Social Development and Management Program (SDMP) Among Mining Companies in CarCanMadCarLan and Its Impact

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Abstract: This study presents the findings undertaken to assess the extent of implementation of Social Development and Management Program (SDMP) among mining companies in CarCanMadCarLan (CCMCL) and its impact to the multi-sector group. This study employed the descriptive research design where quantitative data gathered through a questionnaire was substantiated with qualitative data gathered through interview. The participants were purposive chosen to represent the social, economic, health, education, and environment sectors. Data were analyzed using mean, standard deviation, t-test, analysis of variance and Tukey's HSD Test. Based on the findings, among the five multi-sectoral groups, Education Sector received the highest mean whereas Environment Sector obtained the least in the assessment of SDMP implementation and its perceived impact. The study concludes that mining operations in CarCanMadCarLan provide positive and negative impacts. The positive impact can be observed in employment generation while the negative impacts can be seen in the environmental destruction and biodiversity degradation. This can be attributed to the extent of implementation of SDMP which cannot be considered as par excellent..

1. Introduction

Mining has improved a lot over the past decades in adopting new technologies, in considering the environmental, economic, social, health and cultural impact of mining operations. However, in this country (Philippines), mining still has to demonstrate what "responsible" mining is, and there is skepticism to overcome because, unfortunately for the industry, mining has a poor record of performance on the issue in the past 50 years [1].

Some leading mining activities in the Philippines are mostly located in Mindanao, specifically in the part of Surigao Del Sur where both small and large scale mining industries have been operating. As shown in Fig.1, CarCanMadCarLan (CCMCL) which stands for fivemunicipalities in Surigao del Sur, namely: Carrascal, Cantilan,

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Madrid, Carmen and Lanuza have been engaged in miningoperations. Yet, a good number of residents of the mentioned municipalities remain firm with their belief that mining is a threat to the communities [3].
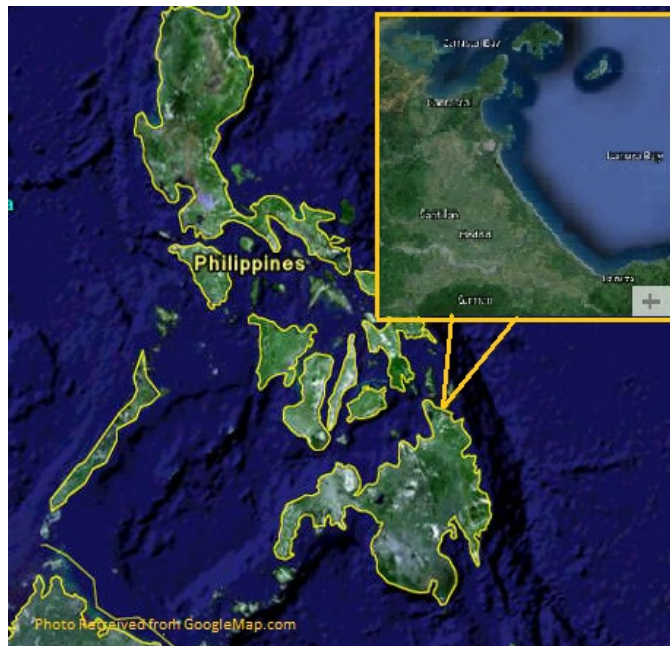

Fig.1. Philippine mapshowing the location of CarCanMadCarLan (CCMCL), Surigao Del Sur [2].

According to Catoto [4], mining practices have already caused health, social, economic, education and environment impact in some mining areas in CarCanMadCarlan Surigao Del Sur. These problems include land degradation, damage to water quality, pollution and harm to livestock and wildlife diversity. Fig.2 emphasizes the present scenario on how mining activities in Surigao del Sur affects the multi-sector.

Fig.2. Effects of mining activities in CarCanMadCarLan, Surigao Del Sur [5].

