

# **Regional mineral beneficiation policy interventions in the SADC: Industry perspectives**

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## **ABSTRACT**

Mining is a significant economic activity in most Southern African Development Community (SADC) countries, and mineral beneficiation has been identified and controversially discussed as one of the possibilities for industrialisation. With many member countries being economically too small to muster the human and financial resources which beneficiation requires, the recently adopted Regional Mining Vision (RMV) envisages interventions at a regional level. An opportunity arose to ask industry role players to what extent the SADC appears to support regional beneficiation policy interventions undertaken by member countries, and what the challenges are in undertaking beneficiation regionally, as a complement to, or substitute of country-specific beneficiation policies. Twenty-five semi-structured interviews were conducted with experts from SADC member countries during the 2019 Mining Indaba. Participants were divided on whether beneficiation should be carried out nationally or in the SADC region. While beneficiation could support value-keeping, key challenges were found to be infrastructure development (i.e. energy, water), scarce skills, access to technology and related cost, but also lack of free trade and movement. We submit that a more integrated beneficiation strategy for the SADC region, as is being developed through the RMV, would indeed be relevant in the future.

**Keywords:** Mineral beneficiation, Regional integration, Beneficiation policy interventions, African mining vision, Mining, SADC.

## **1. Introduction and background**

Mining is a significant economic activity in most Southern African Development Community (SADC) countries, accounting for more than 10% of GDP in four members of the 16-country block (Angola, Namibia, Botswana, Zimbabwe) and contributing 2/3<sup>rd</sup> of all export value from the region over the decade 2007-2016 (incl. Angolan oil). It makes up more than 90% of export value in Angola, Botswana and the DRC, and between 40 and 75% in six other member countries (Tutalife and Jourdan, 2019). Until the recent adoption by the Council of SADC Mining Ministers of the Regional Mining

Vision (Tutalife and Jourdan, 2019), there was no coherent and effective approach to beneficiation in use at the SADC regional level.

There are many documents on beneficiation strategies in SADC member countries (e.g. SADC, 2015; Department of Mineral Resources, 2017) and the African Union has its own African Mining Vision (African Union, 2009) as well as its Agenda 2063 in which beneficiation economics are outlined (African Union, 2009). The academic literature, however, is critical of many of the current national policies of beneficiation (Pongsiri, 2002; Davies, 2014; Solomons, 2014; Gapa, 2017). Likewise, while mining companies are encouraged to beneficiate, the lack of creativity in dealing with the beneficiation call has been critiqued in the business world (Davies, 2014).

An opportunity arose at the Mining Indaba 2019 in Cape Town to engage SADC mining industry role players on their experiences with beneficiation activities, plans and policies in the region. This paper seeks to present and analyse what mineral industry professionals in the Southern African mining industry think about national and regional opportunities for and policies on beneficiation.

## **2. Literature review**

Since beneficiation is an industrial and economic activity, the following beneficiation theories are selected for this study: economic theory of beneficiation; political theory of beneficiation; mixed theories of beneficiation; and applied beneficiation theories. It is not easy to undertake beneficiation, as raw materials production does not give one a real advantage over other countries (Johwa, 2018; Gylfason, 2004) for downstream activities or throughout the value chain. What gives a company an advantage would be a move towards forward integration – a company purchasing downstream actors in order to exercise control over the value chain (Johwa, 2018).

### *2.1. The economic, political and mixed theory of beneficiation*

While the economic theory focuses on economic activities, the political theory looks into the balance of power. Mixed theories are about combining the two. Since beneficiation is discussed for economic development, theories leaning towards the economy will be elaborated. It is possible to create jobs and develop the country through beneficiation initiatives provided there is infrastructure to support that (Fasheun, 2010) such as advanced technologies. The need for sustainable development is evident in the mining industry (Lusinga, 2011) but beneficiation remains the issue across the SADC region. Opponents claim that structural changes should be made to avoid shock waves from an already distressed mining industry. Countries that are well-endowed with geo-resources potentially advance socio-economic development through downstream mineral beneficiation (Chitaka *et al.* , 2018).

