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Blockchain, Traceability, and Monitoring for Brazilian Gold



Table of contents

Blockchain, Traceability,
and Monitoring for
Brazilian Gold

5	KNOWING THE ORIGIN OF GOLD	State-of-the-art technology in lieu of paper receipts 7 <i>Blockchain: The technology that is the forest's ally</i> 8
9	HOW TO TRACK AND MONITOR GOLD?	Structure 11 Records 12 Key Steps 17 Agents involved 19 Alerts for effective surveillance 20
23	THE PRIVATE SECTOR CAN NOW MOVE FORWARD	Steps that the private sector can now pursue 25
27	TRACING THE ORIGIN OF GOLD IS NECESSARY, AS IS CHANGING THE RULES OF THE GAME	



KNOWING THE ORIGIN OF GOLD



With the implementation of a system capable of certifying the origin of Brazilian gold, the country would have a powerful tool to restrain deforestation and human rights violations, optimize enforcement actions, curb illegal trade and increase transparency across the entire mineral sector.

Therefore, Instituto Escolhas studied the market's characteristics to better understand the institutional and regulatory gaps that prevent greater control over its production chain. The result is an innovative system of traceability and monitoring of the exploration and marketing of gold, using blockchain technology and molecular tags that can be easily adopted by the government and businesses.

The urgent need for Brazil to have a traceability system becomes evident when we know that the country commercialised an alarmingly high 229 tonnes of gold with serious evidence of illegality between 2015 and 2020¹. This is nearly 50% of the national production.

¹ Instituto Escolhas. Gold under the microscope: more than 200 tons of Brazilian gold are potentially illegal. São Paulo, 2022. Available [here](#).



Photo: Bruno Kelly / Amazônia Real

STATE-OF-THE-ART TECHNOLOGY IN LIEU OF PAPER RECEIPTS

The trading of Brazilian gold does not require proof that the metal was extracted from an authorized area, nor that its extraction complied with environmental norms. Many transactions are still made using paper forms and invoices, such as the gold sold by by wildcat miners to securities companies (“*Distribuidoras de Títulos e Valores Mobiliários - DTVMs*”). Read more about it [here](#).

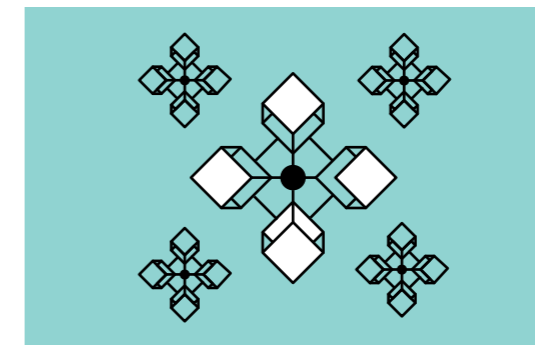
Wildcat mining (garimpo) in the Amazon forest.

And, not incidentally, most of this gold came from the Amazon. Today, the area occupied by the *garimpos* (wildcat mines) in that region is already larger than the area of industrial mining in the whole country². In indigenous territories alone, where mining is illegal, the number of gold mines has grown fivefold in ten years and there have been constant episodes of extreme violence against native peoples. This scenario is only sustained because there are no controls over the origin of Brazilian gold, not even tools to monitor the extraction to ensure, at minimum, that it will only occur in regulated areas and with proper environmental and social controls.

² Mapbiomas. Expansion of Mining and Garimpo in Brazil over the Past 36 Years. August 2021. Available [here](#). Portuguese only.

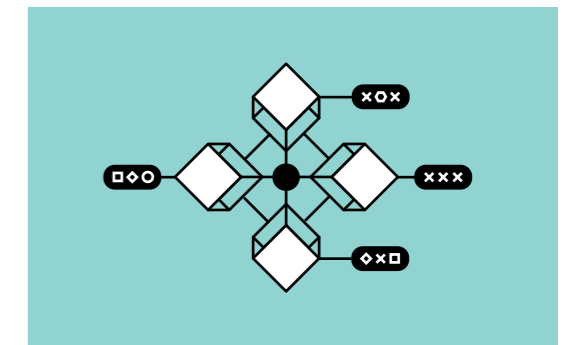
BLOCKCHAIN: THE TECHNOLOGY THAT IS THE FOREST'S ALLY

1.



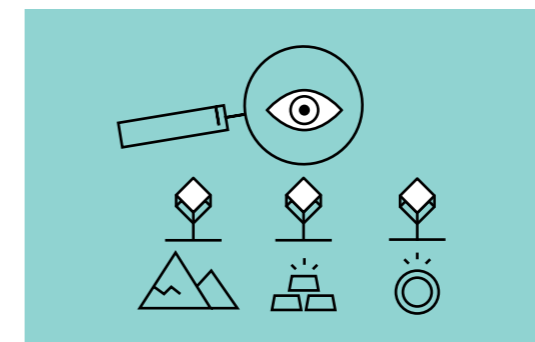
Blockchain technology can be defined as a sequence of digital records (blocks) connected to each other, forming a chain.

2.



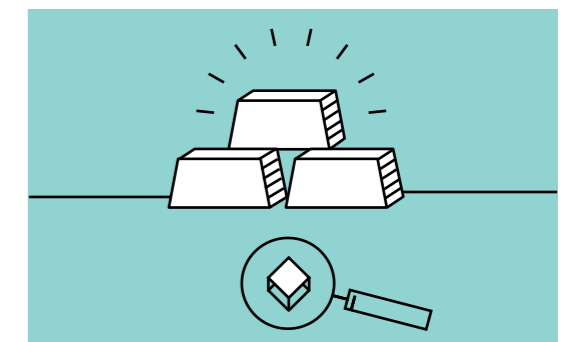
Each record is assigned a unique identifier and cannot be altered without “breaking” the chain, ensuring the security of the information.

3.



Thus, *blockchain* facilitates the monitoring of production chains, such as gold, since all stages - from extraction to the final consumer - can be securely recorded in the chain.

