

# Growth enabling policy formulating strategies for the Zimbabwean Artisanal and Small-Scale Gold Mining Sector

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Artisanal and small-scale gold mining (ASGM) in Zimbabwe can significantly contribute to the economy and improve livelihoods but an enabling policy environment is lacking to achieve this vision. The government of Zimbabwe (GOZ) regulates ASGM on the basis of socio-environmental protection; legal compliance and economic contribution. Past experiences show growth stifling inadequacies in the policy framework arising from conflicts in providing adequate socio-environmental protection and maximising economic contribution. In this study, we examined the GOZ's policy framework and evaluated its impact on ASGM growth and economic contribution. A review of past government positions in the articulation and administration of mining license fees, taxes and royalties, environmental laws, mineral pricing and marketing conditions and corresponding reactions from the sector was done. Findings showed that most policy interventions retarded growth of the sector and limited its fiscal contribution. Following these findings, strategies that can be fused into the policy framework were recommended.

**Key words:** policy framework; government authorities; ASGM informality; economic contribution; systems thinking.

## INTRODUCTION

ASGM in Zimbabwe is emerging as a rapidly growing sector, still facing major challenges but of course with significant potential to expand. Transformation is required and it is now necessitating vigorous research and policy thinking. Ideally, the growth and development of the ASGM sector can be indicated by an efficient use of available resources to meet effective demand and social needs. The sector has struggled to attain these goals over the years. A glance into various policy interventions by GOZ shows impulsive and non-intelligent policy traits which have always met up with resistance from miners and also resulting in unintended impacts on the growth and development of the sector. However, ASGM growth can still possibly be underpinned by proper application of an appropriate policy mix and a multi-sector strategy that propels economic transformation (Ibrahim, 2017).

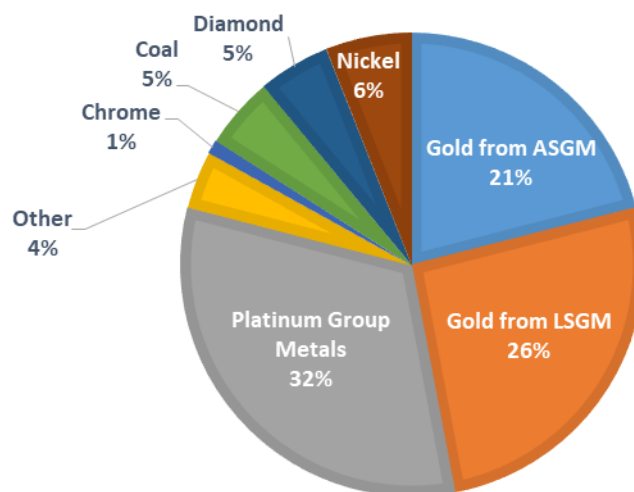
One way to foster growth of economic sectors like ASGM is through the application of behavioral economics. At least this approach brings new insights into how to craft better policies by offering new policy tools, improving predictions about the effects of existing policies, and generating new welfare implications (Henning, et al., 2018). Secondly, growth enabling policies can be necessitated by a holistic approach to analysis that focuses on the way that a system's constituent parts interrelate and how systems work over time and within the context of larger systems (Rouse, 2005). Viewing policy measures from within a system is absolutely essential because actions meant to stabilise the sector may actually destabilise it as unanticipated side effects get to be created. Such unexpected dynamics

often lead to policy resistance, the tendency for interventions to be delayed, diluted, or defeated by the response of the system to the intervention itself (Meadows, 1982). A system can respond to an intervention in ways the regime doesn't anticipate. This means policy resistance arises because we often do not understand the full range of feedbacks operating in the system (Sterman, 2000).

Therefore, if the sector is to grow, there is need for effective political institutions that can diminish policy constraints to achieving development goals and to better understand the needed conditions, the prevailing constraints, and predictions of policy impacts (Torero, 2018).

## REVIEW OF ZIMBABWE'S GOLD MINING SECTOR

Zimbabwe has a gold resource estimated at 84 million tonnes (t) at an average grade of 4.9 grams per tonne (Mlambo, 2015 ). This is one mineral among an estimated 60 different other minerals, 40 of which have been exploited at some point. However, according to Pact and the Institute for Sustainability Africa (2017), only a handful of these minerals contribute significantly to the economy of Zimbabwe: gold, diamonds, platinum group metals, coal, and nickel (Figure 1).