Government resource-based industrialisation policy is key to scaling up linkages from downstream, upstream, and side-stream activities. They may require very significant social capital development, particularly for downstream beneficiation, which has less of a direct business benefit and logic than supply-side industrialisation, as shown by Kato (2017) in his analysis of the aluminium industry in Richards Bay, South Africa.

The Extractive industries have become a major growth driver for many countries in Africa – the SADC region is not left out of the spectrum. The overreliance on minerals and other geo-resources makes the countries prey to the resource curse trap (Nichols, 2018; Ojakofofu, 2018). This is one of the challenges that policy makers ought to address in SADC countries and AU in general (Bhorat *et al.* Nd).

Jones (2012) argues in favour of mixed theory of beneficiation. That author believes for example that China's activities in buying up mines in the African continent should be both political and economic. In fact, poor beneficiation policies and implementation thereof rob the economy a lot. It can, in fact, have a destructive role to the economy (De Beers, 2014).

Beneficiation may require access to scarce physical resources. In this regard, Lockhart (1984) demonstrated that water shortage affects beneficiation practices. Beneficiation by hydration requires access to water during the operations. Countries such as South Africa, Botswana and Namibia (unlike the DRC) find themselves in a water scarce situation that needs effective planning and provisions for water for consumption and industrial use.

## 2.2. Beneficiation in African economic policy

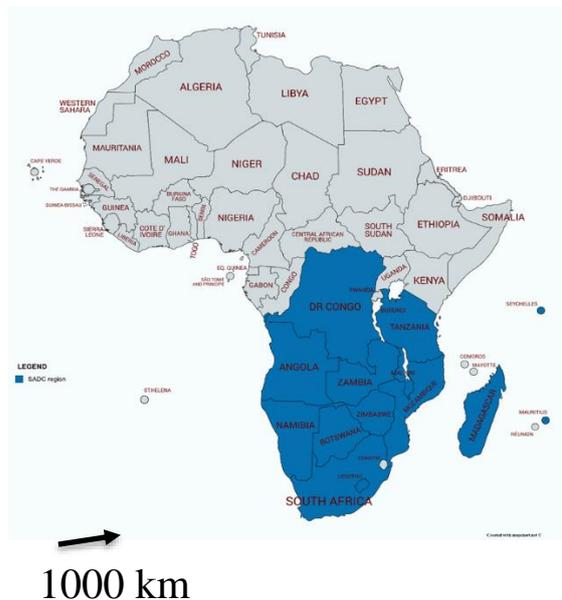
Beneficiation is about value addition (The beneficiation strategy, 2015) and is a government policy in South Africa (as opposed to the nationalization of the mines).

Usually two school of thoughts stand out when it comes to beneficiation and their position are lucid (or silver-tongued): Proponents' and opponents' school of thoughts. Most politicians in the SADC countries are among the proponents of beneficiation practices. On the other hand, opponents are mainly found amongst economists and industrialists, although, even within these sectors, there are different views. Be it as it may, the case of opponents is opposed by proponents vehemently (Corrigan, 2019).

Among the proponents, Baissac *et al.* (2015) studied a variety of aspects including beneficiation and are of the view that beneficiation is key to economic development, provided there is the infrastructure for it. The African Union (AU) Agenda 2063 also promotes mineral beneficiation policies in Africa – the SADC is not exempt to such an influence. There are studies that dispute what Baissac *et al.* (2015) stipulates about beneficiation. It is posited that beneficiation should be one of the major economic activities. Isheloke (2018) studied mineral beneficiation from the South African perspective and found that more needs to be done still.

