A Competitive Framework for Mineral Beneficiation and Value Addition in Zimbabwe

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Abstract: The development of mineral beneficiation and value addition has the potential to drive sustainable socioeconomic development in Zimbabwe. However, the country has been facing challenges in fully leveraging its mineral resources endowment for economic growth. This paper aims to address this issue by presenting a comprehensive framework for mineral beneficiation and value addition in Zimbabwe. The framework was developed using a mixed-methods approach that involved a literature review, stakeholder consultations, and data analysis. The objectives of the framework are to enhance mineral beneficiation and value addition, promote sustainable socioeconomic development, and create economic opportunities for local communities. The framework comprises a set of strategies and policies aimed at addressing the challenges facing the mineral sector, including inadequate infrastructure, limited technological capacity, and inadequate financing. The framework also emphasizes the need for stakeholder collaboration, human capacity building, and the adoption of environmentally sustainable practices. The paper concludes by highlighting the potential benefits of the framework, including increased employment, foreign exchange earnings, and overall economic growth, and calls for its adoption by policymakers and stakeholders in Zimbabwe.

Keywords: Framework, Strategies, Sustainable Socioeconomic Development, Mineral Beneficiation, Value Addition.

1. INTRODUCTION

Mineral beneficiation and value addition have become important economic drivers for many countries. The development of a framework on mineral beneficiation and value addition for sustainable socio-economic development of Zimbabwe is therefore necessary. The framework is intended to guide the implementation of mineral beneficiation and value addition activities in Zimbabwe. This paper discusses the components of the framework, elements of the framework, the steps undertaken in developing the framework, and its validation.

Zimbabwe is endowed with rich mineral resources, including gold, platinum, diamonds, chrome, coal, and many others (World Bank,2018). These minerals have the potential to drive economic growth and development, but their full potential has yet to be realized due to various challenges facing the mineral sector (Hawkins, 2009). The country has been exporting raw minerals without value addition, resulting in losing potential revenue and jobs. In addition, the mineral sector has been affected by inadequate infrastructure, limited access to financing, and inadequate technological capacity (Matsika, 2010).

The Zimbabwean government has recognized the potential of the mineral sector to drive economic growth and development and has implemented various policies and strategies to promote mineral beneficiation and value addition (Gudyanga, 2016). However, progress has been slow, and the sector is still facing significant challenges. The country's economic situation has also been challenging, with high levels of poverty, unemployment, and limited foreign exchange reserves (Ross, 2003).

Against this background, there is a need to develop a comprehensive framework for mineral beneficiation and value addition in Zimbabwe. Such a framework would provide a roadmap for leveraging the country's abundant mineral resources for sustainable socioeconomic development. The framework would need to address the

challenges facing the sector, including inadequate infrastructure, limited technological capacity, and inadequate financing. It would also need to promote stakeholder collaboration, human capacity building, and the adoption of environmentallysustainable practices.

The development of such a framework would require a multidisciplinary approach, involving stakeholders from government, industry, civil society, and local communities. It would also require a thorough analysis of existing policies, strategies, and frameworks for mineral beneficiation in Zimbabwe and other countries. By developing a comprehensive framework for mineral beneficiation and value addition, Zimbabwe can unlock the full potential of its mineral resources,create jobs, and drive sustainable socioeconomic development.

2. THEORETICAL FRAMEWORK

This section contains a detailed analysis of the theoretical framework of this study. The theories underpinning the development of this framework include the Systems Theory, Resources Curse Theory, Critical Enquiry Theory, and Multi-Sectoral Policy Alignment Theory.

2.1 Systems Theory

The study argues that the effectiveness and efficiency of governance can be improved, and eventransformed if it is informed by systemic thinking. A systems perspective provides for a more appropriate, holistic, and a more integral approach toward the strategic planning and dissolving of complex problems. Hence the study employed the systems theory propounded by Ludwig von Bertalanffy (1986). A brief overview of governance as a concept within the Zimbabwean context is followed by an overview of systems aspects, systems methodologies, and related legal, regulatory, and policy frameworks. These methodologies are applied to aspects of governance in many developed nations hence lessons were drawn followed by recommendations regarding thefuture application of systems theory and principles for governance purposes in the mining and mineral sector of Zimbabwe.