*Figure 1: Mineral share in Zimbabwe's total minerals output value, 2016 (Pact & The Institute for Sustainability Africa, 2017)*

As can be seen from Figure 1, gold mining contributes 47% which is a significant share of the mining sector. The 47% is divided broadly into large-scale gold mining (LSGM) and ASGM. The Mines and Minerals Act Amendment Bill, 2015 defines a small-scale miner as, “an indigenous person employing not more than 50 people including contractors, on a registered mining location of not more than 40 hectares in extent, who produces and or processes not more than 1200 tonnes of ore per year.” Neither, the amendment bill nor any previous piece of legislation defines the artisanal miner. However, it is generally accepted in Zimbabwe that the distinction between ASGM and LSGM (and further, between artisanal gold miners and small-scale gold miners) is based on the scale of operation and degree of mechanization. On the other hand, artisanal miners are understood to be unregistered and hence possess no property rights (Pact & The Institute for Sustainability Africa, 2017).

The Zimbabwean gold mining industry makes huge contributions to the country's economy. These contributions come in several forms some of which as listed by Pact (2017) are:

- Direct contribution to Gross Domestic Product (GDP);
- Employment creation;
- Foreign exchange generation;

- Gross national investment;
- Social infrastructure development through corporate social responsibility activities;
- Direct contribution to government revenue (tax revenue);
- Development of upstream (supply) and downstream linkage industries; and
- Induced effects of household spending, which together result in multiplier effects on the economy.

The contribution of ASGM does not only end at the macro-level but also transcends to be a micro-economic contributor to livelihoods and, therefore directly alleviates poverty.

However, the sector does not only bring about benefits but numerous challenges to the environment as well as the society. ASGM is associated with environmental degradation, social ills, and poor health and safety records (Pact & The Institute for Sustainability Africa, 2017). Environmental pollution through mercury and cyanide, land degradation, river siltation, mine accidents and high prevalence of occupational diseases are among the common negative impacts of ASGM. Many studies focusing on these negatives have been done and to highlight one, the Global Mercury Project (2016) revealed alarming mercury and cyanide concentration levels in mining areas e.g. in the Kadoma area of the Midlands province in Zimbabwe (Tables 1 & 2).

*Table 1:Mercury concentrations near Kadoma–Chakari area mine in 2006 (Pact Institute, 2015)*

<b>Sample Site</b>	<b>Hg Concentration (Milligrams/Litre)</b>	<b>Threshold Levels in Milligrams/Litre (SAZ, ZINWA, WHO&amp; Standards)</b>
<b>Seepage from water pond (a)</b>	2.13	0.02
<b>Tailings impoundment (b)</b>	1.14	0.02
<b>Stream down the mill (c)</b>	0.13	0.02

The sample data was collected from different points where effluent discharged from the stump mill, a gold milling facility which used mercury in gold amalgamation. With a standard threshold level of 0.02, the figures in the table show that mercury is above the stipulated limits, suggesting that water sources within the community are polluted with heavy metals and that any use of open water is likely to raise mercury concentrations in the blood stream or its bioaccumulation (in animals) (Pact Institute, 2015).

Further findings of the Pact (2015) project indicated that Zimbabwe has some of the world’s highest levels of mercury pollution and human exposure to toxic risks. In a sample of miners examined for mercury poisoning in a study in Insiza Mining District, 60% of the population had general body weakness, 55% had nausea, 50% had lost teeth, 45% had a history of respiratory distress, 40% had high salivation and tremors, 40% had high mercury levels in hair, and 30% had high mercury levels in their blood. These symptoms are all associated with occupational mercury poisoning.

*Table 2: Cyanide levels at a mill site(Pact Institute, 2015)*

<b>Sample Site</b>	<b>Sample Results (Milligrams/Litre)</b>	<b>Threshold Levels in Milligrams/Litre (SAZ, ZINWA &amp; WHO Standards)</b>
<b>After tailings impoundments</b>	2.17	0.01
<b>Turura Stream</b>	0.23	0.01
<b>Seepage from borrow pit</b>	0.105	0.01

As shown in Table 2, the presence of cyanide concentrations of 2.17 milligrams per litre after tailings impoundment suggests neutralization was inadequate and implies high cyanide pollution—hence, a high chance of polluted water in the immediate environment. According to the International Cyanide Management Code (2018) cyanide is acutely toxic to humans and has adverse effects on the environment.