### 2.3. Beneficiation opportunities and challenges in the SADC region

Integrating the SADC region economically is one of the challenges that the organization faces, and the lack (until recently) of a sound common mineral beneficiation policy does not make it any easier to member countries. Fig. 1 shows the SADC region and its size. In our cursory analysis, it could take advantage of several multi-country beneficiation opportunities, including cross-border engagements between Zambia and the DRC (Katanga) for copper (and cobalt); between Zimbabwe and South Africa for PGM; as well as Namibia and South Africa for Zinc. Despite the distance, opportunities for trilateral trade and cooperation on heavy mineral sands (HMS) among South Africa, Mozambique and Madagascar could also be enhanced. Last but not least, the SADC could benefit as well from multiple states' relation on diamond polishing to improve value addition and extraction in the region. Countries forming the last group are Namibia, Botswana, South Africa, Lesotho, Zimbabwe and the DRC.



**Fig.1:** The SADC region (Adapted from Nshimbi and Moyo, 2017).

Pallotti (2010) examines the economic strategy used in the SADC before the democratic dispensation in South Africa and the SADC Trade Protocol and neo-liberal approach to industrialisation, in the dawn of the African renaissance and Pan-Africanism, and in the post-colonial era. Consistent with Hurt (2000), Pallotti (2010) compares trade conditions in South Africa prior to and post democratic dispensations. It would enable member countries to formulate collective goals and to reach negotiated solutions to challenges in the implementation or decision-making process (Hulse, 2017).

Mpho (2019) laments the negative impact of corruption on transnational trade and advocates for synergy with the SADC Anti-Corruption Strategic Action Plan for 2018-2022, the African Union

Convention on Preventing and Combating Corruption and the United Nations Convention Against Corruption.

Hausmann *et al.* (2008), cited in Corrigan (2019), argue that beneficiation is as pervasive as limited as a policy paradigm in South Africa. Baissac *et al.* (2015) posit that the policy in Zimbabwe entailed both indigenisation and beneficiation and has found broad support in regional initiatives like the African Union's African Mining Vision (AMV). Mungoshi (2011) studied beneficiation in Zimbabwe – a study which demonstrates that a different approach to South Africa was followed. The Indigenisation policy was established in order to support the beneficiation endeavour (Abedian, 2013 as cited in Baissac *et al.* (2015)). According to Leiman (2007: 43): “political sustainability is the crucial component of the problem”.

Lusinga (2011) and Uys and Webber-Younman (2019) studied beneficiation technologies from economic and environmental perspectives and showed how complex the operations are. There are numerous literature on beneficiation in the SADC countries (Jordens *et al.*, 2013; Lockwood, 2016; Corrigan, 2019) but a gap exists when it comes to effective integrated policy of beneficiation for the entire region – and that's why investors are needed (Dludla, 2017).

The SADC Regional Mining Vision (RMV) as adopted in 2019 is a comprehensive framework for regional resource-based development and is presented in Figure 2. It is noted that the RMV pays attention to all three industrialization pathways related to the minerals industry. Very significant economic value potential has been documented for backward and upstream linkages, with the region importing much of the capital goods it needs (Tutalife and Jourdan, 2019). In its listing of forward/downstream linkages, to produce more feedstocks into the SADC's economy, we find its menu to be a rather staid 20<sup>th</sup> century listing that includes staples such Fe/steel, polymers, Cu/Al, for agricultural, construction, and power users, with a quite incredulous inclusion of fossil fuels (coal, oil and gas).

Beneficiation (broadly defined) is often viewed as being of strategic importance to mineral-producing countries. Nonetheless, the beneficiation industries are exposed to various cyclical and systemic constraints that can hinder the ability of mineral-producing countries to establish and sustain these industries, with the capabilities that support effective mining differing from those that support effective beneficiation (Van Zyl, Bam, and Steenkamp, 2020; Corrigan, 2019). A multidisciplinary approach to beneficiation and mining in general should be the way to go, and training and education have a role to play in that regard (Ross-Watt, 2019).

