Green paper

NATIONAL MINERAL SECTOR POLICY FRAMEWORK AND ACTIONS

A shared vision for optimizing GOVERNANCE, COMPLIANCE AND PERFORMANCE
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<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ASM</td>
<td>Artisanal and small mining</td>
</tr>
<tr>
<td>CEEA</td>
<td>Cumulative Environmental Effects Assessment (Appraisal)</td>
</tr>
<tr>
<td>CIDA</td>
<td>Canadian International Development Agency</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>EITI</td>
<td>Extractive Industry Transparency Initiative</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
</tr>
<tr>
<td>GENCAPD</td>
<td>Guyana Environmental Capacity Development Project</td>
</tr>
<tr>
<td>GGDMA</td>
<td>Guyana Gold and Diamond Miners Association</td>
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<td>GGMC</td>
<td>Guyana Geology and Mines Commission</td>
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<tr>
<td>GSDS</td>
<td>Green State Development Strategy</td>
</tr>
<tr>
<td>IAST</td>
<td>Institute of Applied Science and Technology</td>
</tr>
<tr>
<td>ICMM</td>
<td>International Council on Mining and Metals</td>
</tr>
<tr>
<td>IIED</td>
<td>Institute for Environment and Development</td>
</tr>
<tr>
<td>IGF</td>
<td>Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development</td>
</tr>
<tr>
<td>LME</td>
<td>Large mining enterprise</td>
</tr>
<tr>
<td>LS</td>
<td>Large scale</td>
</tr>
<tr>
<td>MNR</td>
<td>Ministry of Natural Resources</td>
</tr>
<tr>
<td>MOC</td>
<td>Ministry of Communities</td>
</tr>
<tr>
<td>MOF</td>
<td>Ministry of Finance</td>
</tr>
<tr>
<td>MOPH</td>
<td>Ministry of Public Health</td>
</tr>
<tr>
<td>MoSP</td>
<td>Ministry of Social Protection</td>
</tr>
<tr>
<td>NAP</td>
<td>National Action Plan</td>
</tr>
<tr>
<td>NAS</td>
<td>National Association of Syndicates</td>
</tr>
<tr>
<td>NDS</td>
<td>National Development Strategy</td>
</tr>
<tr>
<td>NEAP</td>
<td>National Environmental Action Plan</td>
</tr>
<tr>
<td>NMSPF</td>
<td>National Mineral Sector Policy Framework</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Form</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>OSH</td>
<td>Occupational Safety and Health</td>
</tr>
<tr>
<td>RDC</td>
<td>Regional Development Council</td>
</tr>
<tr>
<td>SDG</td>
<td>Sustainable Development Goal</td>
</tr>
<tr>
<td>SEA</td>
<td>Strategic Environmental Assessment</td>
</tr>
<tr>
<td>SME</td>
<td>Small mining enterprise</td>
</tr>
<tr>
<td>SMS</td>
<td>Small and medium scale</td>
</tr>
<tr>
<td>UG</td>
<td>University of Guyana</td>
</tr>
<tr>
<td>WB</td>
<td>World Bank</td>
</tr>
<tr>
<td>WBCSD</td>
<td>World Business Council for Sustainable Development</td>
</tr>
<tr>
<td>WMO</td>
<td>Women Miners Organisation</td>
</tr>
<tr>
<td>WWF</td>
<td>World Wildlife Fund</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-Governmental Organisation</td>
</tr>
</tbody>
</table>
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GLOSSARY AND USAGE

“Mining” or “mineral” sector/industry/policy

This green paper distinguishes between the adjectives “mining” and “mineral” when used to modify the nouns “sector”, “industry” or “policy”. “Mining” is seen as the narrower of the two terms; it emphasizes extractive activities. Usage of “mineral” extends, however, to (i) the forward linkages directly associated with mining, such as the metallurgical and jewelry industries, and (ii) the trade in minerals and metals. Fortunately, when the terms are used interchangeably, the context provides the correct meaning.

ASM, SMS

The Guyana mining law recognizes three scales of mining based on claim size and on volume of earth material handled: (i) large-scale, (ii) medium-scale, and (iii) small-scale. In Guyana, these terms do not indicate or connote the level of mechanization of operations or the socio-economic class of the miner. They are treated as purely legal terms. The socially-loaded term “artisanal” is rarely used in Guyana to refer to small miners and we do not use it in this paper.

The green paper, however, uses the terms “small mining” and “small and medium-scale” to refer jointly to all mining below the large scale.
DESCRIPTIVE ABSTRACT/OVERVIEW

Guyana’s mineral sector is pivotal as a major source of the financial and other development opportunities necessary to fulfill the country’s green development agenda. A comprehensive policy framework, designed through public consultation and research, can ensure that the economic benefits of extracting and utilizing mineral resources can be converted into sustained human benefits through targeted investments in areas such as social welfare, and infrastructure.

The last document with such wide scope and high status is Chapter 32 of the National Development Strategy (NDS) for 2001-2010, released in 1997. The current effort aims to build a new consensus on policies and actions to develop the mineral sector in an era of new challenges and demands.

Minerals are a finite, non-renewable and depletable natural resource. Mining within a green development strategy must ensure, to use the World Bank’s Total Wealth formulation, that the inevitable natural capital losses must be counterbalanced by gains in produced capital (such as infrastructure) and in human capital (a better life for citizens).

Furthermore, a policy framework for the mineral sector must bear in mind future generations and therefore must fully embrace internationally-set goals on climate change, sustainable development, environmental management, biodiversity, and transparency.

The green paper accepts that mining in Guyana has other implications and impacts: for other land uses, such as forestry, protected areas, and Indigenous and other communities; and for national sovereignty, border security, health security, law enforcement, hinterland and infrastructure development, social cohesion, internal population movement and redistribution.

This policy framework also recognizes that large or overarching mandates must work in tandem with how mining manifests itself on the small level with regards to individuals and groups, such as small miners, sector employees, service providers, and residents in mining communities and regions.

The Green Paper is divided into four parts. **Part I** answers the question “why is a comprehensive mining policy needed?” It further describes the methodology to produce this first draft and, eventually, its final version, and provides a few hopefully helpful notes on public policymaking.

**Part II** presents thirteen background briefs that provide context and assessments to aid policy formulation. Its main purpose is to highlight most of the predetermined or set guidelines and limiting factors in the search for policy options.
**Part III** is the core of the green paper. It presents the vision, principles, policies, and main strategies and actions for developing the mineral sector under the title of a National Mineral Sector Policy Framework and Action Plan. The policy framework is energized and organized under three broad themes: the optimizing of (i) the **governance** of the sector, (ii) **compliance** by mining operators, and (iii) the **performance** of the sector as measured by its technical advancement and its contribution to national and sub-national economies. It is recommended that the MNR/GGMC should conceptualize, organize, operationalize and communicate its mandate through these three themes (or policy baskets).

Outside of its table format for the framework, the section also discusses several of its key recommendations, such as:

- a miners assistance scheme.
- a national geodata acquisition and dissemination program.
- an Inspector General Office for the GGMC.
- a non-oil local content policy and CSR.
- a paved hinterland road network.
- revenue sharing between central and local governments.
- environmental management of mining.
- royalty regime.
- legislative amendments

**Part IV** attempts, first of all, to analyse the policy ideas in Part III from two perspectives: (i) under common policy fields such as fiscal, legal, institutional, and environmental (mostly, for ease of reference); and (ii) the extent to which Part III matches the principles of the Green State Development Strategy Framework (as all national policies have to be in sync with Guyana’s green agenda).

Secondly, Part IV addresses the matter of policy implementation. It identifies the risk factors to be overcome for successful policy execution, and offers a few notes on GGMC, as the agency mandated to implement mining policy.
PART I INTRODUCTION

Part I answers the question “why is a comprehensive mining policy needed?” It further describes the methodology to produce this first draft and, eventually, its final version, and provides a few hopefully helpful notes on public policymaking.

1. STATEMENT OF PROBLEM: Why a comprehensive mining policy?

The mission of Ministry of Natural Resources (MNR) is to “develop, implement and oversee policies for the responsible exploration, development and utilization of natural resources whilst ensuring the protection and conservation of the environment and advancement of the green economy.” The MNR’s policy positions could be constructed from the various statements and speeches made, and the decisions and actions taken, especially by portfolio ministers and senior GGMC (Guyana Geology and Mines Commission) managers. While these official statements and actions span a wide sweep of issues, they are not underpinned by any single comprehensive planning matrix, as no such documentation on the mineral sector has emerged in recent times.

The last document that can claim such status is the National Development Strategy (NDS) for 2001-2010. The NDS, which was launched in January 1997 and co-ordinated by the Ministry of Finance, involved 23 technical working groups with representation from the private sector, government agencies, non-government agencies, and the University of Guyana. Chapter 32 of the NDS addressed mining policy and included recommendations on fiscal regime, institutional aspects, legislature changes, infrastructure development, and environmental issues. No policy document on mining has since encompassed such scope.

Apart from this absence for over 20 years, the MNR also recognizes that a demand exists presently for a new and stronger consensus among stakeholders on the development challenges and goals in the mineral sector. Some of these challenges relate to increased mining activity and to the country’s commitment to international conventions such as on global climate change, governance, environmental protection, and green development.

The MNR therefore holds the view that the current endeavour to draft new policies and plans for the sector should not only update the key content areas of the NDS, but must also seek to emulate the consultative and participatory approach used in its drafting.

Overarching all these considerations is the government’s belief that the mineral sector must expand its role as one of the main drivers of the country’s sustainable development agenda.
2. TERMS OF REFERENCE

The specific task is to produce a 10-year strategic development plan for Guyana’s mineral sector\(^1\) covering the period 2019-2029 that adheres to the core principles of:

- Sustainable development of mineral resources;
- The government’s vision of a green economy;
- Sound environmental management;
- The various mining-specific international agreements to which Guyana is a signatory,
- Participatory and consultative democracy.

3. SHORT NOTE ON PUBLIC POLICY-MAKING

Mining policy is public policy, i.e., a guide to action taken by the state for the good of society. As such, this mining policy is seen as government’s intent to obtain wanted improvements which it believes would not be obtained but for this policy being in place. Policy making is therefore motivated by the belief that the current state of affairs, however good, falls short of what is desired and, assumedly, what is achievable.

In Guyana, much consensus among stakeholders exists on what the future of mining locally should look like. The challenge is to craft policies and plans to reach the desired future in an environment of limited capacities and resources, uncertainties over cause-effect relationships, inadequate data and information, and a weak results-oriented and implementation culture. Several proposed strategies in this green paper target these deficiencies for improvement.

The vast literature on public policy provides two good bits of guidance here: (i) making public policy is largely a political process, more so where the process is deliberately designed for multi-stakeholder participation and/or approval. The “best” policies therefore may not be based only on a rational or scientific model, but on compromises and satisficing (satisfying and sufficing) approaches. The current fiscal regime on mining stands out as an example of this satisficing; and (ii) policies are not just made and then executed. They are designed and redesigned through a process of periodic fixes and adjustments to respond to changing conditions and lessons learnt as implementation proceeds.

\(^1\) not including the petroleum sector.
Mining is a broad and complex policy field. Policy formulation requires a continuous search for more effective ideas, more so as the information and other deficiencies mentioned above are gradually overcome. Providing a framework, as we do in this document, rather than attempting a comprehensive listing of ideas, best facilitates policy enrichment and integration.

Significant chunks of mining policy today are mandated through Guyana’s participation in a range of international agreements and protocols. The green paper includes these commitments as default policy options.

Finally here, the green paper adopts a non-discriminatory posture towards the large-, medium- and small-scale mining subsectors. All are considered important in meeting the country’s sustainable development goals.

4. POLICY MAKING METHODOLOGY

The methodology in producing the green paper includes:

(i) a multistakeholder approach for issue identification and policy legitimation.
   - a public call for submissions was published in the three major newspapers;
   - invitations for contributions were sent directly to persons of knowledge;
   - one-on-one meetings were held with stakeholders and contributors (Annex I);
   - discussions were held with GGMC managers and the commissioner
   - the positions of stakeholders were sourced from the newspapers, press releases, and conference minutes.

(ii) a literature review of:
   - case studies, best practices, industry news journals, and guidelines of international mining-related NGOs (such as ICMM and IGF);
   - GGMC documents (such as were presented);
   - university research papers on mining.

(iii) discussions at conferences and other forums (Annex I).
Points to note

i) A green paper is for open discussion by all. It is amendable based on public and stakeholder feedback. As such, this paper does not represent the final positions of the Ministry of Natural Resources.

ii) The process of stakeholder consultations continues. The green paper has benefitted meaningfully thus far from this process. The policy team will issue further invitations for meetings.

iii) Much effort was made to capture the main concerns of the mining community from their statements in the media and from their contributions at meetings and conferences (such as the Small Miners Conference in June 2018).
Part II presents thirteen background briefs that provide context and assessments for policy formulation. Its main purpose is to highlight most of the preset guidelines, requirements, and constraints that inform the search for policy options.

**BACKGROUND BRIEF #1  Governing frameworks for local mineral policy**

At the outset, a mining policy for Guyana is constrained by the Guyana Constitution, national development vision and goals, and several regional and international conventions and agreements. Together, these sources lay down value systems, goals, standards, guidelines, rules, targets and even implementation deadlines in areas such as human rights, the environment, climate change, and sustainable development. The Minamata Convention, for instance, sets a 2027 deadline for Guyana, as a signatory, to reduce, if not eliminate, the use of mercury in mining. And the Kimberly Process has motivated changes in the regulations on the trading and export of local diamonds.

Below, the green paper singles out a few such frameworks for additional comment because of their fundamental or far-reaching influence on the shape of the mineral industry.

**The Guyana constitution**

In its Preamble, the constitution speaks of the nation’s commitment to protect its natural environment and endowment. In Article 36 (Land and the environment), the constitution further declares that the “well-being of the nation depends upon preserving clean air, fertile soils, pure water and the rich diversity of plants, animals and ecosystems”. In Article 149J (The Environment), the constitution embraces the idea of sustainable development by declaring that the State “shall protect the environment for the benefit of the present and future generations” by preventing pollution and ecological degradation, promoting conservation, and securing sustainable development and use of natural resources. In the same article, the constitution recognizes these goals must be pursued “while promoting justifiable economic and social development”.

**Guyana Green State Development Strategy (GSDS)**

The GSDS policy framework is projected to guide Guyana’s economic and sociocultural development for the next fifteen years. The objective of GSDS is to “reorient and diversify Guyana’s economy, reducing reliance on traditional sectors and opening up new sustainable income and investment opportunities in higher value adding and higher growth sectors.” The six principles on which the GSDS is built are:
i) **Cohesion and inclusion**: human rights, multi-ethnicity and gender equality, non-discrimination and protection of vulnerable and marginalized population groups.

ii) **Well-being, education and quality of life**: moral fabric, improving quality of living for all Guyanese, promoting sustainable lifestyles and protection of the environment.

iii) **Sustainable use of biodiversity and increased resource efficiency**: acknowledging the role that nature plays in Guyana’s economic and social structure, and decoupling economic growth from environmental degradation.

iv) **Decarbonisation and climate resilience**: aiming for a transition to a 100% renewable country by 2025.

v) **Sustainable finance: redirecting and mobilising investments**: economic output and production have to develop while reducing the impact on environment, such as redirecting investment to sustainable infrastructure and green economic sectors.

vi) **Good governance, decentralisation and participatory processes**: ensuring transparency and sharing services and decision-making to the population; engaging civil society and creating a space for citizen participation

**The Extractive Industries Transparency Initiative (EITI)**

Guyana’s membership of the EITI process is likely to have far-reaching impacts on the ethos and governance of the mining industry. Guyana will be required to radically increase transparency and accountability in several areas of mining administration, such as:

- the collection, allocation and general management of revenues from the mining sector,
- the maintenance of publicly available mining license registers,
- the full disclosure of information about license awards and transfers, including a description of the process for awarding licenses, the criteria used, and deviations from the legal framework and policies on license allocations.

**Additional influences**

Guyana is expected to comply with a range of other international agreements with direct implications for mining, including:

- UN Rio Declaration on Environment and Development
• United Nations Framework Convention on Climate Change (UNFCC)
• United Nations Declaration on the Rights of Indigenous Peoples
• Convention on Biological Diversity.
• The Kimberly Process.
• Treaty on Cooperation for the Development of the Amazon Basin.
• Minamata Convention on mercury use.
• The 2030 Agenda for Sustainable Development.
• UN Universal Declaration of Human Rights.
• The ILO Declaration on Fundamental Principles and Rights at Work.
• UN Convention against Corruption.

Several of these conventions require the country to prepare National Action Plans (NAPs), with monitoring and reporting requirements. These too act as further controls on mining policy design.
The green paper spans a timeframe of ten years from 2019 to 2029. Expectedly, in that span, the national and international landscape is likely to see changes. These changes will inevitably impact the development of the mineral sector. Forecasting societal developments is difficult and error-prone. Nevertheless, this green paper speculates that in the next decade, projected impacts on the sector include:

i) The Guyana economy is likely to remain mineral-dependent, as measured by GDP, export earnings, foreign investment, and employment.

ii) The emergence and rapid development of the local petroleum sector, with the expectation that government revenue base and expenditure will increase exponentially.

iii) Through greater government expenditure, accessibility to the hinterland by more and better roads and other transportation links will significantly increase.

iv) Expanded investments in construction will escalate the demand for stones and sands.

v) The net depletion of the gold and diamond deposits accessible by low-tech exploration and mining methods is likely to occur.

vi) Demands will persist that the mining sector must meet and exceed internationally-set goals on climate change, sustainable development, biodiversity, and transparency.

vii) Advances in large-scale mining and mineral processing technologies will bring low-grade and/or deeply-buried mineral deposits within commercial reach.

viii) The presence of women as mine owners and operators will increase, thereby necessitating more gender-sensitive mining policies.

ix) Land use planning will feature more prominently and affect the extent to which mining grounds are made available. Guyana has, for example, committed to allocate 17% of its land for protected areas by 2020.

The green paper gives due regard to the policy implications of these trends.

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2 See also Background Brief #7.
BACKGROUND BRIEF #3  A mineral-dependent economy

The country’s large and growing dependence on mining has elevated the sector as the foremost driver of socioeconomic development currently and potentially. An ICMM study ranks Guyana sixth in 2016 among 180 economies on its Mining Contribution Index (MCI), a number that measures the significance of mining to an economy.³ Guyana’s mineral sector is therefore the key to providing the country with the financial and other development opportunities to meet its green development agenda.

The apparent paradoxical claim that the extraction of non-renewable mineral resources can be part of green development is resolved if one appreciates that:

“… in principle the economic benefits created by mining can be sustained indefinitely through appropriate investment in education, health care, infrastructure, and other activities that can create well being long after mining ceases. In other words, a depleting mineral resource can, in effect, be converted into a sustainable, renewable source of human well being through appropriate investment”⁴.

The sector will continue to contribute heavily to:

- Gross Domestic Product,
- foreign exchange earnings,
- foreign direct investment,
- direct fiscal revenues,
- direct, indirect and induced employment,
- forward and backward linkages.

The mineral sector’s absolute and relative contribution to the economy is projected to increase several folds in the near future on account of:

- start-up of offshore oil production by Esso Exploration and Production Guyana Limited (EEPGL) in 2020,⁵

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³ International Council of Mining and Metals (2017)- Role of Mining in National Economies. The index synthesizes four factors, including the production and export values of minerals.
⁵ Petroleum is not included within the scope of this policy paper.
• startup of manganese production by Bosai Minerals Group (Guyana) Inc in the NWD in 2019,
• startup of bauxite production by First Bauxite Corporation at Bonasika in 2019,
• expansion and startup of several gold projects, such as at Toroparu in the Upper Puruni and by Guyana Goldfields Inc in the Cuyuni.

For an economy dependent on non-renewable mineral resources, resource depletion poses a pressing threat. As Table 1 shows, depletion remains a far-off prospect even for the old bauxite operations in Linden and Aroaima. Nevertheless, policy must be set to ensure the continuous presence of over fifty active large-scale exploration programs.