The prevailing concept of governance in the Zimbabwean mining and mineral sector is primarily based on simplistic processes that negate the interior realities of both individuals and the collective that co-produce the visible worlds. Current practices, unethical behaviour based on pre-conventional worldviews, and short-term linear and simplistic thinking, are inadequate andinappropriate to address the challenges emerging from complex policy contexts in the mining sector in the context of mineral beneficiation and value addition (World Economic Forum,2015).

The visible symptoms of this reality are expressed in terms of the ineffectiveness and inefficiency of current governance systems in Zimbabwe, with a particular focus on the mining and mineral sector. A systems approach to governance provides powerful methodologies that can facilitate more effective and efficient governance performance. Governing actors need new worldviews and a holistic, integral consciousness as well as skill in the use of systems methodologies to govern more competently (Schwell, 2015). Systems methodologies produce new knowledge, insight, and understanding that can facilitate wise choices. Hence the study will make use of the systems theory in developing the framework for mineral beneficiation and value addition.

The value of the systems theory in this study is that Systems Theory concepts and methodologies from the domains of systems thinking were applied to evaluate the concept of governance in Zimbabwe as a system. Governance effectiveness and efficiency within all spheres of government in the mining and mineral sector and related stakeholders can be improved through the application of systems methodologies which is significant in the framework which was developed in this study which advances sustainable socio-economic development of Zimbabwe.

2.2 Resource Curse Theory

The current political climate, energy constraints, and fiscal problems in Zimbabwe pose a major threat to the optimisation of the mineral sector to achieve economic recovery. Failure to transformand create economic linkages

within the mining sector will imply that economic recovery will not be met. Studies have shown that resource-rich countries, particularly in Africa, have been associated with low economic growth levels and development due to the resource curse theory, corruption, and rent-seeking behaviours (Collier and Goderis, 2007) and Rosser, (2006). Althoughthe resource curse theory is associated with mineral rich countries as widely documented, there is limited research on how to optimize the mineral sector to address or minimise the resource curse problem and achieve economic development. Recent literature such as Smillie, (2009) andHawkins (2009) and other Non-Governmental Organisations (NGOs) has focused on the issue ofgovernment transparency and accountability on rents capture without necessarily nailing or providing possible solutions for the country to benefit from mining extraction and use the sector as a base load growth tool for economic recovery.

2.3 Multi-sectoral Policy Alignment Theory

Multi-sectoral Approach refers to a deliberate collaboration among various stakeholders and sectors to jointly achieve a policy outcome. Hence the study lays emphasis on collaboration between various stakeholders in a bid to achieve mineral beneficiation and value addition in Zimbabwe. In a nutshell, the synopsis of the study to demonstrate the conceptual framework would be that for mineral beneficiation to be feasible the systems theory, Multi-Sectoral Policy Alignment Theory, and the Critical Enquiry Theory must be applied to inform the basis for mineralbeneficiation and value addition. However, lessons are drawn from the Africa Mining Vision that drives the national agenda which is the National Mining Vision that will advance the sustainable socio-economic development of Zimbabwe if the proposed framework is implemented successfully.

3. METHODOLOGY

The study employed a qualitative approach and a sample size of 25 respondents was employed in the study of developing a mineral beneficiation and value addition framework. A comprehensive literature review of existing research and reports on mineral beneficiation and value addition in Zimbabwe was reviewed in the study which provided a solid foundation for the framework. This approach involved identifying and analyzing the strengths and weaknesses of existing policies, strategies, and frameworks for mineral beneficiation in other countries. Stakeholder consultations were also employed in the study. The stakeholders include policymakers, industry players, civil society organizations, technocrats in the mining and mineral sector, experts, and local community leaders, who provided valuable insights into the challenges and opportunities facing the mineral sector in Zimbabwe. This approach involved conducting interviews, official document reviews andsurveys to gather data on stakeholder perceptions, experiences, and expectations.

Examining successful examples of mineral beneficiation and value addition in other countries provided valuable lessons and insights for developing a framework for Zimbabwe. This approachinvolved analyzing case studies of successful initiatives and programs in other countries and adapting them to the

Zimbabwean context. A comprehensive analysis of available data on the mineral sector in Zimbabwe also provided valuable insights into the current state of mineral beneficiation and value addition in the country. This approach involves analyzing data on mineral policies, production, exports, and revenue, as well as data on the state of infrastructure, technology, and human capacity in the sector.

4.STEPS IN DEVELOPING THE FRAMEWORK

This section outlines the steps taken in the development of a beneficiation and value addition framework for Zimbabwe. A competitive mineral beneficiation and value addition framework wasdeveloped using literature in the study. The literature in the study presents case studies of different countries around the world where mineral beneficiation frameworks have been developed and the extent to which such approaches employed in those countries have been successful.

