

Control assessments of gold products marketed by Madagascar.

Hanitra. L. Ramefivololona & Lala. Andrianaivo ,

Université d'Antananarivo, Ecole Supérieure Polytechnique d'Antananarivo, Laboratoire Exergie et Géoingénierie,
BP 1500 Antananarivo 101 Madagascar
ramefivololonahl@gmail.com

Abstract

Gold resources are exploited in Madagascar. The Ministry of Mines is responsible for verifying the quantity and quality of gold exports for royalty and tax purposes. The government is aware of the need to strengthen its capacity to evaluate mineral exports, in order to control minerals and precious metals such as gold in an efficient and timely manner.

Indeed, gold exported from Madagascar must be considered in terms of quantity as well as quality, in order to make a greater contribution to the state budget. Gold mining is quasi-informal, with artisanal and small-scale mining (EMAPE) in Madagascar. The volume of production is officially estimated by the annual export of gold products. Since then, the basis for withdrawals of mining royalties and rebates (RRM) has been 18 Karat (Kt) of purity of gold product traded.

The aim of this article is to analyze the administrative control of commercialized gold products in Madagascar using the IGF-OECD guide evaluation method, in order to improve existing administrative control.

The main results concluded that the current administrative control over the quality and quantity of exported gold products requires improvement. Madagascar would have strategic options: on direct measurement of the value of mineral exports to avoid the risk of undervaluation, on determining the points and internal procedures for export evaluation applied by mining companies and administrative control to ensure the reliability of their results, and on the importance of a laboratory accredited and standardized at national and international level.

Key words: *Gold, exported, quality, quantity, control, analysis, evaluation, laboratory*

1. CONTEXT

Many countries, such as Sierra Leone, are concerned about the risk of underpricing mineral exports. Comparison of third-party sales contracts with operating agreements has shown that the low sales price is due to the low quality of the ore. Nevertheless, in the case of bauxite, the entire export volume is sold to a related company in Romania. Given the high level of integration in the bauxite sector and the absence of a reference price, Sierra Leone believes that there is a high risk of underpricing bauxite exports [12].

Similarly, in Madagascar, gold is one of the most sought-after mining products, and is generally mined illegally and informally [16] [17]. The lack of transparency concerning the quantity actually produced poses a problem for the reintegration of the sector in the balance of payments [2]. Likewise, marketed gold is greater than or equal to 18 Karat (Kt) purity [21]. This threshold forms the basis for calculating the fees withheld by the authorities. Whereas, according to the gold regime, gold can only be exported at 24Kt purity [8]. Gold exported from Madagascar must be considered in terms of quantity as well as quality, in order to make a greater contribution to the state coffers. A 25% increase in mining royalties and rebates (RRM) was observed between the 24Kt and 18Kt purity gold grades [23].

The reorganization of the gold industry in 2020 corresponds to the action of suspending exports [17] and setting up national gold reserves in the Madagascar Central Bank for better traceability and a procedure for purchasing gold from formal suppliers. However, Madagascar is a country where gold mining requires even more organization. The absence of a refinery and an accredited laboratory in Madagascar remains a problem in terms of the risk of under-assessment of gold product quality [20][24]. The aim of this article is therefore to analyze the administrative control of gold products marketed in Madagascar. The study consists of an evaluation of the existing administrative control system in relation to the Malagasy legislative framework and the international standard, with a view to identifying strategies for improvement.

2. MATERIALS ET METHODS

In order to analyze the administrative control of gold products traded in Madagascar, the chosen method is based on the IGF-OECD evaluation guide on controlling the value of mineral exports: strategic options for States (2018) [12].

Five indicators have been defined: volume of gold exported, control points, control assessment process, control factors for undervaluation risks and the criterion of a quality analysis laboratory for gold products.

Data collected from the gold agency of Madagascar (ANOR) on the volume of gold exports would justify the option of investing in the creation of an ISO-accredited laboratory.

