Project management tools applied to the prospective study to obtain ARM/Fairmined certification for ASGM in Brazil

Ferramentas de gestão de projetos aplicadas ao estudo prospectivo para obtenção da certificação ARM/Fairmined em minas auríferas artesanais e de pequeno porte no Brasil

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Abstract

This paper addresses the feasibility of the Fairmined Certification system implementation in Brazil, as it was framed by the Alliance for Responsible Mining (ARM). It was based on a project for the "Development of market incentive to formalization of artisanal and small scale mining (ASM)" in Latin America. The methodology required by ARM – and provided by the same agency – was a survey through its "Basic Questionnaire". The expected outcome was to select Brazilian artisanal and small-scale mining organizations (ASMO) suitable to apply for their Fairmined certification system. The hypothesis was that ARM basic questionnaire classification was not enough to answer the research question: are there ASMOs in Brazil meeting the conditions of and interested in attending the requirements to operate under the Fairmined certification system in the gold mining sector? If they exist, what are the possible gaps to be regarded and addressed? Thereby this study demonstrates the applicability of some project management tools, specially the SWOT analysis, in order to facilitate the answer to the research question.

Key words: gold mining; certification; ASM; SWOT analysis.

Resumo

Este trabalho aborda a possibilidade de implantação do sistema de Certificação Fairmined no Brasil, tal como foi formulado pela Aliança para a Mineração Responsável (ARM, no acrônimo em inglês). O trabalho é baseado no projeto para o "Desenvolvimento de incentivos de Mercado para a formalização da Mineração Artesanal e de Pequena Escala (MAPE)" na América Latina. A metodologia requisitada pela ARM – e fornecida pela mesma – foi uma pesquisa através de seu "Questionário Básico". O resultado esperado era selecionar Organizações de Mineração Artesanal e de Pequena Escala (OMAPE) brasileiras em condições de atender aos requisitos do sistema de Certificação Fairmined. A hipótese foi que a seleção baseada apenas no questionário da ARM não seria suficiente para responder à questão de pesquisa: existem OMAPEs no Brasil em condições de e interessadas em atender aos requisitos para o sistema de Certificação Fairmined? Nesse caso, quais seriam as possíveis lacunas a serem preenchidas? Este estudo traz a aplicabilidade de algumas ferramentas de gestão de projetos, especialmente a análise SWOT, para facilitar a resposta à questão de pesquisa.

Palavras chave: mineração aurífera; certificação; MAPE; análise SWOT.

1. Introduction

This work is part of a major project of study in response to a research demand from Alliance for Responsible Mining (ARM). ARM baseline project targets the "Development of market incentives to formalization of artisanal and small scale mining (ASM)" in Latin America. The major project was cascaded down on a demand for a "Prospective Study of Artisanal and Small Scale Gold Mining (ASGM) in Brazil aimed to subsidize the feasibility of the Fairmined model to mining". Therefore, the research goal was to assess feasibility of a Fairmined certification for the small-scale gold mining sector in the country.

It is of note that in spite of being small scale, it accounts for 13% to15% of Brazilian total gold mining production per year, according to Ibram (2012). My contribution was on bringing a methodological approach sourced on project management tools to facilitate the task, i.e., to improve feasibility assessment of the ARM Fairmined certification system. Given this context, for a better understanding of the approach, some definitions and concepts will be introduced.

Firstly, it is hard to find a consensus for what ASM is. Proposals exist either based on total production, equipment used or number of employees hired. Following the Geology Service of Brazil (CPRM, in Portuguese acronym) recommendation (CPRM, 2000), the production will be taken as criterion, however, adjusting the unit from tones per year to ounce/troy per year (oz/y), as such: Large Scale Mining for production >1.000.000 oz/y; Medium Scale Mining for production <1.000.000 oz/y and >100.000 oz/y; Artisanal and Small-scale Mining for production <100.000 and >10.000 oz/y (RIBEIRO-DUTHIE, CASTILHOS, 2016), and in case of gold production, ASM can be < 10.000 oz/y. Therefore, our sample was legalized ASM according to DNPM, with production <100.000 oz/y.