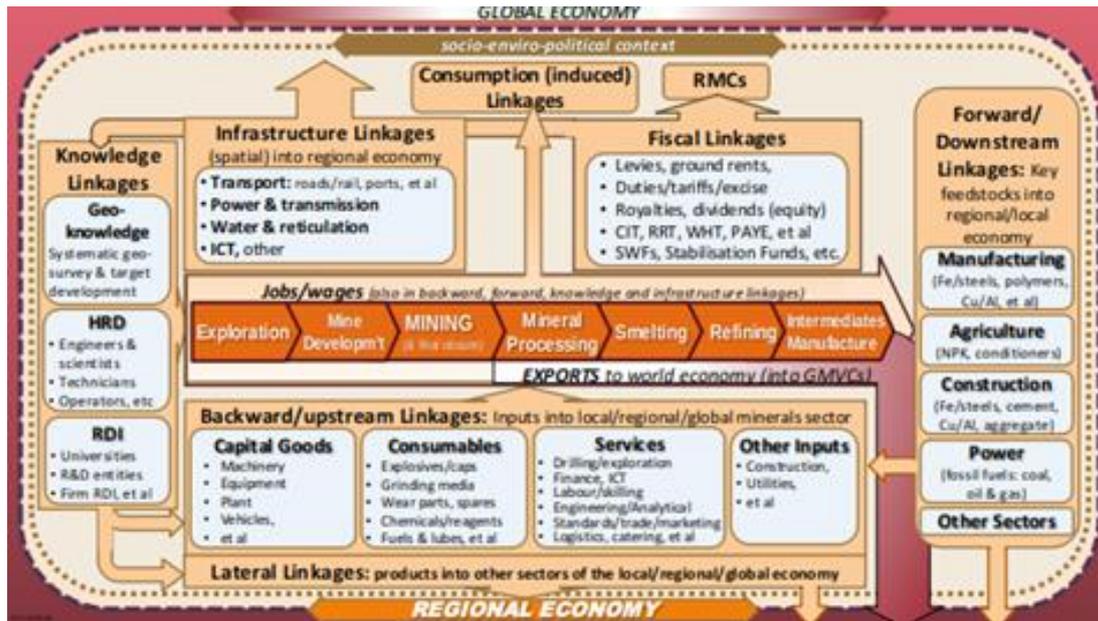


Fig. 2: SADC Regional Mining Vision (Source: Tutalife and Jourdan, 2019)

Van Zyl *et al.* (2020) enumerated amongst others the following challenges as policy-affecting issues: volatility, uncertainty, and exhaustibility. Coping with the Fourth Industrial Revolution is but another challenge to beneficiation activities. Balancing what happened in the past through good leadership style is beneficial to the mining industry (Uys and Webber-Youngman, 2019).

Botswana is portrayed as a model of beneficiation economy that leads to economic growth (Jagadeesh, 2015). More than 3,000 workers are currently employed in polishing operations (compared to fewer than 500 in 2006) and several thousand more through ancillary businesses serving the diamond sector. Polished diamonds exported neared USD 800 million in value in 2013 and were forecast to top USD 1 billion by 2015, compared to USD 100 million in 2008. In Debswana, the government retained a big share – a move which is profitable to the country (Baissac *et al.* 2015). It is argued within the De Beers that the country should invest beyond mining to yield benefits going forward (Bhorat *et al.* Nd).

### 3. Methodology

This study is exploratory and qualitative in design. Prior to the research per se, a pilot study was conducted to fine tune the research instrument – an interview schedule. A pilot study is a pre-test or a mock interview in this case. It means a small sample was drawn to try out the interview in order to see whether it is going to be effective in collecting the needed information. It allowed rewording, time-framing and collecting experts advice prior to the interviews at the Indaba. This means a mock study was conducted to test the interview schedule for validity and reliability purposes.

Two experts participated in the mock interview prior to the Indaba. An ethics clearance was issued in due course. Twenty-five relatively in-depth and semi-structured interviews were conducted with interviewees selected purposively from a variety of organisations, mainly from the mining sector. The study was conducted to identify upstream, and side-stream demands, challenges and opportunities of beneficiation in the SADC region. Thus, the interviews were set out to collect the perspectives of experts and professionals on the research problem.