Working through its community, the mining industry should show full-hearted support and social responsibility to gain sentiments within and in neighboring communities, therefore, obtaining positive information that may help protect and maintain the operations through Social Development Management Program (SDMP) [6]. When people including the multi-sectoral groups of the community receive direct benefits to local education, infrastructure and health care, they are much more likely to accept and support mining activities. Buxton [7]: In response to the growing demand of society, companies which proclaim to be environmentally aware and corporately responsible have formulated environmental policies into their mission statements and strategic plan. However, the difficulty lies in the implementation. How should these policies be applied within the range of activities undertaken by organizations? Companies can only claim to be socially responsible if their direct, indirect, and cumulative impact on society benefits the most vulnerable and worst off [8].

In this study, both the profile of the mining industry and the multi-sector groups in CarCanMadCarLan were considered as relevant variables. The profile of mining companies include: mining site/location, number of employees, number of years in operation, size of operation and identified activities of social development management program (SMDP) projects. The profile of the multi-sectoral participants considered the following relevant variables: age, sex, educational background and occupation. The study also answered the following: The extent of implementation of SDMP among the Mining Companies in CarCanMadCarLan on the components of: Social; Economic; Health; Education; and Environment; The significant difference in the extent of implementation of SDMP with respect to the profile of the mining companies and the profile of the participants; The perceived impact of the Mining Companies in CarCanMadCarLan to the following sectors: Social; Economic; Health; Education; and Environment; The significant difference in the participants' perceptions regarding the impact of mining companies when they are grouped according to sector.

2. Materials and Methods

A. Participants and Procedure

The participants of the study were representatives of the multi-sectoral groups who were purposive chosen based on the following criteria: number of years as a resident in the place where the mining industries are located and as non-employee of the mining industries. Central Limit Theory (CLT) which provides for a minimum of 30 participants was employed to get the actual sample. From the thirty (30) representatives of the five sectors in every community, five (5) participants from each sector answered the structured questionnaire and one (1) senior leader was considered for the interview. Choice of senior leader participants was based on the criteria as follows: forty-five (45) and above years of age and have resided in the locality for at least twenty (20) years. They were those interviewed to gather more candid information on the mining industry in the locality.

B. Instrument

The study made use of a researcher-made questionnaire as the main tool of research. Two kinds of questionnaires were used. One kind of questionnaire intended for the mining industry contains two parts: Part I is on the company's profile which includes the mining site/location, total number of employees, number of years in

operation, and the size of its operation. Part II elicits information on the identified activities of Social Development Management Program (SDMP) projects of the industry in a checklist form. The mining companies had to check the identified activities which they already implemented and disregard if they have none. The second kind of questionnaire is focused on the participant's profile, Part I includes the participants age, sex, educational background and occupation. Part II asks for the industry's extent of implementation of Social Development Management Program (SDMP) where the participants had to describe the extent of implementation of SDMP according to sector using the scale of 1(Very Low) to 4(Very High). Part III elicits information on the degree of impact of mining industry to the multi-sector in CarCanMadCarLan. The participants had to indicate the degree of impact of mining company using a scale of 1(No Impact) to 4(High Impact).

Data were analyzed using frequency count and percentage distribution, mean and standard deviation, t-test, analysis of variance and Tukey's HSD Test. These tools were used to measure the difference among the five sectoral groups with regards the extent of implementation of the SDMP with respect to the profile of mining companies and participants; and the difference among groups' perceptions on the impact of mining industry when they were grouped according to their profile. Stan [9] stated that ANOVA and Tukey's HSD Test determine the variation between groups to the variation within groups.

3. Results and Discussion

A. Extent of Implementation of SDMP by the Mining Companies in CarCanMadCarLan

Table 1 reflects the summary on the extent of implementation of SDMP by mining companies in CarCanMadCarLan.The Grand Mean assessment in the extent of implementation of SDMP of the mining companies in CarCanMadCarLan is 2.80 with a standard deviation of 0.82. Four of the five components of SDMP received a Qualitative Description rating of *High* indicating agreement of the extensiveness of program implementation in the five mining companies. These include Education (3.16), followed by Health (2.80), Economic (2.69), then Social (2.58). The Environment received the lowest mean of 2.46 indicating that this program component of SDMP was not extensively implemented.