4.



This makes it possible to guarantee the origin of the gold circulating in the market, making it a major ally in protecting the forest and its people.

1. STRUCTURE

The system for tracking and monitoring gold must be digital, with trusted and secure records. For this, the technology known as DLT (Distributed Ledger Technology) is recommended. This is a distributed database, in which users enter the information that is to be recorded in a *blockchain*³. All records must be connected and they must be publicly accessible, allowing for social monitoring and transparency in the industry⁴.

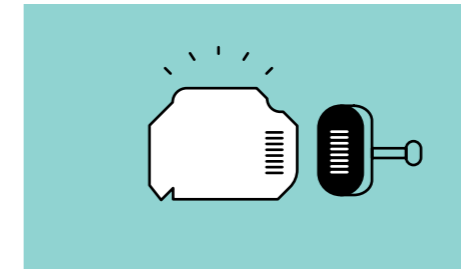
³ These records may receive time stamps and unique codes (hashes), which are incorporated into other records, creating a connection between the different information links (blocks) that form a chain of records (chain).

⁴ Except for information protected by fiscal confidentiality, whose access would be restricted to the competent bodies.

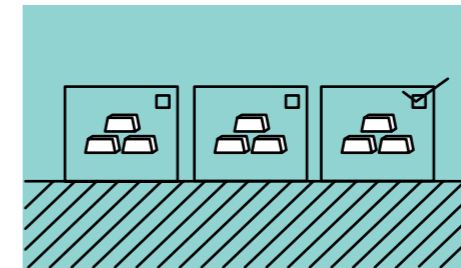


2. RECORDS

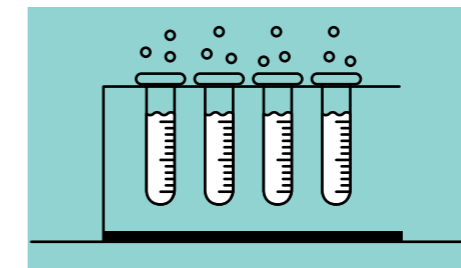
2.1 Physical Tagging



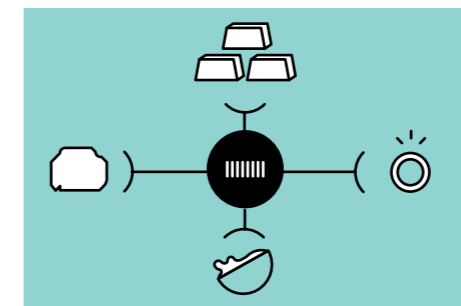
To ensure the origin of the gold until it reaches the end-user, it is essential that the metal be physically tagged before leaving the extraction area.



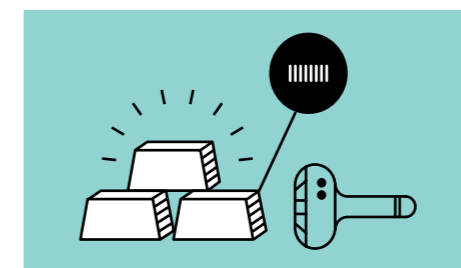
This creates a unique batch for a given volume of gold, preventing it from being handled by unauthorized persons or from being mixed with gold mined in other areas.



This can be done by adding silver isotopes to the gold, which respond to certain light frequencies, such as ultraviolet, for example.



This tagging – which is maintained both in the solid and liquid state and does not break down during refining processes – can be converted into an alphanumeric code that is later read by devices programmed to recognize it⁵.



In other words, it is a technique that creates a molecular bar code for gold. The technology is being used in other countries⁶.

⁵ A discussion of methods for molecular tagging as applied to fighting fraud can be found in Smith, A. F., Skrabalak, S. E. (2017). *Metal nanomaterials for optical anti-counterfeit labels*. *Journal of Materials Chemistry C*, 5(13), pp. 3207–3215. doi:10.1039/c7tc00080d.

⁶ *Security Matters and Perth Mint to establish 'world first' traceable mine to market gold solution*, July 29, 2020. Available [here](#).



2.2 Electronic Invoicing

All handling and trading of gold must be registered and accompanied by Electronic Invoices (NFe). This requirement should be valid for the entire national territory, since paper tax documents, as is still the case for gold, increase the possibilities of fraud and weaken controls.

Currently, the Brazilian Federal Revenue Secretariat sets the fiscal document standards for gold as a financial asset - which is sent from the garimpos to the financial institutions - and even allows them to be printed⁷. For the rest of the gold, commercialised as merchandise, there is no national requirement to use

the electronic format either.

The issuance of printed invoices is anachronistic and should be revisited, as is already provided for in Bill 836/2021 and recommended by the Federal Prosecutor's Office itself, which comments: *"How can we uphold effective mechanisms to guarantee the origin of gold if the primary basis of its proof must be filled out by machine and with copies made using carbon copy paper? As we have seen, these ideas and practices are out of time and place in a digital and interconnected contemporary world."*⁸

In addition, it is essential that the NFe contain information about the transport of the gold and its origin, as detailed below.

⁷ According to Normative Instruction Nº 49, of May 2, 2001, of the Federal Revenue Secretariat, of May 2, 2001.

⁸ Brazil Federal Public Prosecutor's Office. Coordination and Review Chamber, 4. *Mineração Ilegal de Ouro na Amazônia: marcos jurídicos e questões controversas*. Brasília MPF, 2020.

2.3 Gold Shipment and Custody Forms

In addition to invoices, there are still no other documents that allow tracking the gold shipment and custody flows across the country⁹. Therefore, it is essential that **Gold Shipment and Custody Forms (GTCO)** be issued, similar to what is used in other sectors, such as timber¹⁰.

