d. Pressure on the market (persons who purchase gold products like jewellery) to either reduce consumption, or to insist on 'certified' gold (conflict-free, Fair Trade, etc.);
    e. Pressure on the stock exchanges or governments where mining and trading companies are listed?

12. To what extent do you believe that parties involved in the refining and the trading of gold can influence gold miners (either industrial-scale or small-scale) to operate in a more sustainable manner?

13. Do you believe that industry associations (Chambers of Mines, ICMM, various Jewellery associations, etc.) currently have an effect on the sustainability of the industry, could they do more, or are their efforts unlikely to have the desired effect?

14. To what extent do you believe that pressure from countries where large-scale mining companies are listed on stock exchanges, or where they are domiciled for tax reasons, can change corporate behaviour?

15. We may want to include questions about specific initiatives that exist already (but I don't know them very well) or should we ask respondents if they are aware of any such sustainability initiatives?

## Appendix 2 Key informants

The following key informants were interviewed:

- Aboagye Ohene Adu (formerly Anglo Gold Ashanti)
- Andor Lips (ING Bank)
- Brechtje Klandermans (Ministry of Foreign Affairs)
- Carolina Rojas Hayes (National Mining Agency of Colombia)
- Charles Chaussepied (personal capacity, Responsible Jewelry Council)
- Chris Anderson (Yirri LLC formerly with Rio Tinto, Newmont)
- Claude Kabemba (Southern Africa Resource Watch)
- Dirk de Kramer (Witteveen en Bos)
- Estelle Levin (Estelle Levin Ltd)
- Felix Hruschka (tbb.hru)
- Filip Delalieux (Schöne Edelmetaal)
- Frank Buijs (VNMI)
- Håkan Tarras-Wahlberg (Swedish Geological AB)
- Jennifer Horning (Solidaridad)
- Joost de Kluijver (Closing the Loop)
- Laura Gerritsen (Fairphone)
- May Hermanus(Council for Scientific and Industrial Research CSIR, South Africa)
- Paula Dobbelaar-Meenen (Waterschap Aa en Maas)
- Saskia van den Dool-Gietman (PGGM)
- Terry Heymann (Gold for Development, World Gold Council)
- Thomas Hentschel (State Secretariat for Economic Affairs – Switzerland)
- Ton Boon von Ochsseé and Peter Veenhoven (Ministry of Foreign Affairs)

Summaries of the interviews can be found in Appendix 3 .

# Appendix 3 Interviews/Responses from key informants

**Interview Aboagye Ohene Adu**
**ex Executive Manager, AngloGold Ashanti, Ghana**

**11 May 2015**

1. What are the main sustainability problems in the gold mining sector?

The most important physical/environmental issues are pollution of water bodies and air. Social impacts are dominated by conflicting demands for land and resources. Stakeholders are of the opinion that local communities are not benefitting from their mineral resources, resulting in (for instance) high youth unemployment rates. Employment creation is therefore the most urgent issue to address, urgently, in order to avert serious conflict with the mining communities.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)?

The processing of gold using mercury, by artisanal miners, poses serious health hazards for their families and nearby communities. This is something to be addressed urgently.
There is no gold refinery in Ghana and so the jewellery industry is not well developed.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

No, they are not. There is actually no serious commitment by the mining companies to address the issues sustainably, largely due to frequent changes in company leadership. *"There is the need for a multi-pronged approach involving various stakeholders to address the issue."*

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

With respect to host country governments, it is important to review (and enforce!) current mining-related legislation, and also to prosecute corrupt officials.
Other governments (including companies' home country governments) can play a role by exerting pressure on mining companies who violate sustainability policies, as well as technical/financial assistance to NGOs, communities, government agencies and consultants.
Processors, refiners and end consumers should refuse to purchase gold or jewellery from irresponsible companies, assuming that these details are known to them.
Pension funds and other shareholders should divest from irresponsible companies.
Banks and other financiers can play a role by refusing to finance irresponsible companies in the gold sector.
Industry associations do have a positive influence, but should move towards enforcing their sustainability policies through regular audits.
NGOs should assist with the education of communities and continue with their advocacy roles.
It is also important to empower traditional leadership - educating Chiefs and other local leaders on sustainability issues.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

Reference is made to the Global Reporting Initiative, apparently implemented by most ICMM members.
The Akoben Audit ( http://epaghanaakoben.org ), done by the Ghana Environmental Protection Agency (EPA) has also had some impact since the results were made to the general public, illustrating the value of transparency. (Note: No recent reports or audits are available, however.)

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

Does support the setting up of , hoping that a well-designed initiative would educate and empower key stakeholders in the mining communities, in order to help address some of the sustainability issues. In Ghana, there is so much corruption in the artisanal mining sector with chiefs, politicians and government officials involved.
Supports the stimulation of traders, processors and retailers to participate in initiatives, as well as banks, pension funds and investors, to influence the companies where they are involved.
Technical assistance to host country governments, on issues like water pollution, health, taxation, etc., is a good idea.
Assistance to NGO's is also supported.

**Interview Andor Lips**
**Director Natural Resources, ING Bank**

**30 April 2015**

1. What are the main sustainability problems in the gold mining sector?

For both LSM and ASM the social-economic impacts are most important, especially potential conflicts around water and power usage between local communities and mining companies. The challenge for LSM is to create local added value, to catalyse local investments and regional development based on their presence.
Many LSM companies do realize this, they know they cannot exclusively claim the available water resources and they do not do that anymore. Mining companies facilitate development of infrastructure, as they are key buyers of water and power. Water management is optimized in modern mining operations.
Therefore LSM can become catalysts for large-scale power or water desalination development where local communities can also profit from. But problems can occur when these developments are across borders, as governments of different countries looking at each other.
In some old mining areas with “orphan mines”, abandoned mines which do not have an owner anymore, water pollution can be a problem. Waste streams can pollute water sources, while nobody takes responsibility for those streams. For the modern mining operations which ING Bank is financing, this is not an issue. Companies take responsibility for their waste treatment and also the post-mining responsibility is regulated very well.

For ASM the issues are around regulation, sharing costs and benefits in a fair way, and environmental issues create by the unsafe use of various chemicals. ASM are often dependent on local middlemen, which leaves them with only limited benefits. ASM gold mining can contribute to regional development, but legislation needs to play a role to achieve this.
ING Bank is only financing large, established gold mining companies and therefore has no links with ASM. The only, indirect, link is that artisanal miners can encroach into the concession areas of LSM, potentially creating safety issues. Big mines often attract artisanal miners. How to deal with that safety issue in a way which is respecting human rights, is not always straightforward. Companies we are working with tell us that they do not attempt to relocate the artisanal miners in any way. The only thing they do is confiscating the equipment of the artisanal miners (e.g. their bicycles and shovels) when they encroach into their concession area. As artisanal miners have to invest in replacing this equipment, they do not like to lose it and will decide to try their luck elsewhere.

Stability of governance is an important factor for a bank when deciding to finance mining operations. The trend is towards governments looking more for a “fair share” of the mining revenues, but sometimes this can be seen as a “super tax” as the company has assumed all the risks in the development phase and the government did not invest.
But this is certainly not the case everywhere. African countries, for instance, regularly have better mining laws than European countries, as these laws are drafted more recently. This applies especially to countries which are classified by the IMF as Heavily Indebted Poor Countries, as international donors have more leverage over the governance systems in these countries. Countries are also learning from each other in Africa, the Francophone countries from each other, whilst developing their legislation based on the French civil law system, and the Anglophone countries from each other, whilst developing their legislation base on the English common law system.
The recently adopted laws are better in the sense of systems for revenue sharing and optimizing economic benefits, but also in terms of managing social and environmental impacts. In a country like Ivory Coast, the IFC Performance Standards on mining are integrated in the law adopted in 2014. For us, as an Equator Principles-bank who wants to assess mining projects against the IFC Performance Standards, that makes life more easy.

But obviously, governance consists of more than drafting laws. Governments are able to set high sustainability standards, but ensuring compliance is not easy. For no group of civil servants, in whatever country, it is easy to make firm decisions on multi-billion projects which might have all kinds of impacts - positive and negative. This is especially difficult in countries where a brain-drain makes it difficult to find well-qualified civil servants. In high risk countries the financing criteria on environmental and social performance set and monitored by international banks and multilateral institutions, e.g. through the Equator Principles, mitigate the risks of a weak government.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)?

From a gold industry lending perspective we do not see the benefit to be actively involved in specific gold trading or consumption. Our clients, the LSM, do ship their gold directly to LBMA-accredited refineries. The gold then comes back as bullion to the mining companies, which can sell it to different clients.
The biggest refineries are the Rand refinery in South Afica, Metallor in Swiss, Johnson Matthey in the UK, Japan and the US. Refining is a marginal business, commercially not very interesting.
Transparency in the supply chain is more an issue for the ASM, as middlemen get gold from many different suppliers.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

The established gold mining companies are aware of the issues and know how to deal with them. They participated in the MMSD initiative, and now they participate in the initiatives of the ICCM and World Gold Council - such as the Responsible Gold Initiative and Conflict-Free Gold. Among the big gold mining companies knowledge and standards are sufficiently developed regarding the four main issues we see:
1. Transparency (e.g. EITI)
2. Social responsibility (e.g. Equator Principles, Voluntary Initiative)
3. Environmental Impacts
4. Safety
But, of course, responsible mining requires a continuous engagement. It needs attention, you are never finished, it is a continuous process of applying best practices and aiming to achieve the highest standards.

Of course there are also small start-up companies in the gold sector, set-up by industry veterans, which are looking for prospective concessions. Companies in this phase do not always pay much attention to sustainability, but this also is less urgent as they are not producing yet. This type of companies only comes on our radar screen when they have found a viable project and are looking for debt funding to develop a mine. At that point, they have an advantage when they have done their homework well and have knowledge of sustainability standards and practices. This makes them more eligible for financing - we and other Equator Principles banks would not step in if they have not prepared these aspects well.

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

To further improve implementation of responsible mining practices, companies and governments should work together. Governments need to be sufficiently informed and mining companies need a good partner to work with. Capacity building among host governments is therefore necessary and foreign governments can play a role in this.

For end-users we do not see a big role, also because the gold market is so wide and so deep. Only 30% of the gold goes to jewelers, a large part is just for storage (mainly by central banks). Industrial gold accounts for 10-15%: these buyers could play a role.
And end-users pushing big companies to become more transparent is also not very necessary, as these companies are sufficiently transparent.

Banks of course also have a responsibility for stimulating responsible mining practices. The policies of ING Bank are clear. That is also a reason why some clients are coming for us, as we could open doors to other banks as well. Although every bank will carefully follow its own due diligence requirements, mining companies may recognize the benefit of complying to a similar set of sustainability performance practices as supported by ING. And these clients mostly meet our criteria anyway, for the last 10% for which they not comply yet we help and push them. The Equator Principles are applied strictly by ING, but not all banks apply the EP as strongly, It would be good if all banks would apply the same standards.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

We think that industry initiatives such as Responsible Gold Initiative and Conflict-Free Gold are useful. The Responsible Jewellery Council is further away from our clients, the mining companies.

For ASM a Fairtrade/Fairmined approach of price setting plus responsible mining practices could be good, because the small producers do not have leverage over middlemen and may have to accept very low prices or have to apply unsafe practices in order to earn some money. Offering an alternative supply chain could be good, but not something ING Bank could play a role in as we don't have a retail network in these countries.

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

What the Dutch government could do is offering technical and legal assistance to host countries, on water management, health, taxation, to build governance capacity. The Netherlands should not set up its own initiative, but should partner with all exiting initiatives and standards to collect and disseminate lessons learned and best practices. The Netherlands is well placed to build such a knowledge platform, as the Netherlands has no strong vested interests in the mining sector, is not a former colonial power of many mining countries and has a lot of expertise on some relevant topics.

The Dutch government could also play a role in creating a level playing field for banks in the mining sector, by working together with other governments to stimulate all banks to set high standards for mining companies.

**Reponses Brechtje Klandermans**
**Ministry of Foreign Affairs**

**9th April, 2015**

Ms. Klandermans was approached with the questionnaire in view of her work in the Great Lakes Region in Africa. Unable to answer specifically some of the questions, she preferred to respond in general terms, by email. This email includes the following text:

> "I am afraid I am not really in a position to answer most of these questions of the questionnaire, as they are really questions for experts to answer. What I can say is that from my perspective the regional trade and conflict dynamics in the Great lakes region are essential. This all comes together in the political economy of the gold sector in the Great Lakes region, and how this is linked to conflict causes or cycles of violence. Any intervention of our government in the Great Lakes region should take that as a starting point.
>
> In DRC armed groups sustain their activities through gold (more and more now that the 3Ts are being certified more and more). But if they cannot use gold, they will use other means, such as simple taxation/extortion of the population, wood, charcoal, fisheries. And it also depends on which part of the system you talk about: the bigwigs have different interests than the simple foot soldiers who probably rely more on taxation and charcoal trade for their living. What I mean to say is that we should understand the dynamics lying underneath the current illegal activities, which implies moving beyond the technical aspects.
>
> So I am mostly interested in the socio-economic aspects in your study. Brief answer I can give is that certified production has the potential to contribute to employment creation. At the same time, we should not forget that non-certified gold exploitation also provides a means of living for many people (feeding into the value chain of the armed groups) and therefore certification can be perceived as a threat by some. Also, land ownership/governance is a large issue in the region which is very densely populated. How this exactly relates to gold exploitation I am not quite sure."