Some questions were biographical/demographical (what is the main activity of your company, where are you located, how long have been active in that sector, etc.), others were analytical (do you have praise or critique about the current beneficiation policy? Does the policy match the Agenda 2063 African Mining Vision? There were also general/ open-ended questions: what impact have beneficiation policies had on the economy; what challenges and opportunities are there? What could be done to make mineral beneficiation work in the SADC?

The interviewees were selected purposively. This means they had to meet certain criteria: they ought to be working in the mining sector or doing some work for a mining company in addition to attending the mining Indaba. They ought to have some experience in the mining sector and be willing to talk about mineral beneficiation issues.

NVivo 12 Pro software was used to analysis the data using a content analysis approach. A thematic analysis was undertaken to derive meaning from the bulk of data-turned information. Hulse (2017) followed a similar qualitative methodology in doing research. This research benefited from a combined 30 years of experience in mining – in addition to over 190 years of experience across the fields.

#### **4. Results and discussion**

Interviewees were mostly from mining companies and their suppliers, as shown in Table 1 (which does not represent the sequence of interviews). Only three participants were from the public sector (government officials) [see 1, 2 & 3]. The large part came from industry with 19/25 representatives from mining or minerals trade companies [see 4-23] whereas another 2/25 were consulting firms [see 24-25]. While government officials tended to push for beneficiation first and foremost, the industry response was divided and tended to prioritise business-making operations. Consulting companies, as part of the industry, were equally divided in their opinion for or against policies of beneficiation in Southern Africa. In principle, beneficiation policies are supported to a large extent by most participants. Recurring themes identified in the interviews evolved around mineral beneficiation policies, economic development, beneficiation challenges, beneficiation opportunities, and general mining issues. They matched those discussed in the literature review in many instances.

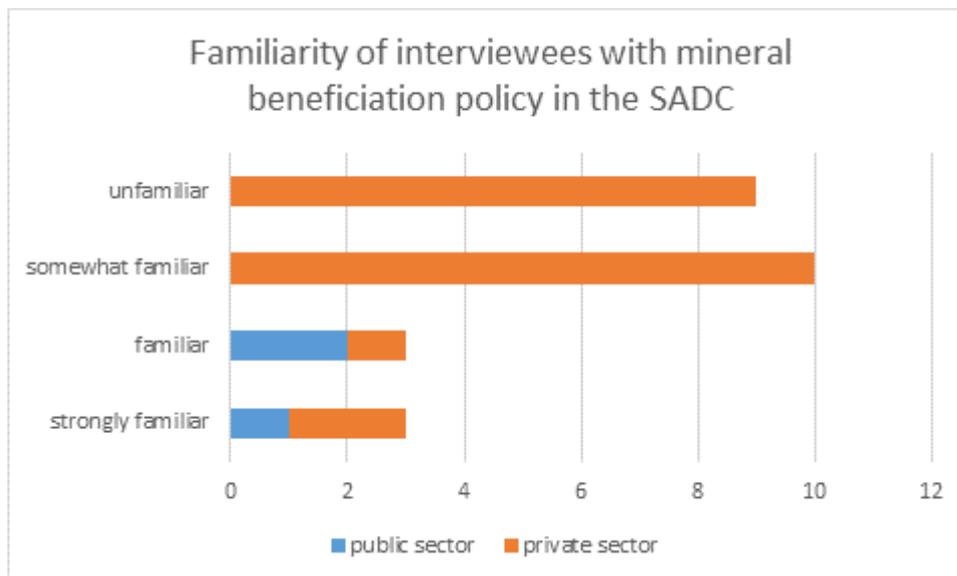
**Table 1: Profile of the interviews and interviewees**

