

Perceptions of the Resident Towards Mining Operation in Barangay Macambol, Mati City, Davao Oriental

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Abstract

This study was conducted in Barangay Macambol, Mati, Davao Oriental, to assess the residents' perceptions and awareness regarding mining operations. Specifically, it aimed to determine the socio-demographic profile of the residents, evaluate the community's acceptability of mining operations, identify the socio-economic and possible environmental impacts of mining, and determine the level of awareness of residents regarding mining activities. A semi-structured questionnaire was used to gather data on the respondents' socio-demographic characteristics, perceptions, acceptability, socio-economic impacts, environmental concerns, and awareness of mining operations. In addition, site visits, ocular inspections, and photo documentation were conducted to validate observations in the study area. Data were analyzed using frequency counts and percentages. The findings revealed that among the 250 respondents, the majority (31%) belonged to the 41–50 age bracket. Most respondents (76%) earned less than Php 3,000 per month, while fishing was identified as the primary occupation of many respondents (44%). Regarding the acceptability of mining operations, the majority (55%) expressed agreement, citing employment opportunities and potential economic benefits for the community and the country. However, respondents also recognized the possible environmental consequences of mining, with 92% believing that mining activities could contribute to environmental degradation and the destruction of natural resources. In terms of awareness, most respondents were informed about mining operations through public consultations conducted by the mining company (76%), although awareness through newspapers, radio, and television remained limited. The study recommends that mining operations adhere to responsible mining principles that promote environmental protection, community welfare, sustainable development, and improved quality of life.

Keywords: Macambol, Mining, Operations, Perceptions, Residents

Introduction

Mining has played an important role in the development of other western countries. In the past, the discovery of minerals resulted in population shifts and economic growth

(Lynch, 2002). Extraction of minerals and coal continues to provide the foundation for local economies in some parts of the world (Humphreys, 2002). Products of this industry are used as inputs for consumer's goods, processes, and services provided by all other industries including agriculture, manufacturing, transportation, utilities, communication, and construction. Uses of mined materials include coal for energy, nickel for making corrosion-resistant alloys particularly stainless steel, copper for wiring, gold for satellite and sophisticated electronic components, and a variety of other minerals as ingredients in medicine and household products (www.bls.gov/eco/cg/cgs004.htm).

In the Philippines with its line agencies, Mines and Geosciences Bureau (MGB), Department of Environment and Natural Resources (DENR), same agree with the mining company that mining brings development but aside from this, environmental destruction caused by irresponsible mineral exploration are also present (<http://www.minesandcommunities.org/company/phitex/html>).

The government and the people living in poverty in rural and upland areas are fully supportive of responsible mineral exploration and development throughout Mindanao and it has certain policies for the sustainable development of mineral resources particularly ensuring environmental protection, health, and safety (Duresa, 2003). This study hopes to assess the perception of the community of barangay Macambol, Mati, Davao Oriental and other agencies concerned towards mining operation. This will serve as a baseline data on how they perceive mining operation - the Pujada nickel laterite projects as a crucial project.

The study aimed to determine the socio-demographic profile of the residents of Barangay Macambol, Mati, Davao Oriental, in terms of their age, sex, civil status, occupation, educational attainment, and income. Specifically, it sought to assess the community's acceptability of mining operations, evaluate the socio-economic impacts of mining on the residents, identify the possible environmental impacts associated with mining activities, and determine the level of awareness of the residents regarding mining operations within their community. The study sought to determine the profile of the residents of Barangay Macambol in terms of age, sex, civil status, occupation, educational attainment, and income. It also aimed to assess how the residents perceive mining operations with respect to their acceptability, socio-economic impact, and environmental impact. Furthermore, the study intended to determine the respondents' level of awareness regarding mining operations in their community. It aims to provide knowledge and serve as the baseline information on the perception of the residents of barangay Macambol towards mining operation in terms of acceptability, socio-economic impact and environmental impact, as well as their level of awareness towards mining operation. The information and data gathered can serve as vital inputs to be used by local officials, residents of the barangay and other stakeholders regarding the mining operation in Magum, Macambol.

The study will focus on the perception of the residents in barangay Macambol, Mati, Davao Oriental with regards to mining operations in sitio Magum through direct observation and interview. It will determine the acceptability, socio-economic and environmental impacts, as well as level of awareness of residents of sitio Magum, barangay Macambol on the mining operation. Thus, the results are only applicable to the people of the said area.