It is in the interest of attempting to balance the merits and demerits of ASGM that the GOZ through its various agencies has intervened with various ever changing regulations and policies. The ripple and sometimes dynamic effects of these policy measures that have been applied is what we seek to unveil in this study.

## **Review of Legislation and Literature**

About 45 acts of parliament interact within the mining sector but with direct influence on the ASGM sector is the Gold Trade Act of 1940 and the MMA of 1961(Mutsinya, 2012). The MMA is the one out of which the Ministry of Mines and Mining Development (MOMMD) was created to regulate the sector. Artisanal miners, unlike their small-scale counterparts, have no legal title and are mentioned nowhere in the available pieces of legislation. Small-scale gold miners generally have a legal mining title registered with the MOMMD and are expected to work within the provisions of the MMA, the Environmental Management Act (2002; chapter 20:27), the Rural District Councils (RDC) Act, the Water Act among various other mining and environmental regulations.

The MMA empowers the Minister of Mines to gazette prices for various mining licenses and appoint members to the Mining Affairs Board which falls under the MOMMD. There is no guiding framework to how the minister does this work. In fact, it's as he sees fit or as he deems necessary. On the other hand, the RDC Act (chapter 29:13), empowers the local council to impose a land development levy on any rural land owners, including miners, that fall within the council's jurisdiction. Apart from collecting levies, the Rural District Council also monitors illegal mining within its boundaries. According to a study by Pact (2017), these legal frameworks were created to suppress the ASGM sector and support LSGM. Even with different amendments to these acts, they remain detrimental to ASGM through deterrent licensing fees and registration requirements.

Viewing from the international level, the ASGM sector is governed by the United Nations Environmental Program (UNEP) guidelines on mining and Zimbabwe is a signatory to the 1992 Rio Declaration on Environment and Development. As a result, the country's ASGM activities are bound to carry out mandatory environmental impact assessments (EIAs). This practice has since been adopted and fused into Zimbabwe's national environmental policy.

Table 3 lists a few of the parliamentary acts regulating ASGM in Zimbabwe that have direct bearing on gold production, fiscal contribution and a few aspects of legal compliance. Changes to the provisions of these acts especially through the various statutory instruments falling under them, have had impacts on the growth of the ASGM sector, hence the need to analyse such changes and suggest policy making operational guidelines that yield growth enabling policy interventions.

Table 3: Various Parliamentary Acts affecting the ASGM sector and their provisions

Act	Provision	Implementing Institution
<b>The Mines and Minerals Act [Chapter 21:05]</b>	It focuses mainly on the acquisition and preservation of mining rights as well as the duties of the Minister of Mines which include appointments to the MAB and the pegging of various mining fees and licenses.	MOMMD
<b>Gold Trade Act [Chapter 21:03]</b>	Under Part II of the Gold Trade Act, no person is allowed to deal in or possess gold unless he/she is a holder of a licence or permit; a holder of a tribute or the holder of an authority, grant or permit issued under the MMA authorizing him to work on an alluvial gold deposit.	Reserve Bank of Zimbabwe (RBZ)
<b>Mines and Minerals (Minerals Unit) Regulations SI 82 of 2008</b>	The SI empowers the Minerals Unit and Border Control Department under the Zimbabwe Republic Police (ZRP) to address any illegal activities and any acts of corruption in relation to the marketing of gold. It also covers the smuggling of gold across the national borders.	MOMMD and ZRP
<b>MMA, Finance Act (Chapter 23:04) and Income Tax Act (Chapter 23:02)</b>	Provide for the collection of royalty and nine other different taxes from miners. This is done by agents for and on behalf of the Commissioner General of the Zimbabwe Revenue Authority (ZIMRA). When the royalties are not remitted by the due date, interest is calculated at a rate fixed by the Minister of Finance on the outstanding amounts from this due date until the date they are paid. The Commissioner General of ZIMRA is also empowered to institute recovery measures in respect of any amounts not charged or remitted as prescribed.	MOMMD, Ministry of Finance and ZIMRA.
<b>Environmental Management Act, SI 7 of 2007</b>	The Act through the Environmental Management (EIA and Ecosystems Protection) Regulations provides for the payment of EIA fees.	Environmental Management Agency (EMA).
<b>RDC Act and Urban Councils Act</b>	Provides for levies payable to the local authority.	RDC and Urban Councils Association.
<b>ZINWA Act (Chapter 20:25) and Water Act (Chapter 20:22)</b>	Provides for the requirement to obtain a water permit for any small to medium scale mining operation for both domestic and industrial purposes.	ZINWA
<b>The Forestry Act</b>	Section 45 provides that no miner may cut down trees without a permit from the Mining Timber Permit Board.	Forestry Commission

