TWO SIDES TO EVERY STORY:

A CASE OF ENVIRONMENTAL COMMUNICATION IN MAE MOH, THAILAND

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ABSTRACT

This report addresses the environmental health communication techniques used by the coal mine and power plant of the Electricity Generating Authority of Thailand (EGAT) in rural Mae Moh. In the past, EGAT was the cause of environmental disasters in which SO_2 emissions soared, causing environmental and physical health effects to the surrounding areas. With such disasters at stake, communication of pollution levels became an important objective for EGAT. Our goals were to identify EGAT's environmental communication strategies and resident's information needs to determine areas for improvement. We accomplished this goal through interviews with EGAT employees and discussion with residents of three Mae Moh villages. Information accessibility, information comprehensibility, and trust emerged as the main barriers to communication that prevent positive reception by the villagers. We conclude the report with communication guidelines addressing information access and comprehension and with further recommendations for EGAT regarding increased interaction with villagers.

ACKNOWLEDGEMENTS

The success of our project depended on the contributions of many individuals over the past four months. We would like to take the time to thank all of those who have helped and supported us in this process.

First, we would like to thank our sponsor, Dr. Nuntavarn for arranging and supervising our project. The guidance and contacts she provided were invaluable for completion of the project. We would also like to thank EGAT employees for their assistance to our project and their hospitality. Numerous employees took time from their busy schedules to give us their opinions. Special thanks should be given to Khun Boontien and Khun Lite for their extraordinary effort in organizing our fieldwork schedule. Khun Boontien also provided suggestions and feedback for persons to interview, format of presentations, and interview question construction. We would also like to thank the village residents and government officials of Mae Moh who met with us and provided us with information we used to develop our conclusions and recommendations.

Thanks is due to both the community members of Mae Moh and the employees of EGAT for teaching us Thai, introducing us to foods, and involving us in other aspects of Thai culture.

We especially appreciated the help of our translator, Khun Opal (Hatarat Poomkachar) who made community interaction possible. Her assistance in interviewing and her knowledge and experience in Mae Moh community enabled us to ask more meaningful and involved questions.

Final thanks go to our Worcester Polytechnic Institute Advisors: Professor Chrysanthe Demetry, Professor Thomas Robertson, and Professor Richard Vaz for their guidance throughout the project. Their comments were especially helpful in teaching us strategies to improve our project. We would also like to acknowledge the contributions of Professor Robert Krueger and Professor Seth Tuler who supplied us with vast resources and ideas in preparation for the project.

EXECUTIVE SUMMARY

Electricity generation is a major source of air pollution around the world (Environmental Defense, 2002). Power plants are responsible for sulfur dioxide (SO_2) and nitrous oxide (NO_X) emissions, which undermine the environment and human health. Electricity Generating Authority of Thailand (EGAT) is the sole supplier of energy in Thailand. The EGAT facility in Mae Moh district of Lampang province, established in 1978, is a coal burning power plant responsible for 25% of the country's energy supply. When uncontrolled, it was known as the largest point source of SO_2 emissions in Thailand (Suayson & Wangwongwatana). The district of Mae Moh consists of 42 rural villages that were inhabited primarily by farmers prior to EGAT's arrival. Construction and operation of the power plant and mine have had severe environmental and social impacts on the area. EGAT has taken measures to mitigate these impacts through environmental improvements and community development. Despite EGAT's efforts, communication between EGAT and Mae Moh residents remains difficult. Through our fieldwork we discovered that mistrust, information accessibility, and information comprehensibility, were the main obstacles that prevented effective communication. With the above mentioned criteria in mind, the goal of our project in Mae Moh was to assess EGAT's current communication strategies and make recommendations for improvements specific to villagers' information needs.

METHODOLOGY

To meet our project goal, we developed the following research objectives:

1. *Build trust with EGAT employees, Mae Moh communities, and NGOs in order to learn about their perspectives regarding EGAT's impacts on area residents*
2. *Identify EGAT's communication strategies in terms of content, presentation, and accessibility and identify the local villagers' information needs regarding pollution and other environmental concerns*
3. *Develop recommendations by comparing EGAT's strategies with the people's needs to determine communication gaps*
4. *Deliver recommendations to EGAT's environmental, public relations, and community development divisions.*

To gain the trust of EGAT employees and learn about their side of the story, we toured EGAT facilities, conducted historical research, and performed interviews. Tours and historical research gave us a general idea of EGAT's operations while interviews helped us identify current communication methods. We interviewed 18 EGAT employees in the environmental, public relations, and community development divisions. From these interviews, we gained an understanding of how these groups work together to develop and implement communication strategies. With this information in mind, we selected three villages from Mae Moh district, each

representing a poor, neutral, or satisfactory relationship with EGAT. To learn the villagers' side of the story, we built trust and established relationships with Mae Moh residents through participation in community events and learning about their culture. These relationship building efforts facilitated informal group discussions with monks, village heads, teachers, and the general public. Informal discussions were conducted with groups of up to 8 villagers and generally lasted 1-2 hours. This method allowed us to obtain their insight on the relationship with EGAT and their information needs. Informal discussions allowed us to investigate potential causes for communication gaps between EGAT and Mae Moh villagers. With gaps identified, we used factors of risk perception, issues of trust and credibility, lessons from stakeholder involvement, and successes and failures of published risk communication models to help us determine areas and methods for improvement.

During our field work, we encountered several challenges and limitations. One of our biggest challenges was establishing trust and credibility with Mae Moh and EGAT communities. We gained trust more easily from EGAT from our daily interaction with the employees. Gaining trust from the villagers was more difficult because of our limited interaction with the villagers due to our residence in EGAT housing and lack of transportation to community events. Our translator not only bridged the communication gap with Thai speaking villagers, she also helped our credibility. Her social science background, with research experience in Mae Moh, facilitated interactions with both EGAT and the community members. Even with her help, we still had to overcome the difficulties of our conversations being a very sensitive subject for EGAT employees and villagers alike. Whereas EGAT employees may have been hesitant to speak out against their own company, the villagers may have been hesitant to provide honest opinions about a powerful institution, such as EGAT. Throughout our research process, we realized that there were two sides to this story of environmental communication. We constantly tried to obtain unbiased information from both sides to provide the reader with a balanced view of the situation. In this paper, we try to convey these two sides by presenting examples of both parties' contribution to successes and failures of the current relationship and communication between EGAT and the local villagers.

FINDINGS

Through evaluation of our interview and discussion responses, we developed the following findings regarding EGAT's communication methods, villagers' concerns, and the existing relationship between the two parties:

1. **Despite EGAT's communication efforts, current methods have varied success.** Some of the communication methods EGAT currently employs include environmental information boards, village announcements, and educational outreach programs. Our research focused on these methods because they received the most feedback from the villagers. Along with a larger issue of mistrust, we analyzed these methods based on the information accessibility

and comprehensibility. Villagers are particularly dissatisfied with environmental information boards that display air quality, noise pollution, and vibration levels. Villagers find the boards difficult to comprehend due to excess of technical information and conflicting data with what they see and feel in the air. When environmental information is included in the daily announcements, villagers find it more accessible as the announcements are a part of their daily lives. However, the problem remains in comprehensibility because the information relayed through this method is the same as that posted on the boards. Educational outreach programs received the most positive feedback from the villagers because they are more accessible and comprehensible than other methods employed by EGAT. In our analysis of EGAT's methods, we had to realize that mistrust in EGAT's operations and monitoring often hinders reception of information even despite improvements in the other two areas. Our research directs us to believe that overcoming the obstacles of mistrust, information accessibility, and information accessibility will improve not only communication but also the relationship between EGAT and the villagers.

2. **Individual pollutant levels are not representative of what the villagers experience.** Villagers have expressed frustration with EGAT's communication methods representing pollutant levels individually because they do not accurately reflect what the people are feeling. A barrier in acceptance of EGAT's communication is the lack of acknowledgement that many small, below-standard pollution levels can add up to a large annoyance.

3. **Unique relationships require unique communication considerations.** Community discussions highlighted each village's unique concerns and perspectives regarding EGAT. We found Pong Chai village's positive relationship with EGAT to be calm and generally indifferent regarding pollution control and environmental communication. They are satisfied with the current communication and do not require drastic improvements. On the other side of the spectrum, Hua Fai village residents are frustrated and dissatisfied with EGAT as a whole. Although villagers here are concerned about the environmental communication they see as ineffective, more urgent issues of compensation and employment take precedence. With these vast differences in satisfaction level, concerns, and demands, we have concluded that "one-size-fits-all" communication models and methods of dealing with communities are ineffective because they fail to accommodate the villagers' varying needs.