Methodology of the study

This study was conducted in barangay Macambol, municipality of Mati Davao Oriental where the mining operation is located. Barangay Macambol has an approximate land area of 18,634.99 ha. This barangay comprises 12 sitios and these are Banlutan, Catmon, Silad,

Owao, Proper, Baas, Tambak, Wagon, Pangibinan, Magum, Casinihan, Sopsopon, and Catmonan (MMPOF, 2001). Barangay Macambol is located in the coastal, southern part of Mati and can be reached either by sea or land using pump boat or public bus or jeepney.

Data sources and collection

The descriptive method of research was used in this study. Schedules of interview were administered to the residents of barangay Macambol. The interview schedule is used to gather the perceptions of the residents of barangay Macambol toward mining operation in sitio Magum. Personal interview and used of questionnaires to the residents were conducted with regards on how they perceive mining operations in terms of acceptability, socio-economic impacts, environmental impacts and socio- demographic. The level of awareness towards mining operation was determined by using Likert Scale. Ocular observation and photo documentation were done during area visits.

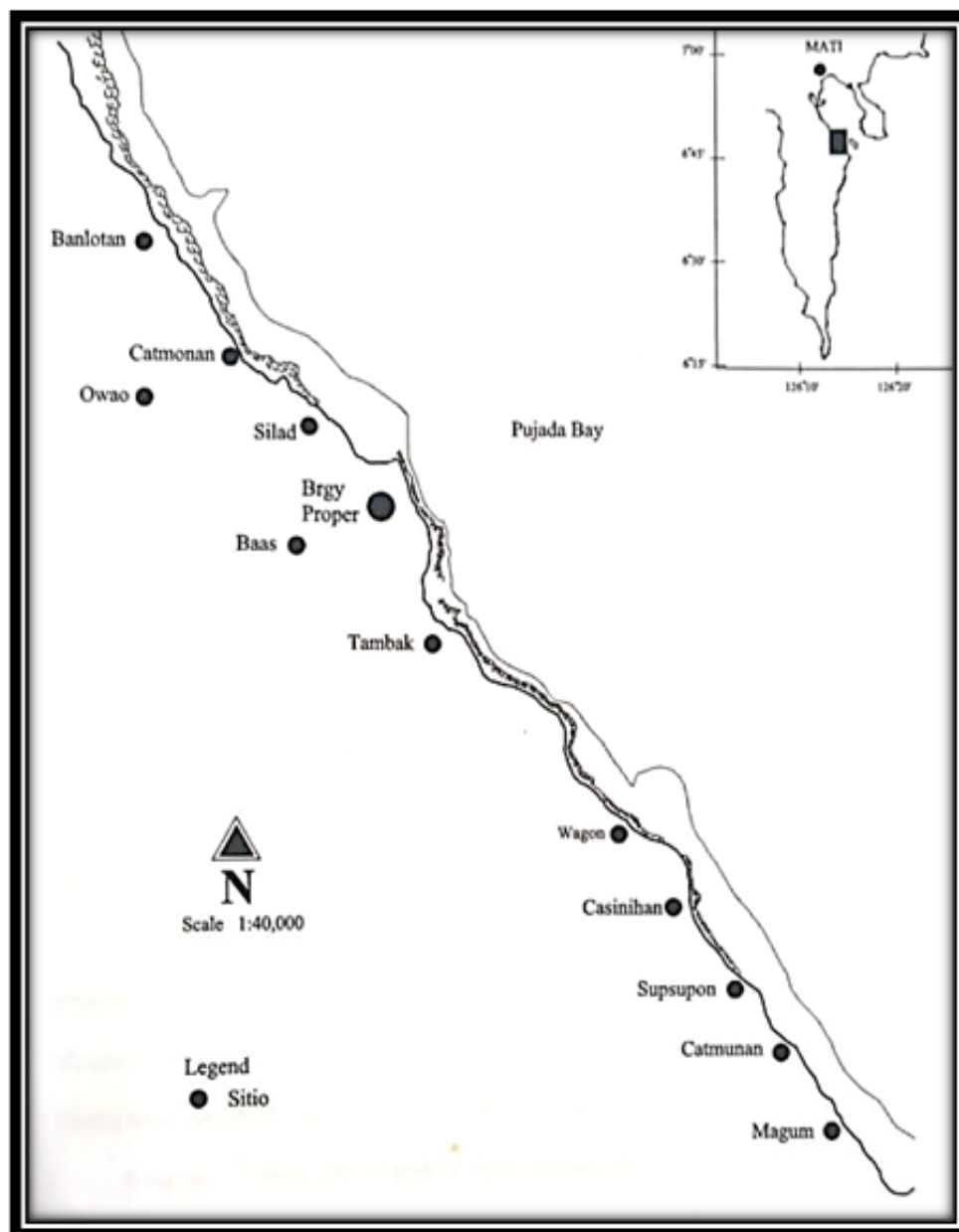


Figure 1. Map of the study area.

Sampling Technique

Random Sampling was used in selecting the respondents of the study. The total number of households of Barangay Macambol is 667, and 3, 454 is the total population (MMPO,2001). However, only 250 respondents were interviewed. This will be determined using the Slovene’s formula (Padua, 2000).

$$\frac{n = N}{1+N(e)^2}$$

where:

N = size of sample = 667

n = the size of population

e = error tolerance (5%)

1= constant

Data analysis

Data derived from this study was analyzed using descriptive statistic such as percentages and frequency counts (Walpole, 1982). The level of awareness was determined using the Likert Scale technique, which presented a set of attitude statements. Subjects were asked to express agreement or disagreement of a point scale. Each degree of agreement was given a numerical value. Thus, a total numerical value can be calculated from all the responses.

Legend. 1- Never (N) 2- Seldom (S) 3- Always (A)

Range: (N) = 1 - 19 (S) = 19 - 2.8 (A) = 2.8 - 3.7

RESULTS AND DISCUSSION

Socio demographic characteristics of the respondents