4.1. Summarised Review of Literature

The initial stage in the development of the framework on mineral beneficiation and value addition for socio-economic development in Zimbabwe was the review of the literature. The main aim was to establish the best practices in the beneficiation and value addition of mineral resources globally. It was also important to review literature that current knowledge is utilized as well as aligning the framework with the needs of stakeholders. In Australia, the beneficiation framework focused on specific minerals. It can be argued that the beneficiation and value addition framework in Australiaprovided the foundation for building strong linkages between the government and the mining companies. However, its focus was mainly on preserving the environment and improving economic output while neglecting the socio-economic aspects which address issues of inclusivityand community participation. Meanwhile, the Chinese framework on beneficiation and value addition of mineral resources outlines the essence of community participation and institutional capacity (Lin *et al*., 2022). The Chinese government successfully deployed a decentralised framework which incorporated various stakeholders to ensure that the proceeds from mining activities benefit the community and the government (Odeye, 2021). This helped to create internal markets and a thriving minerals ecosystem for the country.

The South African government's beneficiation and value addition policy framework is an indication of a commitment to ensuring that minerals attract value before they reach the world markets. However, it has not been fully implemented to test its applicability including the fact that is entirely based on eliminating constraints on beneficiation and value addition. According to Huni (2018), the beneficiation and value addition framework in Botswana contains many practically implementable aspects which make it the best in Southern Africa. Kgola (2019) indicates the framework focuses on improving socio-economic development because diamond is the main source of foreign currency in Botswana. Botswana's example was unique, with the government and De Beers' vested interests so aligned from the beginning that the partnership started from a position with a likelihood of convergence.

Matinde (2018) argue that Zimbabwe has endured a long period of piecemeal policy frameworks which lack a holistic picture of the entire mining industry. In particular, the mining industry relied on colonial policy frameworks which focused on improving the lives of minority groups with little or no intention for beneficiation and value addition (Murombo, 2021). Only mining companies and owners benefited from the proceeds of mining. Since 2008, the ZIMASSET economic blueprint echoed the beneficiation and value addition of mineral resources, and little has been done because the colonial policy frameworks continue to influence policymaking (Tinarwo and Babu, 2022). It is therefore suggested that the non-existent hybrid framework should be developed to promote the implementation of beneficiation and value addition of mineral resources in Zimbabwe.The main aim is to involve communities, improve institutional capacity, and a robust legal framework to achieve sustainable socio-economic development. The focus on sustainable socio- economic development is based on the fact that beneficiation should lead to an improved standard of living in the surrounding communities.

4.2. Development of the beneficiation and value addition framework

The second step was the development of a framework for beneficiation and value addition provides the starting point for understanding the value addition and beneficiation concept and shepherding it towards full realisation. Figure 5.1 shows the framework and indicates the linkagesbetween various stakeholders who should participate in various processes for the realisation of socio-economic development. The government, civil society, local communities, and academics have a role to play in ensuring the beneficiation program is a success. Assumptions in the development of the framework include the fact that the government is committed to unlocking value of its mineral resources for the benefit of local communities.