Attempts of definition concerning ASMs are somewhat schematic, as the International Council in Mining & Metals (ICMM) already highlighted: "ASM activities occupy a spectrum from small, informal subsistence activities through to organized formal small commercial mining activities" (ICMM, 2010: p. 3). In fact, as it was seen from field research, common features intersect among gold mining companies of diverse scales in the Brazilian scenario.

Attending to the diverse feature of ASM, there is also the socioeconomic-environmental approach proposed by UNDP, which accommodates a global overview on the subject: "SSGM brings important economic gains to individuals and nation states but also causes environmental damage, public health threats, and social problems" (UNDP, 2011: p. 4). One of those main environmental and health impacts related to ASM gold production is Mercury emissions. According to United Nations Environmental Programme (UNEP), ASGM is the greatest responsible for Mercury released to the atmosphere, counting upon 37% of global emissions (UNEP, 2011). Studies have addressed Mercury contamination associated to ASGM (GUNSON, VEIGA, 2004; CASTILHOS et al., 2006) and Mercury contamination threats are of such concern that a global treaty – the Minamata Convention– was signed by 140 countries in 2013, with the aim of reducing Mercury risks to human health and the environment. In line with this concern, as the certification schemes are a trend among the large scale

companies, it seems ARM tries to extend this practice to the small scale enterprises when it addresses through its certification scheme issues as such: 1) negative impacts of mining with incentives for a more responsible mining; 2) socio-environmental threats of the production process and solutions for them; 3) beneficial outcomes when assuring livelihoods for large populations. Such alliance for sustainable mining intends to improve conditions for artisanal and small miners to become viable business “economical, technical, environmental and socially” (ARM, 2014: 4).Thus we see that ARM uses a market strategy, which is to satisfy the demand of the final consumer, to encourage a cleaner and ethical economy based on the principle of social responsibility.

This initiative is in line with CETEM mission to innovate and improve technologies for the mining sector through sustainable practices. ASGM is recognized as a subsector very vulnerable to poor mineral processing practices; as a result, it constitutes a target to be addressed with the growing presence of small producers in developing countries, especially in economical crises periods. Some projects at CETEM have dedicated to guiding the small miner to reduce environmental impacts of their mining activity, such as POT (Orientation Program to Small Gold Producer), held in the biennium 1995-1996. Another example is the development of “Retorcet”, equipment built to ensure “complete separation of gold" and avoid "issuing the volatilized mercury to the atmosphere" (BRAGA, 2014: 87), thereby protecting human health and fighting excessive Mercury pollution. In line with that, ARM has the goal of improving the "environmental management, especially mitigating the effects of the use of mercury and other toxic metals, strengthening ecological restoration and responsible management of water" (ARM, 2014: 4). To achieve that purpose, requirements are described at a "STANDARD" (ARM, 2014), which will not be detailed in the present work. ARM standard constitutes a “To be” (future envisaged), and the reality observed on the field research forms a “As is” (present reality): confronting both enables to point out gaps on a process of change.