### Table 1: ESTIMATED MINE LIFE FOR LARGE-SCALE OPERATIONS IN GUYANA

<table>
<thead>
<tr>
<th>Company</th>
<th>Mineral</th>
<th>Location</th>
<th>Mining life cycle</th>
<th>Mine life (yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guyana Goldfields Inc</td>
<td>gold</td>
<td>Aurora, Cuyuni</td>
<td>Early production</td>
<td>16</td>
</tr>
<tr>
<td>Troy Resources Ltd</td>
<td>gold</td>
<td>Kauroni</td>
<td>Early production</td>
<td></td>
</tr>
<tr>
<td>BCGI (Rusal)</td>
<td>bauxite</td>
<td>Aroaima</td>
<td>Production</td>
<td>50*</td>
</tr>
<tr>
<td>First Bauxite Inc</td>
<td>bauxite</td>
<td>Bonasika</td>
<td>Pre-production</td>
<td>25</td>
</tr>
<tr>
<td>Bosai Minerals (Bauxite)</td>
<td>bauxite</td>
<td>Linden</td>
<td>Production</td>
<td>&gt; 50*</td>
</tr>
<tr>
<td>Bosai Minerals (Manganese)</td>
<td>manganese</td>
<td>Mathews Ridge</td>
<td>Pre-production</td>
<td>30 ?</td>
</tr>
<tr>
<td>Several operators</td>
<td>sands</td>
<td>Soesdyke</td>
<td>Production</td>
<td>&gt; 100*</td>
</tr>
<tr>
<td>Several operators</td>
<td>quarry stones</td>
<td>Mazaruni</td>
<td>Production</td>
<td>&gt; 100*</td>
</tr>
</tbody>
</table>

Source: company reports, 2017

* Authors’ estimate

**POLICY IMPLICATIONS**

Guyana’s mineral-based economy will remain vulnerable once:

- export receipts are subject to the vagaries of international market conditions, such as commodity prices;
- the mining base remains narrow and mineral-based forward linkages are underdeveloped;
• new discoveries are few and far apart due to low investment in exploration or over-rated mineral endowment;
• deposits become geologically harder to find;
• mining revenues are not judiciously employed for sustainable development.
## BACKGROUND BRIEF #4  
**Nature of mineral resources**

<table>
<thead>
<tr>
<th>NOTES</th>
<th>POLICY IMPLICATIONS</th>
</tr>
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<tbody>
<tr>
<td>Mineral resources refer to all the accumulations or concentrations of the earth’s natural chemical elements and materials of intrinsic worth to man. If the concentration process is not sufficiently long or efficient, the accumulations may not be large enough to economically extract. Relative to the size of the Earth’s crust, mineral accumulations or deposits are extremely rare. Their existence (formation and preservation) depends on pure geological luck.</td>
<td>Much of our mineral potential remains speculative and undiscovered; unevaluated; or too small for large-scale extraction (Annex II).</td>
</tr>
<tr>
<td>In any region or country, there is great uncertainty in knowing if deposits do exist and, if they do, in knowing their exact geographical, geological and economic characteristics (posing a large exploration risk).</td>
<td>Policy-making must sensibly set and regularly review the rewards/risks balance to encourage large investments in such high-risk and costly undertakings.</td>
</tr>
<tr>
<td>Rights to all mineral resources are owned by the state(^6)</td>
<td>The right to explore and exploit the mineral resources may be temporarily transferred to an individual or a corporate entity through a license, permit, permission or lease. Such granted rights are considered real estate properties but are independent from surface or land ownership rights which still belong to the state(^7).</td>
</tr>
<tr>
<td>Mineral resources are finite and non-renewable.</td>
<td>Guyana’s mineral resources have to be managed to ensure benefits not only for the present but also for future generations, as mineral stocks gradually deplete.</td>
</tr>
<tr>
<td>Mineral resources can be extracted only where we find them.</td>
<td>Guyana’s mineral industry is mostly a hinterland-based activity, bauxite and sand mining being a notable exception. High costs...</td>
</tr>
</tbody>
</table>

---

\(^6\) see, for example, section 6 of Mining Act 1989; section 5 of State Land Act.

\(^7\) Mining Rights Cadastre (2009) - World Bank Group, p.2.

Mineral resources (as ore deposits) are more than a pure geological concept (deposit size and ore grade). Their essence also includes economic considerations, such as world metal prices.

It takes more than a deposit to form a mine. Non-geological factors, such as the legal system, are often determinative in moving to mine development.
To find mineral resources, we have to look (or explore) for them, a task that has become increasingly difficult as the easily located deposits have mostly been discovered.

For large-scale operations, exploration typically follows a sequence of steps, each with its own objectives and each followed by a decision point whether to continue or relinquish the ground. (Figure 1)

Not all exploration leads to a mine.

Exploration costs and risks will escalate, forcing companies to demand more fiscal and legal concessions.

Policies must ensure that the non-geological considerations (such as tax regime) at the decision points encourage companies to continue to the next stages.

Policies must spur extensive exploration activity to increase the probability of mine development. One study calculated that for every possible large gold discovery, Guyana needs to have eighty active gold exploration licenses.\(^8\)

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**Figure 2: MINERAL EXPLORATION STAGES**

---

8 Woolford, W (2005) –....
### Nature of mining

<table>
<thead>
<tr>
<th>NOTES</th>
<th>POLICY IMPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining is a temporary use of the land.</td>
<td>Mining can therefore be given priority over other land uses, more so if reclamation of mined-out areas is enforced.</td>
</tr>
<tr>
<td>Mining can occur only where mineral resources are located.</td>
<td>This places fixed constraints on land use planning, infrastructure development, and spatial development initiatives.</td>
</tr>
<tr>
<td>Mining will cause unavoidable disturbances to the physical environment. In Guyana, it is the leading driver of deforestation and degradation, but affects less than 0.5% of forested land.(^9)</td>
<td>Environmental management of mining is necessary to minimize and reverse these disturbances. But the impact of mining on the forest and other resources on a regional scale must not be overblown.</td>
</tr>
<tr>
<td>Responsible mining recognizes environmental protection and occupational health and safety as integral and not imposed components.</td>
<td>Technical, financial and cultural barriers to responsible mining must be addressed.</td>
</tr>
<tr>
<td>For large-scale operations, mining typically involves a sequence of steps, each with its own environmental and economic impacts (Figure 2).</td>
<td>Compromises must be avoided or only temporarily allowed during phase-in or grace periods.</td>
</tr>
<tr>
<td>Responsible and efficient mining cannot occur optimally without mine planning, which, in turn, depends on knowing beforehand the distribution of profitable and unprofitable ground.</td>
<td>Environmental and other regulations must continue to respond accordingly.</td>
</tr>
<tr>
<td>If not properly conceptualized, a contradiction may appear to exist between mining (the extraction of a finite or depleting resource) and mining should be seen as the conversion of natural capital into proceeds for the</td>
<td></td>
</tr>
</tbody>
</table>

---

sustainable development. development of social and human capital.

It takes more than a mineral deposit to make a mine. Good geology has to be accompanied by an attractive investment climate for mineral development to occur.

---

**Figure 3: MINE DEVELOPMENT SEQUENCE**
Guyana’s mineral policy must be informed by, and respond to, the dynamics in the international metals and materials market. The nature, developments, forces and trends of international mining largely determine the expectations Guyana can entertain for attracting mining investments and for seeing favorable market conditions for its exports of minerals and metals. The country’s posture to these factors outside its control will have to be attuned and agile.

Below is a listing of key factors in international mining likely to impact significantly on the scope of mineral development in Guyana. The assessment is based on a review of reports by Price Waterhouse-Cooper, the USGS Minerals Outlook Yearbooks, and the World Bank.

- The minerals and metals projected to be in high demand in the immediate and long-term future are lithium, cobalt, nickel, copper, rare earths, manganese, aluminum, and graphite. Demand for these minerals and metals are based on the expected rapid and sustained growth in the manufacture of batteries and handheld electronics. Sand for construction is also projected to be in long-term undersupply. Guyana has favorable geology and/or actual mineral occurrences for these commodities (see Annex 2).

- Gold and base metals (zinc, lead and copper) remain the top mineral targets in terms of annual exploration budgets of companies.

- The health and shape of the minerals and metals markets will largely be determined by the economic performance and policy of China and, to a lesser extent, of India and Brazil. Already, Guyana is experiencing the results of this trend through the acquisition of its bauxite and manganese deposits by Chinese companies.

- International mining is still prone to booms and busts. It is currently on the cusp of a boom. However, large companies have a weak appetite for seeking new opportunities and making capital expansion.

- Much exploration internationally is conducted by junior companies, on whom the majors depend heavily for new and de-risked investment opportunities. Canadian juniors mostly target Latin America. Accordingly, almost all gold exploration in Guyana over the last three decades has been conducted by Canadian juniors.

- The industry is seeing a growing influx of investment by non-mining investors, such as financial institutions.

- Concerns of international mining CEOs include increasing tax burden, geopolitical uncertainty, volatile commodity prices, and over-regulation.
NOTES
The main impetus for Guyana’s mineral sector development both in terms of volume and range of output will remain foreign direct investment in the sector. The ability of the country to attract such investment revolves around its geological endowment and its actual and perceived investment risk profile. On the later factor, the equation is simple: high risk perception leads to inadequate investments, which in turn leads to a stunted mineral industry.

Probably, the most comprehensive country risk assessment from a mining industry perspective is the Mining Journal’s annual World Risk Report. In its 2017 edition, Guyana is not featured among the rated mining jurisdictions. However, this green paper has applied the Mining Journal’s user-friendly methodology to tentatively rate Guyana’s attractiveness as a mining investment destination.

The journal’s investment risk index is a composite based on the following risk baskets:

- **Legal** (the mining code’s ability to protect investment);
- **Governance** (the ease at which miners should expect to set up and conduct business and how severe the challenges are likely to be related to corrupt bureaucracy)
- **Social** (the level of underlying political and social tension that could lead to unrest, protests, activism or violent conflict)
- **Fiscal** (how punitive the tax structure is as well as the health of the underlying economic environment)
- **Infrastructure** (a jurisdiction’s energy security and how well it is set up with mining-related transport).

The scores for these baskets are made up of two constituents: hard risk (using established and respected metrics where available) and risk perception.

For our purposes here, this paper has limited its focus to the mining code. For mining codes, the journal’s investment risk index uses the MineHutte Regulatory Risk Ratings. ¹⁰ MineHutte’s analysis of mining codes is based on:

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¹⁰ MineHutte is a private research organisation based in London, England, that conducts regulatory risk ratings and analysis as well as a database of mining-specific legislation, regulation and technical reports, with the aim of providing rich, intelligent and objective information to guide investment decisions in the mining sector.
1) **Open access** (measures the ease of acquiring exploration rights and the ‘openness’ of the system to foreign, junior and other participants);

2) **Exploration exclusivity** (measures the extent to which the exploration rights are exclusive to the holder, including for undiscovered minerals);

3) **Exploration duration** (measures the ability of a holder to retain exploration rights through a minimum exploration period);

4) **Right to mine** (measures the ability of the explorer to acquire mining rights, as well as environmental permits);

5) **Tenure certainty** (measures the ability to fully extract resources from a mine and the right of access);

6) **Economic certainty** (measures the discretion of government to interfere with economics operationally and on an exit strategy);

7) **Regulatory certainty** (measures the stability of the regulatory framework);

8) **Other factors** (measures all other aspects of the regulatory framework both positive and negative).

Each of the eight factors is scored out of 10 or 15 points. On this scale, a rating of 100 means zero regulatory risk. MineHutte warns any investor to be cautious if they hold an investment, or plan to invest, in a jurisdiction with a rating of less than 50.

The following is the assessment of Guyana mining legislation and regulations based on the averaged scores of two members of the policy drafting team (Table 2).

<table>
<thead>
<tr>
<th>CRITERIA</th>
<th>SCORE</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open access</td>
<td>10/10</td>
<td></td>
</tr>
<tr>
<td>Exploration exclusivity</td>
<td>10/10</td>
<td></td>
</tr>
<tr>
<td>Exploration duration</td>
<td>9.5/10</td>
<td></td>
</tr>
<tr>
<td>Right to mine</td>
<td>15/15</td>
<td></td>
</tr>
<tr>
<td>Tenure certainty</td>
<td>14/15</td>
<td></td>
</tr>
<tr>
<td>Economic certainty</td>
<td>14.5/15</td>
<td></td>
</tr>
<tr>
<td>Regulatory certainty</td>
<td>4.5/5</td>
<td></td>
</tr>
<tr>
<td>Other factors</td>
<td>10/10</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>87.5</td>
<td>Minimal Risk</td>
</tr>
</tbody>
</table>

< 30 Critical Risk  | 31-44 Severe Risk  | 45-54 Substantial Risk  | 55-64 Moderate Risk  | 65-75 Low Risk  | > 75 Minimal Risk.
Guyana is scored by this paper as a minimal risk country as far as its mining code goes. A cursory review of the other risk baskets however suggests that Guyana would score poorly.

**POLICY IMPLICATIONS**

This green paper sets as one of its pivotal strategic goals the optimization of the country’s mining policy regime along the parameters used in the Mining Journal rating. Such an approach provides an explicit framework of targets and performance indicators for improving critical investment determinants such as mining legislation, fiscal regime, infrastructure, and social and political climate. Important to recognize however that alongside hard objective measures of risk, investor perception of risks must also be surveyed and considered by the government.
### SWOT of the mining sector: THREATS AND WEAKNESSES

<table>
<thead>
<tr>
<th>Industry wide</th>
<th>Policy implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult access to mining districts in terms of:</td>
<td>- Reduced profitability of operations;</td>
</tr>
<tr>
<td>- poor roads, especially for supply trucks during rainy seasons,</td>
<td>- Marginal deposits rendered uneconomical;</td>
</tr>
<tr>
<td>- high air fares.</td>
<td>- New potential mineral areas hard to reach;</td>
</tr>
<tr>
<td>Meeting International obligations (EITI, Rio, etc)</td>
<td>- Shortened or disruptive production season in the SMS industry.</td>
</tr>
<tr>
<td>Inadequate institutional capacity and operational efficiency at GGMC.</td>
<td></td>
</tr>
<tr>
<td>Location and vast spread of mining activities</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Large-scale</th>
<th>Policy implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narrow mining base (few minerals exploited)</td>
<td>High national economic vulnerability to boom and bust cycles of the international market.</td>
</tr>
<tr>
<td>Inadequate geodata in terms of quantity, quality and accessibility.</td>
<td>Low attractiveness of the country to local and international investors.</td>
</tr>
<tr>
<td>Low large-scale exploration and production activity</td>
<td>Slow and unrealized economic growth</td>
</tr>
</tbody>
</table>
### SMS MINING

<table>
<thead>
<tr>
<th>SMS MINING</th>
<th>Policy implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate deposit study and mine planning. Unsystematic mining.</td>
<td>Much scope exists for optimization through the use of strategies and actions that produce a critical mass of sustained results. Undersized, sporadic or low-impact initiatives should be de-emphasized.</td>
</tr>
<tr>
<td>Suboptimal compliance with mining laws.</td>
<td>Drawbacks include:</td>
</tr>
<tr>
<td>Sub-optimal recovery rates.</td>
<td>- Sub-optimal contribution to the national coffer.</td>
</tr>
<tr>
<td>Unreported gold and diamond production</td>
<td>- Risk of international sanctions (for diamonds under the Kimberly process).</td>
</tr>
<tr>
<td>Meeting the Minamata commitments on mercury use</td>
<td>Scope exists for improvements through efforts that target points of production.</td>
</tr>
<tr>
<td></td>
<td>Risk of international sanctions. Will require approaches that strike balances.</td>
</tr>
</tbody>
</table>
### SWOT of the mining sector: STRENGTHS AND OPPORTUNITIES

#### Industry wide

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Policy implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed mining-related legislation (mining, environment, OHS, Land, etc)</td>
<td>A shared national understanding exists of the challenges faced by the industry and what approaches have and have not worked.</td>
</tr>
<tr>
<td>Established mining institutions with separate mandates</td>
<td></td>
</tr>
<tr>
<td>Long experience in mining administration</td>
<td></td>
</tr>
<tr>
<td>Large and growing economic role of mining</td>
<td>Important to avoid perils such as resource depletion, boom and bust cycles, environmental degradation, and non-sustainable use of mining revenues.</td>
</tr>
<tr>
<td>Availability of numerous international guidelines and best practices.</td>
<td>Guyana does not have to reinvent the wheel.</td>
</tr>
</tbody>
</table>

#### Large-scale

<table>
<thead>
<tr>
<th>Policy implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive fiscal regime, low to medium investment risk rating</td>
</tr>
<tr>
<td>Policies will have to ensure that Guyana ranks in the top tier on the criteria investors and analysts use to measure country investment risks.</td>
</tr>
<tr>
<td>Presence of large scale operations</td>
</tr>
<tr>
<td>Relatively stable political climate</td>
</tr>
<tr>
<td>Relatively sound mining code</td>
</tr>
</tbody>
</table>

#### SMS mining

<table>
<thead>
<tr>
<th>Policy implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>High (but suboptimal) level of formalization and regularization of SMEs</td>
</tr>
<tr>
<td>Education and awareness programs among SMS miners have a good basis for success and have scored successes, but high levels of non-compliance may signal causes other than lack of knowledge.</td>
</tr>
<tr>
<td>Literate local mining population (Annex 3)</td>
</tr>
<tr>
<td>High awareness of social and environmental issues within the mining community (Annex 3)</td>
</tr>
</tbody>
</table>
# Proper framing of the SME subsector

<table>
<thead>
<tr>
<th><strong>NOTES</strong></th>
<th><strong>IMPLIEDATIONS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Globally, small mining can fulfill several human and national development needs, such as poverty alleviation. Such mining must therefore be framed within each country’s specific social settings and development goals. In Guyana’s context, small mining is best framed within several contexts, each of unquestioned legitimacy:</td>
<td>• The government, the public and other stakeholders must view the subsector as positive and necessary.</td>
</tr>
<tr>
<td>• as a source of income and indirect and direct employment for tens of thousands of Guyanese from the coast and hinterland;</td>
<td>• Government policies must be totally facilitative and non-discriminatory towards SMS mining.</td>
</tr>
<tr>
<td>• as an investment destination for Guyanese;</td>
<td>• Unsatisfactory aspects of SMS mining, such as poor mining methods and environmental damage, must therefore be seen only as challenges—not as causes to restrict the activity.</td>
</tr>
<tr>
<td>• as a national and community economic development driver through its contributions to government revenues and multiplier effects;</td>
<td>• The rightful place of SMS operations, however, within the economy and society (its social license) can be further consolidated, the more it embraces safe, efficient, environmentally-friendly, and socially-responsible mining.</td>
</tr>
<tr>
<td>• as an impetus for hinterland development;</td>
<td></td>
</tr>
<tr>
<td>• as a means to establish territorial sovereignty.</td>
<td></td>
</tr>
<tr>
<td>• as a means of population redistribution away from the coastland.</td>
<td></td>
</tr>
</tbody>
</table>
NOTES
The green paper posits that to more effectively design policy interventions in SMS mining would require detailed and systematic surveys of the industry’s producers and installed capacities. Such surveys must be based on ground evidence and statistical data. They are necessary for optimizing governance and performance within the industry.

Opportunely, a study does exist that can inform the present policymaking effort and can serve as a template for future and more comprehensive efforts. The study, titled Institutional Assessment of the Guyana Gold and Diamond Miners Association, and commissioned for the GGDMA by the IDB, is useful in two ways in that it provides:

- an appropriate classification of SMS producers based on the readily identifiable characteristics of size and number of operations, and the extent to which mining machinery and technology is employed (metal detectors, excavators, bulldozers, crushers);
- a description of the common and differentiated interests and needs of the identified classes of SMS miners, the relevant parts of which have been extracted, edited and presented in Annex 4.

For ease of reference, the green paper suggests that each subgroup be referred to as a CLASS. Additionally, we have edited out the word “scale” (as in, for example, “small scale miners”) from the original scheme to keep the classification distinct from the terms used in the mining law.

**Table 3: SUGGESTED CLASSIFICATION OF SMS MINERS**

<table>
<thead>
<tr>
<th>MODIFIED DESCRIPTIONS</th>
<th>CLASSES OF PRODUCERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artisanal miners (manual production)</td>
<td>CLASS 1</td>
</tr>
<tr>
<td>Micro-producers (ground sluice or mini sluice with 3-inch small pumps)</td>
<td>CLASS 2</td>
</tr>
<tr>
<td>Small miners A (bare dredge land operators)</td>
<td>CLASS 3</td>
</tr>
<tr>
<td>Small miners B (1-2 dredges/crushers with excavators)</td>
<td>CLASS 4</td>
</tr>
<tr>
<td>Medium miners: with 3-5 dredges.</td>
<td>CLASS 5</td>
</tr>
<tr>
<td>Medium miners: with 6-9 dredges.</td>
<td>CLASS 6</td>
</tr>
</tbody>
</table>
Medium-large miners (10 and greater dredges/crushers with two subsets: 10-19 dredges and over 20 dredges).