	SADC countries	Expertise	Duration in service	Sector/activity
1	DRC	Mining cadastre	16 yrs	Government official
2	Tanzania, SADC	Regulation regime and fisc	7 yrs	Policy formulation and local content
3	Lesotho	Policy formulation	5 yrs	Government regulatory board
4	RSA, Madagascar	Mineral processing	1½ yr	Mining company
5	RSA	Beneficiation	8 yrs	Manufacturing
6	RSA, SADC	Conveyor belting	24 yrs	Automotive
7	RSA, SADC	Mining	6 mths	Mining company
8	RSA, Namibia, 32 countries worldwide	Explosive, fuel, mining	6 yrs	Mining and trade
9	Angola, DRC	Civil explosive	8 yrs	Mining and trade
10	RSA, SADC	Mining	6 mths	Mining trade
11	RSA, SADC	Trade	10-12 yrs	Supplying
12	Namibia	Mining deals	16 yrs	Mining equipment
13	RSA, SADC	Mining	6 mths	Mining company
14	RSA, SADC	Mining	6 mths	Mining company
15	AFRICA	Finance	1 yr	Mining company
16	DRC, RSA	Mining trade	5 yrs	Mining company
17	DRC, RSA	Mining	7 yrs	Mining company
18	RSA, Zambia, Namibia	Mining	5 yrs	Mining company
19	RSA, Namibia	Mining	1 yr	Zinc mining
20	Mauritius, Zambia and DRC	Drilling	2 yrs	Mining company
21	Namibia	Mining transactions	16 yrs	Equipment supplier
22	RSA	Mining supplier	2 yrs	Mining supply
23	SADC, Africa	Lasting explosive supplier and beneficiation	26 yrs	Manufacturing and supply
24	RSA, Zambia, Botswana, Namibia, Tanzania	Corporate advisory company	8 yrs	Mining business consulting
25	DRC	Mining	3 yrs	Mining consulting

Interviews 1 and 25 done in French, 2-24 in English

#### 4.1 Beneficiation policy

Whilst the interviewees agreed to engage on the topic of beneficiation, they were not all experts on this topic. Fig.3 indicates the interviewees’ familiarity with mineral beneficiation policy integration in the SADC region.



Given that only 6/25 interviewees (amongst whom the 3 sole government employees) indicated good or very good familiarity with beneficiation policy in Southern Africa, it could be said that what the interviewees by large had to say was not informed by good knowledge of recent policy processes on this matter.

With this caveat, indications from this study are that while in theory the current country-specific beneficiation policies in the SADC align with the AMV, in the views of some interviewees they don't in practice. In South Africa, beneficiation is a national policy and is the case for many SADC countries. Countries like the DRC have such policies in papers but in practice there is shortage of beneficiation infrastructure. A more coordinated policy could result in a better understanding of the government and industry role in carrying out beneficiation policies in the SADC (Interviewees no.1 to 8).

#### *4.2. Economic development*

At least 50% of the participants viewed beneficiation as being key for development of the SADC economy or their countries – quite a few disagreed. They called for investment incentives, tax brackets, and business friendly measures that support return on investment for corporations such as those investing in the DRC's mining sector.

#### *4.3. Identified challenges in the SADC*

Mozambique has a higher cost of energy than South Africa. Beneficiation strategy complexity should be set around the cost of energy in the regions to succeed as SADC. The literature supports the finding above: it indicates that mining is an important job-creation, skills and IT transfer in the industry, with the potential to improve people's living conditions (Van Zyl *et al.*, 2020).

The current legislation in place in the DRC prohibits raw materials exportation (Interviewee no. 1) – but, it happens every day anyway! What the SADC needs include: infrastructure, manufacturing factories for beneficiation, training and skills/competence transfer...a common market as well as a tax reduction. In Southern Africa (Zimbabwe including), mineral ores are taken abroad for beneficiation purposes (Interviewee no. 2) as it used to be in the Congo as well.

#### **4.4 Specific cases in the SADC beneficiation programmes**

The study reveals that, in Namibia, they successfully aimed at raising locally purchased manufacturing products from 6% to 20%. It is also argued that: “where a country produces scarce resources with high levels of demand, there is room for bargaining — as Botswana did with De Beers in the sale, sorting, cutting and polishing of diamonds” (Johwa, 2018).