The pieces of legislation in use are structured in such a way that they leave room for the incumbent authorities to make certain decisions which in their best opinion are for the good of the nation in view of the government's key result areas. A good example is in the fixing of royalties specified in the Mines and Minerals Acts Chapter 21:05 (MMA). In Section 245 Subsections (3) and (4) of the Act, the Minister has power to use factors he 'deems necessary' in fixing royalties (Parliament of Zimbabwe, 1961). Now, the minister's personal opinion or assessment without a set of guiding principles employed may not all the time yield sustainable decisions. In the 2015 amendment bill to MMA under Section 6 which amends Section 7 of Chapter 21:05, the Minister is granted power to appoint individuals he 'deems expedient' to be members of the Mining Affairs Board (MAB) (Ministry of Mines, 2015). It is apparent that this bill gives too much discretionary power to the minister thus creating room for nepotism, corruption, chicanery and bottleneck. Operational guidelines or decision-making frameworks are therefore a necessity for decision makers.

## METHODOLOGY

Document reviews were used to uncover ASGM's macro- and micro-economic contributions. Data used in the research was obtained from primary and secondary sources from 1998 to 2018. The data was obtained from reports published by key stakeholders including Pact Zimbabwe, MOMMD, Zimbabwe Miners Federation (ZMF), Chamber of Mines of Zimbabwe (COMZ), relevant academic publications, reports, articles and GOZ publications. This study was guided by the following research questions:

1. What are the trends in production, fiscal contribution and legal compliance?
2. What legal interventions were implemented over the same period?
3. Can the trends and the implementation of the interventions be connected?
4. What do the responses to interventions reveal about how future interventions should be implemented?

Selected cases of policy changes implemented by the GOZ were analysed and the effects they had on the performance of the ASGM sector were evaluated. Event chain models were used to evaluate points of failure in policy implementation. The models indicate the goal that the GOZ had; the situation that the sector was in; the problem leading to the situation; interventions by the GOZ and the results that followed.

## RESULTS AND DISCUSSION

### Mineral Production Trends

Gold production trends shown in Figure 2 represent gold that was sold to the formal market. Gold production trends in Zimbabwe can be tracked as far back as the immediate post-independence era of 1980 but for the purpose of this study only figures from around the turn of the 21<sup>st</sup> century were used. As the century turned, figures collapsed from a peak of 27.1t in 1999 to as low as 3.6t in 2008 due to the deterioration of the country's economy characterised by hyperinflation, price distortion due to overvaluation of exchange rate, failure of national treasury to pay foreign currency components to miners, lack of forex to procure critical imports, suspension of capital budgets and hence closure of many LSGM. However, it should be noted that economic deterioration mainly affected LSGM whereas ASGM was rapidly growing. The rapid growth of ASGM only got impeded between 2005 and 2006 when the whole ASGM sector was criminalised under the *Chikorokoza Chapera* (no more artisanal mining) operation instituted by the GOZ.