CLASS 7

IMPLICATIONS

The classification provides opportunities for more targeted policy formulation and implementation. In Part III, this paper recommends as an action measure that GGMC should produce (and regularly update) such a profile and baseline study as a norm.
In this green paper, all policy elements on the environmental management of mining (EMM) spring from the objectives, activities and outputs of phase I of the two-phased GENCAPD project. Three reasons justify this decision: (i) the wide range of frameworks and approaches provided by the GENCAPD project, (ii) the fast waning influence and usage of these resources in recent EMM strategies and operations at GGMC, and (iii) the availability of the project reports as well as staff and other persons trained under the program.

The goal of the GENCAPD project (Phase I) was to strengthen capacities of key mining sector institutions in Guyana in environmental management. Phase I was accordingly designed to address several deficiencies, such as:

- absence of clear policies and guidelines for environmental management.
- limited capacity of the environmental management agencies in terms of financial, technical personnel and material resources.
- absence of detailed regulations and codes to guide the actions of miners.
- lack of monitoring and enforcement capabilities.
- inadequacy of baseline information to permit the formulation, implementation and evaluation of environmental policies and actions.
- limited exposure of mining stakeholders to new technologies and techniques.

The program was funded to the tune of CDN $3.75 million and ran from 1998 to 2004. The main local agencies involved were the Guyana Geology and Mines Commission (GGMC), the Environmental Protection Agency (EPA), and the Guyana Gold and Diamond Miners Association (GGDMA). The University of Guyana also played a small role in the project.

Several improvements in SMS mining have been directly credited to the program. Examples include better sluice box performance and better water management.

Phase II (2007 – 2010) of the GENCAPD project consolidated and sustained the achievements of Phase I. In addition, the second phase undertook activities such as dry mining, tailings management pilot project, reforestation of mined out areas, a feasibility study on use of cyanide for processing of gold by SMS miners, a programme for reduction of malaria using bacteria, several small grants projects, and trapping and export of ornamental fish as an alternative or complementary economic activity to mining.
The approaches and deliverables that most shape the recommendations on EMM in this green paper are:

- the introduction of the practice of Cumulative Environmental Effects Assessment (CEEA)\textsuperscript{11} into the Guyana environmental management system;
- the production of codes of practice, operational manuals, and other guidelines
- the promotion of evidence-based decision making;
- the promotion of policy-driven scientific research, inclusive of field tests and demonstrations;
- the attempts at establishing “Self-monitoring Environmental Groups” (groups of individuals from within mining communities, engaged in monitoring the effects of mining where and when their way of life is, or likely to be, affected).

Policy recommendations on EMM in this green paper hold to the conviction that optimization of EMM must be based on capitalizing on the results, experiences and knowledge generated by GENCAPD.

\textsuperscript{11} We propose the use of the more digestible equivalent term Cumulative Impact Assessment (CIA).
PART III NATIONAL MINERAL SECTOR POLICY FRAMEWORK AND ACTIONS

INTRODUCTION

This section is the core of the document. It spells out the policy framework and supporting actions for the development of the mineral sector. The policy framework encompasses several elements: a shared vision for the industry, guiding principles, policies, and strategic goals. The strategic goals are directly underpinned by several key actions required to activate the framework (Figure 3).

It is here proposed that to achieve the shared vision for the mineral sector requires principles, policies, strategies, and actions to optimize governance, compliance and performance within the institutional setting of MNR and GGMC and within the operational setting of mining (figure 3).

Figure 3: BUILDING BLOCKS OF POLICY FRAMEWORK

A SHARED VISION

GOVERNANCE OF THE INDUSTRY

COMPLIANCE BY THE MINING INDUSTRY

PERFORMANCE OF THE INDUSTRY

POLICY PRINCIPLES, GOALS, AND POSITIONS

STRATEGIC GOALS

ACTION MEASURES, PLANS AND PROGRAMS
The three themes of governance, compliance, and performance (which are expanded on below) serve to provide an integrated, goal-oriented and clear vision to guide and organize the myriad of policies, strategies and actions (whether existing or new) required to build a better mining industry.

In outlining below the required strategies and actions, the green paper sticks to what it hopes are the essential factors (a Pareto approach\textsuperscript{12}), and makes no claim of exhaustively capturing all details and complexities.

<table>
<thead>
<tr>
<th>SHARED NATIONAL VISION ON MINING</th>
</tr>
</thead>
</table>

The following wording is recommended:

All Guyanese within their lifetimes wish to see and benefit from a mineral sector that increasingly fosters sustainable socio-economic development without incurring preventable or unacceptable costs to the physical and social environment and to the livelihoods of future generations.

<table>
<thead>
<tr>
<th>THE THREE CORE THEMES</th>
</tr>
</thead>
</table>

Taking the mining sector into a new era is achievable by optimizing governance (the manner in which public mining institutions fulfill their mandates), compliance (the extent to which those who are regulated respect and follow rules and standards and meet legal requirements) and performance (the extent to which the industry meets and exceeds technical/operational and national economic goals).

Optimization first requires a clear and shared vision of the desired future, followed by a relentless search for and eradication of inefficiencies, gaps, and inadequacies. It is a continuous improvement process, the levers for which are policies, strategies and actions.

1: GOVERNANCE

From the perspective of mining practitioners, other sector stakeholders and the general public, a host of shortcomings and grievances stem from the poor governance of the industry by government agencies. Whether based on reality or perception, complaints

\textsuperscript{12} Also known as the Law of the vital few. It states that 80\% of results come from 20\% of causes. It is changes to those causes that bring about significant impacts. Consequently, large changes to non-essential causes would produce only small results, if any. One must focus efforts accordingly.
have ranged from unfair and unequal treatment of miners; opaque decision-making; slow and unprofessional administrative processes; poor access to, and lack of, information; and corruption.

Given a steadfast commitment by MNR, GGMC and other agencies, optimizing governance of the industry is achievable through mostly short and medium term goals. Ongoing efforts, such as meeting the EITI mandate, are already moving in the right direction.

(i) Core governance principles for the mineral sector

To realize the shared vision, irrespective of what policies and actions are formulated, they must be embedded in principles of good governance, in particular:

- **The greater public good principle.** The public good is placed before and above individual or narrow group interests.

- **The sustainable development principle.** The needs of future generations are taken into account in current policies that must therefore strive to meet sustainable development goals.

- **The inclusionary and fairness principle.** The legitimate expectations of sector stakeholders are met in terms of participation in making decisions that directly affect them, and in terms of fair treatment and equitable access to opportunities.

- **The transparency principle.** Sector stakeholders, including the public, must have open access to information of public value.

- **The rule of law principle.** Official decisions must be made in a predictable and consistent manner based on a system of predetermined, transparent and objective rules and criteria.

- **The responsiveness principle.** Mechanisms must be set up to ensure mining-related grievances and concerns of sector and non-sector stakeholders are given voice and effectively addressed.

- **The continuous improvement principle.** There must be openness to change and a willingness to try new or different approaches, and to incrementally improve and strengthen current approaches and practices, to produce better results as measured by increases to the greater good.

- **Evidence-based decision-making.** National decision-making on mining must be guided as far as possible by objective evidence and data, whether already available or specially produced.
• **The balance of interests principle.** The government must seek to find the acceptable balance between the legitimate profit motives of mining investors and operators and the revenue-generation needs of the state.

• **The ease of doing business principle.** Official procedures and processes must be time- and cost-efficient from the point of view of the public.

**POLICY #1:** The promotion of open government and the removal of the perception and reality of administrative inefficiency, unfairness, and corruption.

(ii) **Targeted benefits**

Good governance must be seen not only for its philosophical correctness, but as an approach to foster practical gains in the mining sector, such as:

- encouraging investment by minimizing social and political tensions in the country;
- reducing the administrative cost and burden of doing business by investors;
- reducing hard risks and risk perception in the eyes of investors;
- strengthening the social license for the development of mining across the country;
- reducing the perception and reality of incompetence and corruption in government agencies;
- building better relations between government and the industry;
- meeting international standards and obligations.

(iii) **Main areas of intervention**

- all administrative systems and procedures (e.g., application for licenses, and allocation of mining ground);
- compliance with international standards and requirements;
- compliance with national legislation;
- awards of contracts and mineral agreements;
- policy-making and rule-setting (and their review and amending)
- exercises of administrative and executive discretion;
- imposition of penalties and withdrawal of rights;
- use and distribution of mining revenues;
- any other action or decision that significantly affects the mining sector.
(iv) Main actions (in table 4 below)
**Table 4: GOVERNANCE**

**POLICY #1**
The promotion of open government and the removal of the perception and reality of administrative inefficiency, unfairness, and corruption.

<table>
<thead>
<tr>
<th>ACTIONS</th>
<th>BASELINE</th>
<th>ASSUMPTIONS (A)</th>
<th>RESPONSIBLE AGENCIES (RA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Train GGMC staff on the requirements, principles and procedures to be applied for mineral sector governance as required by the mining policy.</td>
<td>No such training occurs.</td>
<td>A1: GGMC and other government agencies will give full cooperation to the GYEITI. A2: EITI will continue to receive full political support.</td>
<td>RA: GGMC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RA: MNR, GYEITI</td>
<td></td>
</tr>
<tr>
<td>(ii) implement fully the EITI. (PB).</td>
<td>Citizens have little access to information on the industry. Culture and practice of transparency are undeveloped in sector organizations.</td>
<td></td>
<td>RA: MNR, GYEITI</td>
</tr>
<tr>
<td>(iii) comply with the Anti-Money Laundering and Countering the Financing of Terrorism legislation (AMLCFT) through (PB): - amended mining regulations.</td>
<td>GGMC is an appointed AMLCFT Supervisory Authority. Current mining regulations do not cater for GGMC’s AMLCFT obligations. Draft updated</td>
<td>A1: Implementation of EITI and AMLCFT provisions could be coordinated and integrated.</td>
<td>RA: MNR, GGMC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RA: MNR, GGMC</td>
<td></td>
</tr>
</tbody>
</table>

PM 1: number of training sessions and trained staff, PM 2: Number of complaints. PM: GYEITI implementation schedule. PM 1: efforts at coordinating EITI and AMLCFT. PM 2: amended mining regulations.
**Coordinating with EITI.**

<table>
<thead>
<tr>
<th>Action</th>
<th>Status</th>
<th>Responsible Authority</th>
<th>Policy Maker</th>
</tr>
</thead>
<tbody>
<tr>
<td>amend the mining legislation to remove ambiguities, vagueness and excessive ministerial discretion</td>
<td>Loopholes and uncertainties exist in the mining legislation. The enactment of proposed changes to the mining act and regulations has stalled.</td>
<td>RA: MNR, GGMC</td>
<td>PM: enacted amendments to the mining legislation.</td>
</tr>
<tr>
<td>establish an independent Inspector General office for the GGMC</td>
<td>No independent oversight of the operations of GGMC currently exists.</td>
<td>RA: MNR</td>
<td>PM: Green paper produced on Inspector General office, followed by draft legislation.</td>
</tr>
<tr>
<td>introduce Freedom of Information (FOI) practices within GGMC and MNR.</td>
<td>FOI legislation exists. Public use has been minimal.</td>
<td>RA: GGMC, MNR</td>
<td>PM: number of FOI requests</td>
</tr>
<tr>
<td>extend ISO-based quality assurance across service-based departments and laboratories at GGMC.</td>
<td>At present, only the processes at the Land Management Division are ISO compliant.</td>
<td>RA: GGMC</td>
<td>PM: number of ISO-compliant processes at GGMC.</td>
</tr>
<tr>
<td>revamp the GGMC and MNR websites to meet open government standards.</td>
<td>GGMC website is content poor and rarely updated. One particular deficiency is that it provides little user-friendly</td>
<td>RA: GGMC</td>
<td>PM: number of users.</td>
</tr>
<tr>
<td>ix) increase the impacts of ministry/stakeholder consultations through:</td>
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<tr>
<td>• a written protocol on meeting schedule, agenda, and follow-up processes,</td>
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<tr>
<td>• appointment of a point-person at the PS level to coordinate and ensure implementation of agreements,</td>
<td></td>
<td></td>
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<tr>
<td>• submission by point-person of progress reports to stakeholders.</td>
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<tr>
<th>Consultations are regularly held, but the haphazard nature of follow-through action by the government is a perceived and actual shortcoming.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1: A written consultation protocol provides more predictability, consistency and stability.</td>
</tr>
</tbody>
</table>

RA: MNR
PM 1: Publicly-available written protocol
PM 2: Number of decisions implemented after consultations.
PM 3: Number of progress reports.

[+] = additional notes provided
2: COMPLIANCE

From the respective of the government, compliance by the mining industry to laws and regulations remains a recurrent and formidable challenge. Expenditure of enormous state resources over the decades on monitoring, education, encouragement and enforcement has produced, at best, uneven and short-lived improvements in attitudes and practices of SMS miners in particular towards environmental protection, occupational health and safety, licensing and registration, and declaration and trading of mineral output.

Compliance will never reach a 100% in any one arena. But the government’s goal must be to optimize matters to a point where (i) residual non-compliance poses no impactful or persistent threat to the realization of set goals, or (ii) where the costs of pushing the needle further outweigh the benefits. Undoubtedly, the country is well below these high watermarks.

POLICY #2: The achievement of critical levels of compliance by miners through education, encouragement, and enforcement/ to reduce non-compliance to harmless levels.

(i) Core guidelines on compliance management

- Compliance with environmental and occupational health and safety requirements must be regarded and integrated as core aspects of modern mining. As such, compliance costs are not an imposition of a needless burden but are the expenditure for conducting responsible business.

- Enforcement of compliance must be sensitive to the technical, financial and informational hurdles faced by miners, especially at the small and medium scale. Implementation therefore could be incremental.

- Penalties for non-compliance must be proportional to the severity of the violation, with a zero tolerance approach for repeated or severe violations.

- Good governance mechanisms must underpin enforcement.

(ii) Main areas of intervention

Compliance by miners should encompass:

- environmental protection and restoration
- social conduct and responsibility
- occupational health and safety
- licensing and registration
- performance obligations
- furnishing of data and information
- declaration, trading and export of mineral output.

(iii) Strategic Goals and Actions (in table 5 below).
### Table 5: COMPLIANCE

<table>
<thead>
<tr>
<th>STRATEGIC GOALS (SG)</th>
<th>BASELINES</th>
<th>ACTIONS</th>
<th>ASSUMPTIONS (A)</th>
<th>RESPONSIBLE AGENCIES (RA)</th>
<th>PERFORMANCE MEASURES (PM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG 2: to make managers of dredges and quarries the focal point of optimizing compliance in SMS operations.</td>
<td>- The regulations mandate that every operation must appoint a manager, who must have stipulated qualifications. Current qualifications are however limited in scope and not strictly enforced. - The Guyana Mining School is underfunded and underutilized.</td>
<td>i) expand and enact the provisions in PART XIII of the draft mining regulations &quot;MANAGEMENT AND RESPONSIBILITY IN EXPLORATION, MINING AND QUARRYING&quot; (PB). ii) expand awareness and training programs for managers of dredges and quarries, especially through the Guyana Mining School (CA).</td>
<td>A1: The Guyana Mining School will be given the resources to accommodate these additional responsibilities.</td>
<td>RA: GGMC PM: number of managers trained and certified. PM: annual budget and training resources of the Guyana Mining School.</td>
<td></td>
</tr>
<tr>
<td>SG 3: to integrate OSH practices and culture as part and parcel of SMS mining of gold, diamonds, sand/loam, and stones.</td>
<td>The Occupational Safety and Health Act was enacted 1997. Regulations on OSH in mining passed in 2015, but are oriented mostly towards large-scale mining. The 2015 COI into SMS mine accidents offers a grounded view of OSH issues in SMS gold mining. A draft plan of action presented by GGMC in response to COI findings. A National OSH policy finalized in 2017, with a call for sectoral NAPs.</td>
<td>i) draft the recommended NAP for OSH, recognizing the specific features of the SMS industry (including its technical and other limitations) (PB). ii) assign OSH responsibility for the mining sector to GGMC through a MOU with the Labour Department of MoSP (PB).</td>
<td>A1: GGMC is given more administrative responsibility for OSH matters in mining. A2: amended mining regulations on OSH are passed.</td>
<td>RA: GGMC. PM 1: passage of amended regulations on OHS. PM 2: NAP on OSH in mining published.</td>
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<td>SG 4: to manage the environmental impacts of mining, using Environmental Management Plans</td>
<td>No strategic and comprehensive action plan exists for the environmental management of</td>
<td>i) conduct CIAs in hot spot mining areas [+]. ii) use EMPs from CIAs as national implementation plans for EMM</td>
<td>A1: GGMC rebuilds its capacity to conduct and use CIAs.</td>
<td>RA: GGMC. PM: number of CIAs conducted.</td>
<td></td>
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</table>
(EMP), formulated through Cumulative Impact Assessments (CIA).\textsuperscript{13} mining (EMM).

| SG 5: to reduce, and where feasible, eliminate the use of mercury in mining and processing by 2027 in line with Guyana’s commitments under the Minamata Convention. | The use of mercury continues unabated, despite high levels of understanding of its harmful effects among gold miners. | iii) establish the recommended NAP Implementation Advisory Group (with representation from MNR, WWF, GGDMA, MOH, GGMC, private sector and civil society), and task it with reviewing and implementing the recommendations of the final NAP on mercury (CA). | A1: Miners and their associations support the objectives of the NAP on mercury. RA: MNR, GGMC PM 1: Advisory group established. PM 2: Attainment of NAP reduction targets. |

| SG 6: To facilitate evidence-based decision-making in environmental and public health management of mining. | The problem is two-fold: (i) inadequate academic research output, and (ii) non-use of available research. In the end, too many decisions in this arena are based on intuition, guesstimates, and anecdotal evidence. | i) establish a task force to draft a national research agenda on the environmental and social impacts of mining \([+]_4\). (PB). ii) implement task force recommendations on required actions. | RA: MNR, UG, IAST, MoH. PM 1: Research task force established. PM 2: implemented recommendations. |

\textsuperscript{13} Otherwise known as Cumulative Environmental Effects Assessment (CEEA). See GENCAPD/GGMC reports.
| **SG 7:** to promote self-regulation and community oversight of mining | Under GENCAPD Phase I, attempts were made to establish local committees to monitor mining activities, but without much success. | i) encourage the establishment of monitoring committees at local levels, with membership extended to miners in the area (promoting self regulation). (CA) | RA: GGMC  
PM: Number of active local committees. |

[+] = additional notes provided
3: PERFORMANCE

Guyana is emerging as an increasingly mineral-dependent economy. The socio-economic growth of the nation is increasing entwined with the achievements of the mining industry. Policies therefore have to ensure that mineral exploration and extraction are at a sufficient rate that mining revenues adequately deliver on the goals of sustainable development.

POLICY #3: Expanding mining’s contribution to national and sub-national economic development.

POLICY #4: Raising the attractiveness and competitiveness of Guyana’s mineral sector for large investments.

Policy #5: Optimizing the economic scope and technical capacity of SMS mining.

(ii) Targeted benefits

- Higher revenue collection from mining
- Higher number of active claims and permits, with reduced hoarding of lands.
- Increased mineral output from all scales of mining
- Optimized recovery rates from SMS mining
- Expanded large-scale exploration activity
- Wider number of minerals under exploration and extraction.
- Developed backward and forward linkages
- Greater impact of CSR activities in regions and communities.

(iii) Strategic goals and actions (in Tables 6, 7 and 8 below).
Table 6: PERFORMANCE (Policy #3)

**POLICY #3**  
The expansion of mining’s contribution to national and sub-national economic development.

**JUSTIFICATION:** For a mineral-dependent country such as ours, there must be a dedicated focus on ensuring the mineral sector increasingly expands its contribution to national revenues, local economies, multiplier effects, industrialization and modernization, and the other goals of sustainable development.