4. **Mutual mistrust prevents effective communication**. Our analysis revealed that the main obstacle in communication between EGAT and Mae Moh villagers is mistrust. Many Mae Moh villagers do not trust EGAT's pollution control measures and monitoring systems. Their mistrust stems from the Thai people's general mistrust of large institutions and from EGAT's past denial of pollution effects. Villagers expressed this deep mistrust during our discussions, stating that EGAT reveals only 50% of information and often turns off pollution control systems to save money. They also stated that the presented environmental information is based on standards made by EGAT and that the data can be manipulated to fit

standard values. On the other hand, EGAT officials have stated that they do not trust the villagers because they exaggerate pollution effects and use health claims to receive compensation even if their health issues were in fact caused by smoking. This long lasting mistrust has weakened the relationship between EGAT and the villagers and is the largest issue preventing positive reception of the information regardless of content and presentation.

5. **Villagers' urgent concerns overshadow EGAT's communication efforts.** Many expressed concerns with EGAT were focused on employment, compensation, facility expansion, and resettlement. With such issues in the forefront of the villagers' minds, environmental communication falls lower on their list of priorities and is often ignored despite EGAT's significant efforts towards communication improvement. We concluded from this discovery that communication efforts will likely take a back seat until the more pressing issues are addressed.

6. **Long term improvements are more beneficial than short term solutions.** Our interviews with government officials revealed their beliefs that EGAT's resources are better spent in community development efforts than in monetary compensation. They believe that monetary support is only a short-term solution to a long-term problem. When EGAT vacates Mae Moh in approximately twenty-five years, it will be crucial for the people to be self-sufficient. The government officials say that self-sufficiency can be accomplished through job training and community development.

We would like to acknowledge that this study is not without flaws. Our limited experience and time significantly decreased the reliability of this study. We had little experience interviewing or evaluating communication methods prior to arrival in Mae Moh. Because of this, our interviews were a learning process. The short time allotted for fieldwork also limited the number and length of our interviews. Lastly, the language barrier was the largest obstacle in this study. Translation was an issue not only in the villages where we relied on a translator, but also at EGAT where the employees spoke limited English. Readers of this study should be aware of these limitations to gauge the credibility of our findings and the following recommendations.

RECOMMENDATIONS

Based on our findings, we have identified three main obstacles of communication: mistrust, information accessibility, and information comprehensibility. We have created recommendations, addressing these areas, intended to improve environmental communication between EGAT and the villagers of Mae Moh. Although the root issues are far deeper than simple communication adjustments can resolve, we provide practical suggestions that can begin to increase the reception of environmental information.

1. **We recommend the use of communication guidelines that addresses the obstacles of information accessibility and comprehensibility.** Our fieldwork has led us to conclude

that lack of comprehensibility and accessibility are two of the main obstacles to EGAT's communication methods. Many communication methods use scientific data and numbers that the villagers cannot understand or apply to their daily lives. To overcome comprehensibility issues, we recommend that language and numerical data be simplified and personalized to increase the information's comprehensibility and relevance to villagers' lives. To address the accessibility, we suggest the increased use of auditory communication methods which provide information to villagers without requiring effort on their part.

2. **We recommend expansion of community consultation before and after new communication method implementation.** We found there is little direct contact between EGAT and the communities for new communication strategy development or for villager response to methods of communication. Most current consultation processes focus on the issues such as relocation and job access. Because of this, some environmental communication methods are difficult for villagers to understand and do not address their concerns. We suggest using Systematic Client Consultation (SCC) for increased interaction with the villagers (The World Bank, 1992). This method emphasizes listening, continuous communication and use of client feedback for future project design. SCC may help EGAT gain a better understanding of villagers' concerns, allowing them to address those needs with more relevant communication methods.

3. **We recommend a training program to teach the villagers how to interpret environmental information.** Many villagers complained that the information they receive from EGAT is too technically advanced and not relevant to their daily activities. We suggest that a training program be implemented that teaches villagers about general power plant operations, pollution control measures, monitoring systems, and most importantly, how to interpret environmental information. This overview would increase villager understanding of the information helping them to find its relevance in their daily lives.

These suggestions, if implemented, could potentially improve EGAT's environmental communication and be a start towards a better relationship with the community through increased interaction. In addition, we hope that our research will reach beyond the limits of Mae Moh district and have applications to other communication difficulties between large industries in developing countries and their surrounding communities. This research has the potential to show other industries the importance of trust and effective communication in their relationship with local residents. It can also demonstrate examples of processes and guidelines for improvement.

CONTRIBUTIONS

Ryan Eley

Ryan served as the primary interviewer during the fieldwork stage of our project. He developed interview questions prior to and during interviews, wording them based on the interviewee's English speaking skills and job responsibilities. In addition, he was the primary composer of material for presentations. Ryan was the primary contact person, facilitating communication between EGAT and our group. Ryan also edited sections of the paper for citations.

Timothy Grant

Tim performed research involved in the technical aspects of EGAT's operations. Tim served as a relentless editor for many sections of the paper, reading drafts repeatedly to ensure quality. This editing focused on grammatical errors, sentence structure, and punctuation. Tim's ideas contributed to discussion which led to development of the findings and recommendations. In addition, Tim provided technical assistance with computer and formatting difficulties which allowed the project process to run smoothly.

Alexandra Kulinkina

Sasha shared responsibilities with Alex as primary writer and editor for all sections of this report. She was responsible for the drafts and finalization of Introduction, Background, and Findings sections of the report. Sasha was especially skilled in organizational tactics and used this to arrange and order sections of each chapter. She also took notes during interviews and developed further questions to be used for analysis and recommendation development. In addition, she coauthored the executive summary and drafted the abstract and acknowledgements.

Alexandra Sanseverino

With Sasha, Alex was a primary writer and editor for all sections of this report. She coauthored the executive summary and findings sections and compiled the references section of the report. She was responsible for the drafts and finalization of the Methodology and Recommendations and Conclusions sections of the report. She also transcribed interview proceedings in great detail and accuracy. Alex also developed the majority of the graphics found within this report. She took pictures of events we participated in throughout our project to be used in this report and for presentations.

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1. INTRODUCTION

Industries around the world emit pollutants that are hazardous to the heath and the environment of surrounding communities. In recent years, industries have made efforts to mitigate their environmental impacts. However, pollution still threatens the health of surrounding communities. Researchers assert that people living near industrial pollution sources have a right to know about risks of health hazards and how the industry handles reducing these risks (Hook & Lucier, 2000; Lambert et al., 1999). Honest communication between the industry and the surrounding communities helps mitigate the people's feeling of being at risk and increase trust in the industry operations (Rich et al., 1995).

Environmental health communication, often referred to as risk communication, is a complex issue that requires consideration of many factors such as risk perception, trust and credibility, and stakeholder involvement. Understanding how a community perceives risk is crucial in the development of an effective communication strategy (Santos, 1990). Studies also indicate that information presented by industries perceived as credible and trustworthy is more easily accepted by the public (Lofstedt, 2004). Similarly, the process of involving stakeholders in the development of a communication strategy allows for a better understanding of the community and their information needs (Webler, 2001). Despite ongoing research, risk communication continues to be a challenge for industries. Many cases of ineffective communication resulting in poor relationships with impacted communities, serve as examples of how intricate the issues of environmental communication can be.

One example of environmental communication difficulties is in Mae Moh district, located in the Lampang province in rural Northern Thailand. Here, a branch of the Electricity Generating Authority of Thailand (EGAT) struggles to communicate its environmental impacts to the surrounding villages. In the last two decades, the Mae Moh coal powered facility has caused negative health and environmental impacts on the area. A history of respiratory problems and damage to crops, coupled with relocation, resulted in mistrust and a generally poor relationship between EGAT and the villagers. To mitigate its negative impacts, EGAT has taken strides to improve environmental quality in Mae Moh by implementing several pollution control methods. In addition, EGAT has launched community development projects aimed to improve the quality of life in Mae Moh (Montgomery Watson Harza, 2002). Despite all these efforts, mistrust persists. One of the ways to regain trust is through effective communication. People of Mae Moh have the right to know how EGAT impacts their lives. This awareness can be facilitated through communication methods that the people can easily access and understand.

Given this setting, the goal of our project in Mae Moh district was to assess EGAT's current environmental communication strategies and make recommendations for improvements specific to community's information needs. We met this goal by addressing each of the following four objectives:

1. Introduce ourselves to EGAT employees, Mae Moh communities, and NGOs to build trust and learn about their perspectives regarding EGAT's impacts on the local residents.

2. Identify EGAT's communication strategies in terms of content, presentation, and accessibility and identify the villagers' information needs regarding pollution and other environmental concerns.

3. Develop recommendations by comparing EGAT's strategies with the villagers' needs to determine communication gaps.

4. Deliver recommendations to EGAT's environmental, public relations, and community development divisions.

We hope that our research will be a step towards improved communication and increased trust between EGAT and the Mae Moh communities. We believe that effective communication will make local villagers more receptive to the information EGAT presents and increase awareness of environmental issues that impact their daily lives. Although we realize that gaining (or regaining) trust takes time, we hope that our communication recommendations serve as a small contribution to a better relationship between EGAT and the Mae Moh villagers.