A total of 250 respondents were interviewed in barangay Macambol, Mati, Davao Oriental. Out of 250 respondents (31%) belong to the age bracket 41-50. (Table 1) They were composed of males (33%) and females (67%). Most of the males were working outside of their houses, which indicates that males are the bread winner of the family that is the reason why mostly are females were interviewed. Most were married (91%); only a few (6%) were single, and (3%) were widower. Most of the respondents (4%) belong to the number of children ranging from 4-6 years old. With regards to their educational attainment, (41%) acquired elementary education, (29%) finished high school level. Only (3%) graduated from college, and only one had no education (0.40%). This indicated that the majority of the respondents had a low level of education. Many (76%) earned less than Php 3,000 a month, which was not enough for their daily expenses.

On the other hand, most of the respondents engaged in fishing (44%); farming (42%); own business (16%); were involved in animal husbandry (8%), and other forms of livelihood (13%). They did not depend on one source of income, and all tend to have lower incomes.

Perceptions of the Respondents in terms of Acceptability toward Mining Operation

As shown in Table 2, out of 250 respondents, a bigger percentage (55%) agrees on mining operation in their place because of different reasons. They agreed because of the work opportunity (53%), community and economic development (1%); they are the workers of

the company (1%), and would be given the chance to get the mineral (0.40%). According to those respondents who agreed that many of the mining operations would give big opportunities to change their lifestyle, especially rural communities like Macambol, in bringing employment and a stable economic base to their community and to the country as well, the mining industry is one of the best occupational records and offers above-average wages and great benefits, affording a pleasant and comfortable lifestyle for mining families.

A lesser percentage disagree on mining operations in their place (45%) for different reasons. They disagree because it can destroy nature (44%), lack of experience in mining (1%), and the inability to work (0.40%). Several respondents criticized the proposed mining operation because they are prioritizing the effects or the impact of this mining on our environment, and they are looking forward to their children's future, because children are particularly vulnerable to environmental toxins. Per pound of body weight, children drink more water, eat more food, and breathe more air than do adults. The health implications of these findings are that children will have substantially heavier exposures than adults to any toxicants that are present in water, food, or air. Children's ability to metabolize, detoxify, and excrete many toxicants is different from that of adults. In most instances, they are less able to deal with toxic chemicals and thus are more vulnerable to them. They are protecting the next generation (<http://ehp.nichs.nih.gov/members/2003/6059/html>).

Table 1. Socio- demographic characteristic of the respondents.