<table>
<thead>
<tr>
<th>STRATEGIC GOALS (SG)</th>
<th>BASILINES</th>
<th>ACTIONS</th>
<th>OUTPUTS (O) AND ASSUMPTIONS (A)</th>
<th>RESPONSIBLE AGENCIES (RA)</th>
<th>PERFORMANCE MEASURES (PM)</th>
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| **SG 8:** to increase tax revenues from mining operations without adversely affecting the investment climate and the cost of doing business in Guyana. | The fiscal regime includes a basket of fixed and sliding royalties, corporate taxes, free equity, rentals, withholding tax, and duties. | i) pending a full review of the fiscal regime, set royalty rates for all ore minerals (including bauxite and manganese) on a mineral-specific, price-based sliding scale (PB) [+]i.  
ii) set royalties on construction material, especially sand, at a rate more reflective of internal and external market demand. | | RA: MNR, MoF  
PM: higher tax revenues from mining. |
<p>| <strong>SG 9:</strong> to increase revenue collection by more effective | Monitoring of the movement of bulk ore through ports and | i) tighten monitoring of all movement of mineral products externally and internally, | | RA: MNR, GGMC, RDCs |</p>
<table>
<thead>
<tr>
<th>Monitoring of mineral payloads.</th>
<th>Check points is overly based on good faith.</th>
<th>Inclusive of construction materials and bauxite (PB)</th>
<th>PM: An upgraded system of check posts and procedures, operated by GGMC, RDCs and/or private contractors.</th>
</tr>
</thead>
</table>
| **SG 10:** To facilitate access by large investors to PL-sized properties through the merging of small-scale claims and medium-scale properties. | As mining ground become less available, large companies are looking to acquire large PL-scale territory through acquiring and merging claims and permit properties. Merging however does not entitle companies to the rights and concessions granted to direct PL holders. | i) Revise the regulations to allow the granting of PL status (with attendant rights and obligations) to properties formed by merging of lower-ranked claims. (PB) | RA: MNR  
PM: Amended regulations enacted. |
| **SG 11:** To expand the number of businesses and economic activities that serve the mining sector (backward linkages) and that use linkages in all forms are poorly developed, with backward linkages the most dominant. | Draft a comprehensive local content policy specific to the characteristics of non-oil mining sector (PB). | | RA: MNR  
PM: Local content policy formulated through a multi-stakeholder process. |
the outputs of mining (forward linkages).

**SG 12:** to encourage higher mineral declaration from SMS operations.

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<td></td>
<td>i) expand the current practice of linking the granting of financial and other concessions to declaration;</td>
<td></td>
<td>RA: GGMC</td>
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<td></td>
<td>ii) use correlation metrics and other data analysis techniques to pinpoint likely under-declaring operations for further investigation;</td>
<td></td>
<td>PM: Increased declaration from SMS miners.</td>
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<td></td>
<td>iii) optimize the operations of the Guyana Gold Board.</td>
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**SG 13:** To expand the impact of CSR of LMEs on community and regional development.

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<td></td>
<td>As a whole, CSR interventions suffer from insufficiency, lack of coordination, and community involvement in decision-making.</td>
<td>iv) initiate and oversee the drafting of (i) a National Charter on CSR, and (ii) CSR-based Community Development Agreements by each LME through multi-stakeholder processes (PB).</td>
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</table>

RA: MNR.
PM 1: number of CSR Charters;
PM 2: growth in CSR interventions in line with community needs, as measured by number of projects, amount of expenditure by companies, and resident satisfaction surveys.
| **SG 14:** To more directly distribute government proceeds of mining to regions and communities that host and hosted mining operations. | Currently, government allocations to regions and communities are taken from a common pool, the Consolidated Fund. This breaks the link between mining proceeds and the benefits derived by regions and communities. The exception is the Amerindian Purposes Fund, which is supported by gold proceeds. | i) institute a revenue sharing scheme where people from regions and communities directly affected by past and present mining can trace benefits in their regions and communities directly to mining revenue (PB).  

$[\text{PB}]$ | RA: MNR, MOF  

PM: amendments to the Fiscal Transfer Act and other affected legislation |
| **SG 15:** to put in place measures to increase the local supply of construction sands and stones to meet the expected boom in infrastructure | Local quarries sometimes fail to meet even present demands for stones in terms of quantity and quality. | i) incentivize investments in quarry operations,  

ii) task GGMC with finding new sources of quarry rock (CA),  

A1: new sources of quarry stone could be found in accessible locations. | RA: MNR, GGMC  

PM: quarry licences and stone production. |
| SG 16: To formulate preliminary policy positions on the management of strategic and critical minerals for which Guyana has potential. | No such considerations exist. | iii) identify Guyana’s potential for critical and strategic minerals (lithium, cobalt, REEs, copper, nickel, etc) and produce a report on possible policy implications (PB). | RA: MNR, MOF  
PM 1: Report commissioned and produced, and necessary adjustments made to fiscal, security and legal regimes. |
|---|---|---|---|
| SG 17: to encourage extraction of the by-products of mining, such as waste rock, gravel, white sands, and heavy minerals (black sands). | Whilst interest locally has been shown in the economic potential of by-products of mines, this industry is poorly developed in Guyana. | i) establish a legal and financial framework specifically directed at such material (PB).  
ii) promote such opportunities. | RA: MNR, GGMC  
PM 1: appropriate legislation enacted  
PM 2: number of applications for mining of by-products. |

[+] = additional notes provided
Table 7: PERFORMANCE (Policy #4)

**POLICY #4**

Raising the attractiveness and competitiveness of Guyana’s mineral sector for large investments.

**JUSTIFICATION:** Guyana’s untapped and fabled mineral potential will remain just that if the country is not extensively and systematically explored. This challenge demands large influxes of private investment capital. In the coming decades, mining’s pivotal contribution to the society and economy will depend on large-scale exploration and extraction of a range of minerals both in northern and southern Guyana. The conversion of Guyana’s mineral resources into human development deserves a dedicated policy focus.

<table>
<thead>
<tr>
<th>STRATEGIC GOALS (SG)</th>
<th>BASELINES</th>
<th>ACTIONS</th>
<th>ASSUMPTIONS (A)</th>
<th>RESPONSIBLE AGENCIES (RA)</th>
<th>PERFORMANCE MEASURES (PM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG 18: To enhance the availability, quality and dissemination of suitable data on Guyana’s geology and mineral potential (inclusive of coastal and shallow marine areas) in line with the information needs of</td>
<td>Access to good geologic data is one of the foremost considerations for large investors and forms one of the risk factors listed in SG 2 below. It is here separately single out as a strategic goal</td>
<td>i) establish a National Geodata Acquisition and Dissemination Program to [+]9:</td>
<td>A1: The present work of the Geoservices Division could be easily integrated and ramped up to meet the requirements of such a program.14</td>
<td>RA: Geological Services Department, GGMC.</td>
<td>PM 1: amount of FDI in mining, PM 2: number of applications for PLs and reconnaissance permits, PM 3: amount of online and other requests for geodata by investors.</td>
</tr>
</tbody>
</table>

14 We refer here to the 2017 GSD 20-20 VISION document, which is the only such GGMC strategic plan presented to us.
mining investors. because of its huge scope. Northern Guyana is extensively covered by regional geological, multi-element geochemical and airborne geophysical coverage, but with poor integration and digitization. Southern Guyana far less covered. Low or difficult public access to such information remains.

**SG 19: To continuously improve Guyana’s mining investment climate by minimizing hard risks and risks perception from the perspective of investors, especially large ones.**

In a highly competitive mineral world, to attract large investors, Guyana has to be diligent in ensuring its investment climate in general and for mining, in particular, is under constant evaluation. A

<table>
<thead>
<tr>
<th>i) assess and optimize the attractiveness of the country’s mining investment climate both in terms of hard risks and risks perception from the viewpoint of investors. Immediate deliverables (low-hanging fruits) include:</th>
<th>RA: MNR. MoF</th>
</tr>
</thead>
<tbody>
<tr>
<td>• remove ambiguities,</td>
<td>PM 1: amended legislation.</td>
</tr>
<tr>
<td>PM 2: improved scores on international scales such as risk ratings, corruption and business climate.</td>
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</tbody>
</table>
proactive, holistic, systematic and continuously improvement approach is needed. Comparisons of investment risks across countries are now standard. Guyana must work towards attaining and maintaining favourable ratings and comparative advantages. Key investment parameters include:
- geological database
- access to lands
- fiscal regime
- infrastructure
- regulatory certainty
- economic certainty
- legal system
- political stability

needless ministerial discretion, and vagueness in all mining-related legislation, thereby increasing certainty and transparency. PB [+]

- facilitate the smooth upgrading of small and medium-scale properties to PLs.
- streamline licensing processes to shorten permitting lead-times.
- implement clear regulations with regards minimizing costs or increasing compensation to companies for undertaking large infrastructure construction or maintenance.
- continue support of targeted departments at UG and TechVoc institutions.
- strengthen the social license of mining and eliminate
- availability of skills
- security

baseless resource nationalism through good governance measures, as outlined in Part III above, thereby reducing socio-political conflict.

[+] = additional notes provided
### Table 8: PERFORMANCE (Policy #5)

**POLICY #5** Optimizing the economic scope and technical capacity of SMS mining.

**JUSTIFICATION:** Small scale mining occupies a central and deeply embedded position in Guyana's history, economy, society and culture. Its existence and development determine the survival and prosperity of hinterland communities and thousands of Guyanese individuals and families across the country.

<table>
<thead>
<tr>
<th>STRATEGIC GOALS (SG)</th>
<th>BASILINES</th>
<th>ACTIONS</th>
<th>OUTPUTS (O) AND ASSUMPTIONS (A)</th>
<th>RESPONSIBLE AGENCIES (RA) PERFORMANCE MEASURES (PM)</th>
</tr>
</thead>
</table>
| **SG 20:** to effectively target policies and plans to specific categories and subgroups of miners within the SMS industry. | The 2015 IDB-funded study of the GGDMA, authored by Mangal-Joly, contains the best attempt at categorizing SMS operations according to criteria such as level of mechanization. | i) produce a fully verified profile of SMS operations and operators, using the 2015 IDB report as a starting point (PB).
ii) craft targeted policies and plans as necessary (CA). | | RA: GGMC
- PM 1: SMS profile produced and regularly updated using field visits and GGMC records.
- PM 2: policies and plans produced that are more attuned to the needs of different groups of miners. |
### SG 21: To improve mining practices for gold and diamond operations, with the focus on:

- technical approaches;
- appropriate technologies;
- level of mechanization;
- recovery rates [+]);
- reclamation of mined-out areas.

Most small-scale mining enterprises lack the required level of capitalization, mechanization and technical application.

### iii) set up a miners assistance program to increase mechanization (PB) [+]10.

### iv) upgrade training and extension services to miners, building on the experience, outputs (in particular the codes of practice) and recommendations of the GENCAPD field studies and other such projects (CA).

### v) expand waivers for green mining technologies.

### vi) expand the reach and resources of the Guyana Mining School

### vii) amend mining regulations to favor specification of equipment and process over mere performance standards.

### viii) continue research on gold mining recovery options

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### SG 22: To increase access to gold grounds,

### i) disincentivize the holding of idle lands and passive

### O1: amended mining

### O2: amended mining

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<table>
<thead>
<tr>
<th>especially, but not only, for Class II to IV miners</th>
<th>speculation ([+_{12}]) ii) further promote the formation of joint venture and syndicates, especially among Class I to IV miners</th>
<th>regulations on escalating rentals.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SG 23</strong>: To reduce mining costs for all classes of miners</td>
<td>i) maintain the current price-based sliding scale for gold royalty; ii) make tax concessions on fuel, spares, machinery, and equipment predictable and more attuned to the various classes of SMS miners; iii) build sealed roads based on a priority list for coastal-hinterland connectivity ([+_{13}]) iv) build feeder roads for internal access to new mining grounds.</td>
<td>PM 1: number and type of tax concessions. PM 2: number of sealed roads; PM 3: reduced travel time to the hinterland.</td>
</tr>
</tbody>
</table>

\([+]=\) additional notes provided
GOVERNANCE

Removing uncertainty and excess discretion in the mining legislation

RATIONALE: To the extent that predictability and certainty in a country’s mining legislation are factors in investment decisions and international ranking assessments, Guyana should accordingly upgrade its legislation. Such an upgrade may also be necessary under the EITI regime to close opportunities for corruption by removing arbitrariness, uncertainty and non-transparency in our laws.

As Background Brief #8 indicates, the country, in our view, scores well on eight key regulatory parameters. The strategic goal however requires legislation characterized by clear-cut rules and statutes with predetermined interpretation. Legislative tightening could be achieved through amending the mining act itself or through specifications in the regulations. The focus here is not on the merits of the statutes but on the appropriateness of the text.

PROPOSED AMENDMENTS

1) Discretionary powers of the Minister and the Commission.

- The term “with the approval of the Minister” appears thirty times in the mining act. Whether or not these references are sometimes merely symbolic, how he exercises his discretion should be clarified.

- The “special circumstances” that the Commission may consider should be known in advance in the four places it is mentioned in the mining act (e.g., 50 (2)). Similarly for when the Commission “thinks fit” (50 (1)) or is or is not “satisfied” (63(3) and seventeen other instances in the Act).

- The circumstances under which the Minister by order may exempt any person or class or persons from any provision of the Act should be spelt out as far as possible (133).

2) Right of Appeal (115 (1))

The right of an aggrieved person to appeal the decision of the Commission to the Minister may be problematic, given the interconnections between the Commission and the Ministry. The Ministry, for example, has staff on GGMC’s board and committees. Appeals

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16 As regards merit, the report supports the recommendations, with noted exceptions, of the 2015 GGMC COI report by Walrond and others.
should best be made to an independent agency, such as the proposed Inspector General for the GGMC.

3) The modifier “reasonable” occurs twenty-six times in the mining act in such terms as “reasonable time”, “reasonable excuse” and “reasonable grounds”. Where possible, these should be defined in the regulations where they carry no standard legal meaning.
GOVERNANCE | An independent Inspector General (IG) office for the GGMC

RATIONALE AND ASSUMPTIONS: GGMC can continuously improve its effectiveness and responsiveness from the perspective of the public and its stakeholders with the support of an independent and dedicated Inspector General Office, organised to exercise routine oversight over critical or problematic field and office operations of the GGMC.

SPECIFIC FUNCTIONS: The functions of the IG for GGMC are:

i) to conduct and supervise audits and investigations relating to the programs and operations of the GGMC, with special emphasis on its regulation of SMS mining activities;

ii) to conduct investigations into allegations of substantial fraud, abuse and wastage of resources;

iii) to receive and investigate complaints from miners and the general public against the actions and decisions of GGMC and its staff;

iv) to recommend policies to promote economy, efficiency, and effectiveness in GGMC operations.

v) to fully and timely inform the Commissioner of GGMC and the National Assembly about problems and deficiencies and the necessity for and progress of corrective action.

INDEPENDENCE OF AUTHORITY: The IG office shall be independent of and external to the GGMC and MNR. It shall be empowered to:

i) prepare its own annual budget, which will be a direct charge on the Consolidated Fund.

ii) set its own internal rules and procedures;

iii) be answerable only to the National Assembly.

SPECIFIC POWERS: In fulfilling its functions, the powers of the IG extend to the right to:

i) subpoena documents, records, and files

ii) summon GGMC management and staff to meetings and hearings.

iii) attend board meetings as observer

iv) with notice, visit offices, mines stations, and other GGMC facilities as required.

v) visit mining operations.
vi) issue advisories and notices.

**SCOPE OF AUTHORITY:**

- The IG must do everything its powers to maintain a cordial relationship with GGMC and to avoid unduly disrupting or delaying its operations.
- The recommendations of the IG are non-binding on GGMC.
- The IG must coordinate its work with other government agencies in relation to matters that concern them.

**STAFFING:** The head of the IG and other key staff must have qualification and experience in mining matters. The IG must be empowered to outsource its workload as deemed necessary.
RATIONALE AND ASSUMPTIONS: For long-term effectiveness, consistency and continuity, the environmental management of mining (EMM) in Guyana needs to adopt a robust strategic and operational framework. EMM based on Cumulative Impact Assessments (CIAs) satisfies this demand. CIA is an approach introduced and recommended to the GGMC and EPA by the CIDA-funded GENCAPD project in 2004.17 Cumulative environmental impacts can be defined as effects on the environment which are caused by the combined results of past, current and future activities. The concept of cumulative effects is based on the fact that single small activities at different locations, when aggregated together across a large area, such as a watershed, may be different in nature or extent from the effects of the individual activities.

The GENAPD project involved training in preparing CIAs and production of operational manuals. The project also undertook a CIA (CEEA) in the Mahdia district. Because CIAs are structurally similar to EIAs, differing from EIAs only by their larger temporal and spatial scope, they are a natural fit with the experience the country has already accumulated with EIAs. Nevertheless, GGMC and EPA should urgently rebuild their capacities to conduct such assessments or outsource such work to private environmental firms and UG.

17 In the GENAPD project, a CIA is referred to, less tersely, as a CEEA (Cumulative Environmental Effects Assessment).
STEPS IN A CIA (CEEA)

### Assessment Framework

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Source: GGMC/GENCAPD report

### ADVANTAGES OF THE CIA APPROACH

i) Establishes a reference line of the environmental impacts and effects of mining across regions.

ii) Produces EMPs, which can be used as strategic action plans in EMM in selected regions, allowing all interventions to be more case-specific and coordinated. EMPs must encompass mitigation measures:

- to remedy problems such as:
  - disposal of mine slurry and tailings;
- destruction of river ecosystems through diversion of channels and mining in buffer zones;
- lack of closure and/or reclamation.

- to upgrade training and extension services to miners, building on the experience, outputs (in particular the codes of practice) and recommendations of the GENCAPD field studies and other such projects.

- to amend mining regulations to favor specification of equipment and process over mere performance standards.

iii) Fosters continuity and consistency of management actions, even in face of staff turnover

iv) Involves community participation.

v) Can be adapted to suit specific aims and circumstances, such as availability of data and resources.

A WORD ON TRAINING OF MINERS: A need to reconceptualize

Training and awareness building is the go-to approach in improving environmental practices of miners. Much of the previous training, however, including where changing innate behaviors is the objective, has relied on the so-called information-deficit model\(^\text{18}\).

This model has underperformed in relation to the enormous time and resources spent on education and awareness (E&A) programs not just in the SMS mining industry but in campaigns such as reducing drug use and de-risking road usage. Worldwide, emphasis has shifted to programs based on robust theories of change. The green paper accordingly recommends that designers of E&A programs for local SMS miners adopt some of these approaches. A good starting point is the review in the WWF report titled “Evaluation of

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\(^{18}\) see Lowe, S. (2013) - Evaluation of Environmental Education and Awareness Programs of WWF-Guianas in the Small- & Medium-Scale Gold Mining Industry in Guyana. WWF Guianas.
Environmental Education and Awareness Programs of WWF-Guianas in the Small- & Medium-Scale Gold Mining Industry in Guyana”. Some of its recommendations include:

i) Evaluation of programs should include both the measurement of outcomes/impacts and the identification of cause and effect relationships (explanations or theories). The latter set of information can guide the design of new programs by uncovering what works, how and for whom. In a word, the days of the so-called black box evaluation should be over.

ii) Consideration should be given to more effective impact models, such as the Health Belief Model (see example in Annex 5) and the Community Social Marketing approach.

iii) Assumptions and beliefs behind the internal workings of the design must be expressly stated. Implicit and hidden assumptions must be made explicit.

iv) Priority consideration should be given to activities that promote sustainability of impacts (such as production of training manuals and codes of practice) and are cost-effective or provide more bang for the buck (such as training of trainers).
RATIONALE AND ASSUMPTIONS: policies and actions aimed at reducing the environmental impacts of mining are hampered by the absence of evidence in the form of data collection and analysis, and scientific research findings. Evidence-based decision-making by responsible authorities can reduce the high level of uncertainty over the nature and extent of environmental impacts, and the effectiveness of interventions by the GGMC, EPA and other agencies.

TERMS OF REFERENCE: The MNR shall set up a small Task Force to draft a National Research Agenda on environment management of mining with the following responsibilities:

i) review previous research on the topic to ascertain quality and freshness, and identify findings that could be used in policy-making and programs today;

ii) assess factors that inhibit/inhibited implementation of previous research findings and propose remedies;

iii) identify knowledge gaps that new research can help to bridge;

iv) propose an agenda based on a prioritization of information needs;

v) conduct a national gap analysis of equipment and manpower needs to undertake the research agenda.

vi) propose an execution plan to implement the research agenda (which must include guidelines for the reporting to and the uptake by relevant government agencies of research findings).

vii) engage in wide consultations to address the above.

COMPOSITION OF TASK FORCE: GGMC, UG, EPA, MoH, IAST

DURATION OF WORK: 2 -3 months

POST-SUBMISSION ACTION: establishment of implementation committee.
The Fiscal Affairs Department (FAD) of the International Monetary Fund (IMF) advised the country in 2017\textsuperscript{19} that the combination of a fixed royalty rate with a mining rent tax is the best regime for collecting mining revenues from the point of view that:

- the royalty will provide the government with stable and predictable revenues,
- the mining rent tax will ensure the government gets a high share of any supernormal profits, and
- the mining rent tax will also encourage the optimal level of business investment.