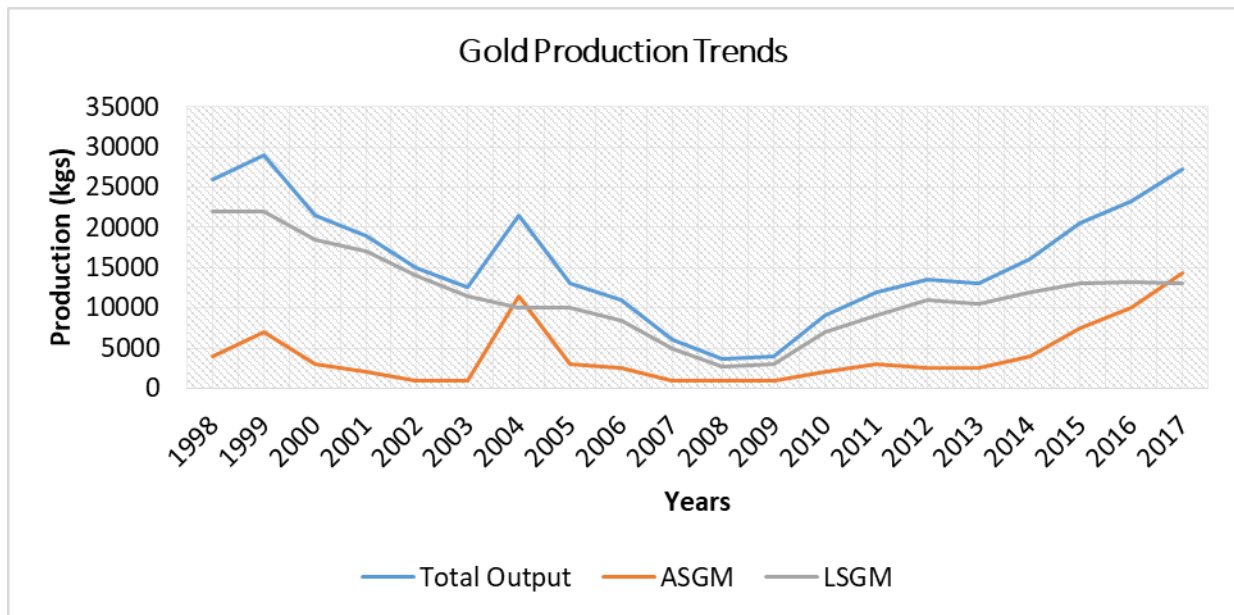


Figure 2: Gold production trends for both ASGM and LSGM for the twenty first century (Chamber of Mines of Zimbabwe, 2016; RBZ, 2016 & ZMF, 2018)

The period between 2006 and 2013 is significant in providing useful insight on how policies can impact gold production while at the same time influencing miners to sell gold through informal channels (Figure 3). In 2006, the GOZ forced all gold producers to sell their gold to Fidelity Printers and Refiners (FPR), the sole national gold buyer, at a lower price (a fraction of the international price) and that policy pushed miners to the informal market. This response by miners coupled with excessive environmental degradation from the sector provoked and prompted the GOZ to then criminalise ASGM. So, criminalisation was accentuated by the rampant informality of the sector which in some sense could be justified but from another angle had a horrid impact on national gold output as production from this sector plummeted to as low as 942kgs in 2008. This does not mean, gold production in the ASGM sector stopped but rather quantities flowing informally increased. The GOZ then realised its error and decriminalised ASGM in 2013 and on top of that instituted measures through RBZ, MOMMD, and the police to monitor the sector and promote its growth through formalisation and provision of finance and equipment. Output began to increase again to an extent that in 2017 ASGM, with 53% contribution towards total gold output surpassed LSGM.

