



# Case Study:

GOTS® GoldTrace solution for Certified and Fair Gold Trading Chains in conflict-affected and high-risk areas.

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# Background

## Risks in the Supply Chain of Gold from Conflict Areas

Figure 2. Risks in the supply chain of gold from conflict-affected and high-risk areas

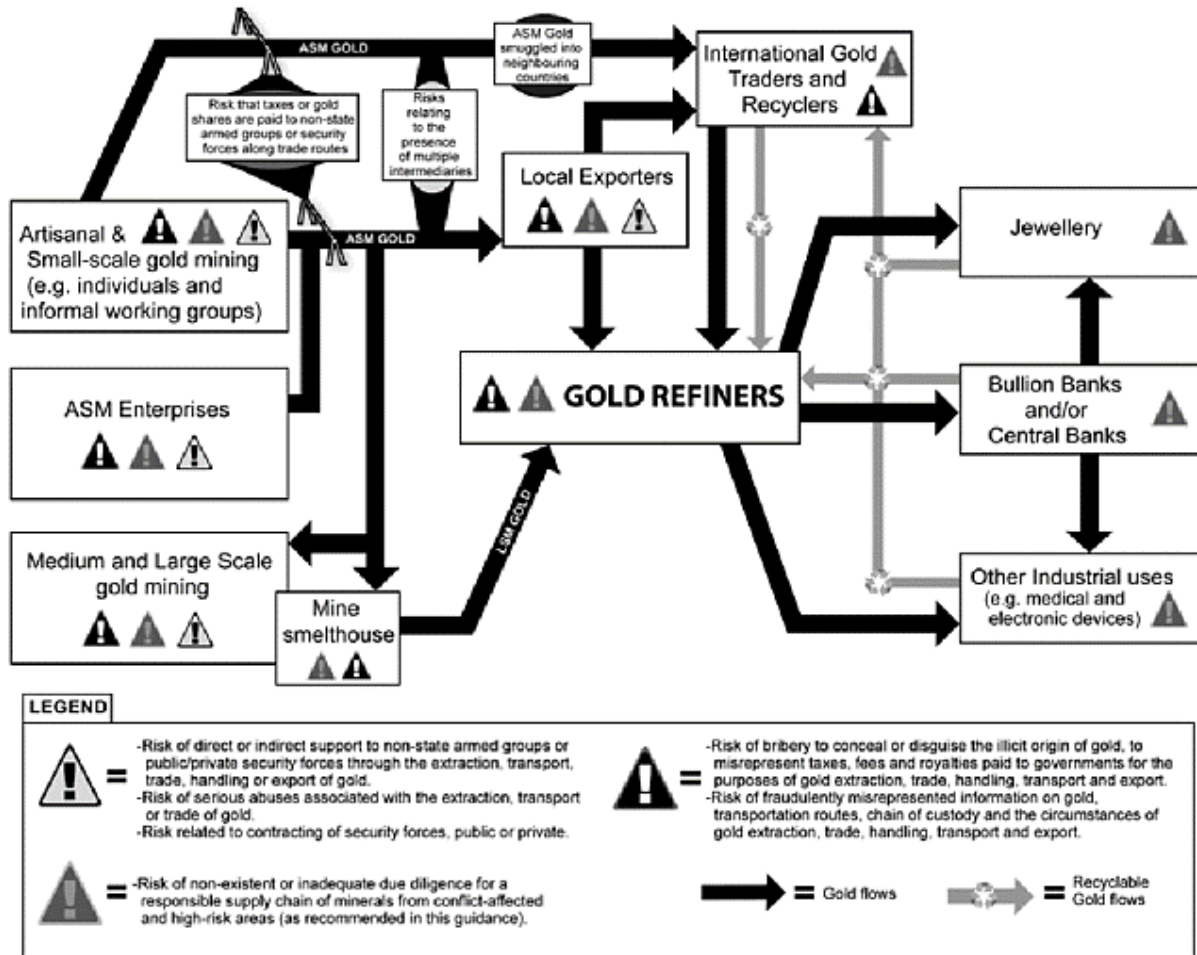


Fig. 2: Risks of the Gold Trade Chain at Conflict Areas.  
Source: OECD<sup>1</sup>, 2012.

The guidelines of the OECD regarding risks of artisanal Gold Trade Chains from Conflict Areas (OECD, 2012) are based, analog to those regarding 3T, on a Top-Down concept; which regards as a vital interest for Refineries the ability to exclusively sell certified materials to their customers. It must be noted that contrary to Tin, Tantalum, and Tungsten supply chains with their relatively limited and closed Markets, this goal appears to be less promising for Gold due to a variety of factors like for example the amount of material processed at the destination markets, the liquidity of gold as pay medium analog to money, and traditions in the handling of gold as jewelry. However, efforts to involve the refineries at the destination countries in the process of certifying gold origin continue. This will work better in the long term when the sources of illegal non-certified raw gold are dried up, driven by market forces which, as previously stated, prefer sourcing Fair Gold from certifiable mines and trade chains.