The GTCOs would be digital and issued by the holder of the gold before the metal is transferred to another person or company, successively, throughout the supply chain, including accompanying exports. In other words, they would be issued initially by the miners, then by the dealers, refiners, gold exchanges, banks, jewellery stores, until they reach the final consumer. When buying a piece of gold jewellery, for example, the consumer would receive this digital documentation that would be attached to the item

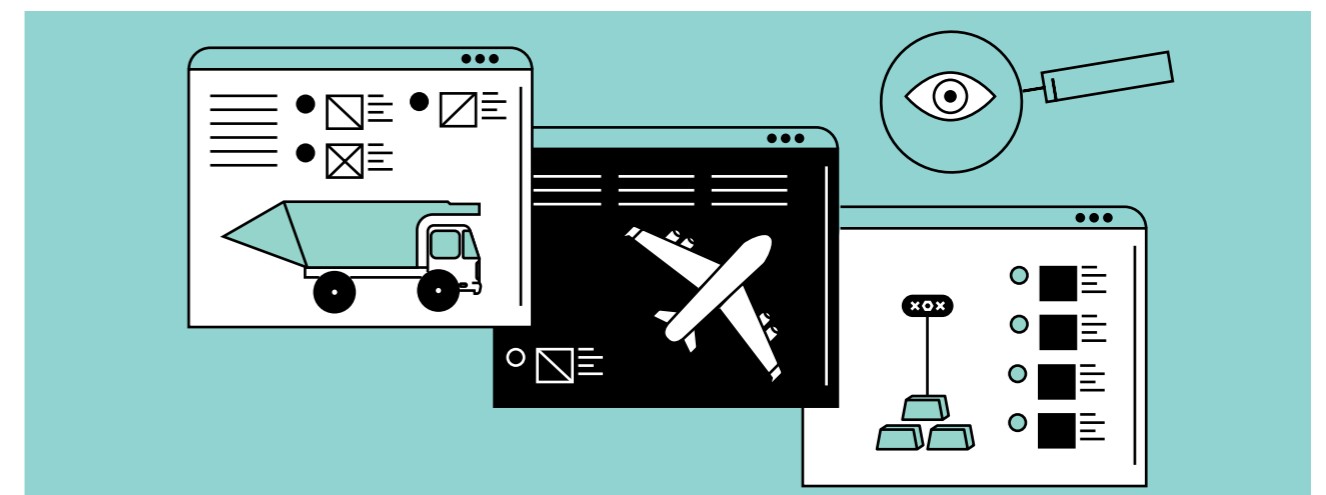
and, in the case of again transferring it to a jewellery store or financial institution, these would make a new GTCO registration in the system.

The GTCO must include, besides the information of the issuer and receivers - such as corporate and personal tax ID's, name and address -, the quantity of gold shipped and under custody, the number of the gold batches, the information of the batches, the number of the mining and environmental licences, the purpose of the shipment, the means of transport and the vehicle licence plates or registrations. The GTCO must also register the electronic invoice number (NFe) that accompanies the shipment, just as its number must be registered on the NFe.

To increase security for the gold shipment, it is also recommended that the GTCOs contain information about the drivers of the vehicles and that they be monitored by GPS.

⁹ The Normative Instruction Nº 49, of May 2, 2001, of the Federal Revenue Secretariat, sets out the fiscal documents for operations with gold as a financial asset or currency exchange instrument and, among them, the Gold Financial Asset Transit Form and the Gold Dispatch Invoice to cover the shipping of this type of gold. However, they are insufficient to establish a record and control of the entire handling and custody of gold throughout the country, whether it is a financial asset or a commodity.

¹⁰ Regarding forest products, shipping and storage is logged using the Forest Origin Document (DOF), issued electronically in a system made available by Ibama, in accordance with Ibama Normative Instruction No. 21 of December 23, 2014. It is worth noting that the MPF itself has already recommended that a similar system could be implemented by ANM to control the origin of gold (see reference on the previous page).





2.4 Registries

It is necessary that companies and people who are allowed to sell and buy gold be registered, with updated and annually validated registrations. Only they must be given access to the gold traceability and monitoring system to perform transactions and enter records. This facilitates the control of transactions and accountability in case of fraud or non-compliance with the requirements.

Thus, mining companies, garimpos, Securities Companies (“*Distribuidora de Títulos e Valores Mobiliários – DTVMs*”), stock exchanges, banks, and jewellers will be duly registered with information on those responsible for making sales and purchases. In the case of DTVMs, authorized by the Central Bank to buy gold from wildcat miners, the Central Bank itself must be responsible

for providing the register and for updates¹¹. Individuals who are only end consumers of gold, such as investors or jewellery buyers, would not be required to register, since the transaction records – NFe and GTCO – would be made by the legal entities involved, including providing the information for these individuals in the system.

In the case of gold from garimpos there is an important caveat. Law 12.844/2013 establishes an extensive list of persons able to carry out the sale of gold to authorised financial institutions¹², including all members of the garimpo chain, such as airline pilots, supply traders, fuel oil suppliers, among others. In other words, anyone with any involvement with garimpo can sell the gold, which is a vulnerability when establishing such controls¹³. This should be modified, as the Brazilian Senate Bill 836/2021 already proposes.

¹¹ Through Resolution 103/2022, the ANM established the National Register of the First Acquirer of mineral goods from the Mining Permit Regime, so that the minerals from the garimpos, including gold, are sold only to those who are listed in the register. However, as the Instituto Escolhas had already pointed out during the public consultation process carried out by the ANM, the penalties for those who do not comply with the rules are lenient, in addition to other weaknesses that can be read [here](#) (Portuguese only). Therefore, it is important that the Central Bank also be involved in registering the financial institutions authorised by it to buy the gold from the garimpos.

¹² According to art. 41 of Law 12.844/2013.

¹³ This shortcoming has also been pointed out by the MPF in the aforementioned document “Illegal gold mining in the Amazon: legal frameworks and controversial issues”.

¹⁴ According to Art. 6 of Law 7.805/1989, which establishes the Mining Permit regime, the ANM (formerly DNPM) may request the presentation of research projects if deemed necessary.

¹⁵ According to Annex VIII of Law 6.938/1981, which stipulates the National Environmental Policy, the activities of extraction and treatment of minerals are considered to have a high degree of potential polluters and users of environmental resources.