These recommendations are in line with the FAD’s 2012 research study on fiscal regimes for extractive industries.\textsuperscript{20} As such, the FAD advised that for larger gold mines, the government should retain the 5% royalty while replacing the escalating or sliding-scale royalty (5% for gold price below $1000/oz, 8% for price above $1000/oz) with a mining rent tax.

What then are the advantages of the mine rent tax over the sliding-scale royalty? Resolution requires consideration of not only fiscal economic theory but also of the hard Guyana context.

A rent tax is akin to a windfall tax. It is a tax in addition to the normal income tax\textsuperscript{21}, by taxing excess or supernormal profits. So, a company would pay, say, 27.5% on normal profits and a rent tax on excess profits (which, in theory, could carry a tax rate as high as 100%). The government therefore shares in the windfall, but without distorting investment decisions on, for example, exploiting marginal deposits, as a sliding royalty scale is said to do.

Additionally, the rent tax has the advantage over a price-based royalty because the tax can be triggered by increased profits due to lowered production costs even as price remains constant. A sliding royalty responds only to changes in price.

The big challenge, of course, is tax administration. As Collier (2012)\textsuperscript{22} warns:

> The problem with any form of taxation is that information is costly and held asymmetrically: the company knows the true division between rents and profits but has no incentive to reveal it. On the contrary, where the government has little

\textsuperscript{19} FAD, IMF (2012)- Fiscal Regimes for Extractive Industries: Design and Implementation.

\textsuperscript{20} In Guyana, 27.5% corporate tax is the normal tax.

\textsuperscript{21} Collier, P (2010) - Principles of resource taxation for low-income countries....
information the company has considerable scope for concealing profits altogether by reclassifying them into costs. While these problems are generic to all forms of taxation, they are far more acute with the taxation of resource rents. Whereas tax rates on profits that result from capital and risk are typically around 25 percent, in principle the tax rate on excess profits should approach 100 percent. The incentives to cheat are thus radically greater, and the scope for cheating is increased by the co-existence of two conceptually distinct forms of profit. As a result, whereas within the OECD the first-best [the mine rent tax] is unambiguously the right policy, in the context of small, low-income countries it is at least debatable.”

In a 2012 paper by The International Mining for Development Centre, the authors said the following about mine rent taxes:

“Although the general concept is relatively simple, its practical implementation may be complex, often misunderstood and can potentially lead to significant compliance costs and disputes. This is largely the reason for the poor rate of adoption in spite of its very high level of economic allocative efficiency. Aside from the petroleum industry, at the time of writing there are no resource-rent based taxes in force in the mining industry…”

How effectively can Guyana administer profit-based taxes, especially one with additional complications as a mine rent tax? The country is only now acquiring know-how to manage the formidable profit-sharing regime in the Exxon petroleum contract. In addition, the country normally grants tax holidays on corporate taxes as an incentive for investments. The suggested mine rent tax therefore comes with much uncertainty and long delays.

One would imagine that as deposits become more marginal, governments can exercise discretion to lower or defer royalties if the current rate would make extraction unprofitable. The green paper therefore recommends that the realities of Guyana would favour retention of the sliding royalty scale, its stated economic imperfections notwithstanding.

The IMF’s other advice on the difficulty of managing waivers on equipment makes much sense and should prompt some degree of recalibration of the regime.

A full study by experts is recommended.

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23 Gui, P (2012)- *Mineral royalties and other mining specific taxes*. The International Mining for Development Centre (a joint venture between The University of Western Australia and the University of Queensland in partnership with the Australian Government through AusAID).
PERFORMANCE

A comprehensive local content policy specific to the non-oil mining sector (PB).

RATIONALE AND ASSUMPTIONS: While it is recognized that large mining companies in Guyana do give regard to promoting local content, it is posited that larger and predictable impacts in these regards could be achieved through a mining-specific local content policy, supported in key regards by legal obligations.

The draft local content policy for the petroleum sector is not suitable in key regards for the non-oil mining sector. Separate instruments are required specific to the nature of mining, in particular its spatial and social connections to communities.

KEY CONSIDERATIONS FOR DRAFTING LOCAL CONTENT: The drafting of a local content policy (LCP) specific to large-scale mining should recognize and consider:

i) the closer geographic link between mining activity and local communities (which is not the case for off-shore oil);

ii) that “local” in local content must therefore also necessarily target the community and regional levels, not only the national;

iii) the remoteness of such communities from townships

iv) the clauses in the Mining Act that require the training and employment of Guyanese and the procurement of goods and services within Guyana (example: 46 (1)(d)(e)).

v) the range of actions through which mining operations can contribute to local development, such as employment, training, contracting, and infrastructure provision;

vi) the need for mandatory reporting.

vii) the recommendations and guidelines of the Intergovernmental Forum in its report “IGF DRAFT GUIDANCE FOR GOVERNMENTS: LOCAL CONTENT POLICIES”.
RATIONALE AND ASSUMPTIONS: While it is recognized that large mining companies in Guyana do give regard to their corporate social responsibility, it is posited that improved and predictable outcomes could be achieved through formal non-binding community development agreements, supported in key regards by legal obligations.

CSR must go beyond general statements of intent or broad goals. Similar to a mining-specific local content policy, CSR must also recognize the close spatial and social relationship between mining operations and communities and regions.

SCOPE OF CHARTER ON CSR FOR MINING COMPANIES

The CSR should cover the following six areas:

i) Human rights
ii) Labour
iii) Environment
iv) Economic and business issues
v) Cultural and natural heritage issues
vi) Community development

GUIDING PRINCIPLES

A charter for CSR in mining should be guided by such international conventions as:

- UN Universal Declaration of Human Rights
- UN Guiding Principles on Business and Human Rights
- The ILO Declaration on Fundamental Principles and Rights at Work
- UN Rio Declaration on Environment and Development.
- EITI guidelines
- United Nations Declaration on the Rights of Indigenous Peoples
- The World Heritage Convention.

MANNER OF FORMALIZATION

- National Charter
- Community- or Regional-specific Development Agreements.
KEY CONSIDERATIONS

- Community Development Agreements should not be a one-size-fit-all arrangement. They must be negotiated by the company and community leaders, local governments, and the Ministry of Communities;

- Agreements must include mandatory reporting mechanism on progress;

- Use of best practices should be enshrined.
PERFORMANCE | Revenue sharing with all mining regions and communities

RATIONALE AND OUTCOMES: As the mining industry expands, the fate of communities and regions will increasingly become dependent on the economic, social and environmental performance of mining companies. There will emerge a greater concern and, with it, a greater demand by local governments and their citizenry to know how they directly benefit from mining revenues. Revenue sharing of mining revenues is a legitimate demand and can do much to promote the reality and perception of economic and social justness. Under the current national budgetary allocation system for RDCs and NDCs through a general Consolidated Fund, citizens cannot trace the link between local development and the revenues the state obtains from mining in their regions.

The only active case presently of such revenue sharing in Guyana is the Amerindians Purposes Fund, established in 2000 and stocked by royalty from gold. The over 180 Indigenous communities can access this fund for small capital projects.

This green paper recommends the replication or expansion of such a facility to cover all communities and regions that host past and present mining activity, including those in the bauxite and manganese districts.

MODE OF DISBURSEMENT

Revenue sharing could be effected through:

- earmarked fiscal transfers to RDCs and NDCs
- disbursements from a regional natural resources fund.

OBJECTIVES AND EXPECTED OUTCOMES

- stabilize mining regions and communities in times of reduced mining activity or mine closure.

- strengthen the social license (and thereby stifle any resource nationalism) for mining in regions and communities by enabling residents to see direct links between mining and their socio-economic progress (a targeted benefit under governance);

- promote social cohesion (a targeted benefit under governance)
• promote the mitigation or elimination of mining-related hazards and environmental damage from past mining, such as unstable grounds and slopes, excessive erosion, mined-out pits, and mercury-contaminated areas.

SCOPE OF REVENUE SHARING
Funds should be earmarked for capital projects only (non-recurrent expenditures). A percentage of the allocation, however, could be directed to a savings facility to cover any future mining-related natural hazards or environmental damage.

MANAGEMENT
If revenue sharing is done through a special resource fund, it should be managed as a multi-year extra-budgetary allocation for projects and problems identified by regions, communities or by central government with the following features:

• fiscal rules for deposit and withdrawal that align with scope and objectives.
• a semi-autonomous management committee of experts and stakeholders.
• open governance rules to allow public participation and access to full information
• yearly impact assessments.
RATIONALE: This green paper endorses the list of benefits of public geosciences information identified in the report, titled Management of Public Geosciences Data:\textsuperscript{24}

- Encouraging exploration in high risk, potentially high return frontier regions,
- Applying the geological knowledge of known deposits to increase the chances of finding more deposits,
- Reducing risk and uncertainty right across the resources exploration industry, by enabling the use and re-use of geoscience data held in public archives,
- Encouraging the participation of a larger number of small private investors than would otherwise be the case,
- Preventing exploration activity falling to ineffectively low levels,
- Reducing expensive re-acquisition of data, thus focusing expenditure on acquiring new data,
- Maintaining [a country’s] competitive edge in attracting international exploration and resource investment,
- Increasing competition through processes for granting or renewal of licenses, tenements and concessions that are informed by the available geo-scientific data, and
- Harmonising the data [...] to underpin policy-making and regional development decisions.

SPECIAL CONSIDERATIONS

i) Geosciences information gathering should give special attention to:

- strategic metals (such as REEs, lithium, nickel, copper and cobalt) geodata acquisition program.
- shallow marine (sea bed) environments, which are known to contain valuable minerals such as diamonds and gold.

\textsuperscript{24} International Mining for Development Centre: Mining for Development: Guide to Australian Practice (2014) - Management of Public Geosciences Data.
• Estuaries and lower reaches of major rivers.

ii) It is crucial for Guyana to recognize that most initial mineral exploration work is undertaken by junior companies. Their mineral property appraisals serve as a feeder system for the mining industry giants, as giants are mostly unwillingly to take on the risks of greenfield exploration in overseas jurisdictions. But juniors may not often be financially equipped to undertake regional scale work at the scale required to detect potential mineral deposits. The GGMC, therefore, should recognize this and select suitable scales for its geological, geophysical and geochemical surveys. The case could be made for GGMC to undertake target appraisal of promising areas through drilling, trenching, ground geophysics, and soil geochemistry.

iii) As data collection and synthesis under the proposed National Geodata Acquisition and Dissemination Program reach a critical stage, GGMC should move to conduct a mineral resource assessment of the entire country (inclusive of the coast and near offshore) with technical assistance from either the geological survey of the US or France, as first proposed in 1993.

OPERATIONAL GUIDELINES

Two sourcebooks are recommended to guide the design of the proposed National Geodata Acquisition and Dissemination Program:


The strength of this sourcebook lies in the survey results it provides on the geo-information needs of large exploration companies. The sample size of 70 international companies is big enough to prompt GGMC to reorient its geological programs where necessary to meet the geodata demand of clients as they themselves have articulated it in the survey.


The document provides actionable guidance on setting up, organizing and managing the data system.

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25 See
26 See GGMC’s 1993 Annual Report.
QUALITY ASSURANCE AND CAPACITY BUILDING

Geosciences information will have to meet standards of quality to be trusted by users as a decision-making tool. The GGMC can assure acceptable quality of work and simultaneously build capacity in several ways:

i) work in partnership arrangements with more capable geological surveys (from Brazil, Canada, South Africa, etc).

ii) persistently advertise and contract certified geologists from overseas.

iii) ramp up on-the-job training programs with systematic fit-for-purpose skills training for geologists. Current efforts seem ad hoc or take-as-you-get.

iv) provide relevant overseas training for key staff and ensure they are productively used on their return. This should involve not just university education, but also work stints at overseas geological surveys.

v) benchmark and standardize against best codes of practice all the main field and lab procedures in the GSD.

vi) conduct a gap analysis of the training programs at UG and the mining school and implement solutions therefrom.
PERFORMANCE | Set up a government assistance to miners scheme

RATIONALE AND ASSUMPTIONS: Several of the critical improvements in SMS mining in Guyana would not occur at all or occur only slowly if the bulk of mining operations are unable to transition into more mechanized operations. Environmental compliance by and economic viability of operations depend on their capacity to remove overburden, manage tailings, harness water supply, conduct pre-mining prospecting, increase recovery, reduce mercury use, and reclaim mined-out areas. In the main, this requires mechanical earth-moving equipment and more appropriate recovery technologies.

Lack of financing and access to bank credit, however, remains an almost insurmountable obstacle for several classes of SMS miners. Miners need assistance to upgrade their operations. Given the nature and magnitude of the problem, the most obvious source for such assistance is the government, either directly or indirectly. A well crafted miners assistance program is possible based on the lessons of previous (mostly failed) attempts locally and on the experience of successful schemes internationally.

No scheme is perfect. The government should see such schemes as an investment, as increased mechanization of operations can move the industry to higher standards for the benefit of the miners themselves, the government, local communities, and the natural environment.

KEY CONSIDERATIONS FOR ESTABLISHING A MINERS ASSISTANCE SCHEME

There are at least six assistance models:

- Loan-based financing schemes.
- Equity-based financing schemes.
- Hire-purchase schemes.
- Donor and government support schemes.
- Financing through cooperation between small- and large-scale miners.
- Financing through buyer credit schemes.

We would select hire purchase schemes because it involves no direct transfer of cash to miners (a difficult sell) and offers scope for adaptable designs. A government hire purchase scheme should be based on the following design:

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• preference for excavators, bulldozers and mechanical mineral recovery devices;
• priority treatment to miners without such equipment;
• priority treatment to syndicates and other partnership arrangements;
• waiver of all duties on targeted equipment;
• lodging of partial collateral by the miner, set at a percentage of the cost price (minus duties) of the equipment (25%, for example). Collateral could be land or cash bond or a freeze on the account of a guarantor.
• no or low interest on repayments;
• a grace period before first payment of installment; then regular payments in line with the mining cycle.
• a repayment scheme that awards points to the miner for gold declarations over a certain amount. The higher the declaration, the more the government reduces the debt.
• reward for quick payback of debt in the form of a full transfer of ownership of the equipment to the miner if a large amount of the debt (example: 80%) is repaid within a short period (example: within five years).
• auctioning of all reclaimed equipment by government, with a pre-set floor price to remove gaming of the scheme.
Noticeable in the long-standing discussion on improving gold recovery in SMS operations in Guyana is the near absence of field tests information. This situation can be explained by (i) the small number of such scientific tests themselves in Guyana, and (ii) the scant regard for and non-use of results from the few conducted tests. Resultantly, we have arrived at the present state where lessons learnt have been forgotten and experiences have not accumulated and been built upon. Much subjectivity and disagreement still exists on such critical questions as what is the optimal performance of a well-designed sluice box, to what extent does amalgamation trap gold, what is the cost-effectiveness of more mechanized devices, and to what extent would sizing help? These questions require more than textbook or theoretical answers if miners are to be persuaded to change practices and behavior.

We have looked at three local studies that should inform the course of action with regards optimizing the recovery rate of SMS operations. These studies looked at optimizing the sluice box and at the efficiency of amalgamation.

**Optimizing the sluice box.** For SMS gold mining in Guyana, the sluice box remains the almost exclusive recovery device. Its popularity, it is reasonable to predict, will not abate in the foreseeable future. In the regulation of the industry, several strategic goals revolve around the persistence of the sluice:

- increasing the financial viability of SMS operations through higher gold recoveries;
- reducing the use of mercury;
- reducing the start-up and running costs of SMS operations;
- reducing the environment impacts of tailings disposal.

Much is made of the reputedly inherent low recovery of sluicing, pegged at 30 to 40%, with single-digit recovery of the fine gold fraction (less than 100 microns). Field research however conducted in several local mining areas on optimizing the performance of the sluice collectively reveals that:

1) from grain-size distribution analysis, the fine gold fraction hovers below 10%. Even total non-recovery of this fraction, therefore, should not be seen as catastrophic. The significance of this point cannot be overstated.

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28 It is not overlooked that overseas field studies can also be a useful source of guidance.
29 The studies referred to are: Styles (BGS), Clarkson (GENCAPD) and Hesterman et al (GGMC)
ii) losses of gold occur across the spectrum of grain sizes, including coarse gold. Much scope therefore exists for efficiency gains.

iii) gold recovery can reach as high as 80% with more efficient trapping mechanisms and operating parameters (such as feed rates).

Time has not weakened the validity of these conclusions, produced in 2000. Indeed, reports indicate that the new sluice design recommended by the studies has produced better recoveries and has today become more popular.

One valuable untested implication of the GENCAPD and BGS studies is that they suggest that screening and/or sizing of the feed before sluicing may produce less than expected gains in recovery.

Unfortunately, for various reasons, the use of the optimized sluice box by miners is well below saturation. Miners may not be aware of the guidelines on making the sluices perform better. The GGMC must still expend serious effort to get the word out. This objective is a low-hanging fruit, which GGMC can readily pick.

To be sure, posted on the GGMC website is a slide presentation, titled “Optimization of Sluice Box Performance”. With the same good intentions, this green paper recommends that the link be replaced by a more miner-friendly operational manual, based exclusively on the guidelines and sketches from the GENCAPD and BGS reports on the sluice box.

Amalgamation. After the sluicing process, secondary recovery is required to separate the gold from the black sands. The vast majority of SMS miners use mercury to extract gold through amalgamation.

A GGMC field study done in 2000, using three state-of-the-art chemical assaying techniques, concluded that the black sand discarded after amalgamation from five dredges tested in Mahdia “still contain[ed] significant amounts of gold.”

These results have enormous implications if they are representative, as they likely are, of the situation across the mining districts. Replacing amalgamation with better technologies not only minimizes the mercury problem (and satisfies our Minamata obligations). It also significantly increases gold recovery and, accordingly, the prosperity of operations. Secondary concentrators, such as the Knelson concentrator and the shaking table, should be promoted not only as mercury-free technologies, but also as good for business.

Given all the foregoing, several courses of action suggest themselves:

30 This result is disputed by GGMC and other personnel. More studies are required.

31 Heesterman, L.J.L., Kemp, A.W. & Sampson, E. 2000. A Summary of Geochemistry of Land Dredges in the Mahdia Area, Potaro District. GGMC.
i) these tests should be replicated in different areas to check on their geographical validity

ii) GGMC’s current default position should be that of promoting the Clarkson/BGS sluice box design and focusing on secondary recovery as having the best cost/benefit ratio of the three stages in the recovery process (pre-treatment, primary recovery, and secondary recovery).

Nothing in this recommendation should imply that efforts to promote the more advanced technologies in all three stages should be sidetracked. However, further research of a similar vein will help to determine where impacts are best obtained.
RATIONALE: The GGMC’s property licensing system requires a re-evaluation to make it efficient, transparent and fair. Regardless of whether complaints from miners are based on perception or reality, a modern licensing system must be built to ensure a high level of service. The GGMC’s Land Management Division is ISO certified for quality assurance. But miners and others have criticized the system for being slow\(^{32}\) or unfair\(^{33}\) and corrupt\(^{34}\). In addition, the practice of landlordism and non-beneficial occupancy remains a “menace” to the future growth of the industry.\(^{35}\)

OUTCOMES: The management of the license allocation must be organized to meet and surpass the expectations of industry in terms of:

- establishment of fair and acceptable allocation rules;
- fair and transparent application of these rules;
- efficient administrative procedures and processes;
- responsiveness to queries and complaints.

MEANS: Getting these outcomes requires:

i) changes to the mining legislation.

ii) computerization of the licensing system.

iii) open- and e-government approaches.

iv) independent oversight and complaints authority.

i) Changes to the mining legislation. The recommended amendments in the 2015 Walrond report are, save one, meritorious and should be enacted without further undue delay. They remove significant ambiguities and loopholes in the rules and their application. They promote fairness.

For one of the recommendations, however, we propose a different, more constitutionally-compliant and administratively foolproof approach. Walrond’s report recommends the setting of a cap on the number of claims per person (twenty is


\(^{33}\) GGMC needs to release lands to small miners – GGDM. INews Guyana. September 27, 2015.

suggested) as a means to thwart landlordism and non-beneficial occupancy. The suggestion contains two serious drawbacks. The first relates to the ease with which caps can be exceeded without detection through the use of intermediate holders. The second concerns the constitutional implications of taking back claims from current holders possibly at the point of licenses renewal to ensure they do not exceed the limit. As it is here assumed that existing holders of multiple properties have to be targeted for caps to work as a fix to current landlordism and land hoarding, a cascade of legal challenges based on constitutional guarantees of property rights will likely arise.