This may be attributed to mining industry's goal of developing a better relation with the community. Since education is the frontward partner of the community, it becomes the top priority of mining industries which may involve a concealed program to win the interest of the community. Infrastructures such as multi-purpose learning center, computers, books, teacher's incentives and other trainings for both educators and learners are given priorities by the mining industries. Wise H. and Shtylla [10], mentioned that it is worth noting that the construction of school and clinic by the mining industries in the communities have direct positive impact on the educational performance of the learners. Not only has mining industries built a school toeducate children of the rural households for better human capital, but also the mining company pays 15% of teachers' salary. There is also the institution of a scholarship scheme for wards of poor families as support for higher education.

Table 1. Summary on the Extent of Implementation of Sdmp by Mining Companies in Carcanmadcarlan on the Multi- Sector

Sector	Mean	SD	Verbal Interpretation	Qualitative Description
Social	2.58	0.98	Agree	High
Economic	2.69	1.04	Agree	High
Health	2.80	1.04	Agree	High
Education	3.16	0.16	Agree	High
Environment	2.46	0.90	Disagree	Low
Grand	**2.80**	**0.82**	**Agree**	**High**

Fig.3. Development of infrastructures and medical mission in CarCanMadCarLan by the mining companies [11]

Fig. 3 shows how mining company is committed to improving the infrastructure, education and health aspects of the surrounding community. The mining companies in CarCanMadCarLan have been keeping their interest towards helping the community through the provisions of educational facilities, infrastructures and quality health services.

B. Difference in the Extent of Implementation of the SDMP with respect to the Profile of the Mining Companies and the Profile of the Participants

Table 2 displays the ANOVA results on the extent of implementation of SDMP of the mining companies operating in CarCanMadCarLan when they are grouped according to their company profile. The results reveal that there is significance in the extent of implementation of SDMP among these mining companies when the grouping is based on location (p-value=0.0001) and number of years in operation (p-value =0.0130). However, there is no significant difference in the implementation of SDMP in terms of number of employees (p-value= 0.0580) and size of operation (p-value=0.3980).

Table 2. Analysis of Variance on the Extent of Implementation of Sdmp by the Mining Companies with Respect to the Company'S Profile.

Source of Variation	Sum of Squares	df	Mean Square	F_{com}	P_{-Value}	Decision
Location	2488.320	1	2488.320	68.061	0.0001*	Ho is rejected
No. of Employees	134.670	2	134.670	3.684	0.0580	Ho is accepted
Years in operation	487.480	2	121.870	3.333	0.0130*	Ho is rejected
Size of Operation	149.780	1	37.445	1.024	0.3980	Ho is accepted

Legend: * - significant at 0.05

As to the location, those mining companies which are in the safe zone have higher extent of SDMP implementation compared to those in the danger zone. Safe Zone areas are valuable when intact, and their value would be jeopardized by extractive industries [12]. In terms of number of years in operation those companies operating for more than five years are compared to those operating lesser than five years. The implementation of SDMP among mining companies is difficult to attain during the first-five years of their operation, this is because they intervene with the time constraint. As compared to the mining industry which has been operating for more than five years, their identified activities based on SDMP will more likely to succeed due to long time duration and quality preparation.