2.5 Titles, Reports and Plans

In a gold traceability and monitoring system, the mining processes should all be logged. They should not overlap with protected areas where mining is not allowed - including Indigenous Lands not yet ratified - and should be cancelled in such cases.

All areas must also register their Economic Use Plans (“*Planos de Aproveitamento Econômico - PAE*”) to allow monitoring of gold extraction flows. This requirement does not yet apply to garimpos, since they are exempt from mining research, although by law the National Mining Agency (“*Agência Nacional de Mineração – ANM*”) can charge for research work, if it deems it necessary¹⁴. This defi-



2.6 Environmental Licences and Documents

The holders of the mining processes must register in the system the environmental licences and vegetation suppression authorizations granted by the competent environmental agencies, in addition to the registration of gold in the Annual Reports of Potentially Polluting and Resource Using Activities and the certificate of compliance with IBA-MA’s Federal Technical Registry of Potentially Polluting and Resource Using Activities¹⁵. The records and validity of these documents must be continually monitored.

During the first sale of gold, the holders of the mines must also present and register these documents in the system to certify their “environmental licence”. The digital “environmental licence” would be assigned a numerical code in the system and would track subsequent movements and sales.

ciency needs to be revisited, since without the PAE and knowledge of the reservations, it is not possible to ascertain whether a given area is producing or commercialising gold beyond what is physically possible. All areas must also record their production in the Annual Mining Reports (“*Relatórios Anuais de Lavra - RAL*”), which is already a requirement and needs to be monitored.

Also, during the first sale of gold, the mining holders must present and register the documents which prove their “mining licences”, that is, the valid mining title and the registration of the last RAL. This digital “mining licence” would be assigned a numerical code from the system, and would accompany subsequent transfers and sales.



3. KEY STEPS

Extraction

(A)**PHYSICAL TAGGING**

It is essential that the gold receive a molecular tag, made with silver isotopes, before leaving the extraction area. This will assign it a unique batch, which can be identified if the metal is handled by unauthorized persons or mixed with gold taken from illegal areas.

(B)**TITLES AND LICENCES**

All extraction titles, licences and environmental documents must be registered in the gold traceability and monitoring system. Titles may not overlap with Indigenous Lands and Conservation Units where mining is not permitted, including Indigenous Lands not yet ratified.

(C)**PRODUCTION CONTROLS**

Gold extraction must occur only within valid title areas and production must be reported in Annual Mining Reports (RAL). Operations need to register Economic Use Plans (PAE), which is not yet required of garimpos.

Shipping

(D)**GOLD SHIPMENT AND CUSTODY FORMS (GTCO)**

Any transfer of gold must be accompanied by a GTCO, issued by the holder of the metal prior to its transfer to another person or company and complementary to the invoices and the Gold Transit Form¹⁶. GTCO will ensure the registration of all transfers, including the number of the gold batches.

¹⁶ Issued for gold financial assets, which leave the garimpos to financial institutions or cooperatives, according to the Normative Instruction N° 49 of the Federal Revenue Secretariat, of May 2, 2001.

(E)**ELECTRONIC INVOICES (NFE)**

The transfers must also be accompanied by NFes, including those of shipment, returns or ancillary documents, containing the number of the gold batches and of the GTCO. For gold shipments and receipt of refining units, when metal in rougher forms is transformed into bars, the incoming and outgoing NFes and GTCOs must indicate the batch numbers sent and contained in those products.

(F)**MONITORING**

To make the transfers even more secure, it is recommended that the vehicles used in the transport be monitored by GPS and that their plates or identifying numbers be registered in the GTCOs.

Sale

(G)**FIRST SALE**

The first sale of gold, immediately after extraction, must be carried out only by the holder of the authorised area and of the environmental permit¹⁷. It cannot be carried out by other individuals who are involved in the business, such as airline pilots or diesel oil salesmen, for example.

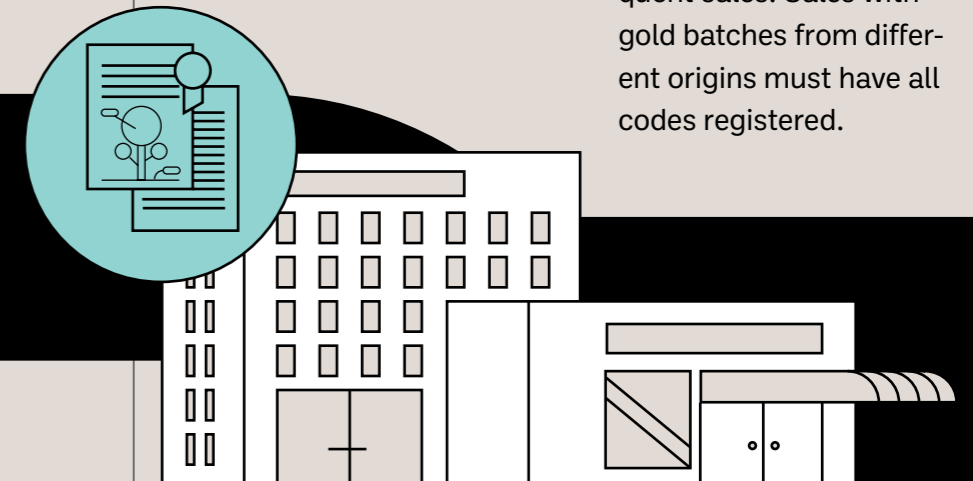
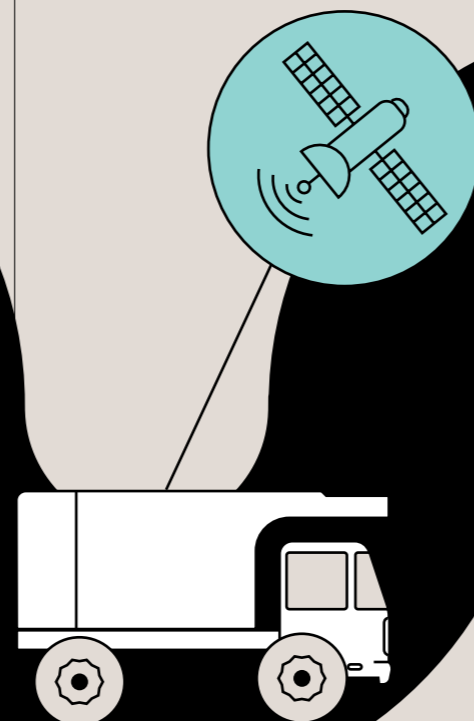
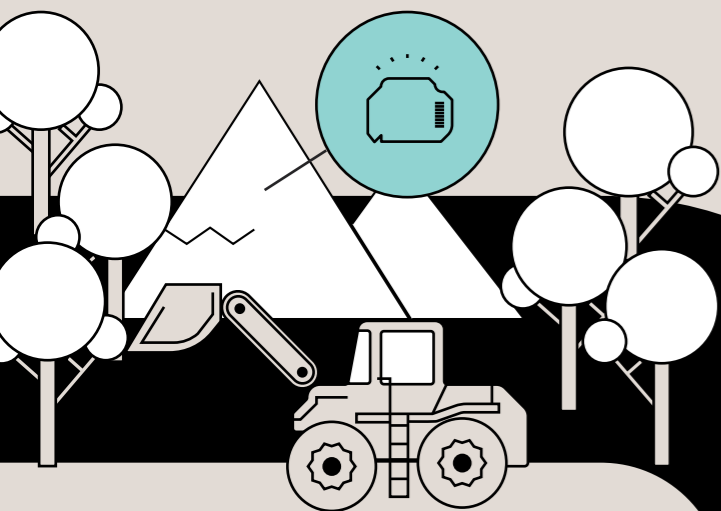
¹⁷ Or by a person who has power of attorney.