**Responses Carolina Rojas Hayes**
**Vice-President of Promotion and Development, National Mining Agency of Colombia**

**27 May 2015**

1. What are the main sustainability problems in the gold mining sector?

The main sustainability problem in the gold mining sector is the informality of the activity as 85% of productive gold units don't have a mining title, which makes governance very challenging.

The main environmental problems associated with gold artisanal and small-scale mining (ASM) is the use of mercury. According to a report by the Alliance for Responsible Mining (ARM) and analysis of the UNIDO (United Nations Industrial Development Organization), Colombia issued approximately 150 - 180 tonnes. of mercury per year from the activities related to artisanal and small-scale mining. This data puts Colombia within the top 3 of countries with the highest levels of contamination by mercury,

Another problem related to mining, including gold mining, is its effect on human health and mining safety. The effects may be exposure to dust, poor ventilation, noise and vibration affecting hearing and exposure to toxic substances such as mercury.

Regarding large-scale gold mining (LSM), we found that there are conflicts between communities and corporations due to the lack of dialogue from the mine owners. This accounts for high levels of uncertainty in the communities, which sometimes have very high expectations related to the development of the mining sector.

Moreover, specifically in illegal mining areas, there are some actors who have had negative experiences with gold mining, and as a result are strongly opposed to sector development. Therefore, it is essential to promote mining well done.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)?

The main sustainability problem in the downstream stages of ASM gold mining, is the use of mercury for the extraction of gold, resulting in toxic wastes that pollute rivers.
It is important to raise awareness about the consumption of responsible gold to stimulate end consumers to change their consumption patterns. Traceability of gold through Colombia's Unique Register of Merchants (RUCOM) could be very useful in this regard.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

Regarding the problematic caused by the use of mercury, the Government issued the Law 1658 of June 15, 2013 to control selling and use of mercury in the industrial activities of the country, including mining, in order to protect human health, the environment and natural resources.

Similarly, the Colombian Government and the United Nations Industrial Development Organization (UNIDO) signed an agreement for the reduction of mercury in mining operations, focused on the departments of Antioquia and Chocó. Moreover, in 2013, Colombia was one of the first of the 140 countries to sign the Convention of Minamata for mercury reduction. The Government of Antioquia has since conducted trainings to promote the use of other clean technologies as alternatives to using mercury.

However, the Government requires all the support available to achieve its objective of eliminating the use of mercury in a five year term, as the abovementioned law 1658/2013 requires. A major barrier is the fact that this informality makes governance over this part of the sector challenging and secondly, many of these mines are controlled by illegal armed groups, who impose their own rules within in the relevant territories.

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

- Host country governments: they are the main stakeholders to promote good mining practices. It is very important to have capacity building among public sector workers in national and local government.

- Other governments: they are essential for promoting best practices and bring the country success stories that can be used as examples of good practices. While the issue of social dialogue is addressed by the national government, the positive experiences of other countries are essential to implement good mining practices in the country. Programmes for education and training for workers in national and local government, miners and communities are also critical for achieving the objectives. Finally, and most importantly, the promotion of traceability of mineral purchases within other countries, to support host country initiatives.

- Non-governmental organizations: the role of NGOs in stimulating the gold mining sector is fundamental, because they can help with monitoring situations in the mining areas and to put pressure on governments and the international community. However, they must be informed and trained on mining topics to provide informed information to the grass-roots levels and to the international community, in order to inform, and not misinform. Also to have open dialogues with government and private sector.

The resources that could be provided through international cooperation will be essential for the development of new initiatives to promote good mining practices, including the social dialogue between companies and stakeholders.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

"*It is very important to consolidate as few initiatives as possible in order to concentrate efforts in those standards that are most recognized by multiple stakeholders. To this end, we strongly support standards under the OECD Due Diligence for extractive industries, since Colombia has adhered to this initiative."*

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

The Dutch government could:

- Encourage traceability of mineral purchases by their country's consumers, supporting Colombian initiatives such as RUCOM;
- provide technical assistance to host country governments on issues like water pollution, and best practices. It is important to remember that the Colombian and Dutch governments have already signed a Memorandum of Understanding to promote cooperation between the Parties on the basis of equality and mutual benefit. This MoU identified some possible areas of cooperation such as Corporate Social Responsibility, transparency and sustainability reports, as well as business and human rights.

**Responses Charles Chaussepied**
**Personal capacity (RJC)**

**03 May 2015**

1. What are the main sustainability problems in the gold mining sector?

- Environmental impacts for artisanal mining mainly
- Socio-economic impacts for artisanal mining mainly
- Health impacts for both artisanal and large scale mining.

All of these problems need to be addressed most urgently as they are linked.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)?

Guiding the artisanal gold in “official tubes”.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

Most of the mining companies belong to international groups and are aware of all the issues mentioned before. They are addressing these questions internally (CSR policies) and with the help of Standards systems promoted by their Industry Associations. All the international companies being listed have to report on the non-financial risks ( IFRS, SOX, CSR reports). Furthermore the international NGO’s are challenging them to improve and settle the environmental and ethical issues. This is more difficult with the artisanal miners which have to be helped (refer to DDI in Sierra leone, SEC in Peru as good initiatives)

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

- Host country governments of course but be cautious.
- EU is already working on gold based on the OECD working group (gold supplement). US Dodd Franck act gold supplement is a catastrophe!! As it developed the smuggling in Central Africa.
- Processors and retailers of gold, refer to the LBMA responsible gold initiative.
- End consumers with the help of NGO’s, already exists.
- Pension funds and other shareholders, through Ethos ( NGO) is already very efficient.
- The gold transactions of banks and other financiers are already covered by the KYC rules which are terribly strict.
- Industry associations are of course a good entry point, they are already promoting the standards systems.
- OECD with the gold initiative.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

- Better Gold Initiative is good
- Conflict-Free Gold is good
- Fairtrade and Fairmined Gold is good but it is a label not a standard.
- Initiative for Responsible Mining is not yet public
- Responsible Jewellery Council is the best in the industry, multi-standards, audit by third party.

- Others?

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

- Don’t set up a new international initiative, there are already too many.
- Stimulating Dutch traders, processors and retailers to participate in an existing initiative is good.
- Stimulating banks and pension funds to exert more influence on the companies they are investing in can use the existing NGO’s.
- Look at the Swiss better gold initiative which is efficient.
- Don’t stimulate end consumers to change consumption patterns
- Don’t stimulate recycling
- Some NGOs are efficient and responsible, many are aggressive and counterproductive.

**Interview Dr. J. Chris Anderson**
**Yirri LLC formerly with Rio Tinto, Newmont**

**30 March 2015**

1. What are the main sustainability problems in the gold mining sector?

Noted that he was speaking from point of view of the major mining companies ("majors"). Majors are generally dealing well with environmental (technical) issues, but the lack of trust between government, companies and local communities is often a problem, largely around the socio-economic issues.

"*Mining operations are primarily technical, companies find it relatively easy to solve technical problems, but for the socio-economic and community health – related issues, the only way to go is to make the people part of the solution.*" This is more difficult, but can be done if communities are appropriately engaged and especially through an external scientific body, or responsible local NGO, though it takes time.

There is very often a lack of relevant capacity in both government agencies and in local communities.

Wrt socio-economic factors: "*Increasing local sourcing of labour, supplies, services, is essential, but difficult if there are insufficient skills or capacities. However, this can be addressed.*"

Wrt health issues, occupational health and safety ("inside the fence") is generally quite well-managed, but community health is more difficult.

"*Public-private partnerships are required, and mines need to work with these, even though it may be slower than just doing everything themselves.*"

Even for the relatively straightforward technical environmental issues, the lack of trust causes problems. For instance, consider that cyanide is really well-managed by the majors, in accordance with the ICMC, etc. There have been some cyanide-related incidents over the years, but it is a much better controlled issue than (for instance) the management of naturally-occurring elements like mercury or arsenic. But the image and perception of cyanide creates a larger issue than the actual technical management of the chemical.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)?

Noted that cyanide is also used in the processing of gold, once extracted, in refining and in the jewellery business.

"*Attempts to apply certification along the lines of the Kimberley process used for the identification of blood diamonds, are unlikely to work.*" It could well make gold too expensive.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

Major mining companies and their associations like ICMM have developed systems and frameworks to improve sustainability. Junior companies often claim that these are keeping them out of the market (higher costs), but JCA rejects that notion.

One needs to protect the environment, "the world is watching": IFC and others.

JCA is not in favour of the growth in CSR, including attempts to legislate this voluntary system. He believes it is not really doable or sustainable. "*Mines, working with CSR, often have the capacity to take on some responsibilities (build local schools, clinics, etc.) but these are generally government responsibilities and there is a risk of weakening government, or even "becoming" some sort of parallel local government.*"

One needs to avoid "just throwing money at the community".
"*The 'CSR mindset' is a barrier, local capacity building is much more important.*"

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

Mining companies can't solve all the problems, but it looks inequitable if the companies don't take at least some action to work with the inequalities between what is available inside the fence, and a poor community outside it.
As mentioned above, partnerships are therefore essential. Majors have gone a long way in this direction.

It is very important to deal with the host government on various levels and various issues – it's not only a matter of paying royalties and taxes. "*National government capacity to govern, and enforce legislation, is important, but interaction with local, sub-national government, is also crucial.*"

Training of these institutions is important to train them, on the workings of the mining industry, but even on how to do administer, how to plan, manage money, and so on.
JCA notes an example where Newmont's Foundation in Ghana ('Newmont Ahafo Development Foundation, NaDEF) was a good way to achieve more than with CSR, using partnerships with local NGO's. NaDEF is based on a commitment, over and above royalties and taxes for $1 an ounce and 1% of net profit from the company paid into a registered foundation. NaDEF has a board made up of a majority of local leaders plus the company, and a secretariat. Priorities for expenditure are agreed upon and documented in a formal and public agreement. Communities within the impact area of the mine can apply to the Foundation for projects. This model has been extremely successful and has won EU awards (see http://www.nadef.org/pages/).

NGO's are not all the same, some are merely anti-mining, but many (even local NGO's) have agenda's around development, with objectives that overlap with what mining companies want to do. Engagement and partnerships with such NGO's is important.

Banks, financiers: "*IFC standards are 'a done deal with respect to large-scale mining', meaning that most majors have the full intention to comply with them. However, the reality of (say) obtaining Free, Prior and Informed Consent (FPIC) from a fractured community is not easy…*"

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

Many of these initiatives are well-intentioned, but implementing them to the extent that they will have enough of an impact on the market, is a major challenge.

Majors like Newmont, Rio Tinto and others have been pulling out of the Initiative for Responsible Mining (IRMA). One reason is the intention to work towards certification that is seen as unrealistic. The uneven supply chain (including majors, juniors, small-scale miners, as well as illegal ASM operators) makes this very problematic.

The Responsible Jewellery Council is making good progress, developing a code of conduct, for instance. Sensible questions are asked. Tiffany's are major players there.

ICMM: member companies have to report every 3 years on their performance against guidelines. ICMM membership is based on signing up to their Ten Sustainable Development Principles. Once accepted as a member, a company must report every few years on how they have abided by and implemented these principles. With the growing membership of the ICMM, it will be interesting in the future to see how well some companies do. There is always the possibility that a company could be excluded for non-compliance!

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

Notes that The Netherlands may not be a huge player in the gold market, but with a seat on the World Bank board, should be able to influence IFC investment decisions.

Starting yet another initiative would not be useful.

Technical assistance would be useful, also at a local level. GTZ, USAID and DFID have worked in this area. The Netherlands have a good reputation and good interactions with government in countries like Ghana.

If local government is weak, it may well be more useful to support and work with local NGO's, rather than having companies take up the local government roles and responsibilities. Newmont has done so successfully in Ghana, engaging the NGO, OICI to ensure that all stakeholders are looking at the same neutral, unbiased data related to mining and mining-related impacts, etc.

7. General comments about gold:

There are people who think that they can compare gold to fur. JCA believes that is essentially a racist and ethnocentric comment, the usage and benefits that come from gold (mining and use) are not limited to upper-middle class women in the western world, but are visible all over the world, throughout history.