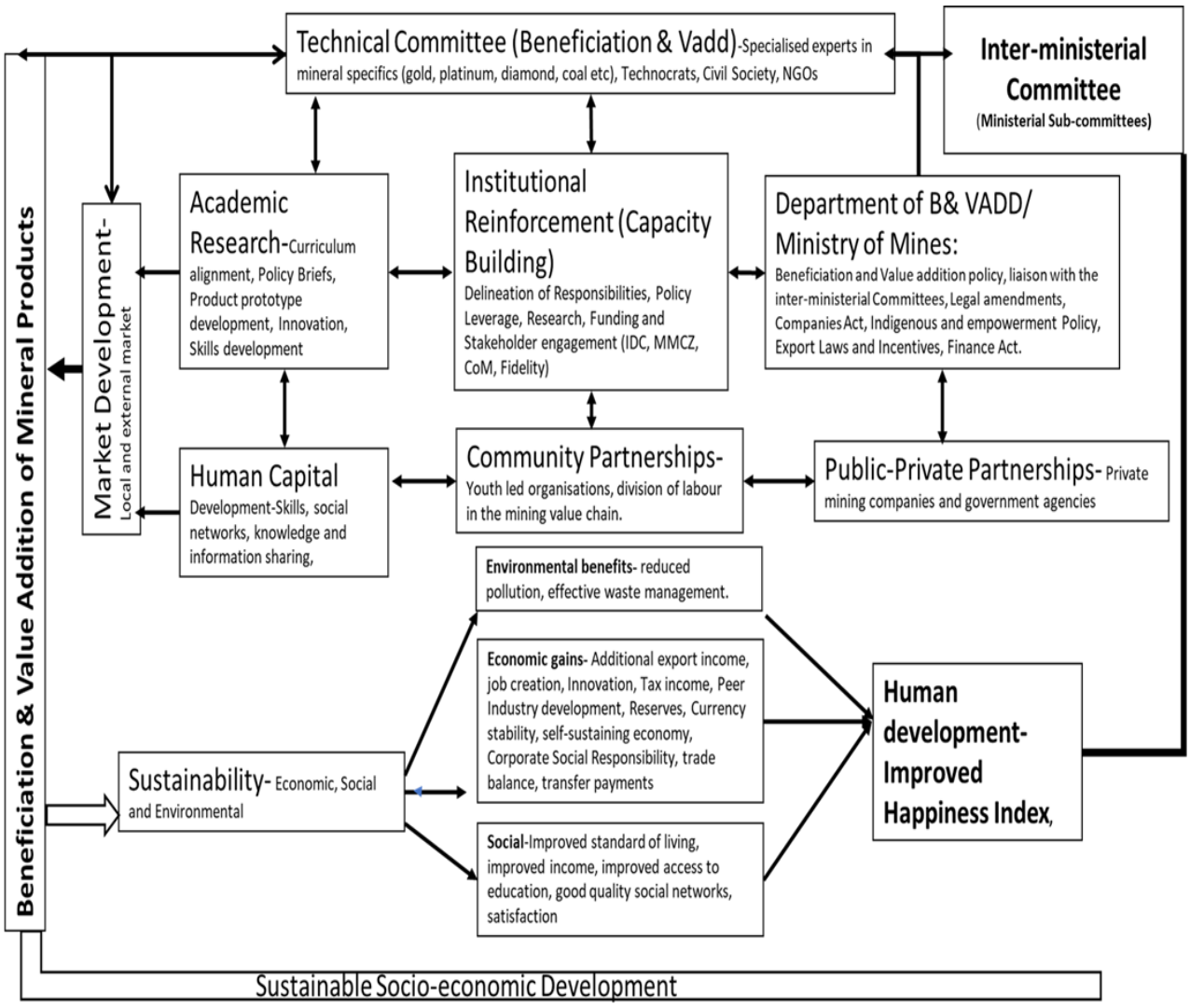

Figure 4.1 Framework for beneficiation and value addition of mineral resources in Zimbabwe, Source: Author's Construct(2022).

4.3 Components of the Framework

The proposed hybrid framework for mineral beneficiation and value addition for sustainable socio- economic development of Zimbabwe has five components, which are discussed below:

4.4 Governance

Governance plays a critical role in the successful implementation of the mineral beneficiation andvalue addition framework. Its distinct role is to ensure that policies are developed, implemented, and monitored in a transparent and coordinated manner. The inter-ministerial committee, which is a key aspect of the governance component, should be responsible for overseeing the implementation of the framework and ensuring that all relevant stakeholders are engaged in the process. This committee should also be tasked with identifying and addressing any cross-cuttingissues that may hinder the successful implementation of the framework.

The Inter-Ministerial Committee is constituted by top government officials in various key ministriesas highlighted in Figure 4.2. The top government officials range from captains of industry, Directors, Chief Directors, Permanent Secretaries, representatives from industry, and Ministers. Furthermore, good governance practices such as transparency, accountability, and participation are essential in ensuring that the framework is implemented effectively. These practices will ensure that all stakeholders are involved in the decision-making process and that

the benefits of mineral beneficiation and value addition are equitably distributed. Additionally, governance can ensure that policies and regulations are put in place to protect the environment and ensure that the local communities benefit from the mineral resources.

In a nutshell, the distinct role of governance in the mineral beneficiation and value addition framework is to ensure that policies are implemented in a transparent and coordinated manner and that all relevant stakeholders are involved in the process. This will help to promote sustainable socio-economic development in Zimbabwe and ensure that the benefits of mineral resources aremaximized for the country and its people.