The inventory of existing gold regulatory texts in Madagascar and the international standard concerning the analysis laboratory was collected to examine the conformity of administrative control over the quality of gold products exported from Madagascar. These are :

The Mining Code [14], the previous Mining Code [15] and its implementing Decree [7], the Gold Regime Decree [8], the National Gold Agency (ANOR) Statutes Decree [9], the Laboratoire des Mines de Madagascar (L2M) Statutes Decree [10], the Interministerial Order on the conditions and modalities for approval of laboratories and private experts for quality certification of mining substances and hallmarking [3], the Order establishing a Single Window for export, on a commercial basis , precious stones, fine stones, precious metals as well as jewelry [4], the Order on the market value of gold [4], the Decision on the export price of gold [6], Minutes of the meeting of direction of Mines and ANOR on the reference price of gold for export and the market value [19], and the general requirements concerning the competence of calibration and testing laboratories [13] .

3. RESULTS

The results are presented in table form (Tables I, II, III, IV, V).

3.1 Production and export volumes of gold products from Madagascar

TABLE I – GOLD PRODUCTION PER ANNUM DE MADAGASCAR TO 2016 – 2020

Year	Gold production per annum (kg)
2016	584,00
2017	2834,00
2018	3051,72
2019	2423,00
2020	1938,00

3.2 Export control phases for gold products

TABLE II – CHECKPOINTS FOR GOLD PRODUCTS OF MADAGASCAR

Mining cycle	IGF-OCDE		Malagasy regulatory texts
	Analysis type	Goal	
Exploration	Initial tests	Initial mineral prospecting	No existing(NE)
Feasibility	Ore content analysis	Estimation of resource value	NE
Extraction	Quality control	Monitoring or controlling the mining or refining process	NE
Marketing	Export grade quality analysis	Determination of sales price, then taxes and royalties	Existing (E) [5] [6] [7] [14] [15]

3.3 Assessment process for gold exports

TABLE III - GOLD PRODUCT QUALITY CONTROL PROCESS

Process	IGF-OCDE	Malagasy regulatory texts
Sampling	Representative sample taken from transported materials for delivery to buyer.	NE
Sample preparation	For lab analysis.	NE
Laboratory analysis	Determining the composition and quality of mineral exports	E [3] [4][8][10][14] [15]

3.4 Criteria to avoid the risk of undervaluing gold products for export

TABLE IV - ASSESSMENT OF RISK FACTORS FOR UNDER- VALUATION OF GOLD PRODUCTS FROM MADAGASCAR

OCDE control factors	Malagasy regulatory texts
Compliance and financial reporting obligations	E
Application of international standards for mineral sampling and analysis by the mining company	NE
Laboratory competence requirements	E [3]
Additional assurance from a private mineral certification company	E [3]
International price basis on reference and market value for state revenue withholding	E[5] [6] [7] [8] [14] [15]
Creation of a laboratory with investment	E [10]
Public mineral quality control systems compliant with ISO/CEI 17025:2017	NE
Competence of public officials in sampling and laboratory analysis of minerals	NE
Standard operating procedures for mineral sampling and analysis	NE
State budget dedicated to export assessment activities	NE

3.4 National laboratory standards for product quality analysis

TABLE V - LAB CONFORMITY IN MADAGASCAR

IGF-OCDE	Madagascar Mining Laboratory (L2M)	Private laboratory
ISO-accredited laboratory	NE	Not identified (NI)
Assurance of the reliability of its results in accordance with ISO/CEI 17025:2017	NE	NI
Economic viability	E [9]	NI
National laboratory accreditation	NE	NI
Ongoing maintenance budget	NE	NI
Ongoing staff training	NE	NI
Equipment testing and calibration	NE	
Twice-yearly participation in laboratory and staff proficiency tests	NE	NI
Qualified and experienced staff	NE	NI
Keeping abreast of new methods and technologies	NE	NI
Transparency of procedures	NE	NI

4. DISCUSSION

Annual declared gold export data (cf. Table I). show a significant boost in gold production of 580 kg and 3000 kg during the period 2016 to 2020. The statistics are precarious, the annual production instability is not conducive to investment.