2. BACKGROUND AND LITERATURE REVIEW

This chapter introduces the two sides of the story of environmental communication in Mae Moh, Thailand. The first side is EGAT, recognizing its past mistakes and current difficulties in gaining the trust of the people. The other consists of the Mae Moh villagers, aware of EGAT's improvements but remaining dissatisfied and frustrated with EGAT's communication efforts. This chapter addresses the background factors that have led to these two very different sides of the Mae Moh story:

1. *EGAT's positive impacts on local economy through community development.*
2. *Changes in villager life due to EGAT's arrival.*
3. *Risk communication research as it applies to reducing communication gaps between EGAT and the villagers.*
4. *EGAT's improvements in both environmental impacts and communication.*

2.1 ENERGY GENERATION IN THAILAND AND MAE MOH

Thailand's energy demand has increased greatly in the last two decades due to the country's rapid economic growth. This growing demand requires additional energy generation efforts. Energy in Thailand is generated from a variety of sources including petroleum products, natural gas, condensate, and lignite coal (Electricity Generating Authority of Thailand, 2006). Because lignite is the most abundant local resource, the Thai government encourages its use for meeting the country's vast energy demands (K. Naopnhthai, personal communication, January 30, 2008).

The Electricity Generating Authority of Thailand (EGAT) is the country's major energy provider. It operates several power plants throughout Thailand, including thermal, hydro and coal powered units. The Mae Moh power plant is Thailand's second largest power source, providing 25% of the country's total supply. Lignite, obtained from an open pit mine in the Mae Moh basin, powers its operations. The Lignite Authority established the first lignite development in Mae Moh in 1954. EGAT took over and expanded mining operations starting in 1969, constructing the first three power generating units in1978. These original units did not have pollution reducing measures and emitted SO_2. EGAT added power units 4-13 over the next 17 years, finishing in 1995. Having learned from incidents of high emissions, EGAT equipped the new units with pollution prevention measures. The power plant currently operates units 4-13 for energy production and the coal mine has expanded to accommodate for constantly growing energy demand. In this mining area, lignite is a favorable local resource for the authorities because of abundance and low cost. Many residents of Mae Moh District understand the energy need but are unwilling to accept the sacrifices and lifestyle changes they are forced to endure due to the facility's operation (Montgomery Watson Harza, 2002).

2.2 EGAT'S HISTORY IN MAE MOH

Most villages in the Mae Moh basin were settled before development of EGAT. The villages were mostly located along forests and river banks and were surrounded by mountains. Villagers' lifestyle generally consisted of cultivation, animal husbandry, and internal trading. Villagers grew rice, corn, peanuts, vegetables, and fruit. The land was very fertile for farming and there was also an abundance of food in the forests and rivers. Therefore, shortages of food and water were a rarity. These settlements were a desirable place to live and many people migrated to the Mae Moh basin over time (Montgomery Watson Harza, 2002).

EGAT's presence in Mae Moh has had significant effects on the surrounding villages, both positive and negative. Environmental impacts have caused many villagers' to adapt to new way of life in Mae Moh. Although EGAT's presence in Mae Moh is usually associated with negative impacts on the area, local people receive benefits as well. EGAT has funded improved infrastructure through the construction of new roads and the repair of old roads. Improved access to the villages led to increased availability of telephones and electricity. Job availability also increased due to improved road conditions and the abundance of positions at the EGAT facilities. A second benefit is EGAT's financial support of the surrounding communities. The district government receives annual compensation in the tens of millions of Baht. EGAT also donates money for the repair and building of temples and schools within villages. EGAT funded projects offer scholarships to high school students and transportation to and from school. Some villages have received water pipelines and occasional medical care at little to no expense. Generally, EGAT's presence has increased economic and community development (Montgomery Watson Harza, 2002).

In addition to monetary contributions mentioned above, EGAT has contributed to the area's development through funding the Population and Development Association (PDA) and Quality of Life Development Association (QDA) projects. The PDA and QDA have similar objectives but use different methods for meeting them. The PDA focuses on employment issues and job training while the QDA is responsible for supporting education and providing social support (K. Michimon, personal communication, January 28, 2008). The PDA is a non-governmental organization established in 2004. Its objectives are to promote vocational opportunities, encourage participation in community development, and enhance potential and capability of people towards sustainable development. The QDA was established in 2000 with objectives of enhancing the quality of life in Mae Moh and increasing understanding between villagers and EGAT. QDA projects assist local schools by providing equipment and lunches for the students. It also provides social support for less capable people (elderly, handicapped, etc.). Community development efforts of the PDA and QDA are generally well received and are some of the most positive impacts EGAT has been responsible for in Mae Moh.

Despite the numbered positive impacts, EGAT's presence has caused problems. First, EGAT's presence uprooted families to allow for mine construction and expansion. Resettlement issues persist; many villagers still desire relocation while others instead campaign for environmental improvement. Second, beyond resettlement, Mae Moh villagers have had to endure water shortages due to construction and operation of the mine's dams and reservoirs. Where local rivers were formerly a natural source of water for domestic and consumption uses, villagers now have to rely on EGAT to provide them with water. Third, mining and plant operation have led to health problems resulting from air pollution and contaminated water. Mae Moh residents have experienced illnesses such as bronchitis, chronic sinus infections, stuffy noses, dizziness, and skin diseases. Such physical health issues cause psychological effects on the community as well. They feel unsafe living in areas around the mine and often feel that EGAT's environmental improvement efforts are insincere (Montgomery Watson Harza, 2002). In a quality of life study of EGAT's impacts on villager health, researchers found that the health of Mae Moh families is not as good as it could be. In 1998, death rates increased from 6.33% to 8.74% from the previous year. The percentage of citizens suffering from respiratory ailments increased as well. The number of patients with respiratory tract infections increased from 480.55 in 1995 to 582.86 in 1998 (for a 1000-population ratio) (Office of National Economic and Social Development Board, ONEDSB, 2001).

Aside from personal health effects, EGAT's pollution affects environmental quality. Crop productivity has decreased, likely due to both pollution and lack of water supply. Negative impacts on farming have forced a people once focused on agriculture and animal husbandry to switch careers to work in employment-related fields. With these lifestyle changes, money has become a more important part of everyday life. Village life, which used to be self sufficient and based on a social structure of kinship and family, was forced to adapt (Montgomery Watson Harza, 2002).

The most serious negative impacts were the two major environmental accidents that impacted villages and destroyed trust between EGAT and the local communities. During the first incident in October 1992, an atmospheric inversion caused high SO_2 concentrations to be released into the environment. The national standard for SO_2 emissions (1300 $\mu g/m^3$) was greatly exceeded at above 3400 $\mu g/m^3$ over a four hour period. Villages located downwind of the power plant experienced severe health effects. Some of the symptoms, quoted in a Pollution Control Department report were "stinging nose and throat, cough, chest tightness, asthmatic attacks, nausea, vomiting, dizziness, malaise and wheezing" (Suayson & Wangwongwatana, p. 2). In addition to the personal health issues in the area, this incident also affected farm animals and crops. According to reports, vegetation "withered and fell to the ground overnight" (Suayson & Wangwongwatana, p. 2). Because this incident received a lot of media attention, EGAT began to make environmental improvements which will be discussed in the following section.

During installation of pollution control measures, an additional SO_2 incident occurred in 1998. In this case, similar atmospheric conditions caused SO_2 to be released into the air at concentrations of 2200 µg/m^3 (Suayson & Wangwongwatana). Approximately 400 Mae Moh villagers were hospitalized for respiratory symptoms similar to those recorded in 1992 (Data Annex: Thailand, 2007). The effects on crops and livestock were similar as well (Suayson & Wangwongwatana).

After the high pollution releases in the 1990s, EGAT took steps to minimize its environmental effects and to improve community relations. EGAT implemented pollution control measures to ensure that its emissions fell below set standards. The measures EGAT implemented address air and water quality, noise, and vibration control (Montgomery Watson Harza, 2002).

Air Quality Improvements. After the 1992 SO_2 incident, the National Environmental Board of Thailand passed the Enhancement and Conservation of National Environmental Quality Act (1992). This act dictated air quality standards for all industries, including emission standards for SO_2, nitrogen dioxide (NO_2), total suspended particulate matter (TSP), and respirable particulate matter smaller than 10 microns (PM10) (Montgomery Watson Harza, 2002). Complying with the new air quality standards, EGAT installed Flue Gas Desulfurization (FGD) systems. These systems reduced SO_2 emissions by 95%, putting the Mae Moh Power Plant well below Thailand's Air Quality Standards (Scrubbers for Bulgaria, 2003). The Power Plant currently operates power units 4-13, all of which have FGD systems (Montgomery Watson Harza, 2002).