Gold is probably also the world's most recyclable metal.

**Interview Claude Kabemba**
**Director, Southern Africa Resource Watch (SARW)**

**11 April 2014**

1. What are the main sustainability problems in the gold mining sector?

Need to differentiate between artisanal and large scale mining.
Artisanal mining on the African continent is poorly regulated.
Artisanal miners engage in mining as a means of survival.
Because they have no expertise they are just guessing, through trial and error they try to locate minerals. So they dig everywhere. As such, this is the first most negative impact on the environment. The other problem is that they don't rehabilitate.
The question then becomes, 'How do you empower these folks with the knowledge and the equipment to test where the gold is. And be able to use that space for extraction.'
This trial and error causes a lot of stress and loss of livelihoods (costs) for these miners.
The other major issue is the use of mercury in ore extraction in or near rivers. This is a danger for the communities, but also the people who use it who often don't understand its properties and dangers.
The biggest challenge is to organize artisanal mining. Right now it is so haphazardly done that the risks are amplified. Where artisanal gold mining is legalized, it can have good economic impacts. The problem is how do you make sure that these people draw maximum benefit? How do you make regulations that help them to be protected? Help them to ensure that their livelihood is well supported by the work they do.
Much of artisanal mining takes place on the concessions of large scale miners. This reflects badly on the mining company. They cannot get rid of the artisanal miners, in some cases they will purchase from the artisanal miners.
Across the board SARW has found that there is insufficient investment and commitment to ESG issues and CSR. They often employ engineers rather than anthropologists or other more relevant experts. The company needs the correct mindset in order to protect the environment and communities.
The company and the government in particular should do a cost-benefit analysis that considers where it is more profitable to extract the resources or to leave them in the ground. Is it beneficial for the country in the long-term or not. The government must be able to make this analysis.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)?

There is not only hard conflict, but also soft conflict. Often the gold is literally being stolen from miners.
The problem with gold is its lack of traceability. Initiatives have been focused on diamonds, coltan, tin and other minerals, but less on gold.
Everybody knows that Dubai gold comes from dubious sources.
The only country where you can say there is conflict gold is in Congo. But the issues for violence are also relevant to other countries.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

The only way to address the problem is to focus on upstream, to make it clean, rather than downstream. Downstream is conditioned by the upstream. Downstream becomes very difficult to control because of the traceability issues.

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively?

Listed in order of importance:
National governments are the most important actors. Miners need to be protected by the state. State means the apparatus and parliaments.
Should also empower local communities. Communities should be empowered for their own self-determination, to allow them to make full use of the resources in their jurisdiction.
The media is also important to monitor, expose, and to name and shame. It should be free to do so. This can be local media, but also international media is essential in generating attention and pressure on host governments.
The extractive industry is now very well covered by civil society, with groups targeting women, youth and many other things. The biggest problem is that these groups lack the capacity to sustain their programs. Now they are very reactive, reactive to funding, not to the agenda that will truly bring about long-term change in the gold sector.
Empowering civil society is more important than the initiatives.
The international civil society groups must work very closely with local groups. But most importantly, agendas have to be aligned. Local civil society groups should not be merely used as tools to facilitate international civil society. They should be empowered by international civil society to become self-sustaining, independent.
Then come voluntary initiatives. They will only work if they are integrated in all the aforementioned elements.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

The best initiative varies by country.
The best initiatives are where the state purchases directly from the miners. The dangers lie in the middlemen who buy too cheaply.
The state has to protect the miners by purchasing. Tanzania is a good example. Tanzanian state purchase of gold is effective because state agents are located close to mining sites making it easier for miners to sell to state agents.
If corruption is a concern in state purchase, then a third independent party can be contracted. In the DRC is increasingly happening, but the program is not being effectively developed.
Using the state is also beneficial for developing the state.
The problem with many initiatives is that they don't educate the miners. Many miners do not know these initiatives, for one thing. But also these initiatives don't educate miners in essential things that would improve their livelihoods, for example, financial management. Most of the time the assumption is that miners will invest their money in their families, but in reality this is not the case. Often they will gamble, buy alcohol, visit prostitutes, or find a new wife. Financial management education should make them improve their behaviour and their lives. In the Congo, it is often the woman's agriculture activities that support the families and not the man's artisanal gold mining. Men do not invest their mining gains in productive purchases (equipment, etc) but in consumption. Teaching them how to bank their finances will increase control.
Focusing on economic and social issues through education will make the miners become more aware of the environment as they will start to think more long-term rather than short-term survival.
If you tell someone, a miner, who is only thinking in survival mode about how to get money to support himself and his family to think about biodiversity, he will think you are a little bit not right in the head.
Initiatives must reinforce what the state is doing.

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

Any intervention must be long-term
But what is the motivation of the Dutch government to do this?

**Interview Dirk de Kramer**
**Witteveen+Bos**

**27 March 2015**

1. What are the main sustainability problems in the gold mining sector?

The overall, main problem is a lack of consideration for environmental issues during the mining process, for ASM and large-scale operations alike.

In large-scale operations, emissions of pollutants into waterbodies are due to substandard environmental practices, but in ASM operations (like in Suriname and Guyana), the situation is worse, with no environmental consideration at all, "everything ripped open", no closure planning.

"*Social and health problems are a direct result of the environmental problems, all of which are due to a lack of sufficient governance.*"

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)?

It is unlikely that substantial new sustainability problems originate later in the value chain, after mining, but the problem is the decoupling of the governance process. There is no governance over the entire chain, with end users not considering the origin of the gold or whatever sustainability challenges might be there. "*The end user view is something like: I don't know where it came from, but its mine now.*"

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

Mining companies vary in scope, attitudes and leverage, but all should be able to deal with sustainability issues. They do so in varying degrees, depending on the company policy and to a certain degree on the governance in the host country: some companies simply follow the (inadequate) laws to the letter, claiming that any problems caused by their operations are regarded as 'acceptable' as per local legislation. In the absence of an appropriate legal framework in the host country (or application thereof), even large international companies often don't do enough.
Wrt barriers: Nature or vulnerable natural resources are certainly a barrier.
"*Gold is essentially a luxury, unlike for example energy that we really need. We don't need gold to survive or function, so maybe some places actually represent a higher value if they are not minded and hence should never be mined*".

Moreover, as long as recycling isn't fully developed yet, our efforts should go more towards recovering gold from e.g. e-waste than exploiting the final 'high investment' / 'hard to get' gold deposits (Ghana is mentioned, with extensive 'gold deposits' in the form of poorly managed e-waste dumps).

The fractured value chain, with lack of traceability from production to end use, is another barrier.

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

Volumes have been written about how/what good governance should be, all great ideas, not all implemented. Much of this work is done by industry (ICMM, etc.) and international financial organizations also produce guidelines (IFC, etc.). MMSD has also produced such reports. But there is no full or successful implementation if host governments are not strong.

It's difficult for host country governments to get to grip with bad deals, to negotiate on an equal basis with mining companies, who have more technical, legal, financial skills: in some cases the mining company will have an annual revenue larger than the GDP of the country they are negotiating with (this is not specific to gold). "*This is where assistance and diplomatic leverage from the Dutch government could be useful, through e.g. assistance in deal formation with a non-profit objective.*" This ties in directly with international affairs, as also the host country of the international company may get involved (in some cases actually the Netherlands - e.g. through a "post-box construct").

Banks and pension funds "are waking up", but not exerting enough influence yet.

Wrt NGO's, there are two types. Some of them are in the "*all mining is bad*" category, and never want to engage with industry. Other, more balanced NGO's should be engaged in the discussion to improve sustainability. Oftentimes local NGO's are essential for involvement of local population at a sub-governmental level (e.g. in the case of indigenous people).

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

Many of these initiatives are aimed at the 'ultimate' end user. These are likely to be ineffective, since we don't buy enough gold in The Netherlands to really consider changing sources over something as abstract as sustainably mined gold: an average person consciously buys gold maybe twice in his life. Maybe the retailer could have some impact, or investors, but not the consumer in the street.

The International Cyanide Management Code, currently implemented by a large sector of industry, appears to be working. It would be good to strengthen this and expand it where possible.

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

ASM: It's very clear that ASM is very hard to tackle, but it's not impossible to reduce the problems/impacts. However, rather than trying a "silver bullet approach" to fix certain technical issues in a standard way, better to look at "end-of-pipe measures" to improve the situation incrementally: once an easily attainable improvement is implemented with direct benefits as a result, the situation may become more receptive to more sustainable solutions. "*There are possibilities where environmental and engineering firms (like Witteveen+Bos) could help, but they are not charity firms: projects must make business sense.*" Chain-wide users may be coaxed into shared investments. Host country government should also be stimulated to deal with the ASM related issues.

Large-scale operations: here the improvement of local (host country) governance is more important. Legacy issues (polluted water, tailings dumps, etc.) offer possibilities and opportunities for good business as well as environmental cleanup. The Smart Tailings concept is an example, as well as the re-mining of tailing to create resources out of what is currently perceived as waste, with the resources freed for investment in solving the legacy problems.

Even if a business case has a financial net-zero result, this would still be net-positive for society. Witteveen+Bos are interested in working on such technical solutions, especially in the areas of waste and water management.

The question is: To what extent should Dutch taxpayers fund these projects? Look for good business cases in countries where there are strong links with Dutch government, in turn generating revenues for Dutch business.

Regarding NGO's, it's important to be selective, target those NGO's that (a) are ready to engage and (b) are present and active in The Netherlands or Europe.

## 7. General comments:

Witteveen+Bos started the "Smart Tailings" concept about 4 years ago and the associated platform has experienced a sustained evolution since then. W+B prefer to work in coalitions with other firms or organizations, so as to combine different skills, experiences, local knowledge, etc.

Past and existing coalitions and commercial partnerships have involved organisations like IHC Mining, Eijkelkamp, Medusa Explorations BV (a spinoff company of the University of Groningen).

Future ambitions are based on roll-out of such ideas, involving mining waste and water, coalitions in developing countries and risk-based land management. Their approach, while constantly morphing, is based on the typically Dutch quality of being pragmatic.

**Interview Estelle Levin**
**Estelle Levin Ltd**

**30 March 2015**

## 1. What are the main sustainability problems in the gold mining sector?

Distinguishes between risks (some are managed, some not) and actual problems. The problems commented on here, are the non-managed risks:

1. Mining in protected areas, critical ecosystems, environmentally sensitive areas, is already a large issue in ASM and is intensifying in medium- and large-scale mining. Actors in the conservation sector don't have enough capacity to manage this conflict. As a result, there is a "drip-drip degradation" or lowering of the hurdles keeping mining operations out of such areas. However, it's noted that "*in some few cases, mining companies can in fact be better conservationists than under-resourced authorities if incentivized properly: they might have better control over an area, have more resources, more skills, and retention of access to the resource may rest upon environmental management measures, etc.*"

2. Pollution of water bodies

3. Socio-economic issues:
   *"Mines are almost never totally integrated "engines for real development", delivering shared value. They are not thought of as social enterprises, but they should be!"* The reason is seen to be the gap between mining company (including ASM) and government perceptions and skills, especially related to business opportunities, business acumen, making public-private partnerships work, etc. "*Mines should not just generate short-term profits (for shareholders), income (for current employees) and taxes (for central governments), but should create local legacies of expanded economy – the basis for creating resilient societies.*"

   "*A social licence to operate is not adequate, it should be about creating win-win-win situations*". Such an approach should be piloted, requiring support from organisations like IFC, EBRD and banks.
   One example: mine sites are excellent opportunities to convert (non-mining) waste into energy, which could be used by the mine, by the nearby community (where some of the waste may be sourced), and so on. Or mines need energy, so mines become the justification for building renewable energy infrastructure that will service the mine AND community, pasing ownership and energy potential to broader economy once mine cycle is over.

   More local content is needed, it's being talked about much more often, but there are limitations (skills levels, business standards, access to capital, etc.).
   Smuggling is almost impossible to completely remove in any industry, but if the (ASM) mining sector had a better business case, with better access to affordable capital, improved banking facilities (for all economic sectors), lower taxes, realistic legal framework, the reasons for smuggling would reduce.

"*Royalties should be reduced drastically (for ASM), allowing the linkages into other sectors of the economy to generate the economic growth (which would be more local) and even taxes.*" The economic linkages to mining should be taxed, noting the gap between mining ministries who get revenues from the mining sector, not the general government 'pot', and are desperate to maintain that autonomy in the face of dysfunctional and corrupt governments ( low accountability for financial management generally, i.e. if they raised money from the economic linkages it would go to someone else's pot and the mines ministry might never see the money).

4. Human rights abuses occur in both large-scale and ASM situations, just differently. ASM are citizens so their rights must be respected; once organized as some type of entity, ASM bear responsibilities to respect others' rights. It works 2 ways. ASM as individual and corporate 'persons'.