4.5 Infrastructure Development

The second component of the framework involves the development of infrastructure to support mineral beneficiation and value addition activities. This includes the provision of reliable and affordable energy, the development of transport infrastructure, the establishment of efficient watersupply systems, and the development of telecommunication infrastructure to support mining operations. The development of infrastructure is essential to support mining operations and to ensure that the benefits of mineral beneficiation and value addition activities are maximized.

4.6 Technical Assistance

The third component of the framework involves the provision of technical assistance to support the development of mineral beneficiation and value addition activities. This includes the provision of training programs, the development of research and development centers, and the establishment of technology transfer mechanisms to promote the adoption of new and innovativetechnologies in the mining sector. The provision of technical assistance is essential to ensure that the mining sector is equipped with the necessary skills and knowledge to undertake mineral beneficiation and value addition activities.

4.6.1 Financing Mechanisms

The fourth component of the framework involves the development of financing mechanisms to support mineral beneficiation and value addition activities. This includes the provision of loans, grants, and other forms of financial support to mining companies, the establishment of venture capital funds, and the development of public-private partnerships to promote investment in the mining sector. The development of financing mechanisms is essential to ensure that the mining sector has access to the necessary capital to undertake mineral beneficiation and value additionactivities.

4.6.2 Stakeholder Engagement

The final component of the framework involves the engagement of stakeholders, including mining companies, government officials, civil society organizations, and local communities, to promote the development of mineral beneficiation and value addition activities. This includes the establishment of stakeholder forums, the provision of platforms for dialogue and consultation, andthe promotion of public awareness campaigns to educate stakeholders on the benefits of mineralbeneficiation and value addition activities. Stakeholder engagement is essential to ensure that the development of mineral beneficiation and value addition activities is inclusive, transparent, and sustainable.

5. ELEMENTS OF THE BENEFICIATION AND VALUE ADDITION FRAMEWORK

This third step involves explaining the elements of Beneficiation and value addition of mineral resources in Zimbabwe. In this regard, the framework suggested in this study comprises various actors in and outside the mining industry.

The Inter-Ministerial Committee is a critical element of the framework. It comprises of top government Officials from various ministries ranging from technocrats, directors, chief directors, permanent secretaries and ministers. The Inter-Ministerial Committee reports to parliament of Zimbabwe and is subject to the specific parliamentary portfolio committee, for instance the Ministry of Mines and Mining Development is subject to Mines and Energy portfolio committee. The Inter-Ministerial Committee addresses cross cutting constraints to beneficiation and create an enabling environment for mineral beneficiation and value addition. The Inter-Ministerial Committee thus plays an oversight role, does monitoring and evaluation and ensures they is implementation of decisions adopted by the body.

The Ministry of Mines and Mineral Resources of Zimbabwe is the overall organ of state that presides over the parliamentary proceedings on matters of value addition and beneficiation. This includes the promulgation of legal instruments and national policies and leads the debates about the appropriate channels of value addition and beneficiation. The Ministry of Mines and Mineral Resources coordinates other laws such as the Indigenous and Empowerment Act, the Finances Act, and the Companies Act in consultation with the technical committee. The technical committee comprises various technocrats such as mineralogists, engineers, geologists, policy makers, metallurgists in mineral-specific domains (platinum, diamond, gold, coal, chrome, etc.) The team of technocrats will also include surveyors, economists, environmentalists, civil society, and NGOs. The role of technocrats is to identify and implement avenues for beneficiation and value addition in respective mineral resources, encourage scientific innovation and assist in policy formulation. The technical committee is a critical component of the framework because it reports directly to the government on their findings from the ground.

For beneficiation and value addition of mineral resources to gain sufficient traction, the existing institutions such as the Chamber of Mines, Fidelity, the Industrial Development Corporation, The Minerals Marketing Commission of Zimbabwe, and other organs of the state who are currently responsible for industrial development and marketing of mineral resources need to be adequately capacitated. This encompasses human skills and financial support to improve efficiencies both in the production processes and value addition. The understanding here is that, if well capacitated, these institutions can perform way above their current levels. This is so because corruption and lack of skills are widely accepted as major drawbacks in the efficient functioning of these organs. Institutional capacity development should be accompanied by a delineation of responsibility. This means each organisation is trimmed off its overlapping duties which often complicate the way their tasks are performed. Lastly, these organisations should be able to carry out stakeholder engagements and assist in policy alignment.