(H)**MINING AND ENVIRONMENTAL LICENCE**

The sale of gold shall be conditional on the presentation and registration of mining (extraction title and latest RAL) and environmental licence (environmental licence and documents). These documents must be registered in the system during the first gold sale, assigned a numerical code that will also accompany subsequent sales. Sales with gold batches from different origins must have all codes registered.

(I)**FISCAL AND SHIPPING DOCUMENTS**

All sales must be accompanied by GTCO and NFe, containing, besides the usual information, the mining and environmental licence codes, the gold batch and GTCO numbers. Buyers of gold, whether individuals or legal entities, must keep the NFe and GTCO records.





4. AGENTS INVOLVED

The users of the gold traceability and monitoring system would be those involved in the extraction, movement and commercialisation of the metal. Namely, government agencies, companies and individuals. All should have their transactions registered in the system on *blockchain* records.

The coordination and management of the system would be the responsibility of the National Mining Agency (“*Agência Nacional de Mineração - ANM*”)¹⁸, given its competence to inspect the sector, along with the supervision of the Ministry of Mines and Energy (“*Ministério de Minas e Energia - MME*”)¹⁹. Institutions such as the Central Bank and the Federal

Revenue Secretariat should also provide information, validate and inspect records, and invoices, such as those related to financial institutions that commercialise gold from mines and to invoices.

Environmental agencies, Funai, ICMBio and Inpe must also be connected to the system. Its databases allow, for example, analysis of the validity of environmental licences for mining processes and verification of situations such as overlaps with protected areas, processes with signs of extraction beyond the authorised limits or processes called “ghost titles”²⁰, which commercialise gold but with no signs of extraction taking place.

¹⁸ The ANM already possesses some digital systems for registering and monitoring information and making it available to the public. Therefore, what is proposed is a fusion of the systems, in addition to the creation of new records and monitoring and the use of technologies such as *blockchain* to provide greater security to the information.

¹⁹ The Secretariat of Geology, Mining and Mineral Transformation is responsible for supervising the control and inspection of the exploration and production of mineral assets in the country.

²⁰ To learn more about “ghost titles”, refer to the work of the Instituto Escolhas, “Gold under the microscope: more than 200 tons of Brazilian gold are potentially illegal”. Available [here](#).

5. ALERTS FOR EFFECTIVE SURVEILLANCE

With a robust and reliable digital system where processes, transfers and gold transactions are recorded, it will be possible to monitor and analyse this data in an integrated manner. An alert system can and should be implemented by the National Mining Agency to identify processes that do not comply with legal and administrative requirements and to identify suspicious operations.

5.1 Data

A reliable database is the first step in implementing an early warning system for the supervision of gold operations. It should include:



DATA ENTERED BY SECTOR AGENTS

Mining processes, licences and other environmental documents, annual mining reports, economic development plans, identification of mining and environmental licences, Financial Compensation for Mineral Exploration (CFEM) receipts, Gold Shipment and Custody Forms and registries of people and companies able to sell and buy gold.



DATA RECEIVED FROM OTHER BODIES

Financial institutions authorised to buy gold from wildcat mines (Central Bank), electronic invoices (Federal Revenue), environmental documents (Ibama and state and municipal secretaries), demarcations of Indigenous Lands, including those not yet ratified (Funai), demarcations of Conservation Units and Management Plans (ICMbio) and satellite images (Inpe).



5.2 Alerts

With an integrated database, it is possible to automatically cross-reference information and create alerts for various situations. They may indicate, for example, the need for on-site inspections, denial or cancellation of mining processes, suspension of processes for changes and even the punishment of those involved. Situations that can and should be monitored include:



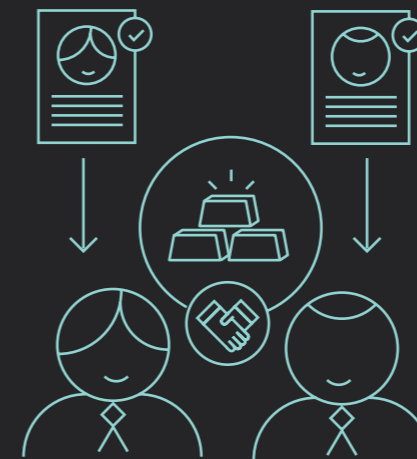
→ Are there overlaps of the mining processes with Indigenous Lands or Conservation Units?