   So many human rights abuses occur in ASM I don't know where to start – hazardous child labour, forced labour, discrimination, dignity in the workplace, right to a safe working environment, etc. Some of this is INTRINSIC, i.e. a product of how the mining is done (badly); some is EXTRINSIC, i.e. a product of the social realities of miners, i.e. poverty and ignorance.

   Large-scale mining – forced resettlement is a major issue, as well as the denying ASM the right to a livelihood ("*they're not legal so why should they get compensation?*"), etc. These examples pertain to how LSM affect the HR of ASM as a specific stakeholder group within a community, but LSM also affect the HR of communities and other specific stakeholder groups also.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)?

No comment on this topic due to a lack of time.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

Main comments are on the ASM subsector.
No, the issues are not addressed effectively. The main barriers are: Culture, misogyny, patriarchy and patronage, corruption, illiteracy, bad law, weak economies, lack of understanding of human rights.

Economic linkages and related issues: "*Governments tend to see ASM as a lost opportunity to earn taxes, they should rather focus on economic benefits that can follow from the linkages to other industries.*" Funding of the mining ministries and authorities is never adequate (in terms of training to ASM & other extension services, supervision for ensuring legality, supporting ASM as a.) citizens and b.) businesses etc.), while the ministries responsible for tax collection, generally are well-funded…

There are many environmental, health and socio-economic issues in ASM, but there are benefits: ASM contributes more to local economy, employs more people, there are potentially more linkages into the local economy, while benefits from large-scale mining tends to go into taxes, mainly ending up in the national economy, capital cities, and overseas. ASM operators generally do it because it's the best economic choice (by far) to provide cash, higher income (10X farming income or GDP/capita in many rural areas), and people are motivated by aspiration for respect.

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

"*Financial institutions, pension funds, banks can play a much larger role. Not just applying the IFC's Equator Principles, but also more engagement with mines and investors.*" This should include setting terms and conditions, providing better rates or better returns for operations with better risk management (e.g. membership in standard-setting organisations, e.g. RJC), and so on.

Host country governments: They have an important role to play, but don't have the capacity to fulfil this role. Home country governments (where companies are domiciled/listed) can legislate that companies should follow home country environmental (etc.) legislation in developing host countries. E.g. Canada / Guatemala case in 2014.

Important to engage with processors and retailers, keep up the pressure to source their gold from responsible sources, and to advertise this fact.

End users: Jewellery industry contains many "dinosaurs", though some like Tiffany's and Bulgari, are on the right track, doing the right things. The electronics industry has made great strides into the responsible sourcing arena, for example using the standardised Conflict Minerals Reporting Template for downstream supply chain management to harmonise data reporting requirements; this is something that could be done for other sectors, and to manage other issues too. Industry associations are crucial in creating joint initiatives to help sectors cope with the broader supply chain expectations of stakeholders under norms like the UNGPs, UN Global Compact, etc. ITRI, CIBJO, RJC, others have developed to do this.

NGO's come in two types: Those who are very "anti" against all mining, and those who are keen to engage, interact, help to make things better. Good examples are: Integrity Watch (they have developed a "fix rate" as a way to measure success/progress through their Integrity Action project), also the Artisanal Gold Council, who have done a lot of work on mercury-related issues, the Alliance for Responsible Mining. Solidaridad is another good NGO, in The Netherlands.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

These initiatives all do things in a different way, should be engaged with in different ways: Fairtrade and Fairmined are not the same thing anymore and should be treated as 2 separate initiatives. Both are effective; ARM likely to work with a wider geographical scope and has greater ASM expertise in it than Fairtrade; tending to work with luxury brands and US market.

Fairtrade is operating in the African Great Lakes Region so can offer 'conflict-free' gold for Dodd-Frank affected importers in the US (or EU conflict minerals regulation affected gold importers). Fairtrade could be rolled out to many more producers in that region, especially E. Africa. Fairtrade gold marketed in Netherlands, I believe. (Notes that she is on the Fairtrade Technical Advisory Group and they are a present client re. the conflict minerals provisions of their Standard; ELL is also partnering ARM in an upcoming project in W. Africa.).

The Better Gold Initiative, a coalition to get "cleaner" gold to the Swiss refiners, is a good initiative to work with but could do more to help producers get on the escalator towards 'responsible' practice. Tends to compete with FT and FM for access to their producers. (For me 'better' means it's improving; this should be their offering – getting ASM started on the journey

towards becoming FT or FM entrants. Better Gold should buy the gold for that period of getting certified FT / FM then when FT / FM certified starts, they withdraw their support and move on to new ASMOs).

The Conflict-Free Gold Standard is a tool produced by the World Gold Council, can be used by mining companies to provide assurance to buyers that their gold is 'conflict-free', in accordance with the OECD Due Diligence Guidance. This standard could be promoted more for use by LSM in conflict-affected and high-risk areas. Also includes provision for sourcing from ASM which should be encouraged (notwithstanding monopsony risks).

"*The Responsible Jewellery Council, using many standards and guidelines of the ICMM, ILO and others, is currently the superior option for medium- and large-scale mining companies that want to show that they are managing their risks.*" (Notes that she is Co-chair of standards committee).

The Initiative for Responsible Mining will be good when it's operational, but it isn't yet. It may well have higher standards than the RJC when operationalised, since it will provide performance standards as well as management systems.

## 6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

Not in favour of setting up yet another initiative, rather for the Dutch government to promote, support, strengthen, improve existing initiatives.

It would be useful to stimulate traders, processing companies and retailers, but their immediate influence might be limited.

Strongly in favour of stimulating banks and pension funds to exert more influence on mining industry – make supply chain due diligence something businesses must show performance on.

Agrees with technical assistance from the Dutch government to host country governments. (Side comment that mercury is not the major problem with ASM yet it gets a lot of attention).

Strongly in favour of increasing gold recycling.

Supporting the right type of NGO's may be useful.

## 7. General comments:

ELL is keen to remain engaged with this particular project.

**Interview Dr. Felix Hruschka**
**Owner tbb.hru**

**5 May 2015**

1. What are the main sustainability problems in the gold mining sector?

Distinguishes between the LSM and ASM sectors:

**LSM:** Socio-economic and environmental problems are high up on the list. Health a little less, since most LSM operators implement appropriate Occupational Health and safety (OHS) programmes.
Contribution to employment, as well as to government revenues of host countries are often significantly below expectation. This is well documented in the WGC report "The golden building block" , where the industry itself recognizes its low contribution to employment (1-2%) or government revenues (possibly as low as 3%, even in countries where mineral export accounts to 30-60%).
Conflicts with disappointed communities, for whom mining contributes little to development, are often the consequence. Most industry players are still far away from FPIC. CSR measures, like building a few roads, schools, hospitals and similar (i.e. substituting the governments' duties) are the most common community "benefits".
Environmental impacts are often rampant, and result in little consequences for the mining companies. In most cases conflicts arise around land and water issues. Admittedly, some mining companies have started to improve their environmental and social performance, in the light of "reputational risks". This is not the ideal "driver", but as long as it triggers improvement, it is a step-change in the right direction.

**ASM:** Against common media opinion, I would rank socio-economic and health problems first and environmental issues last. This is not intended to downplay environmental issues (e.g. the use of mercury) but to highlight that the most (health-) affected in the ASM sector are the miners and their families themselves. "Real" ASM is usually small and the environmental impact is local and limited.
Of course this does not apply to the few large accumulations of ASM (always the same few cited in media) or where ASM has already outgrown their segment and operates at medium-scale size (e.g. Madre de Dios, Peru). This is exacerbated by the current trend to criminalize ASM as "illegal" mining. Illegal mining is a serious problem (e.g. Chinese illegal immigrant investors in Ghana, FARC in Colombia, etc.), but this distracts seriously from the millions of community based ASM miners for whom gold mining was always a traditional economic activity and who suffer from crack-downs on "illegal miners" becoming even more socially and economically marginalized.
When looking at the ASM sector, its positive contributions to income and local economic development are often ignored. With approximately 30 million ASM miners (15 million of them estimated to be involved in gold mining), ASM is not only a significant contribution to poverty reduction, but in many regions also the main means to maintain subsistence farming (farmers or herders complementing their income through mining, subsisting on gold as the "cash crop") and therefore sustaining their traditional livelihoods and agricultural ecosystems. In many places, without gold, such farmers or herders would have left their land long ago and have migrated to urban slums.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)? Please mention one or two and indicate which problem needs to be addressed most urgently.

Given that the majority of big refiners is still hosted in industrialized countries in the “global north”, health and environmental problems appear to be well controlled.
Regarding the manufacturing sector, often outsourced to low labour-cost countries like India etc., I would be less confident.
The foremost important issue is in my opinion the lack of transparency in the supply chain. “*As long as transparency in the supply chain is not achieved, it allows for ignoring all above mentioned (substantial) sustainability issues in the extractive stage.*”

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

Definitively the mining and trading companies would be able to address and solve the issues; why not? The gold price would just be a few dollars higher; who cares? The higher the gold price, the better the gold business; this would not affect anybody if it does not distort competition. The question is: are they willing to address them? Or even more provocative: can they be motivated (or required) to address the issues and not only the symptoms? *“Regarding this I believe that the self-regulating potential of the industry is not sufficient, and additionally to the stakeholder groups mentioned in the question, governments (or supra-governmental bodies) have to be included.*” OECD is in principle a good start, but “*by focusing on the formalization of the supply chain from ASM, while most countries erect huge entry barriers for ASM to enter the formal sector, such guidelines are in danger to become paper tigers*.”

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

As mentioned above, governments and supra-governmental organization play a major role. They set the legal and institutional framework, within which the private sector fulfils its role to maximize profits. This includes banks, funds, industry associations and similar. Their legitimate primary mandate in a free market economy is also to maximize profits. That is what people expect (e.g. when paying money into a pension fund or entrusting savings to a bank) The other powerful stakeholder groups are retailers and consumers, located at the end of the supply chain; limited in number of course, as a large portion of gold consumers reside in countries which share different ethical values, but still large enough to make a difference.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

There exist several (or maybe even abundant) efforts and studies to benchmark the different initiatives. Below is one of the benchmark tables taken from a RJC presentation some years ago (details not yet found):

| Issues covered | Initiative | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | OECD DDG | Global Initiatives | WGC | LBMA | BCC / GeSI CFS | RJC CoC / CoP | ARM/ FLO FTRM | Regional Initiatives | ICGLRs RCM | BGRs CTC |
| Geographic Scope | global | | global | global | global | global | global[1] | | Great Lakes Region | EDI, RW and DRC |
| Conflict financing | | | | | | | | | | |
| Fraud and Money laundering | | | | | | | | | | |
| Legality of Supply Chain Operators | | | | | | (CoP) | | | | |
| Human rights violations & Human Security | | | | | | (CoP) | | | | |
| Chain of Custody | | | | | | | | | | |
| Community development | * | | | | | * | | | * | * |
| Environment | | | | | | (CoP) | | | | |
| Labour issues | | | | | | (CoP) | | | | |
| Other Social / Political / Economic | | | ** | | | ** (CoP) | | | | |

In my opinion, there are generally 3 types of initiatives:

- Focusing on sustainable development and integrating supply chain transparency as a development tool. Most of them are driven by consumer awareness (or expectation of a market advantage through an added ethical value), for instance FM, FT, RJC;
- Focusing on compliance with existing regulations such as OECD or DF1502. e.g. Conflict free gold, LBMA;
- Second level initiatives building on top of existing initiatives, and depending on the point of view and approach either reinforcing and strengthening existing initiatives or "free-riding" existing initiatives (putting their "label" on top of other initiatives' work).

Being asked to list the first-level initiatives which contribute effectively to sustainability, I would name (in alphabetical order): ARM (=fairmined), Fairtrade, IRMA and RJC.
I believe that RJC (for LSM) and ARM (for ASM) are the flagship initiatives. IRMA is already taking too long to take off, and Fairtrade is mainly capitalizing on their past 3-year partnership with ARM; but both have potential and can develop further.