The ministry should form partnerships with the private sector. There are private companies that have vast experience in the mining industry. Such companies assist the government in finding appropriate ways to improve beneficiation and value addition of mineral resources. For example, the government of Botswana used this model in partnership with De Beers to improve beneficiation and value addition. Private companies are also critical assets in the formation of community partnerships wherein various skills are imparted to the youth through organisational corporate social responsibility schemes. Artisanal mining pacts can be forged through these avenues so that skills are transferred across a wide range of personnel. The more people gain skills the larger the spectrum of innovation and income generation. Both the public and private sector should aim to improve human capital development using direct methods and of teaching and learning and workshops.

Beneficiation and value addition should also be deeply entrenched in the academic and research institutions. Academic institutions should align their curricula with various levels of education. Meanwhile, skills development in minerals beneficiation and value addition are mostly concentrated in professional colleges such as vocational colleges and limited at lower levels. Innovation should be allowed space to occupy at lower levels of academic learning. Apparently, there is limited discovery and technology use in minerals processing particularly in value addition because possibilities are limited by lack of access to innovative learning platforms. Thus, the academic domain should provide avenues for new product development using mineral resources.

Currently, research institutions have limited output regarding value addition and beneficiation. Yet, this thrust has the potential to generate innovative ideas which are critical for improving the competitiveness of mineral

resources and products. Research should inform policy and industry such that beneficiation and value addition is recognised. More importantly, research helps in the development of standards that are currently limited to raw mineral resources. In Zimbabwe, there are no standards for processed mineral resources. This barrier to beneficiation can be overcomethrough the establishment of appropriate standards or copying from the international standards to ensure that the value-added products fit in the international market.

Beneficiation and value addition should have a well-developed domestic and international market. The local market should be inter-industrial and industry to retailers and consumers. In the current situation, there are no industrial linkages to sufficiently show multistage value addition. The market for raw minerals such as gold, platinum, diamond, lithium, and iron ore is only internationaland the local consumers only purchase finalised goods from outside. Therefore, beneficiation willonly be fully achieved if the industrial cycle through value addition begins and end locally. The international market should also be fed with processed products so that they can attract a highervalue. In this way, beneficiation will yield sufficient results.

Beneficiation and value addition is not the end, it is the cornerstone of human development. Human development must be sustainable. Sustainability has three pillars which are social, economic, and environmental. Social sustainability embraces an improvement in the standard ofliving, improved access to education, access to resources, healthy social networks, and access to decent health facilities, food, and clothing. These indicators are critical measures of beneficiation to an ordinary individual. Beneficiation should ensure that the welfare of the elderly people is properly managed even though, their contribution is limited. Beneficiation and value addition should lead to reduced conflicts between various actors in the mineral markets.

Economic sustainability embraces the continued existence of income generation within the defined system of beneficiation and value addition. It is the primary cause for beneficiation and value addition initiatives. There is no doubt that in the current situation that much of the economicgains are locked in raw mineral resources or value is lost through the informal markets. Economic sustainability brings a self-sustaining environment wherein value is generated from within the country and sources of investment are locally sourced from the proceeds of value-added mineralresources. There are many channels that can be used to derive economic sustainability for example, value addition increases the competitiveness of the country's exports which increases the foreign currency inflows, improved revenue through taxes and levies, and ultimately a positive balance of payments. Value-added mineral resources are a critical support structure for strengthening the local currency. This is because the value of a currency is supported by strong mineral resources such as gold.

A healthy economy should be able to sustain its needs using locally generated incomes. The ZIMASSET blueprint has already highlighted the devolution of provinces and given way to the creation of Special Economic Zones. The idea here is that the economic gains should not be confined to national interests while neglecting the local communities. Through beneficiation and value addition, the operating entities should create jobs for the local youth. Corporate Social

Responsibility programs are a vital channel of giving back value to the community, however, thisis fully achieved through value addition and beneficiation. Improved economic gains will help to sustain economic activities through transfer payments. Economic gains from mineral resources if well managed can become the backbone of the economy.

5.1. Uniqueness of the Framework

The framework developed for mineral beneficiation and value addition in Zimbabwe is unique in several ways. Firstly, it takes a holistic approach to the development of the mineral sector, with afocus on the entire value chain from exploration to production and marketing. Secondly, it emphasizes the importance of local value addition, which has the potential to create employmentand generate additional revenue for the country. Thirdly, it recognizes the importance of technological development and transfer, which is crucial for the efficient and sustainable processingof mineral resources.