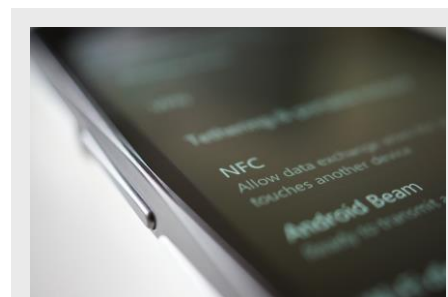
# GOTS® GoldTrace Solution

The solution comprises six main Component Groups:

1. Tamper-proof transport bags with a durable adhesive sealing mechanism and optical color change after sealing. The transport bags are equipped with a labeling field, as well as an integrated RFID-based electronic seal with permanent encrypted data storage which records transaction data of the traceability process as well as a unique serial number which is also physically printed on the bag. This data is, thanks to the complex cryptographic process used, protected against read attempts from unauthorized 3<sup>rd</sup> parties. Attempts to tamper with the bag's content are signaled by color and shape changes.
2. Identity cards (ID) for the trading actors and entities which take the form of an electronically readable seal that can be integrated in keychains, identity cards or other representation mediums.
3. Mobile read- and write devices protected against splashing water with unique Device-IDs and a normal mobile phone connection.
4. A mobile GOTS® GoldTrace App, which is specifically authorized for usage and installation on a device with the specified unique Device-ID. The App reads data from digital IDs and past transactions out of the Transport Seals to check the causality of a transaction (Place, Chronological Order, Tolerance of Process-related Information and Authorization). Afterwards it writes to the electronic seal an encrypted combination of digital IDs and Transaction Data of all involved process steps. It also transmits a copy of this encrypted data back to the central online database.
5. GOTS® Online Database to administer IDs, transaction data records, data reports and analyses. Access control based on roles and IDs permits fine-tuned control of which specific data records are available to each actor of the process. Therefore, unauthorized access to data is reliably prevented.
6. GOTS® Webservices to provide access to data as allowed by the existing access control rules. Through GOTS® Webservices it is possible to import/export data from/to 3<sup>rd</sup> party systems; generate individualized Tables, Reports, Analyses, or Maps to meet specific needs; and interactively synchronize data with external systems.



*Personal RFID ID-Cards supporting advanced digital identity certificates and hardware-based data encryption.*



*The GoldTrace App is compatible with low-cost, readily available Android phones with NFC support.*



The GOTS® GoldTrace Solution was developed with special consideration to the specific challenges found in conflict-affected and high-risk areas in Africa, reliably certifying Fair Gold trade chains with Fair sources. In comparison to traditional IT Solutions for Certified Trading Chains, commonly based on Barcode or RFID identities, GoldTrace provides the following advantages for the Process Owner:

- No requirement for permanent online operation: Areas without network coverage are tolerated thanks to in-device data caching and smart data synchronization mechanisms which permits delayed transmission of data based on mobile network/signal strength conditions.
- Trustworthy Fair Trade Chain Auditing schemes, based on secure process documentation, strong identity management, transaction logging, and audit-based certification of provenance.
- All transaction data is stored inside the transport bag for later synchronization and to support due diligence checks.
- Low cost for end users: Compatibility with widely available Android-based smartphones provides a significant infrastructure cost advantage.
- Integration with SERCAM® GOTS® Global Object Tracking System: Provides a real-time geographical visualization of trading chains based on precise GPS measurements at all contact points with the tracked ware.
- Advanced Digital Identity Management: Allows in-depth control of the assignment/revocation of roles and permissions to each person and device involved in the Certified Trading Chain process.
- Local and International Law Compliant: Each implementation of the GOTS® GoldTrace Solution is precisely tuned to comply local and international Laws and Regulations regarding Certified Trading Chains for Gold, Fair Trade, and related Extraction, Processing and Export processes.

Furthermore, GoldTrace also introduces a series of security mechanisms that allow trustworthy certification of Trading Chains in Multi-stakeholder environments:

- All governmental authorities are able to access all detailed data about involved identities and Transactions throughout all steps in the Certified Trading Chain process. Similarly they are able to view, edit, further process, export and download statistical data.
- Only the regulatory body in charge of registering and sanctioning the operation of mines in the country is able to create, modify or revoke digital identities.
- Only regulatory bodies are allowed to authorize the sale of gold from the Mine to intermediate traders. Similarly, only regulatory bodies are allowed to authorize the sale of gold from intermediate traders to exporters.
- The generation of Export Certificates is only possible in authorized administrative portals which are installed at the offices of the responsible regulatory body. Optionally, a data export interface can be constructed between this administrative portal and the hosting organization's own IT systems.
- Authorized gold extraction cooperative representatives can access and export statistics regarding their own cooperative. Similarly, authorized mine representatives can access statistical data regarding their own mine. Intermediate traders, smelters and exporters have access to statistics regarding their own buy/sell transactions.

<sup>1</sup>OECD. (2012). "OECD 2013 Due Diligence Guidance for Responsible supply Chains of Minerals from Conflict-Affected and High-Risk Areas 2nd Edition Supplement on Gold November 2012" ©OECD publishing. ISBN 987-92-64-18501-2, Supplement on Gold.