Total suspended particulates (TSP) also concern Mae Moh residents since levels in the area have consistently been over Thailand's national standards (Montgomery Watson Harza, 2002). Although TSP comes from a number of sources (dust, fly ash, vehicular exhaust) EGAT installed electrostatic precipitators that remove 99% of fly ash and dust from stack emissions. To reduce dust from mining, EGAT planted a "green belt," a barrier of trees around the mine that capture and settle heavy dust particles. Another method of controlling dust EGAT employs is spraying the overburden, roads, and machinery during operations (Montgomery Watson Harza, 2002).

Water Quality Improvements. EGAT uses vast amounts of water each day about 12,000 m^3 for the mine and up to 165,000 m^3 for the power plant. Both facilities discharge contaminated wastewater unsuitable for drinking, wildlife and agriculture. In order to protect groundwater, Mae Moh Mine has several stations to pump the contaminated water into settling ponds. These ponds allow the heavier particles to settle to the bottom. This water is then fed into wetland areas where organic treatments cleanse the water of impurities. Treated wastewater is reused in mine and power plant operations or discharged back into the environment (Montgomery Watson Harza, 2002).

Noise and Vibration Control. Many villagers living close to the mine also complain about noise and vibrations. To address these issues, EGAT installed monitoring stations in areas of concern. According to monitoring data, both noise and vibration levels are well below national

standards. Out of concern for nearby residents, EGAT also restricted mining and blasting operations to occur between 0900 and 1700 hours (Montgomery Watson Harza, 2002).

With these environmental impacts and improvements, there becomes a need for communication to explain the impacts on villagers. To address the challenges that arise in this communication, the components of risk communication can be applied.

2.3 RISK COMMUNICATION LITERATURE REVIEW

To delve deeper into the problems surrounding environmental communication in Mae Moh, we consulted risk communication literature. Our research revealed many challenges that arise in communicating risk to the public. One of the most difficult aspects of risk communication is that it is not a black and white issue of safe versus unsafe. It is ruled by each case's unique conditions and the need to accommodate for these conditions in communication strategies. Every stakeholder perceives risk differently, depending on the presentation and effectiveness of the provided information. An expert explained: "We can have the most advanced risk insights, the best science, the leading experts in the field, but if we do not have an effective communication plan, we will fail" (Nuclear Regulatory Commission, 2004). Effective communication requires analysis of several contributing factors that impact understanding and acceptance of information by the public.

The following are some of the general aspects of risk communication that literature review revealed:

1. *Understanding how the receiving community perceives risk.*
2. *Acknowledging the importance of the communicating agency to be trustworthy and credible.*
3. *Becoming familiar with models for effective risk communication.*

Risk Perception. In order to establish effective risk communication strategies, it is important to understand how the public perceives risk. Demographic and sociological factors, such as race and gender differences, education level, and cultural biases are a few of the many factors that influence risk communication.

The issue of disempowerment is yet another factor of risk perception. People who feel vulnerable are inevitably prone to feel more at risk (ex. people in misrepresented areas whose opinions often go unheard). As the following quote shows, minority communities often feel like environmental hazards are imposed on them. "Many risk problems are framed by minorities as questions of justice and fairness and not as technical, scientific, or economic problems" (Scatterfield et al., 2004, p. 121).

Researchers have identified and classified many characteristics of risk perception referred to as "outrage" factors. Some of these factors are whether the risk is voluntary or involuntary, controlled by the system or by the individual, dreaded or not dreaded, and whether it comes from trustworthy or untrustworthy sources. For instance, people tend to view voluntary risks that are within their control as less dangerous (ex. smoking or driving without a seatbelt). However, when it comes to a risk that is imposed on them, like a contaminated water supply, it is perceived as more dangerous (Santos, 1990). Another example is trust: "If the public trusts regulators, then they will perceive the risk to be less than when they do not trust the regulators" (Lofstedt, 2004, p. 4). The amount of trust the public has in the regulators and their perceptions of risk are in direct correlation.

In the context of our project, outrage factors play a role in Mae Moh villagers' perception of risk. Considering the fact that EGAT is a powerful institution, villagers may feel vulnerable and more at risk to environmental hazards. The risk is also out of their control and involuntary. These factors are just one of the components that influence environmental communication between EGAT and Mae Moh villagers.

Trust and Credibility. Research shows that another important aspect of risk communication effectiveness is the communicating agency's trustworthiness and credibility. Efforts to establish trust in the community is typically the foundation of a healthy relationship between an organization and the public. The community perception of a company depends on whether it is caring, competent, and honorable (Covello et al, 1987). A company can achieve this positive perception is to be open and transparent, including the public from the beginning of the risk communication process. According to Fessenden-Raden, "Don't tell [the community] there is nothing wrong and then come in and sample with moonsuits on" (Craigmill, 1987). This type of action excludes the public, indicates information concealment and fosters mistrust.

One of the obstacles organizations face in establishing an open relationship with the community is maintaining trust and credibility. "Numerous recent studies clearly point to lack of trust as a critical factor underlying the divisive controversies that surround the management of technological hazards" (Flynn et al., 2001, p.43). In the case of Mae Moh, EGAT minimized environmental effects through emission reducing improvements (Scrubbers for Bulgaria, 2003). It has also attempted to communicate these improvements to the surrounding villages but the lack of trust persists between Mae Moh and EGAT. This illustrates that in many communication cases; even truthful information is only as credible as the source that provides it.

Effective Risk Communication Strategy Components. Before forming a risk communication strategy, it is important to identify the issue, audience, communication message, and method of presentation. Issues that require communication are not obvious or tangible; they are created by the public. Johnson states that issues "stem from particular political, economic, and technical contexts" (1999, p.337). After issue identification, researchers recommend that the

communicator become familiar with the audience. Much of the research on risk communication emphasizes the need to be aware of the audience's concerns, questions, needs, and abilities. Different audiences require different communication strategies. Because of this, messages are more effective when developed after audience assessment, in response to the audience-specific factors. The Seven Cardinal Rules of Risk Communication, created by the Environmental Protection Agency (EPA), provides guidelines for such actions. This pamphlet emphasizes the personalization of information stating "there is no such entity as 'the public'; instead, there are many publics, each with its own interests, needs, concerns, priorities, preferences, and organizations" (EPA, p.1).

When creating the communication message, organizations must determine several factors: how much information should be included, what information should be discussed, and how information should be presented. Experts in the fields of communication ethics state that full disclosure is an organization's best route. This approach has its drawbacks, specifically, assuming that the public desires to receive all information. Full disclosure often overloads the public with too much technical information, forcing them to sift through vast quantities of text to determine what is important (Johnson, 1999). To avoid information overload, organizations must determine what information is to be included in a risk message. Ethics experts argue that information should veer from the technology of the risk and focus more on what directly affects the daily lives of the public. This includes information as to what will be done in risk prevention, who can be held responsible, what recourse is available, etc. (Johnson, 1999). Debates on this topic continue, the opposition arguing that providing only personal-based information and neglecting the actual data is unethical.

While the informational content is important, equally or possibly more important is the method of presentation. Poor presentation of information can lead to the distribution of biased information. Jungermann states that, although it is difficult to do, the best messages are ones in which "the recipient cannot tell whether the message comes from a proponent or an opponent of the risk activity" (1996, p.317). Information can be introduced in a technical manner with scientific, quantitative data. This method frames consequences as measurable physical data. In contrast, information can be presented in an audience-based manner that focuses more on the individual's requests and the social consequences. Plough and Krimsky referred to these two methods of presentation as technical rationality and cultural rationality respectively. Providing multiple forms of information allow the public to choose which presentation best suits their needs (Krimsky & Plough, 1988).

2.4 EGAT'S RECENT COMMUNICATION STRATEGIES

With the installation of environmental improvements in response to the incidents in the 1990s, increased communication became necessary to convey improvement efforts to the public. Along

with developing specific communication strategies, EGAT also works to strengthen their relationship with the surrounding villages.

Currently, the communicated information is based on the data from EGAT's 11 monitoring stations located within the mine and several villages. Every station transmits data to an environmental database for analysis (Montgomery Watson Harza, 2002). From the database, reports are compiled and disseminated to various divisions of EGAT, the PCD, and local governments. EGAT monitors both water and air for various pollutants. Water quality is monitored by stations within the mine itself and the surrounding reservoirs. Air quality monitoring stations record levels of sulfur dioxide, nitrogen dioxide, TSP, and PM10 (Montgomery Watson Harza, 2002). EGAT uses several methods for presenting the monitoring data.