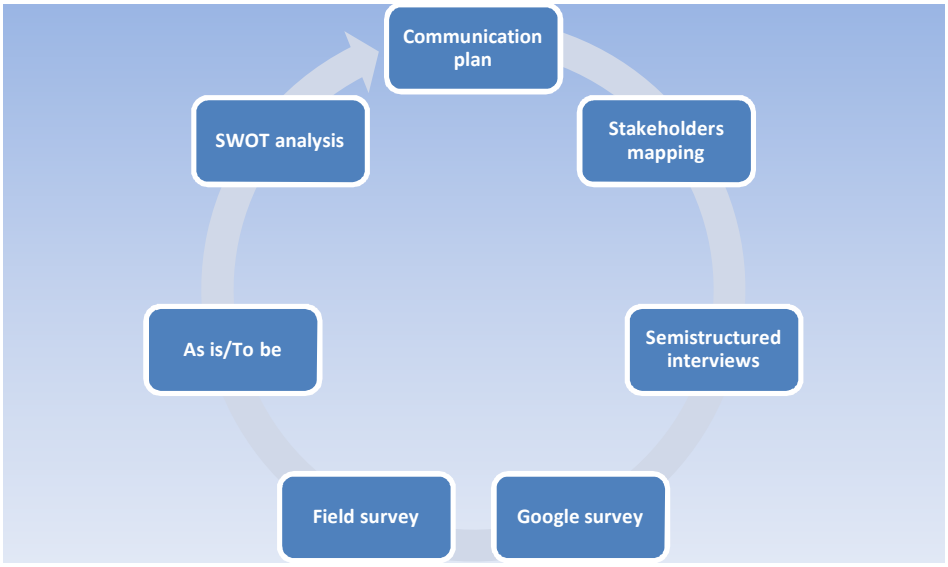

Figure1. Depicting project management tools and steps used to answer the research question.

This business understanding combined with other tools constituted steps to answer the research question. These steps are depicted in figure 1 above. Given the specific circumstances of each country, the mere transposition of

formulas that have worked in a particular context does not guarantee infallibility in another cultural reality; the internal and external environment analysis can be an important leg in a prospective study as it was the case in the ARM request. This aspect is also anticipated in the ARM guidelines, which highlights the importance of "conduct or facilitate the artisanal or small scale mining is responsible and incorporated in accordance with the legal, social, cultural and organizational reality of the local context" (ARM, 2014: 7).Thus, the study of Brazilian context was commissioned.

Based on all information collected from technical visits, surveys through ARM Basic Questionnaire, meetings and interviews with stakeholders, data combined allowed a SWOT Matrix analysis, which assisted by allowing for the mapping of scenarios and identification of organizational Strengths, Weaknesses, Opportunities and Threats – as the very acronym stands for (KOCH, 2001).This matrix was selected as it can be used for enterprises of all sizes and it is a tool for planning future actions of a project. It takes into consideration the internal and external features of an organization; and aspects that can maximize the goal of a project, as well as aspects that can limit the same goals. By doing so, it allows for risk anticipation and is very appropriate to process of change. For this reason, the method was used and it was capable of contemplating both the quantitative and the qualitative features observed in the mine sites.

By this means, the matrix was intended to facilitate ARM to select what conditions are more suitable for a candidate mine site to the ARM certification. According to analysis and subsequent hypothesis, the ARM basic questionnaire would not allow by itself the identification of differences between mine sites for reasons such as: questionnaires accepted intentions as response; and they could be answered online, thus they did not predict the risk of non-compliance – what was compensated by field visits.

2. Objectives

To facilitate and support the assessment of the Fairmined Certification System feasibility in Brazil, with ARM Basic Questionnaire as main method according to the technical proposal agreed with the agency. And to cross-reference results from surveys with information obtained through stakeholder approach and technical visits, in order to have more inputs being assessed according to the SWOT matrix analysis requirement.

3. Materials and Methods

Having legalized ASMOs mapped through DNPM database, their potential stakeholders were evaluated taking ISO 26.000 as guideline, listed, organized into groups, and contacted by e-mail, telephone, interviews, meetings. A communication plan (letters, booklet, awareness presentations) and semi-structured interviews (customized according to each stakeholder profile) was run. ARM Basic questionnaire (as per ARM website), was set to run online through Google survey translated into Portuguese and sent to ASMOs. Field research was undertaken in the states of Mato Grosso, Pará and Amapá for technical visits and face to face surveys through ARM Basic Questionnaire. Outcomes were analyzed following ARM classification per "*pepitas*", with respective scores.

SWOT matrix analysis was used as it was applicable (Koch, 2001). The SWOT Matrix model considered is demonstrated (as per figure 2), where each quadrant explanation was set according to a literature review.