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

Does not support setting up a new international initiative, unless the Dutch government identifies new issues which are not yet covered by existing initiatives and cannot be delivered by existing initiatives with due support.
Does support the stimulation of Dutch traders, processors and retailers to participate in an existing initiative, but this requires careful analysis of the positive and unintended negative consequences. "*Only focusing on conflict gold for example is counterproductive, as it drives ASM even deeper into marginalization*".
The stimulation of banks and pension funds to exert more influence on the companies they are investing in, may have limited success. It is firstly important to exert influence on banks and funds themselves to act with more conscience. They are part of the (legitimately) profit maximizing private sector. First the banks need to change their attitude and only then they can they influence their clients.
Supports the provision of technical assistance to host country governments on issues like water pollution, health or taxation, but including aspects of ASM policy, lowering the entry barriers for ASM miners to integrate into the formal economy. Cautions against supporting host countries' aspirations to formalize ASM under an expectation of immediate tax income, though.
Supports stimulation (but not patronizing!) end consumers to change consumption patterns. Voluntary standards initiatives need to remain voluntary to remain effective.
"*Stimulation of recycling does not resolve the social and environmental issues, could just be a 'feel good' argument for jewellery items. Gold has always been recycled - nobody throws it away after use! And … recycled gold does not contribute to development, either*".
Supporting NGOs is a good idea, but in order to be effective and efficient, not all NGO support needs to be channelled through Dutch NGOs. National initiatives in the host countries urgently need direct support to create leverage there.

**Interview Filip Delalieux**
**Schone Edelmetaal; VNMI**

**8 April 2015**

1. What are the main sustainability problems in the gold mining sector?

The main environmental issues are the use of non-BAT processes, including the use of chemicals like mercury.

In relation to socio-economic impacts, the fact that non-governmental armed groups are inhibiting the development of a regular economy and a free market, is seen as the main problem.

The mining industry suffers from occupational health and safety impacts due to the use of chemicals like mercury, unsafe working conditions (exacerbated by a lack of protective clothing and safe equipment), harsh working conditions and a lack of respect for normal working hours.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)? Please mention one or two and indicate which problem needs to be addressed most urgently.

Jewellery manufacturing in low income countries, which do not have (or do not enforce) sustainable development policies, leads to problems with worker health and safety, and exploitation of the workforce.

In recycling the problem is the leakage of conflict minerals (or fenced metals) into regular, legal material flows. Due diligence on gold supply chains is impeded (even in the EU) by a lack of classification or formal admission of refiners. (Filip: can you please explain what you mean with 'formal admission'?) Especially the poorly regulated manufacturing and trading of gold bullion bars (serving as a physical commodity investment) is a 'forgiving' and therefore lucrative outlet.

The collection and recycling of gold scrap, due to the high mobility and the associated high cash flows, is particularly sensitive to money laundering schemes.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

Major mining and smelting companies are well-equipped to address these sustainability issues in an effective way and most of these companies have already engaged in 'voluntary' due diligence, public reporting and third party auditing.

Subsequent stages in the gold supply chain have adopted responsible sourcing initiatives under the expert guidance of the respective sector organisations, including the World Gold Council, the London Bullion Market Association and the Responsible Jewellery Council. The high effectivity of these initiatives results from their mutual recognition and the fact that they are fully compliant with the OECD Guidelines on supply chain due diligence.

Although these initiatives are 'voluntary', companies that would choose to not comply, would *de facto* place themselves outside of the regular market.

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

Governments can influence by raising awareness of the public and formally registering compliant smelters and refiners.

Processing and retailing companies should raise awareness and adopt labels in order to communicate clearly to the end consumers of gold.

The sensitivity to the origin of gold in their products (electronics, jewellery, investment bars) under end users or consumers, should be raised.

Banks, pension funds, other financiers and shareholders should be made more aware and the levels of transparency should be raised. Relevant policies (especially with respect to the purchase of investment bars) should be adapted.

Industry associations should make stronger efforts to raise awareness and to ensure the sharing of best practices by their members.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

"*The Responsible Jewellery Council's Chain of Custody is the most effective initiative to ensure responsible sourcing of raw materials and responsible manufacturing of semi-finished products for the jewellery industry.*"

The LBMA's Responsible Gold Guidance is the most effective initiative to ensure responsible resourcing by refiners, facilitating responsible end products (like investment bars) and semi-finished products (like gold grains).

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

He is in favour of setting up 'Special Sustainable Economic Zones' in host countries, similar to the sustainable trade initiative for tin in Indonesia.

Stimulating Dutch traders, processors and retailers to participate in existing initiatives is probably the best way forward, while the stimulation of end consumers to change consumption patterns is probably the most sustainable way forward.

With respect to recycling, the stimulation of the circular economy deserves all the political attention that it can get, not only limited to the gold supply chain.

**Interview Frank Buijs**
**Director Vereniging Nederlandse Metallurgische Industrie (VNMI)**

**22 May 2015**

1. What are the main sustainability problems in the gold mining sector?

VNMI is the Dutch sector organisation for producers of metals in raw, unprocessed forms. Our members produce around ten metals, including aluminium, zinc, steel and copper. Together they have 50,000 FTEs. Gold is also produced by one of our members, Schöne/Umicore, but only through recycling used products.

In consultation with stakeholders we are now in the process of mapping the risks all of our members have in their supply chains, as is expected from us by the UN Guiding Principles on Business and Human Rights and the OECD Due Diligence Guidance on Responsible Supply Chains. We are identifying the high priority issues in these chains as well as critical stakeholders. Our aim is to join existing initiatives. For us this is a very exciting period, given the increasing political pressure to clean up our supply chains.

In the mining phase (not specifically gold mining), we have identified the following issues as deserving high priority:

- Forced labour and child labour
- Land rights
- Health & safety
- Environmental pollution.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)? Please mention one or two and indicate which problem needs to be addressed most urgently.

In the recycling phase, we see health & safety as a major issue when it concerns the e-waste recycling activities in West Africa and other developing countries. Our members are not directly linked to these recycling activities, but nevertheless we do not like to be associated with these issues.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

Some of our members are subsidiaries of mining companies, others have close trading relationships with mining companies. I don't have a clear opinion on this question.

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

The downstream processing companies which the VNMI is representing can certainly take a role. We are realizing this, we are prepared to take our responsibility, but we are still in a process to determine what is the best way to tackle these issues.
We are aiming to collaborate with sector organizations (International Council on Mining and Metals (ICMM)), NGOs (maybe Oxfam) and data providers (MVO Nederland, Business & Human Rights Resource Centre) who could help us to find the right facts and to get instruments to play our role in tackling the issues.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

We are focused most on the UN Guiding Principles on Business and Human Rights and the OECD Due Diligence Guidance on Responsible Supply Chains.

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

The role of the government is to take away impediments which would limit our efforts to deal with the issues. We would for instance like to see a single European certification system for conflict-free minerals and we would hope that LBMA-certification is recognized as such.
We think the Dutch government should not take initiatives focused on individual metals, as the issues to be addressed in the different mineral supply chains are very similar. The VNMI and its members would prefer an integrated initiative which would target the metal mining sector in a comprehensive way. The KPMG risk assessment report identified the metalelectro supply chain as a whole as a risk sector, we would like to see a government initiative focusing on this supply chain.
It would help our own risk assessment and value chain mapping if the Ministry of Foreign Affairs would help us to get more data on specific issues linked to the value chains in which our members are operating.

**Interview Dr. Håkan Tarras-Wahlberg**
**Swedish Geological AB**

**26 April 2015**

1. What are the main sustainability problems in the gold mining sector?

The most important environmental challenge to sustainability is the fact that many gold ores are closely associated with sulphide minerals. Mining and extraction of the gold therefore releases these minerals and the contained metals into the environment, often resulting in major problems, including Acid Mine Drainage (ARD) and the release of toxins like Arsenic into downstream surface water bodies. This is the most important issue to address.

Other environmental impacts (dust, noise, etc.) can be controlled or contained better, and large-scale mining companies usually do this better than ASM operations.

Socio-economic problems are prevalent, and the scale of these problems generally increases with decreasing host government governance over the sector. Poorly-functioning states are therefore a major factor: They allow companies (even ICMM members seen as responsible companies) to operate differently from the way they would in their home countries. Also, if such companies discontinue operations for whatever reasons, there is the risk that the operations may be purchased or otherwise taken over by other companies that operate with lower standards.

By signing up to the ICMM guidelines, it is my understanding that those mining companies then commit to filling any gaps between local needs and host government capability that may exist. This is much more difficult a task in developing countries than in countries where the state is able to shoulder/meet most - if not all - such needs.

Health issues are generally well-managed by the modern, large-scale mines, but are prevalent in ASM operations, medium-scale mines, and potentially also the older, large-scale mines that are still characterized by a large work-force. More modern, mechanized mines have lower health risks, but also much lower employment, so there is a trade-off between the benefits of higher employment and more health problems.

"*ASM operations with no environmental or social impact, have not yet been seen.*" Even in the most benign examples of small scale gold mining that I have seen, there is, e.g. increased sedimentation in rivers, spread of mercury when gold is extracted from concentrate etc. "*ASM is driven by poverty, and in developing country scenarios usually involves rather desperate people, for whom survival is more important than environmental or social issues.*"

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)?

The overall question, bearing in mind the major end uses of gold, is whether the world needs so much gold in the first place. But the need for gold will stay in place so long as it retains its 'safe haven' status.

Recycling is naturally important and this should be increased as much as possible. It is likely that the biggest loss of gold is in the recycling of electronic scrap, since a lot of scrap is exported (illegally) from Europe and imperfectly recycled in developing countries before it makes its way into Europe or China. This is probably the most important recycling issue to tackle.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

Modern, large-scale, mechanised mining operations that are active in the developed countries are generally addressing sustainability issues in a better way than in their operations in less well governed places. ASM operations are seldom if ever run in a responsible way, from a sustainability point of view. The performance of ASM operations can be improved, and some projects have attempted that, but the solutions themselves have usually not proved to work in the longer term (e.g. after funding for the initiative ceases).

The major barrier to achieving sustainability at a mine site may be nature itself. Issues of importance include the nature of the ore (as described above) and also of the topography and climate where a mine is situated. For instance, areas like the Zambian Copperbelt are quite forgiving, the terrain is generally flat, and there is enough rainfall to assist vegetation in recovery. But mines in very low-rainfall areas, or in very high mountain areas (like in Peru or the paramo in Colombia) may have very long-term (or permanent) effects on the environment. Wetlands might need to be drained, there may be no flat areas where tailings dams can be built, and so on. The implication is that perhaps one should just never mine in some areas.

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

The strongest component should be the host government. They should be active in governance of the sector, and not leave this responsibility to the companies themselves, or to industry associations like ICMM. "*We have never seen a situation where the host government leaves the field and where industry itself operates perfectly.*" This is an area where the Dutch government might have an impact – assisting host governments with strengthening their governance.

NGO's perform an important role to apply pressure on companies and on governments, make these parties and other stakeholders aware of the issues.

End consumers have very little power or influence.

Banks and pension funds, as investors, may own large shares in the mining companies, but it's not believed that they have had much influence thus far. When a large pension fund has divested from a company, and there are some examples of this happening, that investment has been replaced by another party, without any concomitant noticeable change in behavior of the company.

The most concrete stimulation should be from the host government, and it can be assisted by the Dutch (and other) governments.

Industry associations like ICMM, WGC, etc., are not seen to be neutral, are rather seen to be representing the companies' points of view. Moreover, while ICMM and similar organisations produce a lot of best practice documents, they are not seen to police the behaviour of their members; e.g. when last was a company kicked out of the ICMM for "misbehaving" – has it ever happened?

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

"*Quite a few of these initiatives have become a sort of self-sustaining cottage industry, consulting to and commenting on the ASM sector.*"

Some local initiatives, for instance, to improve the marketability of gold products (coins, bars branded as 'the oldest gold in the world', etc.) may create the possibility to sell some gold at a premium, allowing the company to cover the cost of extra sustainability-related work. This is unlikely to ever be possible for a large proportion of the gold market, however.

### 6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

The most effective interventions by the Dutch government are likely to be:

- Providing policy, governance and technical assistance to host country governance. The focus should be on improving governance systems, but technical assistance for remediation of existing environmental impacts should also be considered.
- Recycling should be stimulated, and the trade in electronic scrap should be controlled better.
- NGO's should be supported to continue their advocacy role.

It is not expected that stimulation through banks and pension funds will have any major impact, nor is it expected that the majority of end users can be stimulated to change their consumption patterns. However, in the longer term, consumers may become better aware; especially if there are alternatives and choices to be made when gold is bought (e.g. I only want to buy gold mined and smelted in Sweden.)

"*Adding any new initiatives to the existing list is unlikely to be useful, there are already too many disparate attempts. Pooling of resources is important.*"

### 7. General comments:

HTW believes this is a very worthwhile and interesting project, and has expressed interest in participating in the round table workshop in June. He is currently involved in research on related (mining governance) topics and is arranging a workshop in Stockholm during September 2015, with focus on the role of government and companies in this respect – focusing on where the "gaps" in responsibility for sustainability related issues may exist.

**Interview Jennifer Horning**
**Solidaridad**

**1 May 2015**

1. What are the main sustainability problems in the gold mining sector?

The biggest sustainability issue for the ASM and small-scale mining sector is the illegitimacy of the sector. Governments see it as *"a nuisance to be cleared",* not as a development priority.

