

# Safety culture maturity in several Latin America mining activities

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## 1. Introduction

Health and safety is a crucial issue in the mining industry because of the implication of fatalities in this sector. A study of safety culture maturity in several Latin America countries has been done based on several previous models applied in other sectors (Westrum, 1993; Hudson, 2003; Lawrie et al., 2006 and Filho et al. 2010).

A questionnaire with 28 items has been done for such purpose, regarding the type of activity, number of employees and safety culture characteristics of the activity. The questionnaire was completed by 38 mining company managers from Bolivia, Peru and Colombia.

The aim of this work is to assess the safety culture maturity level in Latin America, determine the difference between artisanal mining and private companies and the usage of continuous improvement systems such as the Fairmined in cooperatives.



Fig 1. Map with the countries involved in the study in yellow.

## 3. Results

Results show different behaviours depending on the type of mining activity, artisanal mines or private companies:

- Private companies have a considerable high level of safety culture maturity regardless of the country and number of employees.
- Artisanal mines do not have a clear trend in terms of size apart from very small cooperatives, less than 10 employees, which show much lower levels of culture maturity.
- There is a remarkable difference between artisanal mines that have implemented continuous improvement systems and others without it. Cooperatives with a continuous improvement system, such as the Fairmined certificate, have been analysed, displaying much higher safety culture levels.

Table 1 shows the results. The higher the value per dimension, the better safety culture maturity. Range between 1 and 5.

Table 1. Mean values of the five dimensions referred to the safety culture maturity

	Employees	Information	Organizational learning	Involvement	Communication	Commitment
Private company	438	3.5	3.3	3.6	3.9	3.7
Artisanal mines	50	2.6	2.4	2.8	2.3	2
Small artisanal mines	<10	2.1	1.7	1.8	2.2	1.2
Artisanal mines Fairmined certificate	61	2.6	2.6	3.1	2.7	2.9

## References

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## 2. Methodology

The model used is based on the five dimensions detailed by Fleming (2001) and Parker et al. (2006) that comprises the questionnaire. Each dimension has several questions:

- Information: System used to inform about accidents and misses.
- Organizational learning: Management of the information related to accidents and misses, as well as the way an incident is communicated to the employees.
- Involvement: Method used to enhance the participation of the employees in safety issues.
- Communication: How, when and what information related to safety is communicated.
- Commitment: Actions done by the company to improve safety and health conditions.

In addition, there are several questions corresponding to other management systems or continuous improvement systems implemented. The first 10 questionnaires were done in situ to verify its suitability and comprehension.

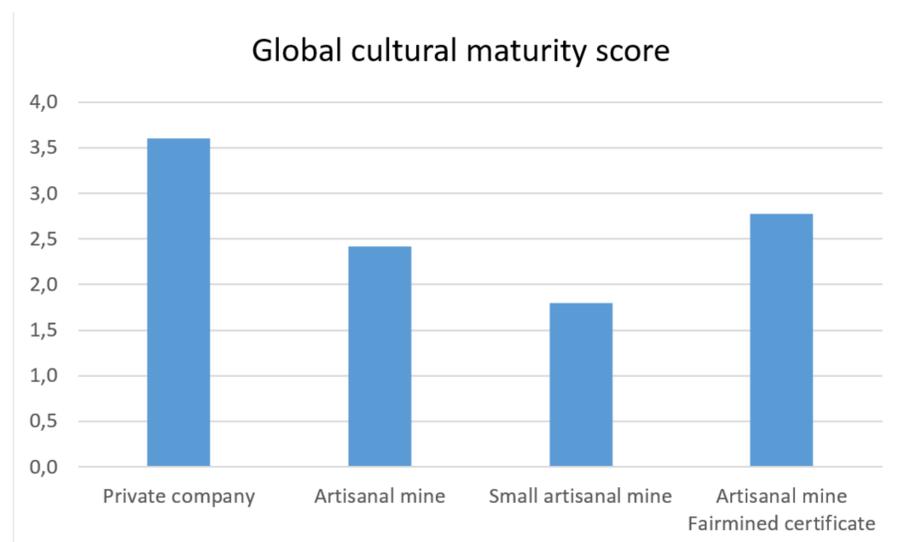


Fig 2. Chart with the score of the different types of activities analyzed.

## 4. Conclusion

- 1) The model used to determine the safety culture maturity level has proved to be an adequate tool for such purpose.
- 2) There is a remarkable difference between private activities and artisanal mines in terms of safety culture maturity. Especially in small ones without the Fairmined certificate.
- 3) All private mining companies have systems implemented to manage safety and health issues.
- 4) When artisanal mines introduce similar systems, they also achieve substantial gains, but their approach is different. Managers from cooperatives have to see direct economic reasons to implement it, such as the Fairmined certificate.
- 5) More data would be necessary to verify the results and know if there is any important difference among Latin American countries.

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