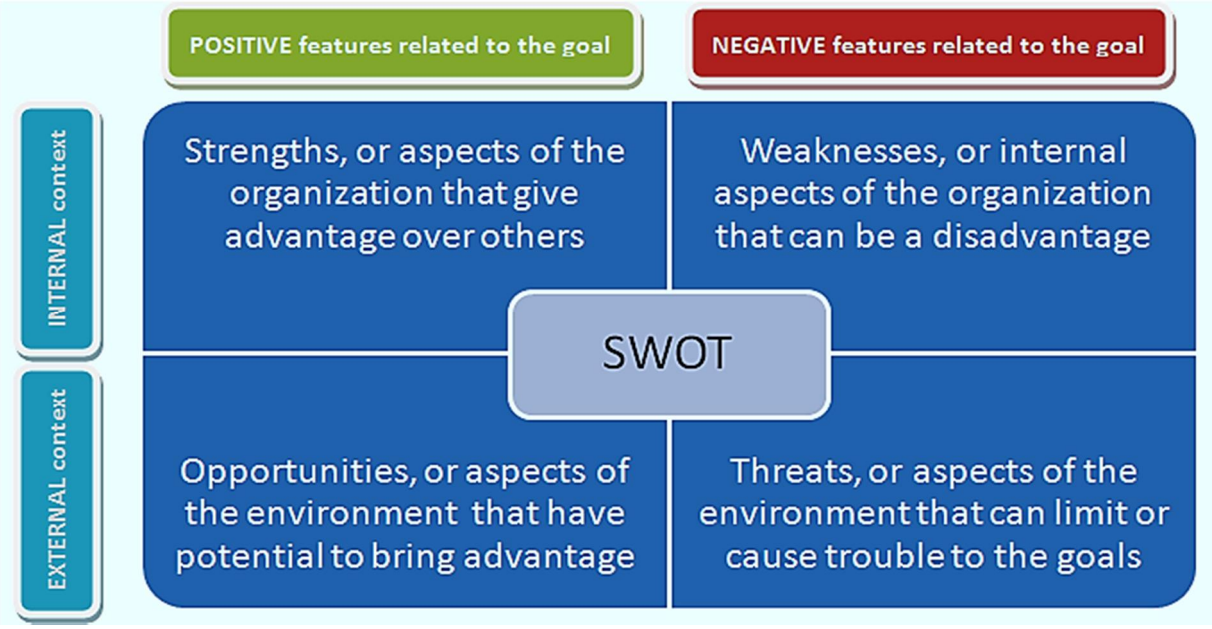

Figure 2. SWOT Matrix model used to analyze mine sites. Author creation based on literature review.

4. Results and Discussion

Results are displayed according to the criteria applied to all mine sites: ASMOs were mapped, contacted, visited and surveyed. Hypothesis was that ARM Basic Questionnaire would not be enough to show relevant differences among ASMOs. Results from surveys based on ARM basic questionnaire are displayed as per figure 3.