Table 3. Analysis of Variance on the Extent of Implementation of Sdmp by the Mining Companies with Respect to the Profile of the Participants

6	Mean	SD	SD Error Mean	F	p-value	Decision
45 and Below	2.8	0.9332	0.097	2.142	0.1460	H_o is accepted
Grand Mean	**2.8**	**0.9096**				
Sex						
Male	2.7	0.9394	0.136			
Female	2.8	0.8945	0.102	1.217	0.2720	H_o is accepted
Grand Mean	**2.8**	**0.9096**				
EducationalBackground						
Elementary, High School, Vocational	2.3	0.9311	0.165	123		
Bachelors, Masters	3.0	0.8459	0.088	49.755	0.0001	H_o is rejected
Grand Total	**2.8**	**0.9096**				

Legend: * - significant at 0.05

Table 3 displays the ANOVA results on the extent of implementation of SDMP by mining companies with respect to the profile of the participants. The multi-sector participants differ significantly in their perceptions regarding the extent of implementation of SDMP by the mining companies with respect to educational

background (0.0001) but not in terms of age (0.1460) and sex (0.2720). Participants who have attained college level have higher assessment perceptions compared to those who have only attained elementary, high school and post-secondary. Comparatively speaking, it is worth noting that participants who have finished bachelors and master's degree obtain higher benefits than the benefit received by ordinary or non-working participants. Possibly the reason is that people who earned highest degree of education are in the high rank position in any workplaces, in some way, they disregard whatever are the communal fluctuations in the community because they are not directly affected with the change. This isconflicting to the part of those who have low family income and poor educational background; they fear the possibility of losing their means of living without any choice of replacement. It is unfair for those who have tried exertingconsiderable efforts for a living and soon will be wasted by the effect of mining.

C. Perceived Impact of the Mining Companies in CarCanMadCarLan to the Following Sectors: Social; Economic; Health; Education; and Environment

Table 4 presents the summary of the perceived impact of mining companies in CarCanMadCarLan.The perceived impact of mining companies to the multi-sectoral groups in CarCanMadCarLan is found to be Moderate based on the grand mean of 2.68 with a standard deviation of 0.087. Positive impact is mostly observed in the education (3.06), health (2.89), and economic sectors (2.59) while negative impact is found in the environment (2.49) and social sector (2.46). Based on the interview from the senior leaders of the multi-sector, mining contributes both positive and negative impact. The educational leaders consistently expressed positive perceptions about the impact of mining particularly on Education. One stakeholder said that mining gives opportunities to the school community. Many contributions were extended by mining companies to teachers and learners, particularly towards their learning development and experiences. In addition, mining contributes positive impact to the Economic and Health Sectors hence, senior leaders stated that mining has made wonderful contributions to their barangay in such a way its SDMP addresses the needs of the people. There has been a huge [economic] progress both in economy and health services. Whatever projects and activities they have agreed upon in the barangay have been successfully implemented because of the support given by the mining company. However, more negative impacts were perceived from the interviewed senior leaders, disappointments were expressed by leaders in the Environment and Social sectors especially about the degradation of natural resources and environment.

Most environment and social leaders expressed nothing good but all negative effects brought by the mining industries. According to the leaders, there is no enough evidence that MGB and LGU collaborated on the geo hazard maps and the ways in managing hazards to the host communities. Most of the political leaders pay lip service only when in front of the public. There was no firm decision and stand from the local government officials since MGB showedno support and considerations from it. In this situation, the townsfolk are the ones searching for the possible moves to prevent the most vulnerable and at risk community because of mining.

Last April 29, 2012, residents supporting and opposing mining in Surigao Del Sur province held separate rallies led by multi-sectoral leaders (Fig. 4). The anti-group commented on the potentially-adverse impacts of mining which include displacement of local people from ancestral lands, environmental deterioration, health and safety of people, poor education and livelihood.

At present, the Mines and Geosciences Bureau (MGB) has suspended the operation of one of the mining companies in Cantilan, Surigao Del Sur. The suspension followed an investigation by the Department of Environment and Natural Resources (DENR) on reports that the identified mining company mined an area that was not covered by its Mineral Production Sharing Agreement (MPSA) [14].