Many of the specific issues (pollution, social issues, etc.) vary per country, but the lack of legitimacy and formalization is a universal problem. It prevents the creation of enabling environments to achieve improvements.

In the large scale mining (LSM) sector there are many impacts, most of which are in some way related to interactions with communities. The improvement of company-community-government interactions is essential from a development point of view, but it's also god business.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)?

It is useful to distinguish between western companies (who have better processing and refining standards) and Asian companies, where there are more environmental and other sustainability issues.

Refineries overall have a smaller impact. There are undoubtedly pollution issues, but there are fewer refineries than mines.

There are labour-related problems in the jewellery manufacturing sector, especially in India.

The main issue with sustainability in the downstream stages of the sector is that there is not enough engagement to have an influence on the upstream component. The current initiatives attempting this are too small and not effective enough.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

No. Barriers include a lack of knowledge within the industry about the solutions. Companies often have a very traditional way of doing things, and are slow to change*. "LSM operators generally don't have a clue about how to engage effectively with ASM, would prefer to clear them off the mine sites."*

Certification is still a new issue for the LSM sector, there are some initiatives to improve this, but these are not coordinated.

Trading and refining companies are not clear about their potential role, but realise that they need to secure supply. There is however an overcapacity in refining and jewellery manufacturing, which weakens the potential impact of small amounts of certified gold coming into their system. Mass balancing is one solution, but with a very physical, visible product like gold, traceability is more important. For instance, buyers of a wedding rings would like to know that the actual gold in their rings came from a clean, sustainable source.

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

The most effective group would be the financial sector. Especially now that there is a downturn in the industry, it is a good time to exert leverage onto mining companies. Financiers always want to reduce their risk, now is a good time for them to reduce other non-financial risks too.

Mining companies do not relate very well to NGO's, they listen better to banks and others in the financial world. Pension funds may possibly be too arms-length as investors, but could possibly be encouraged to engage closer with mining companies.

It is good to involve consumers, but they are not likely to have a driving force, other than trusting that leading brands of (for instance) jewellery and electronics manufacturing are acting responsibly and sustainably.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

These initiatives all have their own strengths and weaknesses.

The Responsible Jewellery Council has a large membership, there are good standards (as written) but it is still seen as an industry association. The governance here could be improved.

Conflict-free Gold: JH has mixed feelings about this initiative. It is good to have this as a catalyst in the Great Lakes Region, but note that such initiatives (also the Dodd-Frank Act) have essentially caused an embargo on countries in the region. And the region only represents a part of the ASM producing world.

There is lots of dialogue conducted under the auspices of the various initiatives, but concrete action and tools are now needed to have a real effect.

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

The Dutch government could be most useful by creating a space to bring together companies and organisations (international, not only Dutch!) to work on a cross-sectoral agenda for the achievement of change.

It would be possible for the Dutch government (for instance) to encourage and facilitate the creation of greater legitimacy and formalization of ASM in developing countries.

Many countries claim to have a dialogue process (cf. the Swiss Better Gold programme) but it is important to bring these together into a collective, international process. The Dutch government has enough credibility to be able to take a leadership role in this regard.

*"It is time to go beyond due diligence and risk reduction, we need to look for bigger solutions."*

7. General comments:

JH is looking forward to participating in the round table on 9th June.

**Responses Joost de Kluijver**
**Closing the Loop**

**18 May 2015**

1. What are the main sustainability problems in the gold mining sector?

JdK has no comments on this aspect, he is not familiar enough with the mining sector.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)?

JdK notes that this is not so much a problem, but presents an opportunity: recycling. This would in his view prevent 99% of the CO2 footprint of the recovered gold (compared to mining of mineral ores), reduces pollution accordingly and creates the possibilities to create income for those parties who are currently encumbered by (what is for them) useless waste. Moreover, western Europe is a world leader in many recycling-related matters, and there is a great opportunity for The Netherlands (among others) to support domestic interests and to do more than merely increase profit for the companies involved.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

JdK states that discontinuing existing processes or experimenting with new ones is difficult for most companies, not to mention huge mining companies.
What he often sees (and assists with) is the step that large (waste treatment) companies want to take towards reducing waste-related problems in developing countries.
There are major risks (reputation, legal, and others) that create barriers for large organisations that attempt this on their own. They therefore like smaller companies/organisations to take these first steps (at times financed by the larger companies) allowing the backers to become known when there is visible success.

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

JdK refers to his abovementioned comments, and suggests that NGO's could play a larger role.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

JdK is not familiar with these initiatives.

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

JdK would advise looking at putting in place incentives, which could spark desired behaviour: Suggests looking at incentives, possibly from a 'negative' angle:

- What developments would lead to companies seeing opportunities to earn something extra (whether directly or indirectly) by acting sustainably (such as the benefits described earlier) or
- What developments would result in companies feeling threatened and forced into sustainable action?

He believes that the Dutch government could help stimulate companies see or create potential opportunities to earn more and support newcomers or competitors who clearly choose for a more sustainable, less environmentally damaging, more social approach. Such assistance could possibly take the form of legal assistance.

The investment policies of institutional investors can also have a large impact.

## 7. General comments:

- These types of questions are in his view too focused on a governmental approach. “Companies are not motivated by the ‘this is a problem and you must solve it’ approach. What is required is a determination of where the opportunities are, and how the market works.” This is in principle similar to the abovementioned approach, but rather expressed as “what knowledge do we have (in The Netherlands or elsewhere) to improve a certain situation and how can a responsible organization use this knowledge for profit as well as gains in sustainability?”.
- The gold supply chain is too diverse (up- and downstream) to improve sustainability for the chain as a whole. He believes that a more successful approach would be to attempt this for individual industries (or individual countries), so that partners and stakeholders can understand and deal with more manageable parts of the chain. This would also facilitate simpler connections between more sustainable behaviour and company marketing expressions. These are often (though sometimes unconscious) reasons for companies to act.
- JdK questioned who was or would be promoting these initiatives: Consumers, members of the supply chain? He sees the best chances for improvements through action by parties who are linked with consumers (end users) but who can also influence production. This points to the producing companies. He suggests that they are less likely to act due to ‘naming and shaming’, but rather by a view of new opportunities, they are companies, after all.

**Interview Laura Gerritsen**
**Impact and Development, Fairphone**

**16 April 2014**

1. What are the main sustainability problems in the gold mining sector?

Fairphone (FP) as an end user. Overall, FP is aiming to make production of phones and materials used as sustainable and fair as possible. Its supply chain is much more complex than e.g. in the jewelry sector as there are thousands of components in a phone.
It is mostly aiming to source from small-scale mining initiatives aiming to support local communities and responsible mining activities as part of a developmental approach. For gold FP is focussing at the moment on Fairmined and Fairtrade production.
Artisanal and small-scale mining is often outside of official governance. Conflict financing has moved from tin and tantalum to gold in e.g. the DRC, easy to smuggle.

- **Formalization** would help to improve the situation in the ASM sector and for local communities, ensure that they
  - are not pushed into illegality,
  - participate in the value chain,
  - can profit from capacity building,
  - have a formal outlet to sell their gold.

FP has less direct insight/no first-hand experience with the problems during large-scale gold mining.

**Traceability** of gold is a challenge as it is used in many components but in extremely small amounts. Production of Fairphone is located in China. The Shanghai Gold Exchange as the agency controlling all import, export, trading of gold is a hurdle in the attempt to trace the gold supply chain as the agency is not completely transparent itself; this makes it very challenging to get a good insight in where the gold used in components comes from and to get gold from responsible sources into China. This is also a problem for other electronics manufacturers in China.

- Role of government or industry associations could be to help establish a **transparent supply chain** into China. China is cooperating with the OECD on the Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas but no full implementation yet.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)?

- **Traceability** aspects as a key issue for end users (see above);

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

- **Host country governments: formalization**
- **Other governments;** diplomatic aspect for NL government, regarding formalization in producing countries, as well as supply chain issues faced by companies at the end of the supply chain in China.

- **Processors and retailers of gold:** should put more attention on sourcing from organizations that aim to make gold production more socially & environmentally responsible instead of avoiding difficult areas; refiners often rather try to avoid controversial countries/regions due to reputational issues (and sometimes customer demands) instead of supporting local initiatives that are doing it well;
- **Industry associations:** could have role in setting up initiatives to enable electronics industry to source from certain mines, creating a transparent supply chain
  → facilitating initiatives to stimulate change; electronics market as an opportunity to make gold supply better.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

- **Fairtrade and Fairmined Gold:** formalization of local producers and supporting sustainable mining initiatives; however, very small amounts still and limited in their approach, which means that it is not possible to expand quickly;
- **LBMA: has also been quite effective, auditing etc. – helps to choose smelters that do not contribute to conflict.**

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

- **Stimulating end consumers to change consumption patterns;**

➔ Broker supply chain initiatives – use diplomacy to make supply chain more transparent
➔ Support initiatives like fairtrade/fairmined/conflict free gold, make them more effective, reach a broader market.

**Interview May Hermanus**
**Council for Scientific and Industrial Research, South Africa**

**1 April 2015**

## 1. What are the main sustainability problems in the gold mining sector?

All of the mentioned issues are of significant importance in both industrial scale mining and ASM, but from her experience, she will focus largely on the South African, large scale industry perspective.

"*Many of the environmental impacts are here today due to decisions made decades ago, resulting in great remediation costs for society today.*"

- Water is the chief issue in a water-stressed country. Acid Rock Drainage (ARD) or Acid Mine Drainage (AMD) are causing great and expensive problems in South Africa today, with extremely expensive remediation required.
- Landscape level issues and effects like sinkholes, and so on, are also important. Also in the context of land use.
- ASM also has a dramatic impact on the landscape, on water use and water pollution, not only due to the direct mining process, but also due to the concentration of large numbers of people, with effects on nearby forests, wildlife, etc as ASM communities also tend to subsist off the land

Socio-economic impacts are just beginning to surface now in SA. We currently have all these existing gold mines (including many old mines) which have left large areas disturbed and sterilized. "*We now need to start thinking about land use choices when new mines are considered: Is mining the right activity for a particular area? What about critical ecosystems? Or do we need this land for agriculture? Can we really afford to mine in all these areas?*" Mining also leads into urban sprawl, also affecting land use.

"*There is an imbalance between real mining input costs (including the externalities) and what value may be achieved by mineral sales. In that context the local added value is particularly important for developing countries. Note that most gold is exported as bullion, allowing other countries to add the value into jewellery, etc.*"

Unemployment-related issues are a significant problem in SA. More R&D needs to be done about modalities for continuing with very labour-intensive operations, or to consider alternatives. Migrant labour related issues are very complex. Work seekers are now attracted from other countries, but historically and at present continue to migrate from poor, rural areas (as a consequence of past government policy). This results in poor people who have to maintain two households, and lots of family and social disruption. The problem is deeply embedded in our social fabric in South Africa.

"*In other countries, surface mining creates enclaves, where equipment and even skilled labour is often imported, but leaving behind environmental problems as long-term legacies.*"

Regarding ASM: here the impacts are enormous, including working women and children, environmental and health impacts. "*Rather than being promoted and strengthened, the activity should rather be tolerated and ameliorated.*"

Smuggling is a big problem. Not only small-scale, there are also sophisticated crime syndicates, sometimes grafted onto the formal sector, so that 'dirty' smuggled gold ends up in the regular large-scale trade. There must have been a lot of collusion to enable it all to work.

Even in a country with relatively strong health and safety standards, health epidemics are associated with mines: TB, silicosis, HIV, etc. These diseases are associated with life in hostels, working in vast, artificially-ventilated areas underground. Health issues are therefore indirectly due to the nature of the large, tabular orebodies, and directly affected by the nature of worker accommodation. Noise underground, in the workplace, is a health issue, but not really noise pollution for surrounding communities. Air quality and dust is a bigger problem.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)?

The fact that "gold is money", that it is mostly exported as bullion, means that other value is added elsewhere, in other countries.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

"*They certainly can make an impact, if they cooperate a lot more, and they don't all do that*". Each company, however, tends to start its own initiatives, so that the overall approach is fractured. There should be more structured cooperation. They could invest more in R&D – innovation, especially on water issues and the creation of local value chains.

Concerning the trend of trading down old and increasingly expensive mines into 2nd or 3rd order companies, with lower costs and lower standards, MH notes that this is indeed a real problem. The state needs to carry some responsibility for all that situation. Governments often do not realise how finite the mining process is, and how long-term the impacts are. More consideration should be given to the entire value chain, as well as all the associated social issues.

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

She supports the idea of 'going with the money' i.e. influencing the organisations that manage investment: banks and pension funds. "*These institutions should think more in terms of mining as only one part of a coherent value chain.*" Mining is also at the centre of many other issues, including urbanisation, climate change, and so on.