Environmental Information Boards. Information boards are EGAT's main device to communicate relevant environmental concerns to villagers. EGAT has posted seven environmental boards throughout ten villages in Mae Moh district. These boards contain information about noise, vibration, and air pollution levels, depending on EGAT's impacts on the specific location (See Figure 2-3 and Figure 9-8 in Appendix B for translation). The boards present air quality through the Air Quality Index (AQI), a classification system based on overall air pollution. It uses a color scale, ranging from good to hazardous, to communicate general air quality. Noise and vibration levels are given in technical terms, along with proposed effects on

Figure 2 The Environmental Information Board in Huai Khing Village

Figure 1 The Environmental Information Board in Hua Fai Village

human health or structure stability. These boards intend to give the villagers a biweekly update of the pollution levels. An EGAT employee translates the raw monitoring data before sending it off to community representatives who update the boards and receive 4,000 Baht per month in return.

Villager Site Visits. EGAT promotes communication by encouraging villagers, especially village leaders, to come to the facilities to learn about operations and monitoring. One of the available site visit programs available to villagers is a tour of the mine, where villagers can observe mining and blasting operations. They can feel the vibrations standing near the blasting sites and compare them to what they feel in their homes. Visitors also have the opportunity to tour the power plant, where they can observe its operations, diagrams of pollution control measures, and monitoring processes.

EGAT's Community Development (CD) department utilizes a local radio station to distribute information. EGAT has a 1-hour program broadcast twice daily on the community radio, to provide environmental information to the public. In addition to EGAT-related information, the station also plays music and advertises communication options for community questions and feedback.

Village Announcements. Though not required by EGAT, village announcements also share information about EGAT. The announcements provide the same information as on the environmental boards. Village headmen receive the information in monthly meetings with EGAT and then utilize community loudspeakers (and messengers for those out of range) to inform the public. EGAT also uses this communication method to relay latest relevant updates to the villagers, such as job openings.

Educational Outreach. EGAT also utilizes the local education system to communicate with the villagers. Mae Moh students learn about a variety of aspects of the environment and EGAT's operations. EGAT arranges tours of the Mae Moh Mining Museum where students learn about mining and electricity generation. EGAT also contributes material about local history, natural resources, and pollution to the school curriculum.

AREAS REQUIRING IMPROVEMENT

In the recent past, EGAT has been very active in implementing and improving communication and community development efforts. Although the efforts have had varied success with the villagers, EGAT's quest for an improved relationship is commendable. Currently, there is little being done to create new communication methods or evaluate past methods. Many EGAT employees believe that there are no problems with the current methods and therefore no strategy improvement required. These employees believe that the villagers' trust in EGAT is at its peak right now and will increase with time, not new communication methods. From community interaction, however, it is clear that there is another side to the story. There are, in fact,

significant areas for improvement that can be addressed to further improve EGAT's environmental communication with villagers.

Lack of trust contributing to poor communication. EGAT has taken measures to improve both their environmental effects and their communication efforts. Despite these advances, "negative perceptions of the Mae Moh power plant and mine persist among sections of the public, the affected people, NGOs and the mass media" (Montgomery Watson Harza, 2002). These negative feelings towards the power plant and mine are based on a variety of issues including land tenure, poor environmental management, and noise. As already mentioned, trust is easy to lose and very difficult to regain. With the 1992 and 1998 SO_2 incidents, EGAT tried to demote the risk rather than communicating in a transparent manner. These incidents have greatly decreased EGAT's credibility, which current improvements have not been able to salvage. Citizens do not trust the FGD system or the dust control measures despite EGAT's claims that "EGAT is confident that the Mae Moh power plant and mine will not adversely affect the environment of Mae Moh District or northern Thailand." According to EGAT officials, trust is a large part of effective communication and it is a main problem they are continually working on (K. Ekapand & P. Sethakamnert, personal communication, January 24, 2008).

Use of technical terms in communication material. From numerous villagers' interview responses, use of technical terms in communication material has proven ineffective. Despite EGAT's effort to present environmental information in a graphical manner to improve understandability, much the information remains technical. As quoted in the Mae Moh assessment report and confirmed by the villagers, they "are not able to understand the specialized nature of the air quality monitoring, the results and their significance" (Montgomery Watson Harza, 2002). This is a large barrier to communication, preventing villagers from actually receiving and understanding the environmental health information.

Lack of accessibility to information. Some of the communicated information from EGAT is not easily accessible to the people. In Na Sak, for example, the environmental information board is located outside the daily routine of most villagers. In addition, environmental boards require action on the part of the villagers for reception of information. Many villagers believe that information should be more easily accessible so that villagers do not have to work to receive it.

2.5 CONCLUSION

From the background information, we can conclude that EGAT's presence has significantly impacted the Mae Moh area. Due to several accidents, EGAT has made improvements regarding environmental performance and communication. Some of these efforts have been more successful than others, but overall, the current relationship between EGAT and the villagers still suffers because of their history. This relationship, built on mistrust and further impacted by a

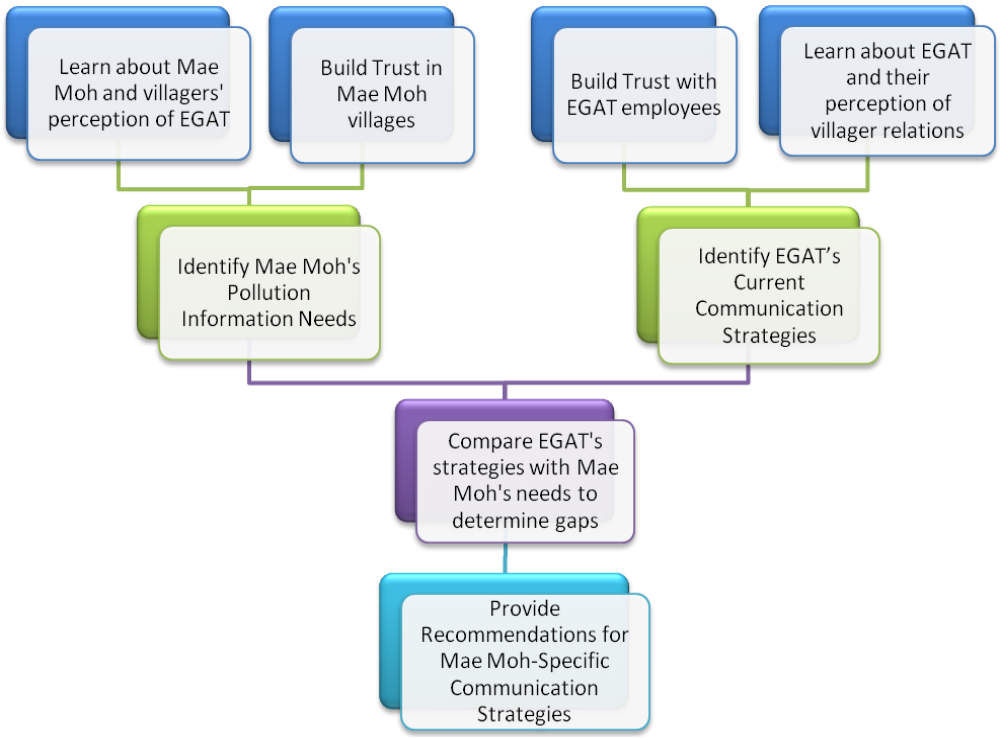
lack of participatory process, contributes to poor communication between EGAT and the Mae Moh community.

3. METHODOLOGY

The goal of our project was to assess EGAT's current environmental communication strategies and make recommendations for improvement specific to Mae Moh's information needs. In order to achieve this goal, we developed the following research objectives (See Figure 3):

1. *Build trust with EGAT employees and the Mae Moh communities to learn about their perspectives regarding EGAT's impacts on local residents.*
2. *Identify EGAT's communication strategies in terms of content, presentation and accessibility and identify villagers' information needs regarding pollution and other environmental concerns.*
3. *Develop recommendations by comparing EGAT's strategies with villagers' needs to determine gaps.*
4. *Deliver findings and recommendations to EGAT's environmental, public relations and community development divisions.*

Figure 3 Graphical Representation of Methodology



3.1 OBJECTIVE 1

Build trust with EGAT employees and Mae Moh communities to learn about their perspectives regarding EGAT's impacts on local residents.

Studies show that outside researchers must overcome obstacles when becoming involved with and researching a culturally unfamiliar community. Some even believe that outside researchers cannot understand or represent the experience of the community (Bridges, 2001). Because of this, groups (particularly disempowered groups) are often resistant to researchers, perceiving their presence as invasion. In addition, inside groups often convey a bland and sanitized version of their reality in a fear of disappointing outside researchers and offending large institutions (Parnwell, 2003). This is especially true for Thais due to their unwillingness to speak out against others. To overcome these complications, outside researchers must gain the trust of the people by forming personal relationships with the researched community members and understanding their culture through individual interaction (Bridges, 2001).