Age level	Frequency (n)	Percentage (%)
10-20	2	1
21-30	34	14
31-40	65	26
41-50	78	31
51-60	50	20
61-70	15	6
71-80	6	2
Sex		
Male	83	33
Female	167	67
Civil Status		
Single	15	6
Married	228	91
Widowed	7	3
Number of children in the family		
1 – 3	90	36
4 -6	100	40
7 – 9	20	8
9 above	25	10
Singles have children	6	2
Singles have no children	9	4
Educational Attainment		
Elementary Level	6	2
Elementary Graduate	102	41
High School Graduate	70	28
College Level	9	4

College Graduate	7	3
No Education	1	0
Estimated Monthly Income		
Below 3,000	191	76
Php 3,000 - Php 6,000	58	23
Php 6,100 - Php 9,000	0	0
Php 9,000 and above	1	0
Occupation		
Farming	106	42
Fishing	109	44
Business	40	16
Livestock raising	20	8
Others	32	13

Table2. Acceptability of the residents towards mining operation.

Do you agree on Mining operation in your place?	Frequency	(%)	Reasons
Yes	138	55	
	138	53	Work opportunity
	3	1	Community and economic development
	1	0	Get some minerals
	2	1	Workers in the company
No	112	45	
	110	44	It can destroy nature
	2	1	Lack of experience in mining
	1	0	Inability to work

* The reasons of the respondents gave multiple answers

Perceptions of the respondents in terms of the socio-economic impact of mining Operation

As shown in Table 3, out of 250 respondents, a higher percentage (69.60%) are not sure that they will work for the mining company for many reasons. They are not sure because the mining corporation has their own workers (80.40%); lack of experience and skills (14.40%); selected workers with backers (44.40%); can destroy the health condition (5.20%); no a ssurance (4.40%); existence of other jobs (1.60%) and over age (1.60%). A lower percentage (30.40%) was sure that they can work in this mining corporation because according to the respondents based during the community consultation the company listed all the capable workers especially the residents of barangay Macambol for they were prioritized by the company as selected workers (16.00%) and some of the respondents are already the workers of the company (17.00%) for the exploration (Table 3).

Table 3. Socio-economic Impact on Mining Operations.

Are you sure you can work in this mining corporation	Frequency	(%)	Reasons
Yes	76	30	
	42	17	Workers in mining corporations
	39	16	One of the selected workers
No	174	70	
	21	8	Has its own workers in the mining corporation
	36	14	Lack of experience and skills
	111	44	Selected workers with backers
	13	5	Can destroy the health conditions
	11	4	Entrusted
	4	2	Existence of other jobs
	4	2	Over age

* The respondents gave multiple answers to the reasons

Perception of the respondents on the importance of the mining operation

Table 4 shows that most of the respondents perceived that the mining operation plays important functions for the economy and for the community in terms of lifestyle and way of living. They perceived that at the start and after the mining operation, there is a possibility that the quality of living would be changed (81%); only a few disagreed (19%). The mining company promised or planned to build for the community establishments such as classrooms, a market, road widening, and many others. A higher percentage (83%) of the respondents favored it because, according to them, the company chose their sitio and they are aware of it. Lower percentages are not favorable (7%) because they are not aware, since they are more focused on their present source of income. They also perceived that it is possible that the number of residents in their place will increase (93%) for employment and business purposes. Only a few are negative (7%) to those respondents not aware, and others are doubtful (10%) because they are not sure of what will happen next after the exploration.

Table 4. Perceptions on Mining Operation.

Perception of mining operation	Responses					
	Yes		No		Maybe	
	F	%	F	%	F	%
Is there a possibility that the quality of living be change?	202	81	48	19	-	-
Are there any establishments built in your place?	208	83	17	7	25	10
The number of residents in your place may increase?	233	93	17	7	-	-

Perceptions of the respondents towards the effects and benefits of mining operation

Based on the data gathered, the respondents gave multiple answers. A higher percentage (53%) of the respondents perceived that mining can bring diseases to the residents because of the chemical waste that is brought by the mining corporation. However, there are some (2%) other respondents who said that it depends on how they dispose of the waste. About 45% the

respondents perceive mining operations to bring prosperity to the residents because of the employment and the chance to build a business. Noise (5%) can also be one of the setback according to the respondents because of the trucks and machinery used by the company for the extraction of minerals that can create noise pollution, and the increase of illegal loggers and miners (1%) that tend to destroy nature. They perceived that nickel extracted would bring to them a source of high income (22%) and for the economic development (11%) for the indirect creation of jobs that are created during the exploration phase, there are jobs to be occupied during the mining and milling phase. The jobs are directly related to the industry. Others said that it depends on the usage (1%), and others said the nickel is the major component of making appliances (0%). But most of the respondents do not know the benefits of nickel (68%), which is the highest percentage.