D. Difference in the Participants' Perceptions Regarding the Impact of Mining Companies in CarCanMadCarLan When They are Grouped According to Sector

The difference in the participants' perceived impact of mining companies in CarCanMadCarLan with respect to the sectoral group is observed in Table 5. There is significant difference in the perceptions of the multi-sector participants regarding the impact of mining companies in CarCanMadCarLan as evidenced by the p-value of 0.0180. The education, health, and economic sector participants see positive impact of the mining companies while those in the environment and social sectors are apprehensive about the adverse effect of mining operation.

Fig. 4.   Rally led by multi-sectoral leaders in CanMadCarLan against mining [13].

Table 5.   Difference In The Participants' Perceived Impact Of Mining Companies In Carcanmadcarlan With Respect To The Sectoral Group

Sectoral Groups	Sum of square	df	Mean of square	F	P-value	Decision
	419.328	4	604.832			Ho is rejected
Between Groups				3.087	0.0180	
Within Groups						
Total	23508.720	120	195.906			
	25928.048	124				

The mean difference is significant at the 0.05 level.

Table 6. Tukey'S Hsd Test On The Impact Of Mining Company In Carcanmadcarlan In The Multi-Sectoral Community.

(I) Sector	(J) Sector	Mean Diff. (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Education	Social	5.80*	1.710	0.008	1.06	10.54
	Environment	6.56*	1.710	0.002	1.82	11.30
	Health	3.56	1.710	0.235	-1.18	8.30
	Economics	4.68	1.710	0.055	-0.06	9.42
Social	Education	-5.80*	1.710	0.008	-10.54	-1.06
	Environment	0.76	1.710	0.992	-3.98	5.50
	Health	-2.24	1.710	0.686	-6.98	2.50
	Economics	-1.12	1.710	0.965	-5.86	3.62
Environment	Education	-6.56*	1.710	0.002	-11.30	-1.82
	Social	-0.76	1.710	0.992	-5.50	3.98
	Health	-3.00	1.710	0.406	-7.74	1.74
	Economics	-1.88	1.710	0.807	-6.62	2.86

(*Based on observed means*) * *the mean difference is significant at the 0.05 level.*

Based on the *Tukey's HSD Test*(see Table 6) on the impact of mining company, there are three identified sectors which differ significantly on their understanding about the impact of mining company. The sectors include Education, Social and Environment. Numerically speaking, Education with the mean difference of 5.80 to Social Sector and Environment Sector (6.56), perceived to have a great impact of mining company which expressed outlying comparison among the two sectors. Hence, on the previous discussion, Education posted the highest degree of impact while Social and Environment obtained the lowest degree of mining impact. Those in the education, economic and health sectors viewed mining industries as positive factors towards achieving progress and development in CarCanMadCarLan while those in the social and environmental believed that mining companies' operation in this part of the country is detrimental to environmental and social development. It is evident therefore that people in CarCanMadCarLan do not have one understanding and acceptability of the mining operations in the locality. With the plurality of their understanding, the finding implies the need for further investigation to dig deeper into the implications of the phenomenon being investigated.

4. Conclusion

Mining is an activity that needs to be properly planned with all likely, probable and possible impacts anticipated, identified, evaluated, and mitigation measures planned because it is a short-term activities with long-term effects [15]. Thus, mining industry should design best practices to contribute to its sustainable management and development program (SDMP) and improve its image in terms of mine safety, social impact, economic imbalance, environmental restoration, and community relation.

Analyzing deeply the result, it shows that the main positive impact of mining companies is the generation of employment opportunities for local folks which consequently benefit the education sector because parents can now afford to send their children to school, however, negative impact of mining activities can be observed in the environmental destruction, biodiversity degradation and social concerns. The study also noted the multi-sector group has varied perceptions about the impact of mining activities. The education, health and economic sectors have positive outlook about mining while those in the social and environmental sectors are apprehensive about mining. As this study comes to conclude, it can be deduced that the positive impact of mining industries in CarCanMadCarLan focusing on employment generation leading to the improvement of the education sector may be outwitted by the fact that more negative consequences may happen as adverse effect of mining activities. This can be attributed to the extent of implementation of SDMP which cannot be considered as par excellent.

Acknowledgment

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