Another important aspect that makes the framework unique is the inclusion of various stakeholders in the mining value chain. As noted in the study, Zimbabwe's beneficiation and valueaddition is marred with several crosscutting constraints. To address the problems emanating from various ministries, an Inter-Ministerial Committee was developed. The committee is made up of sub-committees comprising technocrats, academics, directors, Permanent Secretaries, and ministers from various ministries as indicated in Figure 5.2. The main aim of the inter-ministerial committee is to adjudicate crosscutting constraints from the concerned ministries. For example, the directors from the Ministry of Energy and Power Development should draft and report on measures to curb the impact of persistent power cuts that negatively affect the beneficiation and value addition of mineral resources. Energy is an important input required in the mining value chain therefore, the availability of power should be prioritized.

More so, other ministries such as the Local Government should ensure that stakeholders are engaged and development cascade to the communities as well as encourage grassroots to participate in beneficiation and value addition programs. The Ministry of Local Government carriesthe responsibility of ensuring that sustainable socio-economic development is realized at the community level. Together with the Ministry of Higher Education and technology development, the Ministry of local government should facilitate research and the development of metrics for measuring the happiness index. The Inter-Ministerial Committee reports to parliament regarding its mandate for ensuring that the crosscutting constraints impeding the implementation of beneficiation and value addition of mineral resources are addressed as a major priority for thesustainable socioeconomic transformation of Zimbabwe.

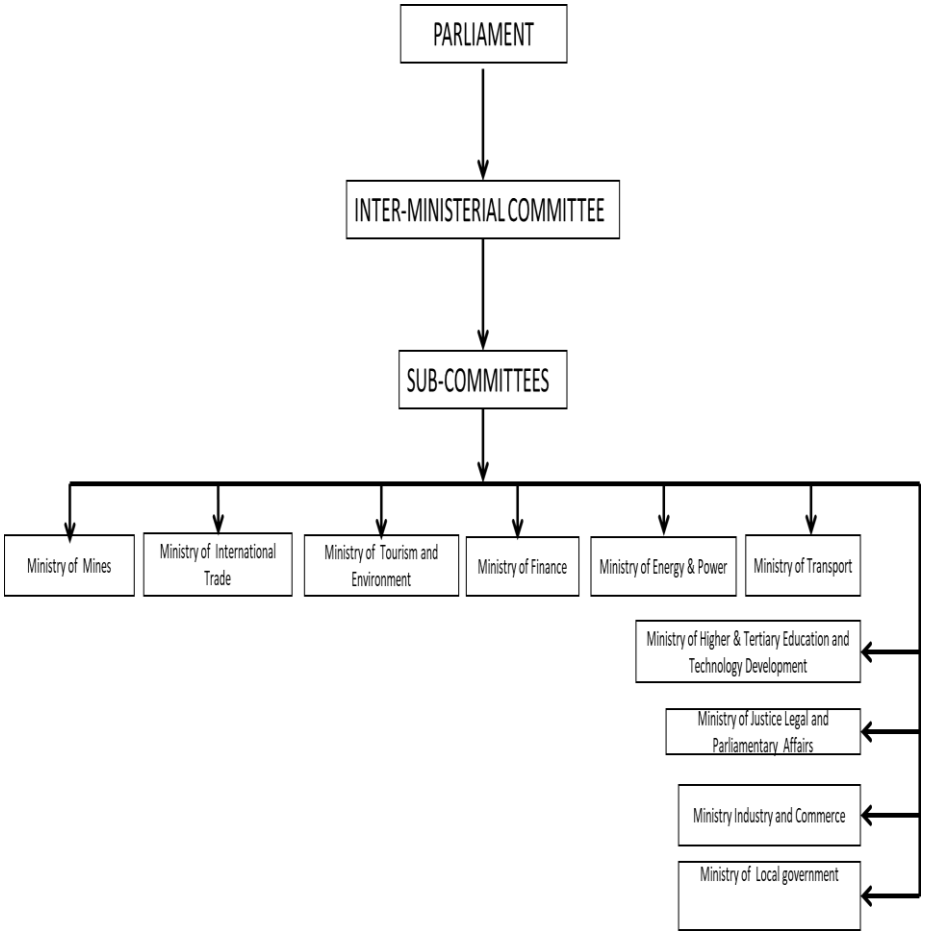

Figure 4. 3 Composition of Inter-ministerial Committee for Beneficiation and Value Addition, Source Author's Construct (2022)

5.2 Validation of the Framework for Beneficiation and Value addition of Mineral Resourcesin Zimbabwe

Validation of a framework is an iterative process that involves various activities and timelines. In this study, the framework for beneficiation and value addition was validated in five steps. The firststep involved the presentation of the framework at a stakeholders' workshop and the stakeholderswere asked for feedback and input in the second step. The third step involved revision and refinement. In the fourth step the framework was presented to experts for review and the comments and views of experts were incorporated in the final framework in the last step.