As outsiders in Thailand, the biggest challenge that we faced was establishing trust and credibility with Mae Moh and EGAT. Gaining trust from the villagers was especially difficult because of our residence in EGAT housing and lack of transportation to interact with communities. The constraints on community interaction forced us to abandon plans of the literature's proposed participatory research approach, which required spending the majority of our work day in the community. Having a translator with a social science background and research experience in Mae Moh helped us reduce the impact of limited community interaction on our research. Because of her high level of credibility in the community, we were able to gather more information in the allotted week.

As outsiders with little credibility in the Mae Moh and EGAT communities, we adopted strategies recommended in our research for achieving open and trusting relationships with both. These strategies required initial introductions and continued social interaction with the stakeholders (EGAT employees, related NGOs, and Mae Moh villagers). The strategies we used to approach each group differed according to obstacles such as amount of interaction and nature of social activities for relationship building. The details of these different techniques are explained below. The following section discusses our actions in introducing ourselves to the stakeholders and learning about their perspectives while keeping the challenges of outsiders in mind.

TRUST AND RELATIONSHIP BUILDING WITH EGAT

Our work with EGAT employees involved three main goals: gaining EGAT's trust, learning about EGAT structure and becoming familiar with EGAT history in the Mae Moh area. The first goal, gaining EGAT's trust, was an ongoing process throughout our research. We began our trust

building by introducing ourselves and presenting our research objectives upon arrival. This presentation gave us an opportunity to demonstrate our preparation and our awareness of the difficulties in communicating with the public. We also expressed our eagerness to work alongside with EGAT employees, and more importantly, to learn from them. This first step facilitated the following research and interviews. Further steps in the ongoing relationship development process involved interacting with our coworkers on a social level, including lunch outings and cultural exchanges. Our efforts toward social interaction were reciprocated with invitations to temples, local markets, and golf matches. Time constraints on fieldwork prevented relationships from becoming as strong as we had aimed. Despite these time constraints, we maintained our relationship by involving EGAT in every step of our methodology. We consulted our EGAT liaisons for schedule development and interview question formation to maintain their involvement. This step informed EGAT of our progress to keep them comfortable with our research process.

Through our second goal, learning about EGAT's structure, we hoped to foster a deeper understanding of the workings of EGAT as a whole and on a division level. Site visits allowed us to gain the big picture of EGAT's structure and operations. This included touring the power plant, mine, mining museum, and environmental monitoring stations. We also observed some of the EGAT-funded community development programs. These site visits helped us learn EGAT's measures to ensure the community's safety and develop the villagers' quality of life. For the concrete structure of EGAT, we obtained a hierarchy of the power plant and mine employees (see Appendix A). A defined structure helped us identify key individuals who were beneficial to speak with and provided contact information for interview scheduling. Because the hierarchy lacked sufficient job descriptions, we were unable to form appropriate interview questions in advance. This limitation forced us to ask general questions in the beginning of our interview process and formulate questions specific to their responses during the interview.

The third goal was to learn about the history of EGAT and its impacts on the Mae Moh area. We used interview responses, along with historical research, to accomplish this goal. Most of the pertinent background information was only available in reports compiled by Montgomery Watson Harza (an independent consulting group), which we received from EGAT. Through reviewing the reports we gathered background information about the environmental disasters and the lifestyle changes of villagers. Credibility concerns arose with our main information resource coming from EGAT for this data. Because there is no other available detailed information on EGAT's history in Mae Moh, we were forced to rely on the reports as a sole source of information for some topics. We feel that the reports are credible but are aware of the possibilities of unreliable information. To lessen the effects of this possible bias and maintain objectivity we confirmed facts from the reports through interview responses. We also spoke with researchers who have studied the EGAT-Mae Moh relationship about the history to clarify facts. These reports were used as an introduction to the local history and were supplemented with interviews and site visit observations throughout our research process.

TRUST AND RELATIONSHIP BUILDING WITH MAE MOH VILLAGERS

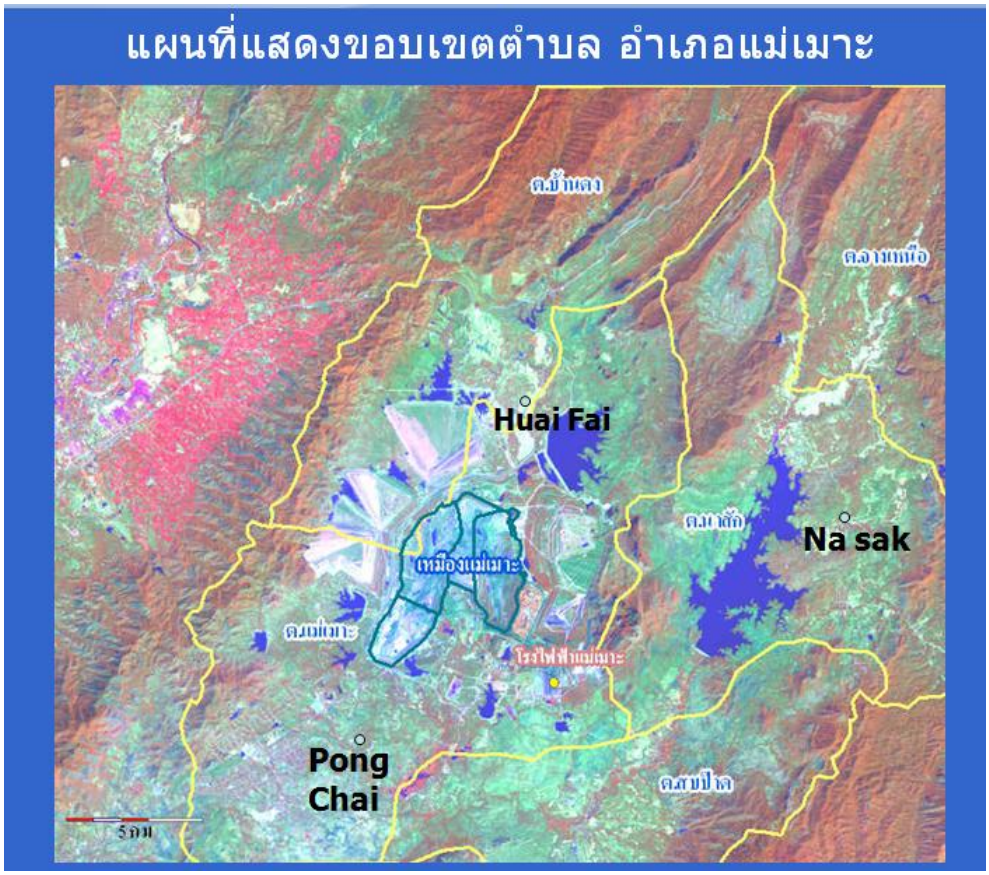
Our primary goal with community interaction was building trust and establishing relationships to encourage the villagers to speak more freely and honestly. Spending time with a local family allowed us to mingle with the villagers at social gatherings. These gatherings provided a valuable introduction into rural Thai culture, and Mae Moh culture specifically. We ate traditional Northern Thai food, visited the local temple and partook in celebration activities such as traditional dancing and instrument playing. Though this community contact was helpful for baseline knowledge of local culture, interaction with our target research villages was most important. Upon arrival to new communities, we meandered and greeted villagers with the Thai wây. These walks often included speaking with village elders on project un-related topics to learn the history of the village. Smiling during these interactions, though a simple gesture, was a part of the relationship building. Villagers reciprocated these smiles, promoting an understanding and relationship formation that transcended language barriers. Lunch in the village restaurants allowed for interaction in a more social atmosphere, fostering a different kind of relationship that eased tensions before stepping back into the group discussion setting. A large part of relationship building involved demonstrating to the villagers that we had a genuine interest in their community and its well being. We sought to show villagers that our primary goal was to understand them as people, rather than as research subjects used for advancing our project. In the discussion setting, inquiry began with personal questions and village historical questions for this purpose. We also tried to show our community interest in other ways, including admiring temples when interviewing monks and greeting children at local schools when interviewing teachers.

To obtain a variety of opinions, we requested to speak to residents from three villages with varying relationships with EGAT. We determined communities fitting this description with the help of EGAT's Community Development (CD) Section. Along with this section, we chose Pong Chai, Hua Fai, and Na Sak. We selected Pong Chai for its general satisfaction and relatively good relationship with EGAT. Hua Fai, is in close proximity to one of EGAT's overburden dumping sites. We chose this village because of its very poor relationship with EGAT and dissatisfaction with mining operations. We decided on Na Sak village because of its distant location and relatively low effects from EGAT. From speaking with representatives from these three villages, we hoped to gain balanced information based on varying trust level and relationships with EGAT.

After identifying target villages for our research, we collectively decided (along with the CD and Environmental Sections) to consult community leaders, teachers, monks, and the general public in every village to obtain views and preferences from a range of villagers. EGAT aided in scheduling discussion sessions with the requested community members. We were concerned with allowing EGAT to make the final decision regarding the village choice and schedule. We worried that giving EGAT this freedom would permit them to focus our research in *their* desired

direction, arranging interviews only in communities with good views of EGAT. After visiting the villages, we believe that our worries were unwarranted and our gathered information was balanced. Community discussion showed that we were in fact given communities with a range of relationship status with EGAT, from very poor to neutral. Despite this success, more control over village selection may have allowed for increased number and diversity of villages.