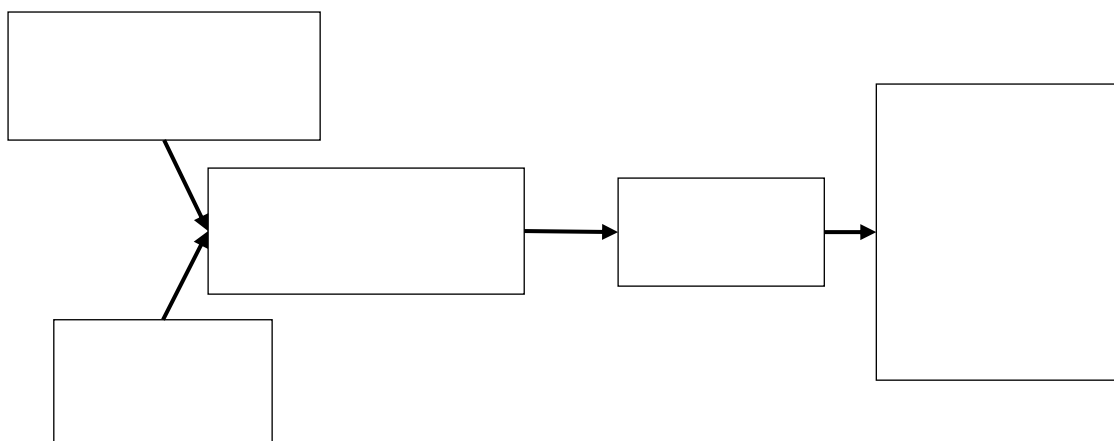


Figure 3: An event oriented view of how the GOZ addressed the informality of the ASGM sector contributing to an almost total collapse of the sector

Implementing policies without a holistic consideration of the various interconnected system components costed Zimbabwe heavily in terms of gold output and furthermore the country was delisted from the London Bullion Market (LBM) in 2008. The aim of the GOZ in criminalising ASGM was to eradicate informality but the practice overlooked the interconnection between ASGM and national gold output. There was no identification of possible feedbacks from the sector which comprises mainly of poverty stricken miners who will obviously seek alternative ways of continuing their existence in the mining fields. As a result informality increased as lowly paid law enforcing agents were being bribed while gold became 'officially' meant for informal trading routes. An understanding of this dynamism, non-linearity, feedbacks and interconnectedness of elements in the system could have brought about sustainable means of growing and in turn benefiting from the ASGM sector. At this point, it can be noted that the ChikorokozaChapera policy measure instituted without scientific reasoning retarded growth of the ASGM sector – it in fact almost brought the sector to a standstill.

### Trends in Fiscal Revenue

The GOZ has been constantly reviewing royalty charges downwards since the year 2013 from 7% for both LSGM and ASGM to 3% for LSGM and 1% for ASGM. A presumptive tax of 2% formerly charged on all ASGM was also scrapped. Figure 4 shows LSGM and ASGM contributions to total royalties paid between 2010 and 2016. As an incentive to the ASGM sector for selling gold to FPR, the GOZ so lowered the percentage royalty for this sector. Hence, the sector is not expected to equitably contribute to total royalties paid to the government and as a result, though with a steady increase since 2014, ASGM royalty contribution remained low but this is obviously compensated for by the dramatic increase in gold production shown in Figure 2.

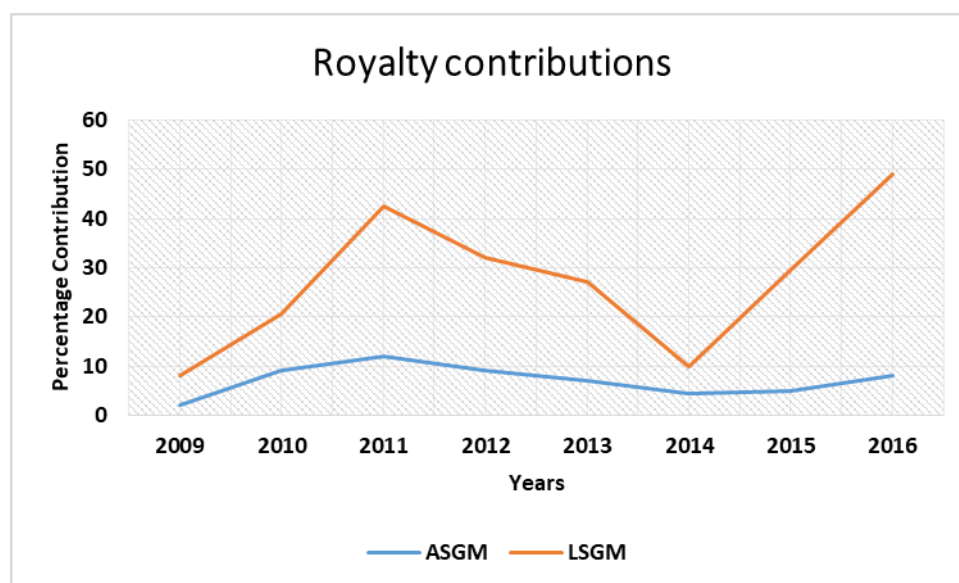


Figure 4: Contributions of both ASGM and LSGM towards total royalties paid between 2009 and 2016 (MOMMD, 2016)