The exact point of export control must be at the point where taxes and royalties are collected. This usually coincides with the point of sale at the time of export, where the mineral products are still present in the country. In Madagascar, regulations [5] [6] [7] [8] [13] [15] stipulate that mining rebates and royalties (RRM) must be withheld from the commune concerned by the mining phase, while the administrative quality control point corresponds to the marketing phase (cf. Table II).

Concerning the process of evaluating exports of gold products, the aim is to determine the composition and quality of exported minerals. Mineral analysis must identify the payable quantity of metal contained in the sample, as well as any impurities likely to reduce the product's ultimate selling price. Table III shows that only laboratory analysis, the last stage in the process, is covered by Malagasy regulations.

In this way, the assessment and process of product control and the withholding of RRM take effect at the point of export (cf. Table II and Table III). Administrative control practice confirms this [11]. According to the IGF-OECD [12], the risk of revenue loss is high in the case of high-value precious metals, particularly due to smuggling, as the assessment must take place as close as possible to the place of production.

Table IV shows the absence of several control factors in the legal texts governing gold in Madagascar. The non-existence of the application of international standards by the mining company is favored by the situation of the quasi-informal sector with artisanal and small-scale mining (EMAPE) in Madagascar [11]. Although each country has a choice of price reference for products to be exported, Madagascar's RRM withholding is based on the market value derived from the invoice declaration of the first sale and/or the amount of the tax base set by the administration [14] [15]. According to the IGF-OECD [12], the risk of undervaluation of state revenues is high, particularly for precious metals. Gold is valued in terms of quality and volume on the basis of an international price reference, resulting in beneficial RRM. Similarly, the requirements for laboratory competence and the additional assurance of a private mineral certification company [3] are included in the legislative framework, although no public or private laboratory has been listed as having this qualification in Madagascar. To date, the mining administration has entrusted L2M [7]

[14] [15] , an organization attached to the Ministry in charge of mines, with the task of carrying out analytical controls on mineral substances [7] [10] .

From a financial point of view, the restructuring of the national laboratory into a public industrial and commercial establishment (EPIC) in 2019 [10] during the health crisis and the suspension of gold exports, leaves its economic viability in doubt. From an operational point of view, the laboratory is not nationally accredited, nor does it comply with ISO/CEI 17025:2017 [13] on general requirements for the competence of testing and calibration laboratories with an international benchmark for the ability to produce reliable results. Human resources are on secondment from the Ministry in charge of mines, the majority of whom do not have the required technical qualifications in mineral analysis and laboratory sampling. No training has prepared them for this, and their experience lies in learning on the job. As for analysis protocols, they are drawn up internally by L2M, without being normative or official. The latest calibration of equipment is unknown. Among other things, the basis of operating procedures is not identified and there is no transparency (cf. Table IV and Table V). Control of export product evaluation procedures is all the more effective when based on international standards or carried out by an accredited laboratory, as this lends strong credibility to its results, as the IGF-OECD guide [12] .

It should be noted that the mining administration has no budget allocated to export appraisal activities (cf. Table IV).

5. CONCLUSIONS

In conclusion, the study has enabled us to identify the trading phase as the sole point of control for gold exports in Madagascar.

The article has also identified the quality control assessment process for gold products, which boils down to the analytical determination of the composition and quality of gold product exports in the laboratory

In addition, the risk of under-valuing gold products for export has been noted, notably due to the failure of factors concerning operational requirements for administrative control, and the lack of association of international standards for the analysis of gold products with the country's legislative framework for mining companies. In addition, existing regulations governing the competence of public or private analysis laboratories are neither applied nor implemented.

According to our analysis, L2M, the only national laboratory accepted by the Malagasy mining administration, has so far been unable to fulfill its role as a public quality control body for gold products to be exported from Madagascar, and is not ISO-compliant. However, annual production is precarious. Although the creation of an accredited laboratory would be ideal for quality control, the option would be an independent or private laboratory.

In short, the situation of administrative control over the quality of gold products exported from Madagascar presents a risk of product undervaluation, a risk of loss of high RRM's due to a single control point and process far from the place of exploitation, and a risk of contestation of the unreliability of gold product quality analysis results without a nationally and internationally accredited and standardized analysis laboratory.

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