Table 5. The effects of the mining corporation and nickel benefits.

The effects of mining corporation	Frequency (n)	Percentage (%)
Noise	13	5
Diseases	133	53
Prosperity of living	112	45
Depending on the way of waste disposal	5	2
An increase in illegal miners	2	1
The Benefits of Nickel		
Source of high income	56	22
Don't know the benefits of nickel	170	68
Depends on its usage	2	1
Economic development	28	11
Usage for making appliances	1	0

* Respondents gave multiple answers

Perceptions of the respondents on the effect of Mining Operation to the Environment

Mining is a good example of our changing worldview because it combines industry and environmental perspectives. Many of us are beginning to realize that it is futile to use our science and technology to exploit and attempt to control nature. Instead, we are beginning to understand that our sciences should help us to restore ecological imbalances and to complement natural processes. Mining is usually found as an industry that exploits and destroys nature (Hill, 1993). As shown in Table 6, the respondents gave multiple answers for their perceptions about what were the effects of mining on the environment. The highest percentage was on the forest destruction (89%) because, according to the respondents, the method that the mining corporation used to extract the mineral was the open-pit mining method, which is very destructive to the forest. Vegetation is removed from the entire mining site. Others said that there are no effects on the forest (9%) because the mining company can prepare a thousand seedlings of trees for reforestation on the affected areas, as supported by the DENR, and others said that there is an effect (2%), but it will affect only those seen on the site. The highest percentage of the respondents perceived was sea pollution (92%) because to them Barangay Macambol is a coastal barangay and may destroy the marine ecosystem, as the majority of their income depends on fishing. Other respondents said that there is no effect on the sea because the company managed the proper disposal of wastes by using the chlorination process to remove toxic chemicals as a potential source of future contamination on water quality before the tailings were company Blue Ridge Mining Company and Asiaticus Managements

Corporation (AMCOR).

The highest percentage of respondents perceived is air pollution (92%) because of the pollutants such as dust and suspended particulates that have detrimental effects on nearby or downwind communities, triggering health concerns for residents. Other respondents said that there were no effects on air (8%) because the company was able to put up a management plan by following air quality permits that they can only operate under calm conditions and avoid operating on windy days. Most of the respondents perceived with the highest percentage that animals got sick and died (92%) because of the chemical wastes to which the animals were exposed. Other respondents said that there is no effect on the animals (8%) because the company coordinates health and safety in the mining environment associated with the dumping of mine tailings by using a chlorination process to remove toxic chemicals before the tailings are disposed of to control the negative environmental impact.

The highest percentage that the respondents perceived was the destruction of the land (92%) because of the removal of vegetation. The erosion, deficiency in nutrients, and organic matter of the soil that was excavated were among the primary problems of mining. The spoil heap's outer edge is even steeper than the natural slopes. The steepness of the slopes makes the soil particularly vulnerable to erosion by water. The spoil heap lacks the vegetative cover of the surrounding natural areas, which further subjects it to erosive forces. Slippages between the spoil heap and the natural slope can and have led to landslides. Other respondents said that there are no effects on land. (8%) because the company was able to put up a management plan through reforestation supported by the DENR. The highest percentage the respondents perceived was human got sick and died (92%) because of the toxins brought by the mining company, which are particularly vulnerable to humans, such as poor sanitation and unsafe disposal, as well as those caused by the introduction of toxic chemicals. Human health is endangered by exposure to natural or man-made toxic chemicals in the air, water, soil, and food chain. Other respondents said that there are no effects on humans (8%) because the company manages it properly by using measures that can minimize or lessen the discharge effects of waste, such as the chlorination process.

Table 6. Environmental impact of mining operations.