In this case, possibly learning from the 2006 error, the government managed to reliably predict the impact of changing royalty charges. The policy direction taken reveals a sense of feedback identification; recognition of how royalty rate is connected to scale of operation; an identification of stocks, flows and variables and how the royalty system structure was responsible for the amounts reaching government coffers. The primary objective of any tax structure should be to attain maximum revenue and economic growth yet with minimum distortions (Odhiambo & Olushola, 2018). In this case an understanding of how high royalties and taxes would set an imbalance between revenue collected and the growth of the sector was exhibited. Hence, the lowering of royalty rates and exemption of ASGM from paying presumptive tax were policy measures that promoted growth of the sector.



## Trends in Legal Compliance

Changes in license fees and the response of the sector between the dollarization era of 2009 and the year 2017 were captured from the ZMF, Artisanal and Small-Scale Mining Summit (2018). Trends observed indicated policy resistance by ASGM. When the explosives license was pegged at \$300, there were 3000 miners with licenses but when the price was raised to \$2000, only 300 miners continued to operate with explosives licenses. When the custom milling license was pegged at \$2000, 458 millers had licenses across the country but when the fee was raised to \$8000 the number of licensed millers dropped down to 51.

The approach of the GOZ in managing the ASGM sector shows elements of an event oriented view of the real world where decisions meant to solve some problems are expected to yield only positive results. Figure 5 illustrates this approach. Non-compliance and a further drop in collected revenue wasn't the expected result by the policy makers but the system had its own way of reacting to new realities.

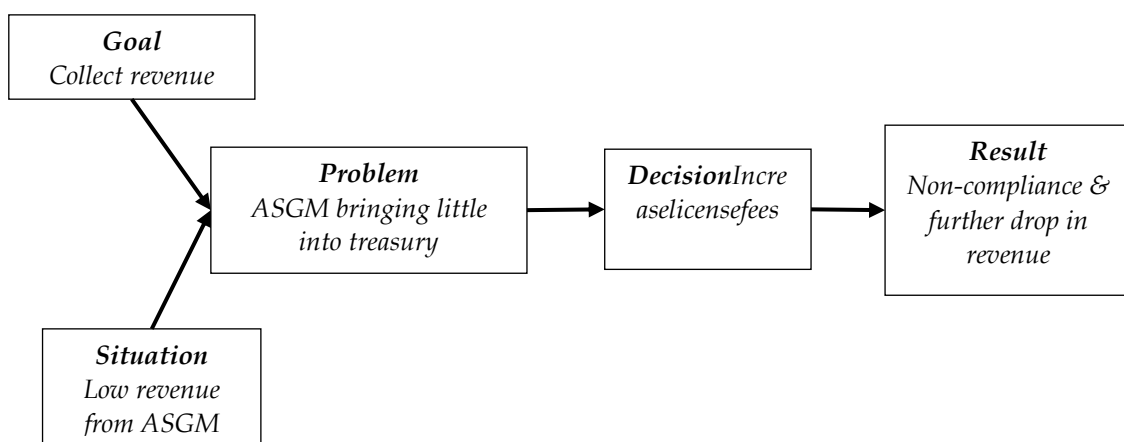


Figure 5: An event oriented view of policy implementation which has had detrimental effects on ASGM performance

## State of Gold Trade and its Pitfalls

Possession of gold without a license or permit is a criminal offence as provided by section 3(1) of the Gold Trade Act (Chapter 21:03) of 1940. Contravention of the clause attracts a maximum sentence of five years or a fine of twice the value of the gold recovered.

Licenses are issued to individuals who can deliver at least 5 kg of gold per month to Fidelity Printers and Refiners (FPR). Most artisanal miners cannot produce that much gold a month, and instead produce a few to hundreds of grams. In 2016, FPR reduced the minimum amount of gold it will buy to 1 gram so as to buy more gold from artisanal miners. The fact that possession of gold without a license is prohibited while at the same time it's costly to acquire and maintain the license creates room for informal behaviour.