Step 1: Presentation of the Framework to Stakeholders

The framework was presented to stakeholders in a workshop conducted to solicit the views of stakeholders regarding the proposed framework for beneficiation and value addition of mineral resources in Zimbabwe. Copies of the framework were distributed among the stakeholders.

Step 2: Feedback and Inputs

In the second step of validation of the framework, feedback, and inputs from stakeholders were harvested. Stakeholders were invited to provide feedback and input on the framework, including suggestions for additional activities or interventions, comments on the feasibility and relevance of specific activities or interventions, and concerns about the potential impact of the framework on their operations or communities. All responses were noted down however, the stakeholders werealso allowed to discuss the framework and help each other to understand the framework. Some of the captured responses captured include:

"This framework covers the most important aspects which are critical for achieving socio- economic development in Zimbabwe, but it only lacks the environmental aspects." Stakeholder 1

Although some stakeholders were interested in the sustainability of the environment, the development of the current framework was based on the dictates of the ZimASSET blueprint which targeted improving socio-economic development through beneficiation and value addition of mineral resources in Zimbabwe. The current framework focused on sustainable socio- economic development because, the outcomes which are measured through the happiness index reflect socio-economic development. The happiness index presents a situation of shared economic gains whereby both the government and communities benefit from the mineral resources. It was further noted that through the framework, beneficiation and value addition will now cascade to rural communities presenting various opportunities for the youth.

Stakeholders also commented that the current framework expatiated important aspects such as capacity development. The framework includes human capital development which cut across various stages starting from the community level to highly skilled personnel who should implementthe policy. Affording the community, a chance to participate in beneficiation and value addition isregarded as the cornerstone of sustainable development because it fosters development-oriented engagements. Although certain individuals will certainly directly benefit from the beneficiation andvalue addition, the fact that the government, private sector, and communities work together shows some level of commitment towards shared socio-economic development.

"The most interesting thing about this framework is its outcomes which are at least measurable. I understand the metrics for measurement of the Happiness Index are yet to be developed but it clearly demonstrates a good intention. It is very important to develop frameworks like the currentone because they provide the basis for which something is suggested. I have no doubt the government will adopt this framework with very few alterations." Stakeholder 3.

During the validation process, it was further suggested that some elements which were repetitivesuch as multiple government organs and the inter-ministerial committees should be reduced to one entity to avoid long winding components. While the idea for a one-stop shop for beneficiation and value addition of mineral resources was

suggested, it was noted that the multiple connectionsin the current beneficiation and value addition framework might cause corruption. However, it wasargued that connections are necessary and should be maintained.

Step 3: Revision and Refinement

Based on the feedback and input received, the framework was revised and refined to ensure thatit was robust, relevant, and actionable. Specific activities and interventions were adjusted or added to address stakeholder concerns and the overall coherence and consistency of the framework was reviewed and refined.

Step 4: Expert Review

The revised framework was reviewed by experts in the field, including technocrats, academics, researchers, and practitioners with experience in mineral beneficiation and value addition. The expert review was essential to ensure that the framework was informed by current knowledge andbest practices in the field.

Step 5: Finalisation

The final step in the validation process involved the finalization of the framework based on the feedback and input received from stakeholders and the expert review. The final framework was designed to be practical, actionable, and responsive to the needs and priorities of stakeholders.

CONCLUSION

In conclusion, the development of a framework on mineral beneficiation and value addition for sustainable socio-economic development in Zimbabwe is essential to promote investment, maximize the benefits of mineral resources, and promote inclusive and sustainable development. The proposed framework includes five components, including policy and regulatory framework, infrastructure development, technical assistance, financing mechanisms, and stakeholder engagement. The framework was developed through a process of consultation and review involving stakeholders from various sectors and was validated through a process of feedback, revision, and expert review. Although the framework is informed by other existing frameworks in various countries the current one is a hybrid and is unique due to its distinctive features which makes it easy to implement and effectively ameliorate constraints. The framework is intended to guide the implementation of mineral beneficiation and value addition activities in Zimbabwe and to promote sustainable and inclusive development.

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