Perceptions on the effect of mining operations on the environment	Frequency (n)	Percentage (%)
Forest		
• Destroyed forest	222	89
• No proper management of the mining corporation	23	9
• There is an effect, but not for all living things in the forest	5	2
Seas		
• Sea Pollution	229	92
• No proper management of the mining corporation	21	8
Air		
• Air pollution	229	92
• No proper management of the mining corporation	21	8

Animals		
• Get sick and died	229	92
• No proper management of the mining corporation	21	8
Land		
• Land destroyed	229	92
• No proper management of the mining corporation	21	8
Human		
• Got sick and died	229	92
• No proper management of the mining corporation	21	8
Plants		
• Plants died	229	92
• No proper management of the mining corporation	21	8

Level of awareness of the respondents towards the mining operation

As shown in Table 7, out of 250 respondents, a few (22%) were exposed to print media like newspapers about mining. Most of the sources were the Manila Bulletin, the mining corporation’s newspaper, *Bandera*, *Journal Mati*, and *Atlas Mining*. The remaining, which is the newspaper. A bigger percentage of the respondents (73%) were not exposed to television to watch news about mining because they do not have T.V. sets at home, and they only viewed television, particularly dramas. However, others (27%) were only exposed on television, and the station that they usually viewed is the ABS-CBN news patrol, and they also viewed VHS tapes coming from the mining company and IMPEDE.

Most of the respondents (65%) listened to the radio about mining news. Most of them gave multiple answers to which radio station they preferred to listen, meaning to say that they do not focus on only one station, and the stations that they usually listened were *Bombo Radio*, *Radio Natin*, *DXDC*, *DXHM*, *DXRB* and *Madayaw FM*. The remaining (35%) do not have radio sets, which means they do not have access to this communication medium. Out of 250 respondents, many (75.60%) said that there were consultations conducted about mining operations, and this was LGU Mati, barangay officials, mining corporations-*Blue Ridge* and *AMCOR*, *IMPEDE*, and *LRC*. The remaining (24%) were not aware because they are not interested and are busy with their work. Based on the respondents’ responses in the interview conducted, there were seminars or information given about mining operation (69%), such as agreeing on mining operation, disagreeing on mining operation effects on the environment, effects on humans, and on the community, and the effects on the economy. The remaining (31%) were not informed because they were not interested and were busy with work. Most of the respondents are informed about the construction of the mining operation (88%), and the remaining (12%) are not informed because some of the respondents live in mountain areas, and during the public consultation, only selected sitios were chosen to join.

The majority of the respondents were informed of what type of mineral was being extracted (78%), which is nickel. Other respondents are not informed (21%). But the majority of the respondents were not informed about the use of the mineral (77%), only a few (23%) were informed. Most of their responses were for making metal and alloys, use in making appliances, and use in making paints.

Table 7. Level of awareness of the respondents towards the mining operation.

Awareness towards mining operation	Responses						Mean	Descriptive rating
	1		2		3			
	F	%	F	%	F	%		
Do you read newspapers about mining operations?	195	78	55	22	-	-	2.4	S
Do you watch the news on television about mining operations?	182	73	68	27	-	-	2.2	S
Do you listen on radios about mining operations?	87	35	163	65	-	-	2.3	S
Is there any consultation happening in your place about the mining operation	61	24	189	76	-	-	2.2	S
Are there seminars on the information given to you about mining operations?	78	31	172	67	-	-	2.3	S
Were you informed about the construction of the mining operation?	31	12	219	88	-	-	2.1	S
Were you informed what type of mineral was found in your place?	53	21	197	79	-	-	2.2	S
Were you informed about the use of minerals?	193	77	57	23	-	-	2.8	S
Mean							2.3	S

Legend: 1 - Never (N) 2 - Seldom (S) 3 - Always (A) DR - Descriptive Rating F - Frequency
Range: N = 1 - 1.9 S = 1.9 - 2.8 A = 2.8 - 3.7