Apparently there is no incorporation of multiple perspectives in this policy approach. Criminalisation of the possession of gold without a valid license will definitely promote underhand dealings thus limiting gold flow to FPR. Furthermore, pegging minimum amount of gold to be submitted at 5kg/month to maintain a license is tantamount to barring miners from trading formally. The policy in this case lacks identification of stocks and flows. Tightening the law, reduces flow of gold via formal channels and consequently diminishes gold stocks in FPR. Policing and prosecuting miners who fail to meet these legal requirements keeps miners marginalised, meaning inefficient resource utilisation and failure to meet economic demand and social needs. Thus, dwindled growth of the sector comes back.

## A policy making approach that assures growth of the ASGM sector

To sustainably achieve production goals in the ASGM sector, viewing the system as a whole rather than parts is critical. Policy makers must possess that ability to think abstractly in order to work in a space where the boundaries of a systems or problem seem ‘fuzzy’ and understand diverse operational contexts of the system (Squires, et al., 2011). Policy makers should also show an appreciation of long term planning, feedback loops, non-linear relationships between variables, and do collaborative planning across areas of the economy (Kopainsky, et al., 2011). The elements presented in Table 4 should form the basis of policy formulation that will accelerate growth of the ASGM sector. The elements were obtained from literature definitions of systems thinking, leveraged primarily from Sweeney and Sterman (2000), Hopper and Stave (2008), and Plate (2014). Table 4 also shows lack of consideration of system characteristics that has been happening in past policy implementations for Zimbabwe’s ASGM sector. In this research we identified the numbered system characteristics as critical in formulating policies for ASGM. Only a few of these features had been incorporated in past policy interventions. We used a normative scale to assess whether there was any incorporation of systems thinking characteristics when a few selected policies were implemented in the past. In the chosen scale, 1 represents strongly disagree, 2 – disagree, 3 – neutral, 4 – agree and 5 strongly agree. The evaluation of how well or not policy makers recognised the different system characteristics was based on researchers’ assessment of past policies.

*Table 4: ASGM policy characteristics that must be considered and how the GOZ has been operating in the light of these system features*

System characteristic	Criminalising ASGM	Hiking license fees	Lowering royalties/taxes
1. Interconnections recognised	1	1	4
2. Feedback loops understood	1	1	4
3. Dynamic behaviour understood	1	1	3
4. Stock and flow relationships understood	1	1	4
5. Multiple perspectives incorporated	2	1	3
6. Non-linearities identified	1	1	3
7. System structure recognised as cause of behaviour	4	2	4
8. System studied as a whole rather than parts	2	2	3
9. System view reliably predicts impact of changes	1	1	4

Apparently, most interventions that the GOZ has been coming with lacked scientific analysis to determine whether intended outcomes could not be inhibited by various factors intertwined in the ASGM sector. It’s only when the GOZ lowered royalties and taxes for ASGM that signs of system thinking could be noticed. With incorporation of system characteristics that we identified, criminalisation of ASGM and the frequent hiking of license fees could have been avoided leading to a steady growth of the sector.

## CONCLUSION

The policy measures and approaches being imposed upon the ASGM sector in Zimbabwe have contributed towards a stunted growth of the sector. Past performance trends of the sector showed oscillations below and above government’s expectations. A review of past ASGM policy interventions by the GOZ exhibited an event oriented view of complex sectorial challenges. As a result, unexpected

results of policy implementations were experienced in terms of gold production and legal compliance. Undesired policy outcomes could have been avoided by viewing the sector as a whole; its constituents as interconnected; the problems arising within it as results of system structure and a consideration of the different system characteristics identified in this research.

Understanding that poor socio-economic status precludes most indigenous people from formalising their involvement in the sector is crucial in policy formulation (Benedict, 2013). Hence, incentivising formal behaviour within ASGM rather than imposing punitive measures can ensure sectorial growth. Capacitating easier doing of business by lowering cost of legal compliance and cost of production are some of the achievements that policy makers must aim for in order to grow the sector. Going forward, all people occupying decision or policy making roles should possess solid systems thinking capabilities or at least sub-contract policy conceptualisation, modelling and simulation to system thinkers.

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