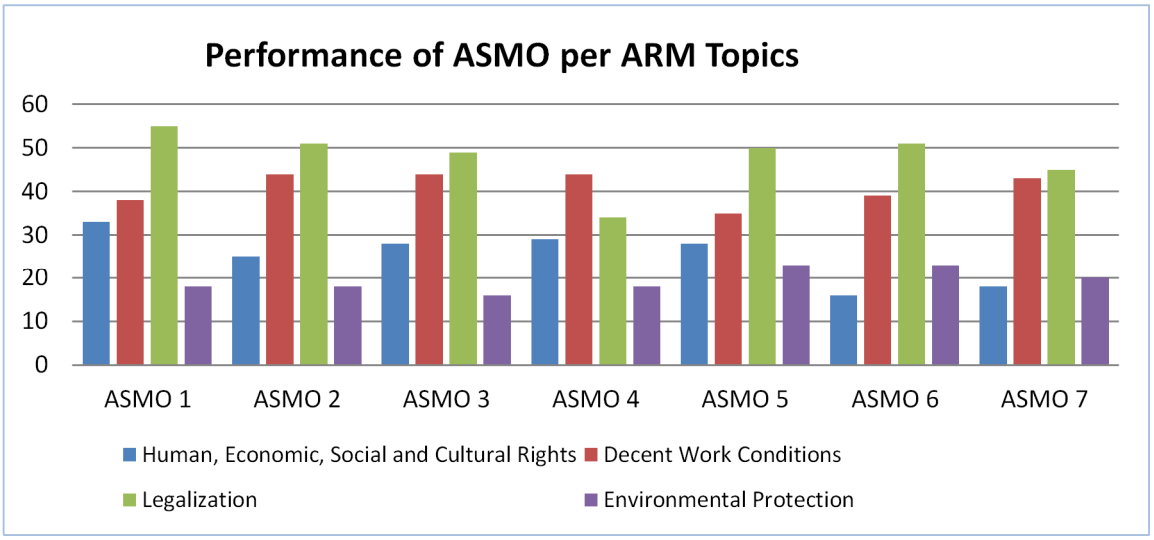

Figure 3. Results of ASMOs according to ARM basic questionnaire per topics.

All mine sites were well above the minimum score of 114 *pepitas,* a classification considered by ARM as a result for ASMO "engaged with responsible" mining (ARM, 2014). However, when the results are analyzed, for example

under topic Environmental Protection, ASMO 1 who had plants nursery and reforestation projects in place performed below ASMO 5, ASMO 6 and ASMO 7, which did not show this type of concern towards environment. Some of them used wood from the Amazon forest to build shafts with no sort of reforestation projects; others disposed Mercury in the riverbeds of their mine sites. Another good example refers to Decent Work Conditions topic. By looking at the graph (figure 3), ASMO 1 performed below all others (except for ASMO 5). However, during the site visit it was observed collective participation on decisions, women as miners and owning equipment – indications of equal rights and gender inclusive practices. Such features were not observed at this extent in any other ASMO within the sample. Hence, hypothesis was confirmed since the results based only on the ARM Basic Questionnaire did not highlight such differences.

The SWOT matrix was plotted for each mine site visited using data from ARM Basic questionnaire, Dr. Minero questionnaire, quantitative and qualitative data observed during field technical visits. All data is summarized in figure 4 below.