Summary

The Macambol mining industry has become a hot item as it gained unwanted prominence. Undue attention was sparked by one regrettable incident and fueled by growing community assertion to their lands, and fanned by raising environmental awareness. These unwanted fears painted a picture of mining that was purely an environmental despoiler, forgetting the fact that mining has been a significant economic contributor in the past, the present, and will be in the future. In the information gathered, the majority of the respondents were married and had attained only an elementary education, which indicates that they had a low level of education. They only engaged in fishing and farming and earned less than Php 3,000 a month, which is not enough for their daily expenses. So, they need an opportunity to earn more income to support their daily needs. The majority of the respondents agreed on mining because, according to them, mining would give a big opportunity to change their lifestyle, especially in a rural community like Macambol, as it brings employment and a stable economic base to their community. To them, the mining industry is one of the best occupational records that offers above-average wages and great benefits, affording a pleasant and comfortable lifestyle for families in the area. Their acceptability to the operation is mainly based on their hope to earn a decent living. Some of the respondents disagreed on mining operations because they believe that it can harm the environment, such as forest destruction, sea pollution, air pollution, threaten animal and human health, and plant life as well. This indicates that despite their low educational attainment, they

are aware of the possible harm mining can bring because of the communication media such as newspapers, radio, television, and the conducted public consultation of IMPEDE and other opposed groups and agencies on the mining operation.

The majority of the respondents are aware of mining operations in their place because the mining company conducted a public consultation for the residents to know and gave them the opportunity to work as prioritized by the company, especially the residents of Barangay Macambol. We are similarly aware that the mining industries poor image is “partly the result of the past abuses and partly consequence of the fact that a modern mine has not been developed in the last decade.” Philippine mining of today remains dominated by mining operations that started in the 60’s and 70’s when the environmental revolution was gaining steam, a time when new mining technologies were evolving, a time when environmental management in mining was starting to get a foothold in the global mining arena (Hill, 1993).

The mining industry deserves a new beginning. The Mining Act will work for the government, the community, the economy, and the environment. If the stakeholders bind together to make it work. The establishment of a multi-stakeholder consultative framework where issues can be resolved in a cooperative rather than confrontational manner is a step towards this direction. We believe that such a framework will not only create greater understanding of the mining industry but will also serve as an important non-regulatory tool to supplement existing regulatory mechanisms (Hill, 1993). In due time, the mining industry can prove that it is not only a viable development alternative but also an able partner of the community, economy, and stewards of the environment (Hill, 1993).

Conclusion

Results revealed that few (31%) belong to the age bracket 41-50. The respondents were composed of males (33%); females (67%), and many (91%) were married. Many (41%) finished at least an elementary education. Most of their sources of income were farming (42%), fishing (44%), business (16%), and livestock raising (8%). The majority of the respondents (76%) have a monthly income below Php 3,000. A high percentage of the respondents agreed on mining operation (5%) and work opportunity (53%). Others (45%) disagreed on mining operations because they can destroy nature (44%) through the introduction of toxic chemicals that threaten the environment. Out of 250 respondents, few (30%) were sure that they can work in the mining corporation, and many of the respondents (70%) were not sure to work because only selected workers with backers could work in the company.

Respondents perceived that there was a possibility that the quality of living could be changed (81%); only a few said no (19%). They also perceived that there are establishments that can be built in their place (83%); only a few said none (7%). There is also a possibility that the number of residents in their place will increase (93 %), as the highest percentage, and only a few said no (7%). In terms of the environmental impact, the destruction of forests (89%), sea pollution, air pollution, animals getting sick and dying, land destruction, humans getting sick and dying, and plants dying too (92%) were the highest percentages in the respondents’ perceptions in terms of environmental impact towards mining operations. A few of the respondents said none (8%) because there is proper management of the Mining Corporation. Other respondents said that there is an effect, but not all the living things in the environment (2%) will be affected. Out of 250 respondents, only a few respondents (22%) were exposed to reading materials like newspapers. Others (78 %) have no access due to transportation problems.

A bigger percentage of the respondents (73%) were not exposed to television to watch news about mining because they do not have TV sets. Only a few (27%) were exposed on television. Most of the respondents (65%) listen to the radio for mining news. Only a few (35%)

do not have radio sets, which means they do not have access to this communication medium. The majority of the respondents (76%) said that there was a consultation that took place about the mining operation project. The others (24%) are not aware because they are not interested and are busy with their work. Based on the respondents' responses, the majority (69%) said that there are seminars and information given to them about mining operations. Others (31%) were informed because they were not interested and were busy with their work. Most of the respondents were informed about the construction of the mining operation (88%), and the remaining were not informed (12%). The majority of the respondents were informed (79%) of what type of mineral was being extracted, and only a few (21%) were not informed of what type of mineral was being extracted. Most of the respondents (21%) were not informed about the use of the mineral. Only a few (23%) were informed about the use of the mineral.