→ Are there mining processes operating without the proper licences and environmental documents?

→ Do the volumes of gold from the same mining process, recorded in the CFEM receipt and in the various GTCO and NFe, exceed what is being reported in the RAL and PAE and documented reserves?

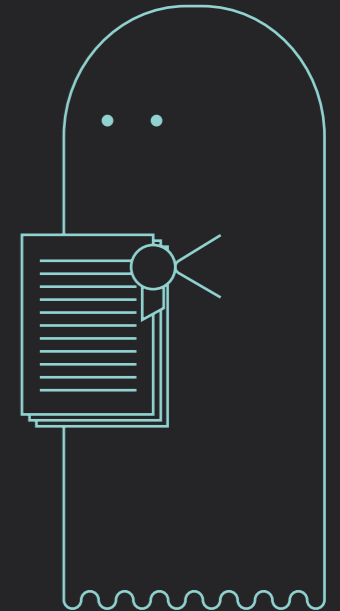
→ Are there records of unusual gold volumes reported in the CFEM, GTCO and NFe receipts linked to the same mining process?

→ Do buyers and sellers of gold registered in NFe and GTCO correspond with the registries of persons and companies able to sell and buy gold?



→ Are there records of CFEM receipts and transactions in GTCO and NFe from mining processes in which there is no visual evidence of activity occurring (“ghost titles”)?

→ Are there records of CFEM receipts and of GTCO and NFe transactions from mining processes in which there is visual evidence of activity occurring beyond the authorized geographic limits?



→ Are there records of CFEM receipts and GTCO and NFe transactions without information on the mining processes of origin?



THE PRIVATE SECTOR CAN NOW MOVE FORWARD



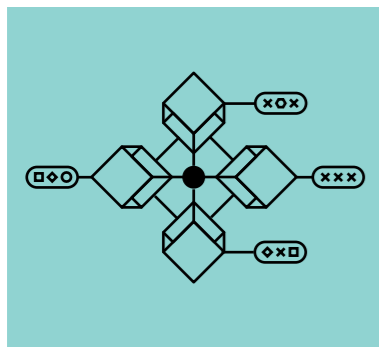
While a gold traceability and monitoring system is not yet mandatory, it can and should be voluntarily adopted by the private sector. By doing so, companies can certify to their clients, in Brazil or abroad, their commitment to the legal origin of the gold, dissociating themselves from forest destruction, mercury contamination and human rights violations, all of which occur mainly in the Amazon.

All those who mine gold should adopt the steps indicated here to safeguard the metal's origin. DTVMs, banks, stock exchanges and jewellery stores should only buy gold that follows all traceability steps and is accompanied by physical tagging, batch number, GTCO and mining and environmental licences. The companies themselves should have their own registration system to provide these safeguards to their clients, who, as end consumers, may require them.



STEPS THAT THE PRIVATE SECTOR CAN NOW PURSUE

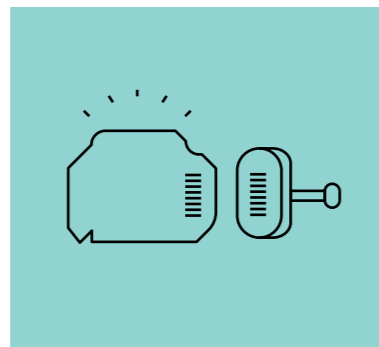
1.



BLOCKCHAIN

Companies can use a digital system using *blockchain* technology to record all information about gold mines, transfers and transactions and verify them to buyers. They must be entered with the identification of the user and the time of registration, being linked to each other, which confers security, since any alteration must require a new registration in the system.

2.



PHYSICAL TAGGING OF GOLD

At the mining site, even before the gold goes to the refining units, it must receive a physical tag, forming a batch, which can be tracked to its destination. For this, molecular tagging technologies with silver isotopes, for example, can be used.

3.



MINING AND ENVIRONMENTAL LICENCE

Companies must register in the system the documents that prove the legality of the mining (mining licence) and the environmental requirements (environmental licence), in addition to giving them an identification. When commercialising gold, they must be presented, and their identification must appear on fiscal documents and on the gold transport and custody forms, in addition to the batch number.

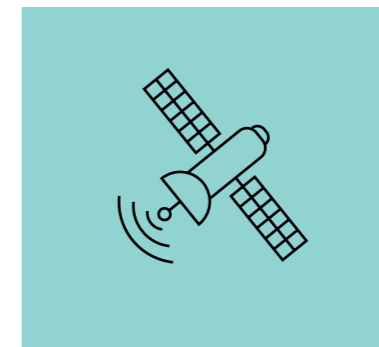
4.



NFE AND SHIPMENT AND CUSTODY FORMS

Electronic Invoices (NFe) and Gold Shipment and Custody Forms (GTCO) must be registered in the system and accompany all gold transfers.

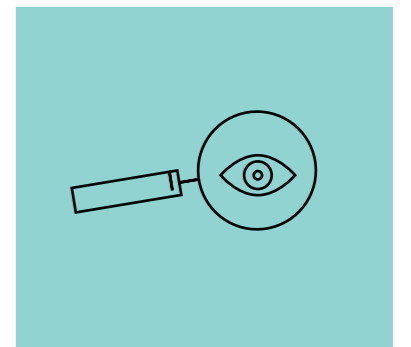
5.



OTHER TECHNOLOGIES

To prove the legality of the mines and the security of the gold transfers, companies can use satellite images, or even drones, monitor their vehicles with GPS and record and present this information to buyers.

6.



ADHERENCE, AUDITS AND CERTIFICATION

It is important to follow up on the documents and records regularly through an external auditing process. All companies can adopt traceability mechanisms and encourage high uptake across the industry. This could unite and optimise auditing efforts to certify the origin of the gold.