The perception is that investors are not going to invest money if leaders are not looking after their business needs and the investment climate in South Africa is not helping – owing to policy uncertainty, crime and xenophobia. Beneficiation is hard and demands a lot of work. One participant lamented:

*It is known that the geology doesn't stop at country boundaries...you know what I am saying...as a company going in mining projects...I will probably continue to mine across the area...for I know the legislation...every time I need to look at a project, I don't need to get a lawyer to get a look on the legislation...the west African ...eh the francophone block, a lot of their conventions, they almost overrun each other (Interviewee no. 3).*

Beneficiation was found to be an expensive activity which, however, in the context of Namibia and Botswana for example made a difference policy wise. Companies are divided on whether the current policies and beneficiation practices work. While Lesotho has sufficient power for its industries, South Africa is usually short of electricity. If anything, beneficiation policy reforms were advocated for by some during the interviews. Participants thought, to a great extent, that a regional or continental market for beneficiation products could be a prerequisite to an integrated beneficiation policy formation and implementation for the SADC region.

In practice, there appear to be a zero-beneficiation situation in Lesotho. A participant revealed:

*I have to say right now practically we have zero beneficiation policy in Lesotho...I am looking at the major sector which is 99% of mining sector, the diamond sector,...we only extract and export the diamond outside, we don't have any downstream local linkages... it is not by choice as much...that was the foresetting that has been there ever since...the new mineral beneficiation policy that Lesotho has is not yet operational (Interviewee no. 4).*

Sustainable development of mineral resources is always a challenge. There is a deplorable mismatch in beneficiation policies within the SADC namely South Africa, Botswana, Zimbabwe, Lesotho and the DRC. Government officials are many a times in disagreement with economists on whether mineral beneficiation should be prioritized in the SADC, with the first thinking it should whereas industrialists call for precautions. It would be necessary to create a market for domestic minerals before enforcing large-scale beneficiation policy integration. Experts question whether compliance with the African mining vision really matters.

A participant lamented the fact that they need a visa to go to their own mine in Namibia. SADC has to deal with the heterogeneous conditions in the DRC to accommodate those who seek return on investment.

## 5. Conclusions

There continues to be a high expectation that the SADC's mineral wealth will drive its economic growth and development. In this study, we have reported on perceptions amongst role players in the SADC mining industry on the role and nature of downstream mineral beneficiation in achieving such aims. The development of a regional vision (which at the time was still under development) seems to have not been well-known in the industry, particularly the private sector. This limited knowledge may have been a factor in the way participants perceived and interpreted beneficiation policies.

Interviewees thought policies were not aligned in practice within the SADC region probably because of differences on national priorities. To some, beneficiation should take place in the country where the minerals were extracted but to others suffice it to happen in the SADC region. Participants thought that regional beneficiation would make economic sense, allow to keep value and reduce transport costs. The main challenges remain infrastructure development (scarce skills, electricity shortage and the cost-factor). Participants called for beneficiation policy reforms in the region. The need to put in place a regional market was pronounced as a prerequisite to fiscal reforms.

We conclude that whilst most of the interviewees were only vaguely aware of the RMV and its policy processes, the concerns which industry representatives in particular raised, are actually fairly well articulated in the RMV, with practical and mostly well-founded plans to address them. Of some concern is the RMV's continued wishful inclusion of older carbon-intensive 20th century "opportunities" for downstream beneficiation. Recent developments in the industry suggest that the global sustainability transition is already affecting the region's minerals industry. Consultation should be taken on whether national or regional beneficiation policies should be prioritized. It will take political will and a long-term approach on infrastructure development and market creation for beneficiation to thrive. An integrated SADC beneficiation policy will require strategic alignment and joint planning to develop the infrastructure and human resource base required. As stated by Baxter (2019), it takes responsibility, respect, trust, honesty and accountability to drive beneficiation reforms in the right direction.

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