The World Bank recommends (and we agree) that a system of escalating rental fees is the most effective solution from a list that also includes: 36

- mandatory relinquishment requirements,
- minimum investment requirements and minimum work requirements (as currently the case in Guyana for medium and large scale licences),
- caps or limits on the number or surface area of claims per licensee,
- minimum requirements for financial and technical capability.

ii) Computerization of the licensing system and (iii) open- and e-government approaches. Should Guyana honor its obligations under the EITI, then much progress can be made under these headings. The EITI requires that implementing countries maintain up-to-date and comprehensive license registers that should be publicly available. 37 We recommend that as GGMC moves to further computerize its land management system, it works closely with the EITI Secretariat.

iv) Independent oversight and complaints authority. The recommended Inspector General Office can fulfill this function.

37 EITI Guidance note 3 on license registers.
RATIONALE: The mining industry at all scales of operation will not reach new heights of performance without a network of all-weather hinterland roads. Low transportation costs and ready access are together the foremost transformational factor for the industry. Without it, the industry will struggle to attain the next level in terms of:

- growth (both of output and range of minerals)
- financial viability (even in a low mineral price environment)
- environmental and OSH compliance
- regulatory coverage and effectiveness
- multiplier effects.

The vision for hinterland road development must go beyond intermittent repairs and maintenance of the current system of fair-weather roads. The vision has to encompass (i) the identification and weather-proofing of key main routes particularly for coastal-hinterland connectivity, and (ii) a system of smaller feeder roads to hinterland communities and new mining grounds.

The selection of routes must be a multi-stakeholder undertaking, utilizing such criteria as:

- existing routes
- locations of current mining hotspots and other economic resources
- locations of hinterland communities
- location of protected and environmentally-sensitive areas
- areas with good mineral potential (such as over greenstone terrains).

Government should place building physical infrastructure at the heart of its economic strategy. This planning should encompass the promotion of Spatial Development Initiatives (SDI) linked to mineral resources.
Part IV attempts, first of all, to analyse the policy ideas in Part III from two perspectives: (i) under common policy fields such as fiscal, legal, institutional, and environmental (for ease of reference); and (ii) the extent to which Part III matches the principles of the Green State Development Strategy Framework (as all national policies have to be in sync with Guyana’s green agenda).

Secondly, Part IV addresses the matter of policy implementation. It identifies the risk factors to be overcome for successful policy execution, and offers a few notes on GGMC, as the agency mandated to implement mining policy.

1: GROUPING OF STRATEGIES AND MEASURES INTO POLICY FIELDS.

Table 9 below reorganizes the twenty-three strategic goals and their action measures into nine fields or headings commonly used to categorize policies. Several of these fields match those used in the 1997 NDS. They are presented here for ease of reference and communication.
Table 9: STRATEGIES AND ACTIONS GROUPED BY POLICY FIELDS

<table>
<thead>
<tr>
<th>STRATEGIC GOALS (SG)</th>
<th>ACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FISCAL AND FINANCIAL</strong></td>
<td></td>
</tr>
<tr>
<td><strong>SG 8:</strong> to increase tax revenues from mining operations without adversely affecting the investment climate and the cost of doing business in Guyana.</td>
<td>set royalty rates for all ore minerals (including bauxite and manganese) on a mineral-specific, price-based sliding scale.</td>
</tr>
<tr>
<td></td>
<td>set royalties on construction material, especially sand, at a rate more reflective of internal and external market demand.</td>
</tr>
<tr>
<td><strong>SG 9:</strong> to increase revenue</td>
<td>tighten monitoring of all movement of mineral products</td>
</tr>
<tr>
<td>SG 11: To expand the number of businesses and economic activities that serve the mining sector (backward linkages) and that use the outputs of mining (forward linkages).</td>
<td>draft a comprehensive local content policy specific to the characteristics of non-oil mining sector.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>SG 12: to encourage higher mineral declaration from SMS operations.</td>
<td>expand the current practice of linking the granting of financial and other concessions to declaration.</td>
</tr>
<tr>
<td>SG 15: to put in place measures to increase the local supply of construction sands and stones to meet the expected boom in infrastructure development.</td>
<td>incentivize investments in quarry operations.</td>
</tr>
<tr>
<td>SG 17: to encourage extraction of the by-products of mining, such as waste rock, gravel, white sands, and heavy minerals (black sands).</td>
<td>establish a legal and financial framework specifically directed at such material.</td>
</tr>
<tr>
<td>SG 21: To improve mining practices for gold and diamond operations.</td>
<td>expand waivers for green mining technologies.</td>
</tr>
<tr>
<td>SG 23: To reduce mining costs for all classes of miners.</td>
<td>maintain the current price-based sliding scale for gold royalty.</td>
</tr>
<tr>
<td></td>
<td>make tax concessions on fuel, spares, machinery, and equipment predictable and more attuned to the various classes of SMS miners.</td>
</tr>
<tr>
<td></td>
<td>build sealed roads based on a priority list.</td>
</tr>
</tbody>
</table>
**Policy # 1:** To promote open government and to remove the perception and reality of administrative sloth, unfairness, and corruption.

- Train GGMC staff on the requirements, principles and procedures to be applied for mineral sector governance as required by the mining policy.
- Establish an independent Inspector General office for the GGMC.
- Implement fully the EITI and AMLCFT regimes.
- Introduce Freedom of Information (FOI) practices within GGMC and MNR.
- Formalize and operationalize a stakeholder consultation mechanism through a written protocol between government and the mining industry.
- Extend ISO-based quality assurance across service-based departments and laboratories at GGMC.
- Effectively target policies and plans to specific categories and subgroups of miners within the SMS industry.
- Revamp the GGMC and MNR websites to meet open government standards.
- Facilitate evidence-based decision-making in environmental and public health management of mining.
- Synchronize GGMC’s systems, staff, skills, and style with its values and strategies. The last two components should inform the first four.
- Identify and manage political and other risks to policy execution.

**SG 12:** To encourage higher mineral declaration from SMS operations.

- Use correlation metrics and other data analysis techniques to pinpoint likely under-declaring operations for further investigation.
- Optimize the operations of the Guyana Gold Board.

**SG 2:** To make managers of dredges and quarries the focal point of optimizing compliance in SMS operations.

- Expand awareness and training programs for managers of dredges and quarries, especially through the Guyana Mining School.

**SG 20:** To effectively target

- Produce a fully verified profile of SMS operations and
policies and plans to specific categories and subgroups of miners within the SMS industry. operators, using the 2015 IDB report as a starting point

craft targeted policies and plans as necessary

further promote the formation of joint venture and syndicates.

**SG 21:** To improve mining practices for gold and diamond operations. expand the reach and resources of the Guyana Mining School

set up a miners assistance program

upgrade training and extension services to miners

expand waivers for green mining technologies.

continue research on gold mining recovery options.

**SG 19:** To continuously improve Guyana’s mining investment climate by minimizing hard risks and risks perception from the perspective of investors, especially large ones. assess and optimize the attractiveness of the country’s mining investment climate both in terms of hard risks and risks perception from the viewpoint of investors, based on the following investment parameters:

- geological database
- access to lands
- fiscal regime
- infrastructure
- regulatory certainty
- economic certainty
- legal system
- political stability
- availability of skills
- security

**LEGISLATIVE**

**Policy #1:** To promote open government and to remove the perception and reality of administrative sloth, unfairness, and corruption. amend the mining legislation to remove ambiguities, vagueness and excessive ministerial discretion

**SG 10:** To facilitate access by large investors to PL-sized properties through revise the regulations to allow the granting of PL status (with attending rights and obligations) to properties formed by merging of lower-ranked claims.
<table>
<thead>
<tr>
<th>the merging of small claims and medium-scale properties.</th>
<th>implement the recommendations on legislation of the 2015 Walrond Report on GGMC, with the exception of that on caps on property ownership (See pg 89 &quot;Optimizing the licensing system&quot;).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governance and performance.</td>
<td>expand and enact the provisions in PART XIII of the draft mining regulations &quot;MANAGEMENT AND RESPONSIBILITY IN EXPLORATION, MINING AND QUARRYING&quot;</td>
</tr>
<tr>
<td><strong>SG 2</strong>: to make managers of dredges and quarries the focal point of optimizing compliance in SMS operations.</td>
<td>establish a legal and financial framework specifically directed at such material. promote such opportunities.</td>
</tr>
<tr>
<td><strong>SG 17</strong>: to encourage extraction of the by-products of mining, such as waste rock, gravel, white sands, and heavy minerals (black sands).</td>
<td>amend mining regulations to favor specification of equipment and process over mere performance standards.</td>
</tr>
<tr>
<td><strong>SG 21</strong>: To improve mining practices for gold and diamond operations</td>
<td>disincentivize the holding of idle lands and passive speculation. further promote the formation of joint venture and syndicates, especially among Class I to IV miners</td>
</tr>
<tr>
<td><strong>SG 22</strong>: To increase access to gold grounds, especially, but not only, for Class II to IV miners.</td>
<td></td>
</tr>
<tr>
<td><strong>ENVIRONMENTAL</strong></td>
<td></td>
</tr>
<tr>
<td><strong>SG 4</strong>: to manage the environmental impacts of mining using Environmental Management Plans, formulated through Cumulative Impact Assessments.</td>
<td>conduct CIAs in hot spot mining areas ([+3]). use EMPs from CIAs as national implementation plans for EMM.</td>
</tr>
<tr>
<td><strong>SG 5</strong>: to reduce, and where feasible, eliminate the use</td>
<td>establish the recommended NAP Implementation Advisory Group (with representation from MNR, WWF, GGDMA,</td>
</tr>
</tbody>
</table>
of mercury in mining and processing by 2027 in line with Guyana’s commitments under the Minamata Convention.

MOH, GGMC, private sector and civil society), and task it with reviewing and implementing the recommendations of the final NAP on mercury

SG 6: To facilitate evidence-based decision-making in environmental and public health management of mining.

establish a task force to draft a national research agenda on the environmental and social impacts of mining

SG 7: to promote self-regulation and community oversight of mining

encourage the establishment of monitoring committees at local levels, with membership extended to miners in the area (promoting self-regulation).

**OCCUPATIONAL HEALTH AND SAFETY**

SG 3: to integrate OSH practices and culture as part and parcel of small and medium-scale mining of gold, diamonds, sand/loam, and stones.

draft the recommended NAP for OSH specific to the nature (including its limitations) of the SMS industry.

assign OSH responsibility for the mining sector to GGMC through a MOU with the Labour Department of MoSP

**GEOLOGICAL/MINERAL RESOURCES**

SG 18: To enhance the availability, quality and dissemination of suitable data on Guyana’s geology and mineral potential (inclusive of coastal and shallow marine areas) in line with the information needs of mining investors.

establish a National Geodata Acquisition and Dissemination Program.

SG 16: To formulate preliminary policy positions on the management of strategic and critical minerals for which Guyana has potential.

identify Guyana’s potential for critical and strategic minerals (lithium, cobalt, REEs, copper, nickel, etc) and produce a report on possible policy implications.
**COMMUNITY AND REGIONAL DEVELOPMENT**

**SG 13:** To expand the impact of CSR of large mining companies on community and regional development.
- initiate and oversee the drafting of (i) a National Charter on CSR, and (ii) CSR-based Community Development Agreements by each large mining enterprise through multi-stakeholder processes.
- draft a comprehensive local content policy specific to the characteristics of non-oil mining sector.

**SG 14:** To more directly distribute government proceeds of mining to regions and communities that host and hosted mining operations.
- institute a revenue sharing scheme where people from regions and communities directly affected by past and present mining can trace benefits in their regions and communities directly to mining revenue.

**TECHNOLOGICAL**

**SG 21:** To improve mining practices for gold and diamond operations.
- expand waivers for green mining technologies.
- review and expand on GENCAPD studies to optimize gold and diamond recovery using commonly available technologies.

**INFRASTRUCTURAL**

**SG 23:** To reduce mining costs for all classes of miners.
- build sealed roads based on a priority list for coastal-to-hinterland connectivity.
- increase road access to new mining grounds within mining districts.
2: MATCHING OF THE GREEN PAPER TO THE GSIDS FRAMEWORK

The section answers the question: to what extent does the recommended policy framework match the principles of the Green State Development Strategy Framework?

Table 10: RECONCILIATION WITH GSIDS FRAMEWORK

<table>
<thead>
<tr>
<th>Principles of the GSIDS</th>
<th>This paper</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cohesion and inclusion</strong>: human rights, multi-ethnicity and gender equality, non-discrimination and protection of vulnerable and marginalized population groups.</td>
<td>Several themes, principles and strategic goals promote or directly target cohesion and inclusion. The paper expressly and prominently emphasizes participatory processes as a key aspect of a new mining policy. The WMO, the Ministry of Indigenous Affairs, RDCs and Amerindian Rights groups are included as stakeholders on several issues. In addition, the paper recommends ways to increase the role of CSR, local content, and mineral-based regional development funds as ways to promote cohesion and inclusion.</td>
</tr>
</tbody>
</table>
| **Well-being, education and quality of life**: moral fabric, improving quality of living for all Guyanese, promoting sustainable lifestyles and protection of the environment. | The paper supports the position that “...in principle the economic benefits created by mining can be sustained indefinitely through appropriate investment in education, health care, infrastructure, and other activities that can create well-being long after mining ceases. In other words, a depleting mineral resource can, in effect, be converted into a sustainable, renewable source of human well-being through appropriate investment.”

38 MMSD, 2001
<table>
<thead>
<tr>
<th></th>
<th>acknowledging the role that nature plays in Guyana's economic and social structure, and decoupling economic growth from environmental degradation.</th>
<th>environmental management of mining.</th>
</tr>
</thead>
<tbody>
<tr>
<td>iv)</td>
<td><strong>Decarbonisation and climate resilience:</strong> aiming for a transition to a 100% renewable country by 2025.</td>
<td>The development of Guyana's mineral sector presents opportunities for greater energy efficiency as well as expanding access to energy, especially hydropower.</td>
</tr>
<tr>
<td>v)</td>
<td><strong>Sustainable finance: redirecting and mobilising investments:</strong> economic output and production have to develop while reducing the impact on environment, such as redirecting investment to sustainable infrastructure and green economic sectors.</td>
<td>In line with this GSDS principle, the green paper gives prominence to two policy areas (i) the expansion of the mining sector's contribution to national and sub-national economic development, and (ii) increasing the international attractiveness of Guyana's minerals and metals industry.</td>
</tr>
<tr>
<td>vi)</td>
<td><strong>Good governance, decentralisation and participatory processes:</strong> ensuring transparency and sharing services and decision-making to the population; engaging civil society and creating a space for citizen participation</td>
<td>One of the three central themes of this green paper is the transformation of the governance of the mining industry with the aim of entrenching fair and open government, participatory democracy, and efficient public service. From its governance theme, the paper recommends core operational principles, strategic goals, and action measures to directly achieve the transformation (see Part III).</td>
</tr>
</tbody>
</table>
A large policy framework and plan, such as this, will face the risk of non-implementation or limited implementation. These risks have to be identified, assessed and counteracted.

Table 11: IMPLEMENTATION RISK ASSESSMENT

<table>
<thead>
<tr>
<th>Risks</th>
<th>Description</th>
<th>Risk management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political risks</td>
<td>Change of government; Cabinet reshuffle; Shift in national priorities</td>
<td>Multi-party parliamentary endorsement of policies; Full cabinet endorsement; Full public disclosure; Long-term strategic planning;</td>
</tr>
<tr>
<td>Financial risks</td>
<td>Budgets for work plans unavailable or only partly approved by GGMC/MNR management</td>
<td>Long-term budget planning; Prioritization of goals and actions.</td>
</tr>
<tr>
<td>Compliance risks</td>
<td>Miners continue to violate the laws.</td>
<td>Targeted education and encouragement; Stricter enforcement; Stakeholder and community involvement in compliance management.</td>
</tr>
<tr>
<td>Institutional risks</td>
<td>Organizational resistance to change</td>
<td>Increasing the ownership by GGMC/MNR management and staff of policies and plans through workshops and meetings.</td>
</tr>
<tr>
<td></td>
<td>Lack of skills and capacity</td>
<td>Capacity building at GGMC that includes use of external human resources (inclusive of retired staff, private entities, and sister organizations), and project-based management;</td>
</tr>
<tr>
<td></td>
<td>Cross-agency issues outside the sole mandate of the MNR or GGMC, such as border security, health security, law enforcement,</td>
<td>Use of interagency committees with point-persons to coordinate implementation of decisions across agencies; Exchange of board membership.</td>
</tr>
</tbody>
</table>
### 4: GGMC WITHIN THE NEW POLICY FRAMEWORK

Planning the implementation of the policy framework can begin within GGMC departments across all policies, strategic goals and actions promptly and simultaneously. To aid this process, we highlight a few of the main work assignments by departments.

**Geological Services Division (GSD)**

The GSD’s own strategic paper is sync with this green paper’s recommendation on the need for a national geodata acquisition and dissemination program as one of the critical components to increase foreign or large investment. The required intensification and expansion of the GSD’s current work program can occur within 1-2 budgetary cycles. A key performance target is to increase by at least ten-fold the number of active PLs within a few years, as well as an increase of investor interest in minerals other than gold and in new areas.
Environmental Division (ED)
The priority task for the ED is to reorient its operations based on the use of Cumulative Impacts Assessments (CIA). Whilst the GENCAPD provided training and manuals under two decades ago, GGMC’s capacity has naturally dwindled through retirements and resignations. It is recommended that the capacities of ED/GGMC, the EPA, and FEES/UG be combined to prepare and execute an CIA-based environmental management for mining, using the GENCAPD manuals and the few residual GENCAPD-trained staff.

The Guyana Mining School and Training Centre Inc (GMSTCI)
The goals of optimizing compliance and the technical and economic performance of SMS mining require a mining school with a mandate, financial and other resources, and internal recognition several times larger than currently the case. As a general rule, training of a large target population, such as miners, only becomes meaningful when it reaches a critical mass of such persons. More specifically, the work of the school makes the efforts of the Mines Inspectorate and Mines Technical Divisions more likely to succeed. The upgrading of the school must be a priority task.

Mines Division (MD)
The enormous responsibilities of the MD on a daily basis both at HQ and in the fields must be recognized. Immediate considerations for improvements within the policy framework include:

- the continued computerization of its records (this however should be done to synchronise with other such internal efforts and with EITI requirements),

- the zoning and prioritizing of mining areas based on the degree of environmental and OSH impacts and risks posed by mining operations in each area. Human and other resources could be then by allocated based on such assessments,

- the use of continuously-cumulative technical studies as the basis for advising miners on recovery techniques, mining methods, and other technical matters.

- the streamlining of responsibilities across departments.
In addition, the green paper uses the Mckinsey 7s framework, one of the most popular strategic planning tools, to offer suggestions on the implementation of the recommended policies by GGMC.

**Structure**

In view of GGMC’s intention to review its structure, the paper advises that organizational change cannot focus on one component in isolation. It must encompass the sequenced and coordinated reform of other components such as values, strategies, systems, staff, skills, and style.

A project-based approach should be examined to implement several of the ideas in the green paper. Projects must have finite duration with clear deliverables, be headed by suitable persons (not necessarily managers) and be manned (a) within single departments (under the present functional organizational design), (b) by cross-department teams (a matrix organizational design), or (c) by external professionals and stakeholders.

**Staff and Skills**

Capacity building should extend to outsourcing of workload to the private and professional sectors, to partnering with other organizations, to rehiring of retirees, to
enlisting the participation of sector stakeholders, and to expanding the use of project teams.

STRATEGIES AND ACTIONS

Sporadic or low-impact strategies and actions must be avoided. If resources are inadequate to undertake several tasks, they should be channeled towards narrower aims. Strategies must recognize that not all miners and mining areas are alike. More targeted and prioritized approaches are required.

SYSTEMS

The ISO certification process should be extended to departments other than the Land Management Division. Quality in the management of license applications must be seen not only in terms of speed of service, but through measures of transparency, adherence to rules and procedures, and fair and equitable treatment for all.

Focus must be placed on recovery and maintaining institutional memory through knowledge management so that learning and experience can accumulate and be passed forward. The vast knowledge bank from the GENCAPD project, for example, should still guide ongoing efforts at environmental management.

For embedding its internal operations and external actions to withstand the attrition of time, the GGMC should expand the use of codes of practice, guidance notes, action plans, SOPs, model contracts and agreements; charters and protocols.

GGMC’s public communication efforts must be intensified, including a more informative and active website as a priority.