Figure 4 Map of Mae Moh District with Visited Villages Labeled. This figure is a map of Mae Moh District; the horseshoe-shaped blue outline represents the boundaries of the mine.



3.2 OBJECTIVE 2

Identify EGAT's communication strategies in terms of content and accessibility and identify Mae Moh's information needs regarding pollution and other environmental concerns.

We needed to learn about EGAT's current communication techniques and Mae Moh's environmental information needs before attempting to develop recommendations. To evaluate communication in Mae Moh, we focused on two particularly important components of risk communication model development: informational content and accessibility. Knowing these components from both perspectives allowed us to compare EGAT's efforts with the

community's needs and determine disparities. To determine the problems with content, and accessibility, we chose historical research and semi-standardized interviews due to limited information on interviewees. The historical research mentioned earlier allowed us to discover previous efforts in environmental safety and communication. Interviews at EGAT and informal discussion with communities helped to bridge the gaps in the literature. Interview and discussion questions were based on the following research questions used to establish our information needs:

- What informational content does EGAT communicate?
- What do Mae Moh villagers want to know?
- What is the presentation of information?
- Who presents this information?
- How does the community receive information?
- How does the relationship between EGAT and the community influence reception?

Using our research questions, we formed interview and discussion questions specifically to the interviewees' responsibilities and knowledge. We were also careful to avoid offensive and unprofessional language.

We directed interview questions at EGAT employees. In total, we interviewed 18 EGAT employees in several departments (see **Table 1** for details). Each group member undertook a task during the interview process. Two note-takers recorded interview results in distinct techniques: concept note-taking and verbatim note-taking. Concept note-taking proved useful for recording conclusions from interviews and applying it to future research and continual question forming. Verbatim note-taking (refer to transcripts in Appendix A) helped in quoting individuals in our report and referencing for possible concept clarification. Language barriers proved difficult even for interviewing English-speaking EGAT employees. At EGAT, many individuals we interviewed spoke enough English to understand the general idea of our questions but often not the question itself. Therefore, some of our more specific questions were not answered directly.

For interviewing community members, we faced similar language concerns. A translator minimized such communication problems to the extent possible. Our translator, Hatarat Poomkachar, was a social science researcher from Chulalongkorn University. She facilitated communication between our team and the community. She has had experience with both EGAT and the Mae Moh communities because of her research in the area during the 1998 pollution incident. Even with her experience, our team was aware of the risks of miscommunication regarding both our questions and the community's responses. In the translation between us and the community, there was potential for biases and misunderstandings to influence data collection. Limitations such as misinterpretation were recognized at the outset and minimized by repeating our data back to the villagers for cross check. We intended to present our research findings back

to the community at the end of our research process to allow for corrections and feedback. However, due to time limitations and lack of a translator in our final week in Mae Moh, we could not enable this feedback process.

With these difficulties in mind, we spoke with villagers to determine their understanding of EGAT's operations and their awareness of communication efforts. In total, we spoke with 22 villagers, generally in a group discussion format (see

Table 1 Interviewee Information from EGAT Interviews

Department/Section	Interviewee Name	Interviewee Job Title	Total Interview Length (hours)
Mine Environmental	Chatchawan Harina-Adisai	Geotechnical Department	**1.00**
	Boontien Khampirapawong	Environmental Operations	**1.50**
	Damrong Thawornvisuttikul	Senior Engineer	**0.50**
General Mining Operations	Jeerapun Langu	Drilling and Blasting Director	**1.00**
	Manpom Potiwong	Licensing and Permission	**1.25**
Mining Museum	Pairote Anupandhanant	Museum Director	**1.00**
Main Office of Mining Operations	Kiertisan Ekapand	Assistant Governor of Fuel Operation	**1.25**
Mine Public Relations	Wiwant Pukjumpa	Chief of Public Relations	**0.75**
Power Plant Public Relations	Kanlayani Naopnhthai	Director of Public Relations	**1.25**
	Note Nantakan	Public Relations Officer Level	
Community Development Office	Pattana Chaimongkol	Potential Development	**1.75**
	Nipaporn Muangkasem	Administration and	
	Charan Saengrattanchai	Assistant	
	Charnnarong Thanatvit	Project Director	
Population and Development Association Office	Kusuma Michimon	Director	**1.00**
	Sunan Saovara	Secretary of QDA	
	Sudarat Somduang	Secretary Assistant of QDA	

Table 2 for details). Personal interviews usually lasted about one hour while group discussions lasted longer, about 1.5-2 hours. We visited Pong Chai and Na Sak once, each for approximately 4-6 hours. We visited Hua Fai twice due to villagers' eagerness to speak to us and share their opinions. We also spoke with teachers and students from the local high school, all of which are residents of villages in Mae Moh district. We gathered general community knowledge of EGAT's operations and pollution through informal discussion. We discussed EGAT's efforts in order to assess the public's comprehension of and access to environmental information. The data collected provided insight into possible communication improvements. It indicated what informational content the people are concerned about, which presentation methods best suit their needs, and
who they trust to communicate the information.

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	Manpom Potiwong	Licensing and Permission	**1.25**
Mining Museum	Pairote Anupandhanant	Museum Director	**1.00**
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	Sunan Saovara	Secretary of QDA	
	Sudarat Somduang	Secretary Assistant of QDA	

Table 2 Villager Information from Village Discussion.

Discussion Location	Discussion Participants	Number of Participants	Total Length of Discussion (hours)
Pong Chai Village	Teachers	2	**0.75**
	Monks	1	**0.50**
	Village heads	1	**0.75**
	General public	4	
Hua Fai Village	Teachers	2	**0.75**
	Monks	1	**3.00**
	Village heads	1	
	General public	6	
Na Sak Village	Teachers	1	**1.00**
	Village heads	1	**1.50**
	General public	2	
Mae Moh High School	Teachers	4	**1.00**
	Students	4	

3.3 OBJECTIVE 3

Develop recommendations by comparing EGAT's strategies with Mae Moh villagers' needs to determine gaps.

To develop recommendations for EGAT's environmental health communication improvements, we needed to become familiar with EGAT's current strategies and the information needs of the community. We analyzed interview and discussion responses from EGAT and community

members and compared their sides of the conflict to determine communication gaps. We identified gaps as areas where EGAT's current techniques for communication are falling short of the demands of the community. Central problems arose in creating recommendations to address these gaps because some issues were beyond simple communication pitfalls. We found that the problems were more complex, venturing into mistrust stemming from prior environmental incidents, lack of support, and bias. From EGAT's side, several officials have stated that community members exaggerate environmental impacts. We kept this in mind while evaluating potential causes for communication gaps and developing our recommendations.

We created recommendations to address these findings, providing applicable suggestions for the problems at stake. Though our recommendations originally intended to encompass only environmental health communication, we adapted them to take broader concerns, such as mistrust, into account. Our recommendations can be divided into two categories. The first category contains recommendations that suggest future actions to improve communication development and evaluation. These recommendations include expansion of community consultation processes for communication model improvement and implementation of a training program for such models. The second category consists of more concrete recommendations that provide ideas for how to improve communication methods. These recommendations demonstrate specific communication techniques to improve village reception of information, such as increased use of auditory communication and simplification and personalization of information. These recommendations intended to provide EGAT with a community-based response to current communication techniques and suggestions for how to improve. The intent of our recommendations was to help communication be more relevant and accessible to the people.

3.4 OBJECTIVE 4

Deliver findings and recommendations to EGAT's environmental, public relations, and community development divisions.

A central obstacle in recommendation delivery was presenting our findings and suggestions in a manner that was inoffensive and respectful. From the beginning of the project, EGAT employees had been concerned about our ability to gather accurately translated information from the communities. They were also concerned that we might stir up resolved issues and receive only poor feedback on EGAT's improvement measures. With these concerns in mind, we needed to create recommendations that displayed our suggestions while promoting positive reception by EGAT and an accepting response. We accomplished this through breakdown of the findings and recommendations. These findings and recommendations were reworded to reflect the level of English spoken by EGAT employees and to create a euphemized version of village communication requirements. We provided our recommendations in a final report to the Mine Environmental Section, however, they can also benefit the Mine Public Relations, Power

Plant Public Relations, and Community Development sections of EGAT. Because our departure from Mae Moh preceded our delivery of recommendations, we were not able to obtain feedback prior to submission of this report.