References

- Arms, K. 1994. *Environmental Science*, second Edition. Saunders College Publishing-Harcourt Brace College Publisher Pp. 183-184.
- Beteman, I., and K. Willis. 1999 *Valuing Environmental Preferences: Theory and Practice of the Contingent Valuation Method*. Oxford: Oxford University Press, p. 40.
- Botkin, D.B and E. A Keller. 1995. *Environment Science: Earth as a Living Planet*. John Wiley and Sons, Inc., New York.
- Brewer, R. 1994. *Ecology*, Third Edition. W. H. Freeman and company. p 5.
- Burgess, J., E. Barbier and C. Folke. 1994. *Paradise Lost? The Ecological Economics of Biodiversity Decline*. London Earthscan. P 34
- Center for Alternative Development Initiatives. 1998. *Understanding the Philippine Agenda 21*. Philippine Council for Sustainable Development Sub-committee on Information and Education, Integrated Environmental for sustainable Development Programmed, Manila, Philippines. Pp. 15-23.
- Cruz, I. 1999. *An Overview of the Mining Industry and Regulatory Climate in the Philippines. Minding Mining! Lessons from the Philippines*, by the Philippines International Forum. February 1999.
- Duresa, J. 2003 *Minanews, Mineral Industry Key Part of Mindanao Growth*. Mindanao Association for Mineral Industries, Inc. (MINA) Information Newsletter Vol. 1 Issue 3 May June 2003.
- Environmental Management and Pollution control*.2003. *The Air We Breathe*. RA. 8749 The Philippine Clean Air Act of 1999. Trimark Publishing. P.1
- Encyclopedia Americana*. 1997. Delure Library Edition. p 168 Pp. 183-184
- Freedman, B. 1994. *Environmental Ecology*, Second Edition Sunders College Publisher 46

- Holden, W 2004. Hotspots in the Philippines: Critical Ecosystem Partnership Fund, Macambol, Mati, Davao Oriental.
- Humphreys, D. (2002). Mining and sustainable development: The mining industry's contribution to sustainable development. International Institute for Environment and Development.
- Lynch, M. (2002). Mining in World History. London: Reaktion Books. Earthscan. P 34
- Mati Municipal Planning Office 2001 Socio-Economic Profile Barangay Hill, B. 1993. Institute of Cultural Ecology Published in Popular Mining #58 p 32.
- Klee, Gary A. 1991. Conservation of Natural Resources. Department of Geography and Environmental Studies San Jose State University Pp. 334-337
- Padua, R.N. 2000. Elements of research and Statistical Models. MPSC Publishing House Cagayan de Oro City, Philippines. Pp.54-55.
- Ricklefs, R.E. 1990. Ecology, Third Edition. W H. Freeman and Company. P5.
- Rio Tuba Mining Operation: An Ecological Time Bomb, Manila Bulletin, 18/10/2003
- Walpole, R. E. 1982. Introduction to Statistics. 3rd Ed. Macmillan Pub. Inc. New York. p.521.
- <http://www.Minesandcommunities.Org/company/philex/htm>. DIOPIM Committee on Mining issues by Natividad Fiel. July 7, 2004.
- <http://countrystudies.Us/Philippines/70.htm>. National: Situation: The Mining Industry In the Philippines by Engr. Catalino L. Corpus Jr. July 10, 2004.
- (<http://ehp.niehs.nih.gov/members/2003/6059/html>.)
- <http://www.marthamine.co.nz/econ-employ.Html>.
- <http://interactive.Usask.Cal/5ki/mining/economy/> July 10,2004.
- www.bls.Gov/eco/cg/egs004.htm. July 4, 2004.
- www.Phisol.nl/pir/v2/Regclimate-99b.htm. The Regulatory Climate for Mining in the Philippines. July 7,2004.
- [www Mmaj.go.jp/mmaj-e/asianlaw/Philippine.htm](http://www.Mmaj.go.jp/mmaj-e/asianlaw/Philippine.htm)./ July 10, 2004.
- <http://www.brgm.fr/MNEO/userneed/IMPACTS.Pdf>. July 4, 2004.
- [www Geogle.com](http://www.Geogle.com). July 9, 2004.