STYLE

A total commitment to service to the mining community and to open government is required. The recommended establishment of an independent Inspector General Office for GGMC should be used to create a paradigm shift in the way GGMC operates.
4: FINAL WORDS

Policy execution requires purposeful and planned efforts at policy maintenance, evaluation, and succession. It bears repeating that policy-making, especially at the level of strategies and actions, is not about writing fixed prescriptions or recipes, but a process of periodic fixes and adjustments to respond to changing conditions and lessons learnt.
PART V  ANNEXES

ANNEX 1  LIST OF STAKEHOLDERS AND INDIVIDUALS, SUBMISSIONS,
PUBLIC CONSULTATIONS AND PRESENTATIONS

The following is an initial listing. As this is a green paper, public and stakeholder consultations remain actively open. We extend our appreciation to those who have contributed thus far and encourage others to accept our invitation to add their input.

1. Oral and written submissions

<table>
<thead>
<tr>
<th>Name of organization</th>
<th>Name of representative</th>
<th>Written submission/report</th>
<th>Oral submission</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Bauxite Corporation</td>
<td>Ian Christie</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Reunion Manganese Inc</td>
<td>Jo Bayah</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>GYEITI</td>
<td>Dr Rudy Jadoopat</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>UNEP</td>
<td>Deidre Shurland and Eustace Alexander</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>CI - Guyana</td>
<td>Curtis Bernard</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>WWF -Guyana</td>
<td>Aiesha Williams</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>RDC #10</td>
<td>Rennis Morian</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>GGMG</td>
<td>Commissioner Geographical Services Environmental Division Mines Division (all sections) Land Management Division Guyana Mining School Inc. Donald Singh</td>
<td>Yes (Commissioner) Yes (Geological Services) Yes (Guyana Mining School) Yes (Environmental Division) Yes (Legal Affairs)</td>
<td>Yes</td>
</tr>
<tr>
<td>Randolph Williams (retired public servant, economist)</td>
<td>Yes (2)</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Jhonny Leon (mineral explorationist)</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Maj Gen Joe Singh</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Dr Thomas Singh (lecturer, economist)</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>
Conferences and public consultations


4. Public Lecture at UG Education Lecture Theatre. Affordable Mercury-Free Solutions for ASGM in Guyana by Bruce Marshall, Instructor/Post doctoral Fellow, University of British Columbia. Monday August 20, 2018
A critical underpinning of a mineral development policy for Guyana is an assessment of its mineral endowment. Such knowledge provides perspective on the extent to which, and in what directions, the country’s mineral sector can develop. For, obviously, a country with a limited mineral resource base cannot hope to build an extractive industry able to contribute significantly to its socioeconomic development.

The Mineral Potential Map of Guyana indicates that the country is blessed with a range of mineral resources. To date, however, only a handful of minerals have been mined commercially, namely: gold, bauxite, manganese, diamonds, and construction materials. Of these, only the first three can be classed as large-scale production. The realization of Guyana’s mining potential remains at an embryonic state and must be a central goal of the country’s mineral development policy. Informed policies in the sector must be based on knowledge of the country’s mineral endowment.

The unknown mineral potential of a region or country is predicted by techniques using geologic and exploration data analysis. The techniques are commonly referred to as a mineral resources assessment.

In the assessment in this report, unknown mineral potential falls into two classes:

- undiscovered types of mineral deposits whose existence is postulated on the basis of geologic evidence and comparative analysis with better-explored countries.

- Undiscovered deposits in favorable geologic settings where other deposits of the same types have been found.

A mineral resources assessment will therefore determine the natural outer limit to which a mineral development policy could hope to (i) expand the range of mineral deposit types and mineral commodities, and (ii) increase the number of discoveries of any one type. This policy framework supports and proposes several initiatives to achieve these and other outcomes.

Additional benefits of a mineral assessment include, firstly, provision of information for national economic planning; secondly, for land use planning (in particular in terms of calculating economic opportunity cost in the context of any green or low-carbon national development strategy); and, thirdly, for privately-funded mineral exploration, in terms of area selection for particular deposit types.
The brief mineral resources assessment below takes as its units of analysis the rock formations and complexes that make up the geology of Guyana. The potential of the formations and complexes is assessed based on the known discoveries they contain and on the undiscovered deposit types that are geologically permissive.
<table>
<thead>
<tr>
<th>GEOLOGIC UNITS/PERMISSIVE DOMAINS</th>
<th>POSSIBLE DEPOSIT TYPES</th>
<th>Economic commodities</th>
<th>Mined at present or in the past</th>
<th>Discovered, but not mined but geologically</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barama-Mazuruni Supergroup (BMS)</td>
<td>Greenstone-hosted Au</td>
<td>Au</td>
<td></td>
<td></td>
<td>GEOLOGY: The BMS consists of volcano–sedimentary sequences in northern Guyana which were metamorphosed and deformed during the Trans-Amazonian tectono-thermal event (2.2Ga - 2.0Ga). The rocks are distributed in three separate greenstone belts: the Barama, the Cuyuni, and the Mazaruni belts. The greenstone belts consist of three lithostratigraphic formations, which from base to top are: i) mafic and ultramafic metavolcanic rocks, at the base of which are mafic-ultramafic flows and intrusions; ii) felsic to intermediate metavolcanics (mostly andesites, dacites and rhyolites); and iii) sedimentary sequence of greywacke, volcaniclastic rocks, pelite and chemical rocks.</td>
</tr>
<tr>
<td></td>
<td>Volcanogenic Massive Sulphides (VMS)</td>
<td>Cu, Pb, Zn, Ag, Au</td>
<td></td>
<td></td>
<td>MINERAL ASSESSMENT: In general, the similarity of the BMS greenstone belts to better-explored and mineral-rich Archean greenstone belts elsewhere, such as Canada’s Abitibi Belt, provides grounds for optimism for the mineral potential here. However, gold is the only commodity characteristic of better-known Archean greenstone belts which has so far been produced in Guyana. Gold mineralization occurs in the BMS in a wide range of geologic settings, with much potential for medium- to large-</td>
</tr>
<tr>
<td></td>
<td>Residual/lateritic Mn</td>
<td>Mn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Comagmatic deposits associated with ultramafic flows and intrusives</td>
<td>PGEs, Cr, Ni, Cu</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unconformity-type U (fracture bound)</td>
<td>U</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Iron formations of the Algoma type</td>
<td>Fe</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Industrial minerals in ultramafic rocks</td>
<td>Talc (soapstone),</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metamorphic industrial minerals</td>
<td>Graphite, corundum, kyanite</td>
<td>Cu</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Basaltic Cu and Sediment-hosted Cu</td>
<td></td>
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</tr>
<tr>
<td>Cu ± Mo ± Au in subvolcanic porphyry stocks</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Kimberlite-hosted diamonds</td>
<td>diamonds</td>
<td></td>
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</tr>
</tbody>
</table>

sized hardrock and saprolite deposits, especially in underexplored regions.

No undisputed VMS deposit has been located in Guyana thus far despite several favourable geological factors. The country has not seen any exploration for VMS deposits over the last thirty years, despite the fact that such deposits remain highly sought-after targets worldwide. The general consensus is that discoveries of VMS in Guyana await better geological modeling, more detailed geological mapping, and exploration techniques better tailored to the tropical environment.

The strong possibility of unconformity-type uranium deposits in northern Guyana is supported by favourable geology and rock geochemistry data.

The potential for deposits of PGEs, Cu, Ni and Cr is considered good, as ultramafic rocks, the host rocks for such deposits, are found in over 20 localities within the BMS. The largest known ultramafic body forms the Kauramembu Hills near the lower Barima River in which elevated levels of Ni and Cr were found. A chromite occurrence was also found in Coral Snake Creek of the Pomeroon River Head. More systematic work should likely raise the attractiveness of such comagmatic deposits in the BMS. Soapstone (talc) is also known at the same location.

Significant molybdenum in soil anomalies and drill cores has been found Yakishuru Hill, Barama; Eagle Mountain, Potaro District; Ianna Hill, Barama; and Jubilee – Million Mount, Puruni.
Much potential for manganese lateritic deposits exists in terms of the expansion of reserves in current discoveries in the North-West and in the systematic appraisal of occurrences in the Cuyuni.

Kyanite is particularly abundant in the upper Karani/Camp Creek area of the Supenaam Basin where it occurs as kyanite schists. One estimate puts resources at 3.7 mt.

The primary source of alluvial diamonds in the Guiana Shield of Venezuela, Guyana, and Brazil has been the subject of much speculation as the source rocks for diamonds, kimberlites and lamproites, have not been definitively identified in the shield. However, on the basis of indications that diamonds mined in Guaniamo, Venezuela, could have a nearby bedrock source, a private exploration company conducted regional exploration in the mid-1990s to find kimberlite-hosted diamond deposits in Guyana (the Upper Potaro-Ireng area). The company concluded that despite positive indicators, no definite evidence of kimberlites was detected.

Assessing the potential for the existence of kimberlites in Guyana will depend on more sophisticated exploration methods to overcome the stated difficulties in interpreting the local results of magnetic surveys and stream sediment surveys for indicator minerals.

<table>
<thead>
<tr>
<th>Younger</th>
<th>Volcanic hosted</th>
<th>Fe</th>
</tr>
</thead>
</table>

GEOLOGY: The BMS greenstone belts are associated with
Granites

<table>
<thead>
<tr>
<th>Type</th>
<th>Mineral(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemlo type or Epithermal Au or Sulfides</td>
<td>Au</td>
</tr>
<tr>
<td>Schist type</td>
<td>Au</td>
</tr>
<tr>
<td>Porphyry Cu±Mo±Au</td>
<td>Cu</td>
</tr>
<tr>
<td>Sn greisen</td>
<td>Sn</td>
</tr>
<tr>
<td>Sn±W vein type</td>
<td>Sn</td>
</tr>
<tr>
<td>Metasomatite-related and granite-hosted U</td>
<td>U</td>
</tr>
<tr>
<td>Pegmatite-related Nb-Ta-Be-Li</td>
<td>U</td>
</tr>
</tbody>
</table>

Extensive syntectonic granitoids, collectively known as the Granitoid Complex or Younger Granites, aged between 2.25 and 2.0 billion years. Rocks are compositionally diverse, ranging from granite to granodiorite, diorite, tonalite and adamellite, reflecting different phases of plutonism and types of protoliths as well as degrees of fractionation. Three main granitoid bodies that separate the BMS into its three main belts are the Amakura-Barima, Aranka-Barama and the Bartica Complex. In addition, there are about twelve granitoid batholiths and numerous small granitoid stocks.

**MINERAL ASSESSMENT:** Granitoid rocks in Guyana have not received much exploration and scientific attention although they cover tens of thousands of square miles of the country. Mineral occurrences/deposits found in granitoids in Guyana so far include (i) magnetite-hematite bodies of iron within hornblende granitoids at Putareng and Enachu, (ii) metasomatite-related uranium deposit at Aricheng, and (iii) gold deposits at Omai, and Eagle mountain.

Given the number of possible deposit types in granites, the Younger Granites constitute a major component of the country’s undiscovered mineral wealth.

**GEOLOGY:** The Roraima Supergroup, which covers large areas of the central and western parts of the Guiana Shield, is composed of unmetamorphosed sequences (1 to 3.6 km thick) of essentially conglomerate, arkose, orthoquartzite and smaller amounts of shale and tuff with jasper, deposited in fluvio-deltaic, lacustrine and aolian environments roughly 1.9 billion years ago.
The Muruwa Formation is a series of open-folded sediments 1.0 to 1.6 km thick, which rest unconformably on the granitoid-greenstone basement. Sediments consist mainly of quartzose and arkosic sandstones, siltstones and conglomerates of fluviodeltaic origin and minor fine-grained cherty sediments of deeper-water origin. The formation is mostly unmetamorphosed.

**MINERAL ASSESSMENT:** The main potential of the Roraima Supergroup and Muruwa formation lies in gold and uranium. Exploration work to date (inclusive of geophysics and drilling) has produced positive signs but no identified mineral deposit. It was once believed that these sedimentary sequences could host uranium deposits similar to the world-class Witwatersrand quartz-pebble conglomerate uranium deposits in South Africa, but such a possibility has now been discounted because of the younger age of Guyana’s rocks. Uranium potential lies in another type of uranium deposit known as metasomatite-related type.

Hardrock gold exploration in the Roraima looking for deposits similar to the world-famous analogues in Witwatersrand has produced to date unsatisfactory results despite similar geologies.

**GEOLOGY:** The Paleoproterozoic basaltic dykes and sills of the Avanavero Suite intrude the Roraima sediments as well as the granite-greenstone basement over large areas of northern Guyana. They are assumed therefore to mark a major tectonic event at the scale of the Guiana Shield, related to an abortive attempt at continental rifting. Their age is pegged at 1.78 billion years.
The Apatoe Suite refers to abundant swarms of dolerite dykes that intrude across Guyana. Dykes are oriented mostly northeast-southwest and can reach a width of 50 metres and a length of several hundred kilometers. The Apatoe dykes mark the precursor stages in the opening of the South Atlantic Ocean during the Mesozoic (around 200 Ma).

**MINERAL ASSESSMENT:** Rocks of the Avanavero and Apatoe Suites (along with the less numerous PAPA dykes) represent favourable settings for several deposit types related to magmatic segregation and injection processes. Such deposit types include Stillwater Ni-Cu, Duluth Ni-Cu-PGE, and Bushveld Fe-Ti-V types.

Exploration work conducted in 2001 produced less than encouraging evidence of PGE mineralization in two of the main sills of the Avanavero Suite.

<table>
<thead>
<tr>
<th>Iwokrama and Kuyuwini Formations</th>
<th>Sn, Mo</th>
</tr>
</thead>
</table>

**GEOLOGY:** The Iwokrama and Kuyuwini Formations occupy regions in central and southern Guyana. The main rock types are volcanics and volcaniclastics (rhyolite, rhyodacite, andesite, lithic and other tuffs). The associated comagmatic subvolcanic intrusives are in the form of plutons, stocks, dykes and sheets, mostly of adamellitic composition. All rocks are Paleoproterozoic age (1.99 to 1.92 billion years).

**MINERAL ASSESSMENT:** The Iwokrama and Kuyuwini have received insignificant attention in terms of both exploration and mineral resources assessment. Molydenum-bearing granites in Brazil are similar to the subvolcanic intrusives in these formations.
Tin occurrence was found in the Kuyuwini Granites

| Sedimentary formations of the Takutu Graben |  |  |  | GEOLOGY: The Takutu graben is characterized by one volcanic phase (forming the Apoteri Volcanics, described below) and three sedimentary phases. Above the lowermost Apoteri basalts rest the Lower Jurassic non-marine clastics of the Manari Formation. They are overlain by the thick Lower and Middle Jurassic non-marine salt and gray shale of the Pirara Formation (the source of oil in the basin). Succeeding the evaporites are the Middle and Upper Jurassic non-marine clastics of the Takutu Formation.

MINERAL ASSESSMENT: Apart from oil resources, the Takutu Graben is a potential host of evaporite deposits. |

| Apoteri Volcanics | Comagmatic deposits associated with ultramafic flows and intrusives | PGEs, Cr, Ni, Cu, |  | GEOLOGY: Apoteri Volcanics constitute dykes and flows of continental flood basalts of ....age. They are generally dark grey to greenish-grey, very fine-grained to aphanitic, amygdaloidal basalts. Quartz, chalcedony, calcite, pyrite, and chalcopyrite are among the minerals that fill the amygdules.

MINERAL ASSESSMENT: The Apoteri Volcanics in southern Guyana are of exploration interest for their oil potential and have been tested in this regard. Based on their basaltic composition, their mineral potential for comagmatic deposits is similar to that of the Avanavero and Apatoe Suites. Agates are presumed to derived from the amygdules in the volcanics. |

| Muri Alkaline Suite | Carbonatite and Alkaline rock- | Nb+Ta+R |  | GEOLOGY: The Muri alkaline complex, located in the extreme south-east of Guyana, consists of adjacent masses of |
predominantly nepheline syenite, which have intruded the surrounding biotite granodiorite of the southern Guyana granite complex. It is postulated that a possible carbonatite plug with maximum horizontal dimensions of 600 m by 800 m is emplaced within nepheline syenite.

**MINERAL ASSESSMENT:** In general, alkaline rocks may contain economic grades of REE, Nb, Ta, Th, U, Fe. Cu, Mo, F and Ba. Exploration by the Geological Services in 1978, and by UNRFE from 1980-1983 over an area of 250 km at Muri Mountains for niobium, rare earths, phosphate and carbonatitite-related limestone returned subeconomic grades. Higher world prices and cheaper access could however raise the prospectivity of this area.

<table>
<thead>
<tr>
<th>Kanuku Complex</th>
<th>Algoma type Fe</th>
<th>Fe</th>
<th>GEOLOGY: The Kanuku Complex is the largest stratigraphic unit in southern Guyana and is represented by migmatites, granulites and gneisses.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Anorthosite Ti</td>
<td>Ti</td>
<td><strong>MINERAL ASSESSMENT:</strong> Because of its high grade of metamorphism, such rocks are considered an unfavorable environment for major mineral deposit preservation. The only mineral occurrence is Tiger Hill, described as an iron formation (±Cu) of Algoma-type, hosted by migmatites and acid plutonic</td>
</tr>
<tr>
<td></td>
<td>Volcanic massive sulphides (VMS)</td>
<td>Cu, Pb, Zn, Ag, Au</td>
<td></td>
</tr>
<tr>
<td>4C</td>
<td>Diamond-bearing kimberlite/lamproite pipes</td>
<td>Diamonds</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Olympic Dam Cu-U-Au</td>
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</tbody>
</table>
Considering other similar geological environments in the world, the Kanuku Group could potentially host titanium, iron, and copper-lead-zinc deposits.

<table>
<thead>
<tr>
<th>Geological Environments</th>
<th>Mineral Deposits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kwitaro Group</td>
<td>Cu</td>
<td>Stratiform sediment-hosted Cu: The Kwitaro Group is represented by five discrete enclaves of metapelites and metarenites, with schists, gneisses and subordinate quartzites and amphibolites.</td>
</tr>
<tr>
<td></td>
<td>Au</td>
<td>Homestake type Au: The Marudi Mt and the Wakadanawa goldfields are located within these rocks. At Marudi Mt, the gold is hosted by iron-rich formations which could potentially point to the presence of large Superior-type iron deposits.</td>
</tr>
<tr>
<td></td>
<td>Fe</td>
<td>Superior type Fe: Showings of manganese have been found in the Kwitaro, with similar rocks in Brazil containing vast deposits.</td>
</tr>
<tr>
<td></td>
<td>Mn</td>
<td>Residual/lateritic Mn: Residual/lateritic deposits have been found in the Kwitaro.</td>
</tr>
<tr>
<td>Coastal sediments</td>
<td>Bauxite, kaolin, quartz sands</td>
<td>Coastal sediments: Quaternary to Recent coastal sediments cover the basement geology and are composed of various clays and clean quartz sands, with minor lenses of peat.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MINERAL ASSESSMENT: The country possesses a large bauxite belt extending throughout the coast. Quartz sand accumulations are similarly abundant mostly in the Hilly Sand and Clay region. Kaolin deposit has been found in Ituni and a few other locations.</td>
</tr>
<tr>
<td>Alluvial deposits</td>
<td>Au, diamond, heavy minerals</td>
<td>Alluvial deposits: Placer deposits are a prime target of local miners for gold and especially diamonds. All of the country's diamond production and significant portion of its current gold output come from river placers. In recent years, only a few attempts have been made to systematically explore for large alluvial deposits. More systematic work could unearth the potential for medium-sized deposits.</td>
</tr>
</tbody>
</table>
ANNEX 3  
EDUCATION AND AWARENESS PROFILE OF SMS MINERS
(extracted and modified from the 2013 WWF evaluation study: Evaluation of education and awareness programs of the WWF-Guianas in the local small and medium-scale gold industry by S. Lowe)

Below are the results of three questionnaire surveys conducted over the last four years by university staff and students. The surveys are from:


2. King, V.A. (2012) – An investigation into the level of preparedness of artisanal small-scale gold mining operations (ASGM) in Mahdia to transform to mercury-free mining techniques. Research done in partial fulfillment of the requirements for the BSc of Environmental Studies.