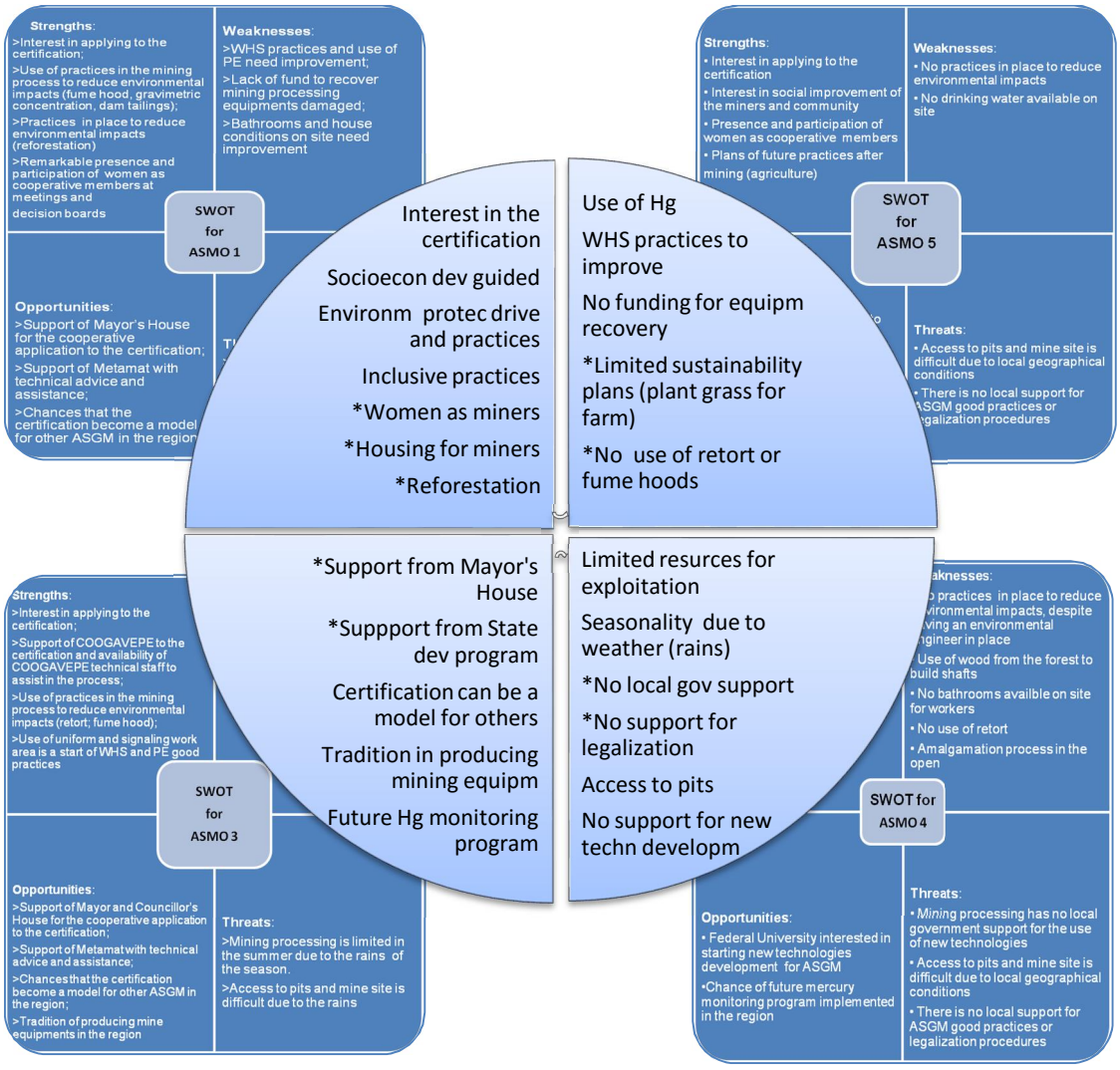

Figure 4. Summary of results converted into a SWOT Matrix. [*Indicates non-general finding].

It is of note the extensive use of Mercury, the lack of concentration before amalgamation, no use of retort or fume hoods at some sites, and the poor WHS conditions. The WHS conditions constitute a critical point in this subsector. However it can be noted that there are sustainable development initiatives and motivation for implementing reforestation, agriculture and pisciculture to assure future livelihood of miners and communities.

5. Conclusion

Treating the ARM demand as a project in itself was a strategy seen as appropriate to frame the assessment; within this approach some project management tools were applicable as per figure 1 depiction, as the certification constitutes an organizational change. The importance of SWOT is seen when it attended the need for nuance in the results of the assessment. The tool has potential to be expanded to other ASGMs, once a mapping of the productive process of the site is understood, what can be assisted by the representation on As is/To be flowcharts. ARM agreed that the SWOT analysis aided to clarify differences among ASMOs surveyed in Brazil.

These methods permitted to identify 3 to 5 mine sites in Brazil interested in and in conditions of applying to the Fairmined certification scheme. Their main strengths are the interest in the certification and environment protection drive demonstrated. Their weaknesses are use of Mercury; and WHS conditions to improve. The opportunities are the tradition of producing ASM equipments in one region; and the role this region plays in sharing models with other ASMs in the country. And the threats are lack of support to new technologies development; and seasonality of the activity due to the rain season or difficulty to access mine sites.

On limitations, they are related to the communication plan, where it was observed that e-mail was not a good approach to ASMOs. Recommendation by stakeholders and word of mouth resulted in better feedback from them. Field research is considered a valuable and appropriate approach to the population under study. Future stage of the project should take into account these findings, as site visits are time consuming.

It seems that once an ASMO in Brazil starts the certification implementation process, the model is likely to be shared with other ASMOs in similar productive models. As such there is potential for benchmarking. Some organizational tools seem to be of support to this subsector, which despite having a long history in Brazil, still does not have enough organizational maturity to carry out an initiative such as certification schemes on their own. Therefore, “translating” business tools into appropriate language may facilitate processes and improve outcomes in future trials. Sometimes all that is needed is an example of success on implementation of good practices to bring about changes and new trends to the market. The benefits are shared with the society whether environmental threats are reduced and socioeconomic improvements are achieved.

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