NGO's have a role, but MH thinks that complete win-win situations are never going to happen, largely due to the land use choices that have to be made. Long-term policies have to be put in place. It is important to consider post-mining landscapes and land use.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

The different existing initiatives all flag different issues. Many represent or address ASM issues, rather than the large-scale mining industry. Some involve different interest groups, for different reasons. This is probably the reason for the proliferation of initiatives.

"*Regarding initiatives that aim to address ASM issues, the entire thinking needs to change, to ensure that people are not trapped in an industry with extreme environmental, health and social. With that in mind, it would be better to support initiatives that work on a policy level, like OECD.*"

Many well-intentioned people are involved the work of the ICMM, and they are surfacing the right issues. The structural issues around mining (like the externalities, difficulties to consider mining operations of different sizes, land use issues, etc.) however makes their work difficult.

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

Does not support setting up yet another initiative.

Technical assistance by the Dutch government would be very useful, especially if this can address post mining land use and related issues. However, merely facilitating, or supporting, is a ‘hollow idea’, real money is required to make things happen, to make actions happen, to be able to involve the required resources.

Regarding governance, lots of work has already been done on this topic. It is difficult to think of something useful that could be added to the existing documentation, for instance. It would be more useful to determine why so many of these documents and guildelines do not translate into actions on the ground. In order to create improved governance, it may also be necessary to for government departments to change the way they work, for example to ensure that employees there feel more empowered in their work. This points to institutional changes which are context specific.

**Interview Paula Dobbelaar**
**Waterschap Aa en Maas**

**18th April, 2015**

In view of Ms. Dobbelaar's experience with the "Waterschap Aa en Maas", rather than any experience with the mining sector *per se*, it was deemed not useful to conduct the standard interview. Instead, we discussed the cooperation between the *Waterschappen* and water management related institutions in South Africa, specifically in an area impacted by gold mining. Contact details for Ms. Dobbelaar were provided by colleagues in the Ministry of Foreign Affairs, who were aware of this cooperation.

The *Waterschappen* (regional water authorities) are cooperating with South African water authorities on a ministerial level, and this cooperation includes assistance during the setting up of Catchment Management Agencies (CMA's) for a number of water catchment areas in SA. Of particular reference is the Catchment of the Vaal River and more specifically the Upper Vaal catchment (one third of the Vaal catchment area), which is impacted by large scale mining (including gold mining) in and around Johannesburg.

The cooperation with the South African authorities is on an equal basis (both parties learning from each other) and from the Netherlands side, involves many Regional water authorities and is therefore coordinated by the Union of regional water authorities (Unie van Waterschappen).

A Memorandum of Understanding has been signed between the parties, which is active until the end of 2016. Dutch participation is funded by the *Waterschapsbank*. One of the focus areas is the sharing of knowledge and assistance with capacity building within the new Catchment Management Agencies that are being set up. A strong water governance focus.

Ms. Dobbelaar participated in a visit to South Africa late in 2014 and during February 2015, during which time they visited Kimberley (diamond mine) as well as a gold mine. She noted that some individual operating mines have rather advanced water treatment systems, making it possible to purify acid mine drainage (AMD) water to drinking water quality. (She mentioned sampling it, too.) Apparently the mine in question has the legal obligation to do this treatment at its own cost and does so. She noted the technical similarity between the mines' water treatment facilities and those used in The Netherlands for the treating of (sewage) water.

There are clearly opportunities for water-related cooperation between the two countries, and for that matter, business opportunities for mines and agencies in South Africa, and engineering/consulting firms in The Netherlands. In that context, it was noted that DHV Haskoning is already present and active in South Africa on quite a large scale.

Proposed policy and action options for the Ministry of Foreign Affairs, could include:

- Utilising the existing cooperation between the Dutch *Waterschappen* and the South African CMA's, to facilitate capacity building and water monitoring and management systems.
- Facilitate cooperation between Dutch engineering and consulting firms (DHV Haskoning and Witteveen+Bos, for instance), and South African authorities like the CMA's, the CSIR, etc., to investigate opportunities to extrapolate current water treatment activities into old mining areas where there is no longer a large-scale mining operator, but where mining waste and AMD is a problem.
- Other opportunities could be in the field of EIA's (environmental and social impact assessments) and public participation. Exchange of experience from the NL to SA and vice versa. Possible input from the MER commissie?

**Interview Saskia van den Dool-Gietman**
**Senior Advisor Responsible Investment, PGGM Investments**

**13 April 2015**

1. What are the main sustainability problems in the gold mining sector?

Mining companies in general are involved in a lot of sustainability issues, almost all environmental, social and governance issues are relevant. For the gold mining sector in particular chemical issues and tailings are relevant, and therefore also health impacts for workers and communities.
In our engagement with mining companies we have given most attention to the relationships with communities, such as conflicts on land, conflicts on water and expectations on employment offered by the mine. The "license to operate" of a mining company is very dependent on how it deals with these relationships with communities. For investors this is therefore also a very important issue, because if mining projects do not get off the ground because they lack a "license to operate" the financial health of the company can be impacted significantly.
As shareholders we deal only with LSM. But sometimes these big mines have relationships with ASM in the surrounding areas by buying the ores etc. And if companies secure concessions in areas were artisanal miners are active, this can create serious liabilities for companies as their efforts to keep people from their land can lead to serious conflicts.
The artisanal miners are often luck seekers from outside the region, which adds to the complexity of maintaining good relationships with the communities. It gets unclear then who the communities are and conflicts may arise within communities between original inhabitants and newcomers. Also: there are many communities in ever wider circles around the mine, so how far does the responsibility of the mine to offer employment stretch?

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)?

We have had only very limited involvement with downstream companies. Traceability seems the main issue, which of course hampers initiatives like "fair gold".
Recycling is mining of the future, also for gold.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

There are big differences in the sector, some companies seriously want to address the issues, but others don't. These companies profit form lower costs by not spending on environmental, health and community issues. This means there is no level playing field in the mining sector, making it difficult for the companies who want to address issues to stay competitive.
Another important barrier for companies to address the issues is that the political component is difficult to manage. In countries with poor governance, it is not clear where returns generated by the mining sector go to. Rules can change easily and monitoring and enforcement are weak.
Gold mining companies can also become a puppet in the political game, which for instance happened with Goldcorp in Guatemala. If local politicians portray all foreign (mining) companies as representatives of capitalism which are only interested in profiting from the mineral resources of the country, there is no way anymore to do good as a company.

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

The most important stakeholders are the host country governments, which need to set clear rules for the longer term and ensure monitoring, transparency and enforcement.

This does not solve the problem of a lacking level playing field, however, as mining companies compete on a global scale. On how to ensure a level playing field there is no simple answer. Some progress has been made with agreements on the OECD or UN level on all kinds of sustainability issues, but implementation differs between different countries. This does not mean such efforts are useless, it remains good to try to get everybody at the table to look for solutions.

Another way to contribute to a level playing field is pushing “free riders” in the mining sector to take their responsibility. Banks and pension funds can certainly play a role in that respect. On behalf of our clients, PfZW and other pension funds, we engage with companies. Since last year this is no longer organized per sector, but by six themes: climate, water, health, governance, human rights and a sustainable financial system. This means that we do not engage with all companies in our portfolio on all themes, but engagement with mining companies can still be part of our thematic engagement.
Apart from this, we have mandated GES in Sweden to engage on our behalf with companies involved in controversies, often relating to human rights, environment and corruption. Among these are often mining companies.
Pressure by banks and pension funds on mining companies has proved to be effective in some cases. The Indian company Vedanta Resources was forced by banks to deal with several of its conflicts with local communities. We are not there yet, but something has been set in motion. Similarly, pension funds were able to force Goldcorp to make a human rights impact assessment of its activities in Guatemala.

But there is never one solution for change in complex commodity chains like this one. It is always good if similar questions are raised by different stakeholders - NGOs, buyers, shareholders. This creates movement among companies.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

We do not have experience with specific initiatives for the gold sector. What we used as guidance to benchmark companies are the ICMM principles. Within this framework, ICMM-members are continuously exchanging experiences on how to deal with issues. It is a continuous learning process on how to implement the ICMM-principles, which brings the companies step by step further in the process.

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

A new initiative does not make sense, but it could be worthwhile to evaluate existing initiatives and stimulate Dutch players (traders, processors, financiers) to participate in the initiative which seems to be most relevant and promising.
Assistance on technical, legal or governance issues to host country governments would also be relevant, maybe the Netherlands could embed such assistance in development cooperation programs it already has in place with one or two countries. But it is questionable if the Netherlands are best positioned to do this as we are not a big mining country, we are not the experts.
As part of its policy focus on stimulating the circular economy, the Dutch government could also step up efforts to promote gold recycling.

**Interview Terry Heymann**
**Director Gold for Development, World Gold Council**

**29 May 2015**

1. What are the main sustainability problems in the gold mining sector?

With respect to large-scale mining (LSM):

- The industry has worked hard to address environmental impacts. "I think that water use, and sharing of water rights between large-scale miners and local communities – is a critical issue that requires further attention."
- I also think that "the industry needs to do more to explain the economics of gold mining; and how they contribute to local and national economic development. More transparency around the costs of mining is required, in order to address concerns related to tax avoidance and to help promote fair distribution of the economic benefits of gold reserves."
- The issue of economic impact is not that companies per se need to have a larger economic impact. It's that the economic impact that they do currently have (which is often large) is not recognised or properly accounted for because we don't yet have well-understood tools for measuring the broader economic impact that responsible mining companies can have (beyond payment of taxes and royalties, important as these are).

Regarding artisanal and small-scale mining (ASM):

- Unfortunately there are many environmental concerns associated with ASM, including use of mercury and poor handling of chemicals and waste products.
- Health and safety conditions associated with ASM are also, again unfortunately, at a low standard, leading to many injuries and long-term health implications.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)?

The most urgent issue is the use of cadmium in certain manufacturing facilities (particularly in India).

The industry should also be doing more to provide confidence to consumers related to responsible sourcing; and demonstrate that each step in the supply chain has appropriate controls in place to exercise due diligence on their sourcing of gold (particularly in relation to conflict areas, but also to promote responsible business practices more generally).

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

There has been much work undertaken over the last few years to address sustainability issues; in particular, the formal part of the gold supply chain (in contrast to the informal, which includes much artisanal and small-scale mining) has made significant progress over responsible sourcing (in particular with respect to conflict areas) and environmental practices.

"*One of the biggest challenges remains how to integrate artisanal and small-scale miners into the formal trade. It's something of a 'Catch 22' situation: While they are not formalized, it is hard to get accepted by formal actors; while they are not accepted by formal actors, it is hard for them to formalize (and improve practices, including legal registration and tax payments).*"

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

NGOs have played an important role in pushing for change in the gold supply chain. These calls for change are most effective when they work to understand the way the gold supply chain works and therefore suggest changes that are evolutionary rather than revolutionary in nature.

National governments, particularly in OECD countries, could do more, to help downstream companies understand what they should be doing as it relates to responsible sourcing.

Institutional investors, including pension funds and others, are increasingly using "sustainability" criteria as an input into their investment decision-making. This is good, but sometimes their criteria are very "one-dimensional" which can lead to bad outcomes.
It is great that institutional investors are increasingly incorporating sustainability criteria in their reporting. "*However, they overwhelmingly tend to focus on examining what companies are doing to mitigate negative impacts rather than assess the role the company can play in promoting positive impacts. The first is obviously critical and all companies should be held to account. But looking only at how companies mitigate negative impacts is only looking at one side of the coin.*" In addition, the way that many of these assessments are made often follows a very "formulaic" approach that does not take into account particular circumstances and situation-specific responses.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

I have a biased view, since the World Gold Council developed the Conflict-Free Gold Standard, which I think has been a major development for the industry; the first industry-led approach to defining responsible business in a conflict-affected area.

The Better Gold Initiative is interesting, but has yet to demonstrate impact.

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

I think that the Dutch government should focus on the jewellery sector in the Netherlands; bring together designers and retailers and challenge them (in a supportive manner!) to "re-invent" their business model so that they use responsibly-sourced gold. "*If the trade expresses a commitment to purchasing responsibly-sourced gold, the upstream part of the gold supply chain will respond.*"

**7.** General comments

TH believes that this is a very interesting initiative and would be pleased to offer any assistance that he can, to support it.

**Interview Thomas Hentschel**
**Better Gold Initiative**

**26 March 2015**

1. What are the main sustainability problems in the gold mining sector?

- **ASM:**
  Environmental, socio-economic and health problems are all relevant. Mining is a very heterogenic sector which makes it difficult to generalize.
  In addition, questions of legality play an important role. A big issue in ASM is formalization, which covers all important issues, i.e. respect of environmental laws, workers' rights & contracts, health & safety. However, depending on the mining system and the country the initial situation differs.
  Interesting entry point would be to facilitate harmonization of legislation on a regional basis: e.g. Andean or African gold mining countries. This could include harmonization of tax legislation and export rules to help prevent smuggling. However, this is not going to be an easy task as it impacts on the national sovereignty.
  → It would be important to analyze what is happening already, experiences, level of awareness. There are already several moves to create more harmonization also via certification.
  → It can be expected that an involvement of the Netherlands would be appreciated by the traditional donors. Also here it is important to achieve a coordinated / harmonized approach.