TRACING THE ORIGIN OF GOLD IS NECESSARY, AS IS CHANGING THE RULES OF THE GAME

This document lists a series of mechanisms that should be adopted by public authorities and private agents to ensure the traceability of Brazilian gold. Furthermore, there is a legal framework that needs to be overhauled, since it allows the quest for gold to move forward in broad daylight, encroaching on the Amazon Rainforest and Indigenous Lands.



DOING AWAY WITH THE IDEA OF “GOOD-FAITH” IN GOLD TRANSACTIONS

Law 12.844/2013, which deals, among other issues, with the shipment and commercialisation of gold from garimpos, facilitates the process of “gold laundering” and makes it difficult to hold accountable those involved. Under the law, wild-cat miners or any agent involved in the business, when selling gold to institutions authorised by the Central Bank, the DTVMs, need only fill out a paper form indicating the origin of the metal. There are no checks or controls.

Therefore, it is very easy to sell illegal gold as though it came from a legitimate area. Moreover, if the DTVMs store these forms, the law stipulates that their purchases were made in good faith, exempting them from liability. As the Instituto Escolhas has shown²¹, there is a conflict of interest in these transactions, since the owners of the DTVMs, their family members or partners may own gold mines and be the sellers of the gold themselves. These rules must be scrapped, proper controls must be required and those involved must be held accountable.

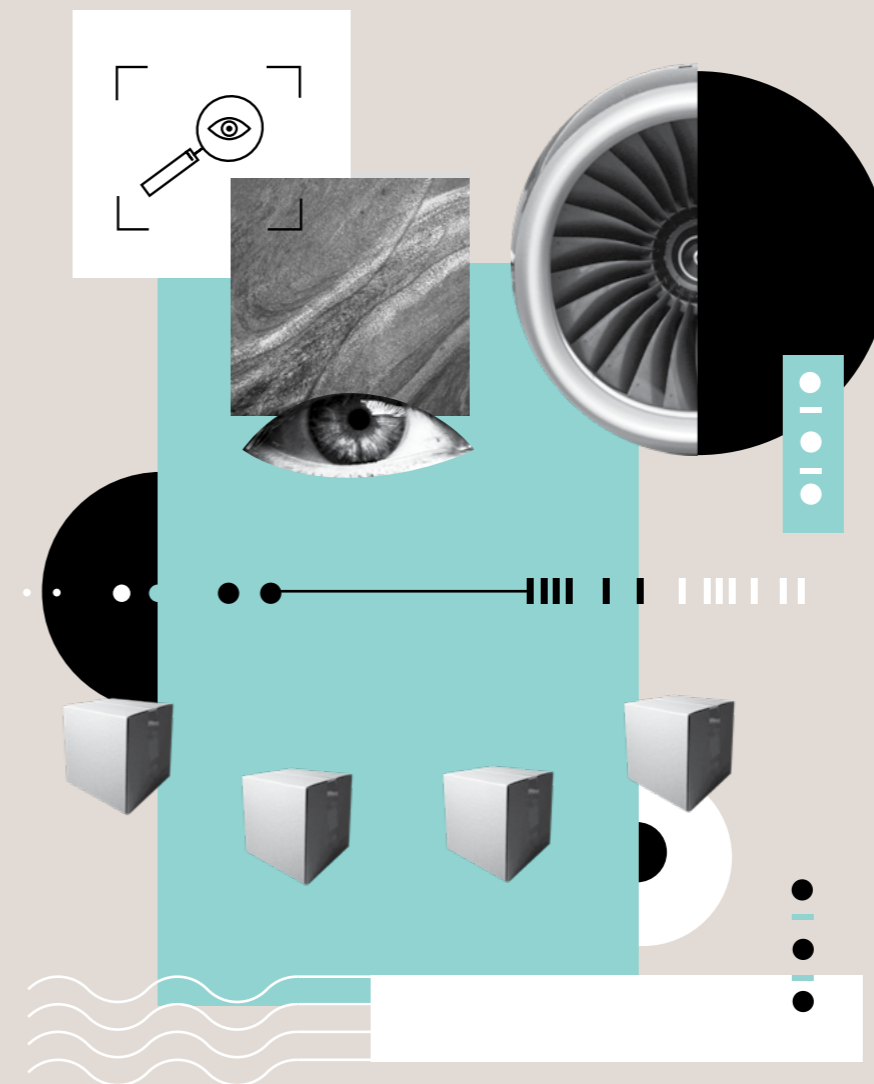
²¹ Instituto Escolhas. Gold under the microscope: more than 200 tons of Brazilian gold are potentially illegal. São Paulo, 2022. Available [here](#).

MONITORING GOLD IMPORTS FROM BRAZIL

To gold traceability, it is crucial that importing countries, the destination for virtually all gold mined in Brazil, also require controls at the origin. They could classify Brazil as a high-risk, conflict area for their imports and monitor purchases. The European Union, for example, already has legislation in this regard, but has not yet listed Brazil among countries to be monitored. However, it will likely be listed shortly. Other countries will probably adopt the same procedure.

DIGITISE ALL PROCESSES AND DOCUMENTS

The digitalisation of all processes and documents, as proposed here, is essential to ensure the traceability of gold. It is necessary that the ANM proceed with this digitalisation²² and that the Invoices that accompany all transactions with gold, anywhere in the national territory, be electronic²³.



²² There are already references in laws establishing that the ANM should proceed with the digitalisation of processes. Ordinance DNPM Nº 361/2014, which regulates documentation relating to the first acquisition of gold from mines by institutions authorised by the Central Bank, in accordance with Law 12,844/2013, established in § 2 of Art. 4 that the body must provide for the digitalisation of all procedures.

²³ Normative Instruction No. 49 dated May 2, 2001, and issued by the Federal Revenue Secretariat, which regulates the fiscal documents for operations with gold as a financial asset or foreign exchange instrument, needs to be updated in order for these documents to be electronic. This should also happen for operations with gold as a commodity and, therefore, for those state regulations that govern fiscal documents.