<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Sample population</th>
<th>Sample number</th>
<th>Sample location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bynoe, et al</td>
<td>2009</td>
<td>SMS gold miners</td>
<td>160*</td>
<td>Mining districts 2, 3, 4, 5</td>
</tr>
<tr>
<td>King</td>
<td>2012</td>
<td>SMS gold miners</td>
<td>80</td>
<td>Mahdia</td>
</tr>
<tr>
<td>Lowe</td>
<td>2013</td>
<td>GGMC field staff</td>
<td>51</td>
<td>GGMC, Brickdam</td>
</tr>
</tbody>
</table>

QUESTIONNAIRE RESULTS

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GENERAL INFORMATION</strong></td>
<td><strong>GENERAL INFORMATION</strong></td>
<td><strong>GENERAL INFORMATION</strong></td>
</tr>
<tr>
<td>• 87% of miners have at least primary education.</td>
<td>• 83.7% of miners have at least primary education (including 27.5% secondary).</td>
<td>• The vast majority of GGMC field officers believed that miners have easy access to official information on environmental matters.</td>
</tr>
<tr>
<td>• 65% of miners involved in mining for over 10 yrs.</td>
<td>• 81.3% of miners come from areas other than Mahdia, mostly from the coast.</td>
<td>• Most officers rated the quality of relationship between themselves and miners as high.</td>
</tr>
<tr>
<td>• 9.4% worked less than 5 yrs.</td>
<td>• 41.2% started mining less than 5 yrs ago.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>KNOWLEDGE</strong></td>
<td><strong>KNOWLEDGE</strong></td>
<td><strong>KNOWLEDGE</strong></td>
</tr>
<tr>
<td>• 14.4% of miners felt their operations had no environmental impact.</td>
<td>• Only 34% of miners were aware of the EU ban on mercury trade.</td>
<td>• 36% of officers rated miners’ knowledge of environmental regulations as high (above average).</td>
</tr>
<tr>
<td>• 50.5% identified mercury and turbidity as impacts.</td>
<td>• 92.5% believed mercury is dangerous.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 93.8% of miners were unaware of</td>
<td></td>
</tr>
</tbody>
</table>
• 77.2% of miners were aware of both the mercury retort and settling ponds as measures to reduce negative environmental impacts.

• Approx. 79% of miners understood the necessity of wearing protective gear to handle mercury.

• 91.3% of miners thought mercury harmful to humans and other life forms.

<table>
<thead>
<tr>
<th>mercury-free recovery technologies.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 90% claimed not to have received information from relevant authorities.</td>
</tr>
</tbody>
</table>

**ATTITUDES**

<table>
<thead>
<tr>
<th>Approx. 65% of miners agreed that mining significantly impacts the environment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>65% of miners saw a need to adopt mercury-free alternatives.</td>
</tr>
</tbody>
</table>

| Only 16% of officers rated as high the sense of personal responsibility of miners towards environmental protection. |

**PRACTICES/BEHAVIOR**

<table>
<thead>
<tr>
<th>79.3% of miners indicated they took some action to protect the environment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The vast majority use mercury during the final stages of recovery.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>72.2% of miners do not use protective gear mainly because of discomfort.</th>
</tr>
</thead>
<tbody>
<tr>
<td>75.5% of miners claimed to use a retort, mainly to prevent wastage of mercury.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>88% of GGMC field officers rated the extent of retort use by miners as medium to high.</th>
</tr>
</thead>
<tbody>
<tr>
<td>They rated the use of respirators and gloves by miners much lower.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>84% of officers reported seeing negligible use of mercury-free technologies by miners.</th>
</tr>
</thead>
<tbody>
<tr>
<td>most officers rated as average to low the extent to which miners discharge slurry into streams directly from sluices.</td>
</tr>
</tbody>
</table>

**Tentative conclusions from data**

• the use of mercury retorts among SMS miners has significantly increased. The situation is likely due to the expected increase in the price of mercury occasioned by the international restrictions/ban of mercury trade.
• awareness of the health hazard posed by mercury and the required protective measures is high.
• high awareness does not produce marked changes in practices.
• low awareness of environmental regulations among SMS miners (as reported by GGMC field staff) suggests more interventions are required to improve the situation.
• the lack of awareness and use of mercury-free technologies among SMS miners suggests one area of immediate focus for EE&A programs.

**RECOMMENDATIONS**

Environmental education and awareness programs must be designed based on field measurements and on more effective intervention strategies.

Tested and standardized questionnaires should be used by sector stakeholders (such as the GGMC, UG and WWF) to facilitate reliable comparisons over space and time. The University can play a major role in this regard.
## LOCAL SMS MINERS: CLASSES AND THEIR CONCERNS

(extracted from 2015 IDB report titled *Institutional Assessment of the Guyana Gold and Diamond Miners Association* by S. Mangal-Joly)

<table>
<thead>
<tr>
<th>CLASS I: Artisanal miners (Detector men /pork knockers)</th>
<th>Common Needs as Other Miners</th>
<th>Differentiated Needs/Interests</th>
<th>Power/Influence in Industry/Other Miners/GGDMA</th>
<th>Information About sub-group</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Safety in hinterland</td>
<td>-Micro loans for purchasing detectors/hire purchase guarantees.</td>
<td><strong>Low overall</strong> - operate on the margins; but do play a role in gold finds.</td>
<td>-Not many are registered.</td>
<td></td>
</tr>
<tr>
<td>-Lower cost of transportation</td>
<td>-Clarity on their rights and obligations in the legislation &amp; regulations.</td>
<td>-Mineral property holders have a mixed approach, some discourage and others encourage detector men and manual prospectors. Some have reported mutually beneficial results with gold finds from which claim owners benefit. Some detector men reported being put off a claim when they find gold so that the claim owner can work and/or rent to other miners. Under the current system they have no recourse.</td>
<td>-GGMC records do not distinguish between privileges sold to these registrations and employed persons and not many detectors are registered (the majority of detector men did not know they had to renew their registrations either)</td>
<td></td>
</tr>
<tr>
<td>-Medical care – malaria, mercury exposure, bush yaws, injuries.</td>
<td>-A system for agreements with claim holders to prospect and work on their land (a model approach).</td>
<td>-A national policy specifically on artisanal mining and plan for regularization as well as development support.</td>
<td>-No studies have been done to determine the scale of the sub-sector, socio-economics, and their specific needs/management approaches.</td>
<td></td>
</tr>
<tr>
<td>-Freedom from police harassment and extortion.</td>
<td>-Personal health management and Life Skills training – money management, asset acquisition and management, small business start-up and management.</td>
<td>-Business support to help launch coastal businesses with earnings.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Low overall - operate on the margins; but do play a role in gold finds.

Mineral property holders have a mixed approach, some discourage and others encourage detector men and manual prospectors. Some have reported mutually beneficial results with gold finds from which claim owners benefit. Some detector men reported being put off a claim when they find gold so that the claim owner can work and/or rent to other miners. Under the current system they have no recourse.

-Not many are registered.

GGMC records do not distinguish between privileges sold to these registrations and employed persons and not many detectors are registered (the majority of detector men did not know they had to renew their registrations either).

No studies have been done to determine the scale of the sub-sector, socio-economics, and their specific needs/management approaches.
### CLASS II: Micro-producers (ground sluice or mini sluice with 3-inch small pumps)

<table>
<thead>
<tr>
<th>Common Needs as Other Miners</th>
<th>Differentiated Needs/Interests</th>
<th>Power/Influence in Industry/Other Miners/GGDMA</th>
<th>Information About sub-group</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Safety in the hinterland</td>
<td>-Access to land where others are working or have worked</td>
<td>Low-Medium</td>
<td>Poor</td>
</tr>
<tr>
<td>-Medical care for malaria, mercury exposure, bush yaws, and injuries.</td>
<td>-A clearly defined place and rights in the legislation and regulations; and a system for agreements with other SMEs</td>
<td>-Influences how local communities regard miners and extent to which they look out for the miner’s interest. Communities viewed miners willing to allow community members to benefit in their operation positively; they saw this as an example of goodwill and business social responsibility.</td>
<td>-Not many are registered</td>
</tr>
<tr>
<td>-Freedom from police harassment and extortion</td>
<td>-Example of benefit sharing agreements with big miners to facilitate legitimate partnerships</td>
<td>-Freedom from private security forces (larger mining operations) harassment and acts of violence.</td>
<td>-GGMC’s records do not distinguish between these registrations and employed persons</td>
</tr>
<tr>
<td>-Rehabilitation of mined lands – these operators often work overburden or tailings and refill tailings ponds providing an environmental service for other miners.</td>
<td>-A policy specifically on artisanal mining and plan for regularization and development support.</td>
<td>-Symbiotic relations with ground sluice operators can provide a productive and low cost way for other miners to refill tailings ponds, and also aid with security, with more eyes watching camps.</td>
<td>-No studies have been done to determine the scale of the sub-sector, socio-economics, their specific needs/management approaches, and their positive and negative impacts on the other miners or mining as a whole.</td>
</tr>
<tr>
<td>-Training in personal health care and life skills – money management, asset acquisition and management.</td>
<td></td>
<td>-On the negative side some of these operators may not be genuine and can pose a security risk to mining operations.</td>
<td></td>
</tr>
</tbody>
</table>
### CLASS III: Small Miners A (Bare Dredge Land Operators)

<table>
<thead>
<tr>
<th>Common Needs as Other Miners</th>
<th>Differentiated Needs/Interests</th>
<th>Power/Influence in Industry/Other Miners/GGDMA</th>
<th>Information About sub-group</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Lower fuel costs</td>
<td>- Ownership access to gold bearing lands with the following criteria: (1) Preliminary geological information that makes prospection worthwhile; (2) functional access infrastructure, (3) Locations in proximity to main mining towns; and (4) water supply</td>
<td><strong>High</strong></td>
<td>Through this study the relative proportion of this sub group is known</td>
</tr>
<tr>
<td>- Access to Finance that is not tied to gold sales (lower price)</td>
<td>- Access to excavators in order to plan mine operations and meet basic legal requirement to construct a tailings ponds</td>
<td></td>
<td>- Mostly 4-inch dredge owners and a lesser number of 6-inch dredge owners.</td>
</tr>
<tr>
<td>- Lower transportation costs via better road networks and better maintained roads</td>
<td>- Main type of finance needed are small-loans (enough to start up a season and cover 3 months operations) that are not tied to gold sales (where gold is purchased at lower than market price)</td>
<td></td>
<td>- Many spend most of their time managing their operations in the hinterland or come from hinterland communities.</td>
</tr>
<tr>
<td>- Reduced taxes on spares for 4x4 vehicles and trucks, extension of these reductions to legitimate trucking and transportation services serving the smaller miners</td>
<td>- More detailed regulations on claim rental/tribute payments than currently exists (including the recent amendment) regulating rights, ceiling charges, and conditions of work.</td>
<td></td>
<td>- Few hold property – mostly small land claims.</td>
</tr>
<tr>
<td>- Training in recovery optimization for sluice operations and fine gold recovery</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## CLASS IV: Small Miners B (1-2 dredges and excavator)

<table>
<thead>
<tr>
<th>Common Needs as Other Miners</th>
<th>Differentiated Needs/Interests</th>
<th>Power/Influence in Industry/Other Miners/GGDMA</th>
<th>Information About sub-group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower fuel costs</td>
<td>Some have but many need ownership access to gold bearing lands with the following criteria: (1) Preliminary geological information that makes prospection worthwhile; (2) functional access infrastructure, (3) Locations in proximity to main mining towns; and (4) water supply</td>
<td>-This is the largest segment of the industry. Its well-being is central to the long term viability of the industry. Thus its ability to succeed or fail is very influential on the industry as whole</td>
<td>-Most common type of miner so most studies done look at their circumstance but this is heterogeneous group with different economic means, land holding levels, and financial capacities - little has studied and been documented about his diversity</td>
</tr>
<tr>
<td>Access to Finance that is not tied to gold sales (lower price)</td>
<td>- Main type of financing needed are medium sized loans to move to new work grounds</td>
<td>- A part of this group is in solidarity with bare dredge operators - they see themselves as the constituency of the current Government but not the past one; they feel taken advantage of by miners who own a lot of land and have increasingly been making direct representation to the Government, thus increasing their direct influence in policy making.</td>
<td>-A core in the business for over 25 years.</td>
</tr>
<tr>
<td>Lower transportation costs via better road networks and better maintained roads</td>
<td>- Some that rent lands need more detailed regulations on claim rental/tribute payments than currently exists (including the recent amendment) - regulating rights, ceiling charges, and conditions of work.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduced taxes on spares for 4x4 vehicles and trucks, extension of these reductions to legitimate trucking and transportation services serving the smaller miners</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training in recovery optimization for sluice operations and fine gold recovery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge and understanding of options for greater gold recovery and mercury free processing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business management skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conflict resolution Skills.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# CLASS V: Medium Miners 3-5 dredges/crushers or combination

<table>
<thead>
<tr>
<th>Common Needs as Other Miners</th>
<th>Differentiated Needs/Interests</th>
<th>Power/Influence in Industry/Other Miners/GGDMA</th>
<th>Information About sub-group</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Lower fuel costs</td>
<td>- Need to attract investors/finance. Most have their own property but cannot finance upgrades in their business. Have difficulty attracting finance via business partnerships and have reported that in their experience foreign companies are not interested in joint businesses or upgrading technologically they want joint ventures primarily to gain access to gold resources and want to run their operations independently. -Some needed assistance dealing with conflict arising neighbouring Amerindian community.</td>
<td>-Medium -This group is comprised primarily of old mining families, some of which have been trying business models that involve upgrading technology used rather than multiplying the use of usual technology. Even though the present influence is not very high, this group has shown the highest potential of all categories to effect the technological transformation necessary to modernize the industry. It can be can be change agent if supported and can bring a positive image to the industry.</td>
<td>Poor -Not much research has been done on this group as most efforts tend to treat the industry as if it were homogenous -Most SMEs in this group tend to have been established in the industry for greater than 20 years -Represented in hard rock and dredging -Efforts to upgrade operations in terms of technology and scale of single operation were found among this group -Most have good mineral properties but have difficulties attracting finance</td>
</tr>
<tr>
<td>- Access to Finance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Lower transportation costs via better road networks and better maintained roads</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Reduced taxes on spares for 4x4 vehicles and trucks.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Training in recovery optimization for sluice operations and fine gold recovery and understanding of options for mercury free processing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Business management skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Conflict resolution Skills</td>
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</tr>
</tbody>
</table>
## CLASS VI: Medium Miners (6-9 dredges/crushers or combination)

<table>
<thead>
<tr>
<th>Common Needs as Other Miners</th>
<th>Differentiated Needs/Interests</th>
<th>Power/Influence in Industry/Other Miners/GGDMA</th>
<th>Information About sub-group</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Lower fuel costs</td>
<td>- This group had a strong interest in keeping the status quo and did not want to see many changes. Several interviewed were Brazilians who were registered by their Guyanese patrons and they were not as familiar with the local context. They explained that they relied on their Guyanese partners to deal with those things. - Most have land and have finances for their operations. Little additional needs were expressed. - At least three persons in this group needed assistance with dealing with conflicts with Amerindian villages.</td>
<td><em>Medium</em> With the exception of one Brazilian with 7 river dredges and a few (who were all among the Association’s membership) this group generally showed low production for the amount of equipment they have reported in their interviews or have registered currently with the GGMC. This does not match the general financial security they expressed. They were not selling gold to shops/local licensed traders where most declaration tracking is weak. It may be possible that production from this category is being leaked. This type of leakage adversely affects the industry and its image.</td>
<td>- Not much research has been done on this group as most efforts tend to treat the industry as if it were homogenous. - Persons interviewed were focussed on capital accumulation by replicating the same technology in multiple operations and demonstrated no particular interest in technological upgrade. - Operations were comprised primarily of multiple 6-inch and 8-inch dredges. One Brazilian owned 7 river dredges.</td>
</tr>
<tr>
<td>- Lower transportation costs via better road networks and better maintained roads</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Reduced taxes on spares for 4x4 vehicles and trucks.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Training in recovery optimization for sluice operations and fine gold recovery and understanding of options for mercury free processing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Business management skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Conflict resolution skills</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


# CLASS VII: Medium-Large Scale Miners Over Ten Dredges/ Crushers

<table>
<thead>
<tr>
<th>Common Needs as Other Miners</th>
<th>Differentiated Needs/ Interests</th>
<th>Power/Influence in Industry/ Other Miners/GGDMA</th>
<th>Information About sub-group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower fuel costs</td>
<td>Reduction in cost of rental for medium scale properties</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Lower transportation costs via better road networks</td>
<td>Improved road network to properties</td>
<td></td>
<td>- Analysts tend to focus on this wealthy and visible group and erroneously generalise their situation to the rest of the industry.</td>
</tr>
<tr>
<td>Duty free importation on 4x4 and equipment spares</td>
<td>Duty free concessions for twin cab and luxury vehicles</td>
<td></td>
<td>- Many have diversified to businesses outside of the sector.</td>
</tr>
<tr>
<td>Training in recovery optimization for sluice operations</td>
<td>Lower fuel costs</td>
<td></td>
<td>- None interviewed demonstrated efforts to upgrade to better technologies. The main business model was to expand operations by numbers - multiplying the same technology.</td>
</tr>
<tr>
<td>Knowledge and access to technology for mercury free processing</td>
<td></td>
<td></td>
<td>- For this group the acquisition and management of land holdings was also a business in and of itself.</td>
</tr>
<tr>
<td>Conflict resolution and staff management skills</td>
<td></td>
<td></td>
<td>- Many in this group hold a considerable number of mineral properties and, in the face of increasing agitation by small miners, were being blamed for the failure of the State to rationally manage prime lands for sustainable and equitable access by all producer groups.</td>
</tr>
</tbody>
</table>

Each of these operators is large enough to engage policy makers on their own. They have also well represented on the GGDMA’s Committee of Management where their perspectives are present at the table. There they exert a strong influence on the GGDMA and the advocacy for the industry in general.

Some in the group have a lot of land upon which other miners depend to work and they exert a significant influence over the business viability of renters and the industry as a whole in terms of their aggregate influence in land rental as a form of land access for other producer groups.
ENVIRONMENTAL EDUCATION AND AWARENESS: HEALTH BEHAVIOR MODEL

EE&A action guidelines

From mercury to mercury-free technologies: a recommended environmental action plan based on behavior models.

(extracted and modified from the 2013 evaluation study: Evaluation of education and awareness programs of the WWF-Guyana in the local small and medium-scale gold industry by S. Lowe. Full report available on www.uog.edu.gy)

Social and psychological behavior models increasingly form the platform for education and awareness programs in the social, health and environmental fields. The Health Behavior Model has emerged as one of the most popular of these approaches to change individual human habits, such as smoking and dieting. This guideline suggests tentative ideas on how the GGMC and other agencies can adopt the model in an environmental and health campaign to get miners to reduce or eliminate the use of mercury. As more experience and data are gathered on local application, additional ideas could be added within the HBM framework.

<table>
<thead>
<tr>
<th>CONSTRUCT OF THEORY</th>
<th>DEFINITION</th>
<th>APPLICATIONS TO PRACTICE</th>
</tr>
</thead>
</table>
| Perceived severity  | Beliefs about the seriousness of the consequences of a health condition. | • Show miners how serious are the health effects of mercury poisoning,  
• Use visual images. |
| Perceived susceptibility | Chances of experiencing a risk or getting the condition. | • Personalize risk for individuals based on self-assessment tools (so that they can realize how often they are exposed to mercury).  
• Make research data on mercury poisoning among users known to them. Such research has already been conducted among miners and jewelers by GGMC, UG, IAST, WWF-Guyana, and Mor.  
• Make messages fear-inducing. |
| Perceived benefits  | Beliefs about desired advantages in performing actions. | • Increase benefits of switching to mercury-free technologies (MFT) by increasing perceived and actual costs of using mercury (e.g., higher price, more enforcement);  
• Emphasize increased income through higher recovery rates of MFT;  
• Offer price incentives to miners for gold produced by MFT. |
| Perceived barriers  | Beliefs about the psychological or tangible costs or obstacles to taking the action. | • Provide information, skills and services for MFT through leaflets, demonstrations, etc.;  
• Make change reachable by scaling back behavior goals;  
• Work with suppliers to make products available;  
• Reduce perceived or actual costs, through removal of import duties for MFT, etc. |
| Self-efficacy       | Confidence in one’s ability to carry out the action. | • Provide skills and how-to manuals on mercury-free technologies;  
• Simplify complex actions and create interim benchmarks;  
• Show evidence of similar-others performing actions. |
| Cues to action      | Strategies to activate readiness to take the action. | • Provide reminders about the behavior: posters, pamphlets, billboards, media campaign;  
• Increase visibility and critical awareness of issues. |

Dissemination of mining-related research output from the University of Guyana for use in the formulation of policies, programs and practices in the local mining sector. Funded by the WWF-Guyana, 2013.
MAIN DOCUMENTS CITED OR REVIEWED


8. GGMC Annual Reports, 2010 - 2015.

9. GGMC/GENCAPD project reports.