- **LSM:**
  Environmental problems are more or less under control, there are sufficient mechanisms in place and in the case of LSM development cooperation should not play a role.
  Social conflicts are more prevalent, related to effects on the local communities, the distribution of earnings and other issues.
  The issue of mineral governance is a topic that would need more attention: revenues are generated, but what is being done with them? Mining income should also lead to useful investments for the local population or region.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, refining, consumption and recycling)?

Rustic refining in production countries should not be supported; it is unnecessary as actual refining will usually be done in LBMA-certified facilities. It is rather used to avoid traceability, as fingerprinting is then no longer possible.
Recycling in industrialized countries is not connected to serious sustainability issues. However, this is still the case in developing countries.
Consumption is more a national problem: are consumers willing to pay more?
→Overall, there is no isolated issue downstream that can be easily connected to international cooperation work, except maybe raising consumer awareness.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

The LSM is focused on the upstream supply-chain segment; there is no interest to go further than that. LSM companies and trading companies are already able to ensure environmentally sustainable production;

An estimated 20% of gold is ASM-produced and thus partly outside of formality; for them it is more difficult to solve problems themselves. Policy issues should best be approached via governments, regional authorities, initiatives like African Mining Vision, through the creation of solid framework conditions.
Trade of ASM-gold takes place via local traders and intermediates; new traceability regulations mean that producers do not have the required papers, with the consequence that they receive less as intermediaries beat down the price. Gold is smuggled out the country, and via detours enters back into the formal streams. Formalized ASM should be motivated to export directly.
→ While the big players have the means to deal with sustainability issues, the small players have to deal with intermediaries, obscuring of origin etc.
→ Formalization is a recurring issue!

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

- **Host country governments;**
- **Processors and retailers of gold; Better Gold Initiative (refiners & brand companies)**
- **End consumers; create awareness of the sustainability issues;**

→ All these stakeholders can contribute, at least on an information and sensitizing level;
→ It should be ensured that communication is taking place in a way that none of the stakeholders is trying to be in the foreground / taking the stage. Aim should be a neutral, serious, fact-based information campaign.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

- Better Gold Initiative: brings together the whole supply chain, however, focus is on ASM, large players are only involved if they collaborate with ASM;
- Conflict-Free Gold: related to industry meeting legal requirements; this should be and is already self-evident;
- Fairtrade and Fairmined Gold: this is a niche market, also due to lack of consumer interest and high costs. As long as there is a lack of market interest there is little stimulus to get certified.
- Initiative for Responsible Mining Assurance: only LSM: this initiative is still under development, difficult to evaluate at this stage how effective it eventually will be.
- Responsible Jewellery Council: It has many members including big brands but focussed on downstream, so not covering the whole supply chain. It is of less interest for mining companies as they already have other certifications and do not see direct advantage

→ Ideally different segments should work together; it should not be purely based on subsidies, but include a proper cost-benefit analysis: what is the eventual impact?

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

- Setting up a new international initiative: Certainly not. It should rather be chosen to cooperate with existing initiatives.
- Stimulating Dutch traders, processors and retailers to participate in an existing initiative: Yes, inform them and encourage them to participate in discussion process.
- Stimulating banks and pension funds to exert more influence on the companies they are investing in: Yes.

- Providing technical assistance to host country governments on issues like water pollution, health or taxation: Yes, and taxation is certainly and interesting issue, especially on a cross-country / sub-regional level; environmental issues should be seen holistic and not limited only to water pollution.
- Stimulating end consumers to change consumption patterns;
- Stimulating recycling: yes, but it is doubtful that much more can be achieved in this sector.
- Supporting NGOs: this requires a balanced approach and should not be the only effort.
- Others:
  - The best entrance point for the Netherlands also depends on the focus countries for development work – where are the closest relations?
  - As the Netherlands are not playing an important role in mining – industrial as well as ASM – it would be interesting to see for which related sectors there is know-how.
  - Formalization as a key issue – can the Netherlands play a meaningful role in that?

**Interview Ton Boon von Ochsseé and Peter Veenhoven**
**Ministry Foreign Affairs of the Netherlands**

**1 April 2015**

1. What are the main sustainability problems in the gold mining sector?

We are not experts on the gold sector, but from literature we have the impression that the main (social) problems are to be found in the artisanal gold mining sector. We favour the integrated ecosystem management approach, which gives priority to addressing the environmental impacts by looking at how (local) people can deal with those environmental in ways which optimize their livelihoods.

2. What are the main sustainability problems in the downstream stages of the gold sector (trade, processing, consumption and recycling)? Please mention one or two and indicate which problem needs to be addressed most urgently.

No opinion on this question, up to the trade organisations and experts to identify.

3. Are the mining and trading companies in the gold sector able to address and solve the mentioned sustainability issues effectively? Why or why not (what are the barriers)?

We are working on *IMVO Convenanten (Agreements on international corporate social responsibility)* for various sectors in the Netherlands. In this framework we have discussed with various players in the gold sector. From this experience, and from talks with trade organisations in other sectors, we think the companies in the gold sector experience the following barriers in addressing the sustainability issues in the gold supply chain:

- There is reluctance to talk about sustainability issues in the gold supply chain, as talking about such issues already could tarnish the reputation of gold jewellery as a luxurious, enjoyable product. But the sector starts to realise that the discussion will not go away by closing its eyes for it and that it is better to be part of the discussion;
- A lack of good knowledge on what kind of issues are relevant in which countries and in which stages of the supply chain, and how they could be addressed. The report we are working on could play a role in this respect;
- The perception that the Netherlands is a relatively small player in the gold sector and that it is not possible for Dutch companies involved in the gold sector to change the whole global gold sector;
- The secrecy surrounding this sector, which makes it difficult to identify and understand supply chains.

4. Which other stakeholder groups could be most effective in stimulating the mining and trading companies in the gold sector to address and solve the mentioned sustainability issues effectively? Why and how can these stakeholders be effective?

In our work on *IMVO Convenanten (Sector agreements on international corporate social responsibility)* we reach out to trade organisations. We do not talk about problems, but we talk about risks and on how can you reduce these. And about what the government can do. We offer them help to deal with the issues in their supply chains which they think are most relevant. And we help them to discuss possible approaches with trade unions and relevant NGOs. We do not strive for broad sector agreements, as this makes it difficult to take concrete initiatives. We strive to focus on specific supply chains, for instance for specific minerals. But it is up to the trade organisations to define for which supply chains and subsectors they feel the need to address the sustainability risks and to try to take initiatives.

This applies as well to the agreement for the financial sector which will be guided by the SER. This agreement can offer banks and other financial institutions the advantage to improve their reputation and show leadership with regard to the other sector agreements. By the nature of their operations, financial institutions have links with all the different sectors. This does not mean that banks should be at the table when other sector agreements are discussed. Banks could for instance draft a standard clause on their contribution, which could be included in each sector agreement. In such cases the government can act as a clearinghouse, by giving support to cross-sectoral initiatives.

Initiatives focussing directly at end consumers do not seem very necessary in the gold sector. This would be necessary when the main traders and processors in the sector would not be interested in addressing sustainability issues without consumer pressure. But in the gold sector it is not so difficult to get the attention of trade organisations. When the government draws their attention to sustainability issues in their supply chain, they are of course interested as they do realize the huge reputational risks involved.

5. Which of the present initiatives which aim to improve the sustainability of the gold industry is most effective? Why and how are these initiatives effective?

We do not have an opinion about that, but the Dutch government could play a role (through this research report) to inform industry players about the effectiveness and (dis)advantages of the different existing initiatives. This could help Dutch industry players to link up to one or more of this international initiative.

6. What could the Dutch government do most effectively to stimulate mining and trading companies in the gold sector to address the most urgent sustainability issues in the sector?

It does not make sense to start another standard-setting initiative in the Netherlands. But the Dutch government could look at a pilot which develops a supply chain for sustainable gold (based on existing standards). This could become a showcase which sets an example for other countries and the broader gold supply chain. This pilot could focus on Colombia, a country which wants to deal with the issues linked to mining in a good way. Focussing on Colombia would also be politically important, as the Dutch government criticised coal mining in Colombia. It would be good to collaborate with Colombia to really improve the situation in the gold sector.

The main thing the Dutch government should do is promote collaboration, with trade organisations and also with NGOs and trade unions. A positive movement is important. The government offers trade organisations to make a sector risk analysis and to identify sector opportunities, but the trade organisations should take the initiative and let the government know what they expect us to do and who should be on the table.
This collaboration should also extend to other relevant countries. Not necessarily many countries, the priority is to be effective in one or more showcases. Collaboration with Switzerland, which has set up the Better Gold Initiative, could be a very good choice.

# Appendix 4 Main commitments National Round Table on Gold

The commitments made during the afternoon workshops during the National Round Table on Gold in June the 9th were put into a poll during the last plenary meeting of the day. The participants could vote with a “yes” or a “no” if they deemed this commitment significant. All the commitments were voted as important with the exception of one which was insufficiently clear. Below the commitments are listed per workshop.
Due to time pressure, some commitments were displayed incorrectly to the audience. The texts of these commitments are corrected here. Also not all commitments of the workshops could be discussed and a maximum of three commitments per workshop was maintained. A full overview of all commitments can be found in the ’ Report on the discussions and outcomes of the National Round Table on Gold (June 9, 2015 in The Hague)’
In between brackets the percentage of the participants in the Round Table which voted “yes” is indicated.

### Workshop 1: Colombia, formalization and mining as an engine for growth

- Commitment by Tessa Terpstra (Ministry of Foreign Affairs): The Dutch government will explore the possibilities through the Dutch Resources Facility (fund to improve resource governance in developing countries through capacity building) to contribute to the formalisation of the gold mining sector in Colombia. (91%)

- Commitment by Filip Delalieux (Schöne Edelmetaal): Schöne Edelmetaal will explore the opportunities to source a part of their gold - via certified refineries - from formalised and certified mines in Colombia. (88%)

### Workshop 2: Conflict Free Gold from the Great Lakes Region?

- Commitment by Sonia Kalauzova (Philips): Philips is committed to steer its supply chains for all conflict-minerals to source only from conflict-free smelters. (94%)

- Commitment by Rein Nieland (European Commission): The EU is committed to its integrated “Conflict minerals strategy” (2014) and pledges support to governments, civil society, SMEs and international organisations working in to that direction. (95%)

- Commitment by Sandra Pellegrom (Ministry of Foreign Affairs): The Dutch government commits to look seriously into funding proposals for new projects that support Conflict-Free sourcing from the Great Lakes region. (83%)

### Workshop 3: Water & gold mining. What can the Netherlands do? Focus on South Africa

- Commitment: All partners from research, governance and business commit themselves to work towards creating a broad platform on water and mining issues and to deliver the content for the platform, with active contribution from different stakeholders to ensure that the platform becomes an instrument for change. (78%)

- Commitment by all participants: The platform will share and showcase knowledge from the Netherlands and will help to build capacity in Colombia, South Africa and the Sahel with technical, environmental, governance and production expertise. (82%)

- Commitment by all participants: NGOs, mining companies, Witteveen and Bos, the Dutch government, DHV Haskoning, Waterschappen and engineering firms can work together on building coalitions as well as cooperate to further implementation of water management programs in the mining areas of South Africa and Colombia. (74%)

### Workshop 4: Urban gold mining in NL and overseas

- A recommendation made by the workshop participants: Look at increasing the number of collection points for electronic waste and make them more visible, to increase the current 30-40% recycling rate for e-waste. (89%)

- Commitment by TNO: TNO commits to work together with others towards a circular economy.

- Commitment by the Ministry of Economic Affairs: The Ministry will set up database with information on the (conflict-free supply) chains of vendible metals. (61%)

### Workshop 5: Financial actors in the gold chain pushing for responsible mining

- Commitment by ING: ING commits to apply all relevant CSR standards when gold mining companies apply for loans and will stimulate other banks, especially EP-signatories, to do the same. (83%)

- Commitment by DNB: By law pension funds have to report on CSR issues. DNB aims to start with an investigation to gain insight into what pension funds have done so far regarding responsible investments. (91%)

- Commitment by Ministry of Foreign Affairs: The Ministry of Foreign Affairs will organize a dialogue with the Dutch mailbox companies owned by (gold) mining companies in the framework of sector agreements on International CSR. (85%)

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