APPROVAL OF BILL 836 FROM 2021

Bill 836/2021, which is in the Senate, needs to be supported, approved and implemented. It lays the foundations for a traceability system for gold sold to financial institutions, requiring Electronic Invoices and proof of mining and environmental licence. It also retires the use of the principle of good faith that governs these transactions, and provides for the digitalisation of information.

ELIMINATING THE BENEFITS GRANTED TO WILDCAT MINING

The wildcat miners are a long way from operating on an informal and rudimentary scale, they act as true industrial organisations. Therefore, the legal treatment that benefits them must end, since they undermine environmental and labour standards and inspections. To this end, provisions of Law 7.805/1989, which institutes the Mining Permit Regime, of Law 11.685/2008, which institutes the Statute of the Wildcat Miner and of Decree 9.406/2018, which institutes the new mining code, must be revised.

It is necessary to require from the garimpos mining research²⁴, indication of reserves, economic development plans, strict environmental licencing and labour contracts and controls. The permits given to individuals should also be limited in number, since today a single person can have countless permits, which sums up to enormous extraction areas.

²⁴ Art. 6 of Law 7.805/1989 establishes that the ANM (former DNPM) can order the presentation of research work if it judges it necessary.

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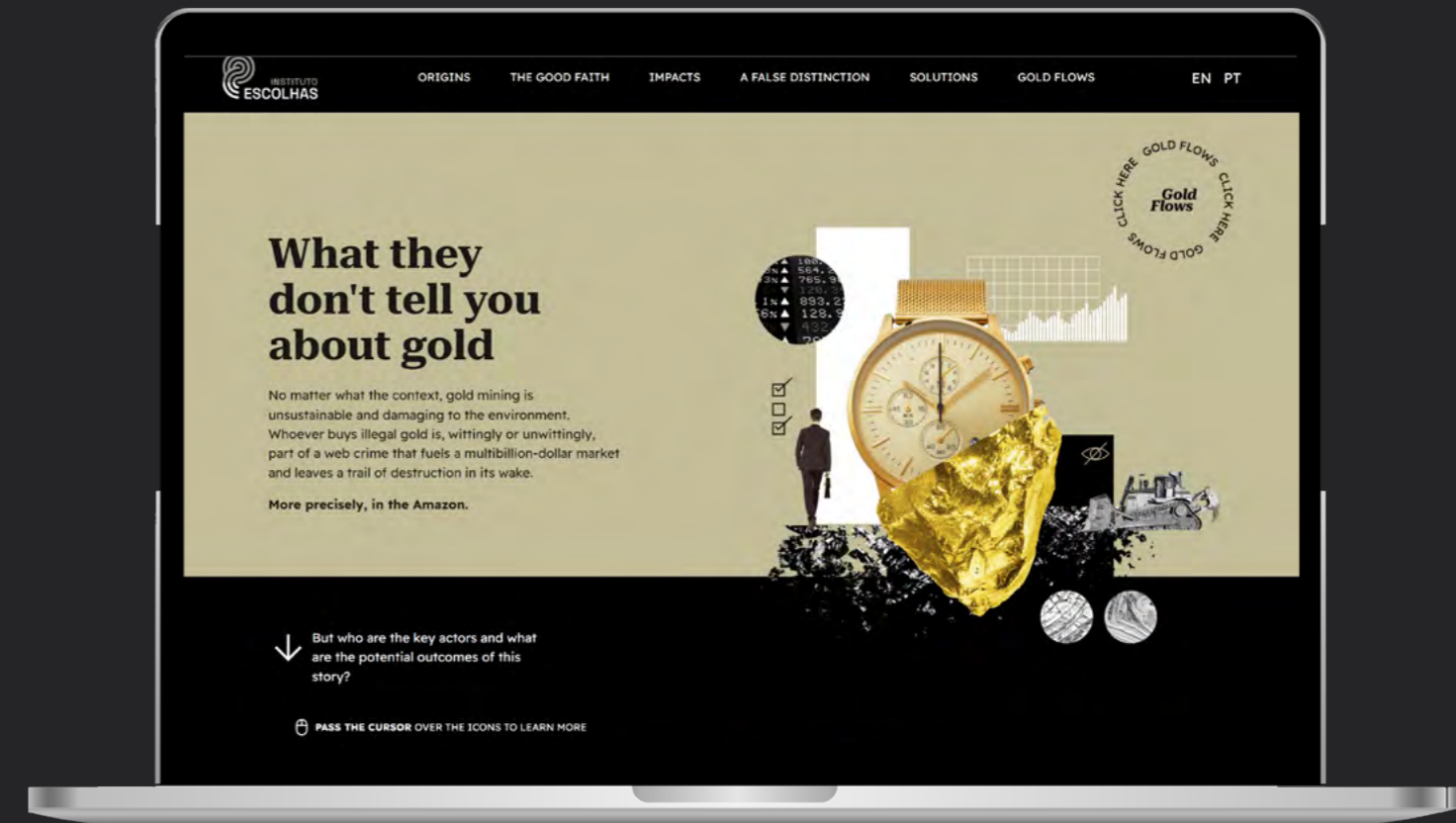


It's time you knew what they don't tell you about gold.

So that you can tell others.

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229 tons of gold are potentially illegal

Between 2015 and 2020, Brazil traded 229 tons of gold with evidence of illegality, equivalent to almost half of the gold produced and exported by the country.

The numbers.

Number	Description
93	tons came from "shell titles" where there was no evidence of extraction
63	tons did not have information on the titles of origin/p>
42	tons came from mining titles with evidence of extraction outside the designated mining
22	tons were exported gold without official production records/p>
9	tons came from titles that had encroached on indigenous lands and protected areas

Paths taken by the gold

In Brazil, gold is mined by either large-scale mining companies or

Path	Regime
1	WILDCAT MINES small-scale mining permit regime
2	MINING COMPANIES mining concession regime