3.5 CHAPTER SUMMARY

Our methodology was developed with the goal of assessing EGAT's communication strategies and providing improvement recommendations in mind. We used our four objectives, to guide the methodology. These objectives included: introducing ourselves and learning about the stakeholders, learning about EGAT's communication strategies along with the community's information needs, developing recommendations for improved communication, and delivering recommendations to EGAT. Through a combination of interviews, historical research, direct observation and other methods we gathered data for the purpose of assessing EGAT's environmental communication effectiveness based on the needs of Mae Moh villagers. Though limitations forced last minute adaptations and ample compromises, we learned sufficient information about each side of the story, used for development of findings. Recommendations and guidelines were developed to educate EGAT on the effectiveness of their current communication and the information needs of the villagers. These deliverables were presented to EGAT in a final report.

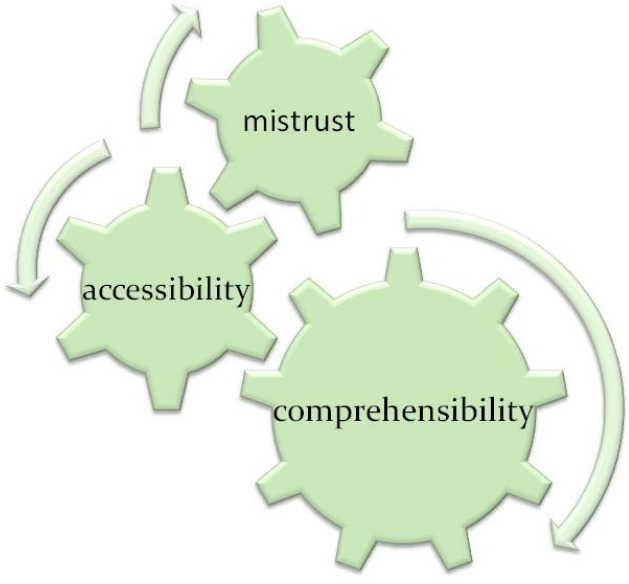
4. FINDINGS

Through evaluation of collected data, we made several discoveries about how the relationship between Mae Moh villagers and EGAT impacts communication. This chapter begins with an overview of the environmental communication methods that EGAT currently employs. We then use evidence from our interviews in the three villages to identify the successful and unsuccessful aspects of these methods. We investigate these methods further by examining themes of mistrust, information comprehensibility, and information accessibility that emerged from our interviews. The chapter concludes by showing how communication challenges play out very differently in the three villages that we visited. Our findings demonstrate the complexity of communication in Mae Moh by presenting a variety of contributing factors. Providing EGAT with these findings will assist them in evaluating their current communication methods and developing further improvements.

FINDING 1: DESPITE EGAT'S COMMUNICATION EFFORTS, CURRENT METHODS HAVE VARIED SUCCESS.

EGAT employs a number of methods for environmental communication with varying levels of success. Even within methods, some techniques are more successful than others. This chapter addresses the following communication methods: environmental information boards, villager training and site visit programs, village announcements, and educational programs in local schools. Each method has achievements and drawbacks, preventing any one method from being a complete success or failure. The largest problems are the interlocking issues of mistrust, information comprehensibility and information accessibility. Because these issues interlock, addressing one of them does not guarantee effective communication (see Figure 5). Therefore, the following methods EGAT currently employs have varying levels of success among the villagers.

Figure 5 Interlocking Communication Obstacles.



Environmental Information Boards. Among our interviewees, environmental information boards have had limited success. To address accessibility, the boards are typically placed in the most visible and traveled locations within the villages. There are some exceptions. In Na Sak, for example, the board is in front of the SAO (Sub-District Administration Organization) office, which is not in the daily route of most villagers.

In terms of comprehensibility, EGAT's efforts to simplify monitoring data on the boards are evident. In some parts, such as the vibration explanations, the boards make a commendable effort to simplify the scientific information to a level that villagers would be able to understand. Intentions for data simplification are also evident in the use of the AQI, a visual representation of air quality to replace technical terminology. However, these efforts are insufficient to increase comprehensibility as a whole. In both Hua Fai and Na Sak, villagers stated that the board "means nothing to them" (general public, personal communication, February 5, 2008). Because they cannot understand the information, they pay no attention to it. Our research and interviews with school teachers revealed that information presented in numbers and scientific units is too technical for an average villager to understand (Pong Chai teacher, personal communication, February 4, 2008; Montgomery Watson Harza, 2002). Though graphical presentation of air quality data is intended to increase comprehensibility, villagers are still confused by the information. Villagers cannot put meaning to pollution standards created by engineers and scientists because they have no application to the daily life of a farmer, cook, or store owner. All of these factors play a role in preventing villagers from understanding the meaning of the data.

EGAT has implemented measures to increase understanding of the information. They have trained village heads on power plant operations and have attempted to explain the meaning of the data on the boards. The hope was that village leaders would then be able to relay this information to their villages. Despite these efforts, village leaders told us that most villagers are not concerned with understanding the content of the boards. They feel that pollution levels are something that they feel, not something that can be expressed by numbers on a board monitored by a remote office. The Hua Fai village headman described it as "perceiving with the mind" (personal communication, February 5, 2008). One Hua Fai villager stated his confusion and frustration with the boards, saying that the air quality is always represented as "good," even though every day he witnesses dust on his car and crops. Since villagers perceive the air quality to be different on a day to day basis and the information on the board only changes twice a month, the written pollution levels do not correspond with what the villagers see and feel. This damages their trust in the monitoring data. We believe that this confusion is both due to pitfalls of EGAT's communication methods and villagers' exaggerations. On one side of the story, the information on the boards is not recent enough to accurately represent the conditions villagers experience outside. On the other side, villagers' views of air quality may be skewed and exaggerated because it directly impacts their health.

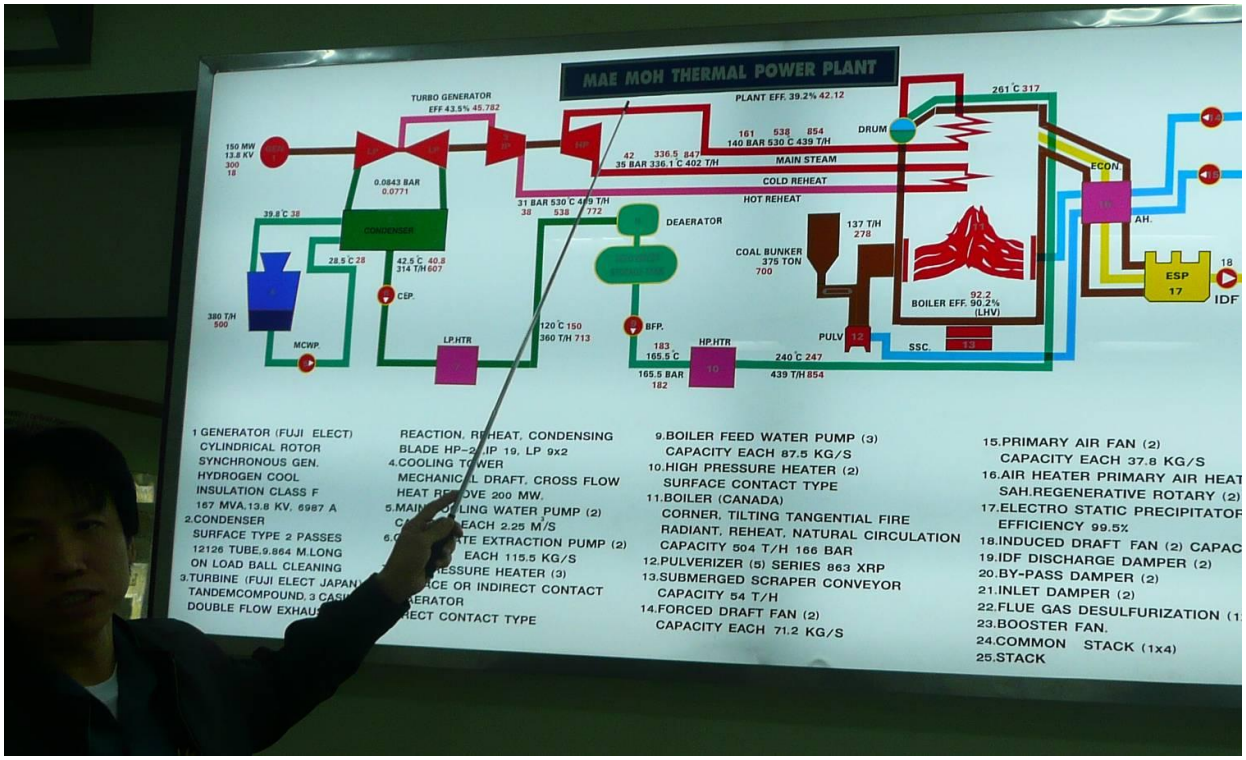
In addition, we observed that although EGAT continually pays village representatives to update the boards, they often fail to do so. The chipped paint on the boards in both Hua Fai and Huai Khing reveal the last updates to be in January of 2550.[1] Inadequate updates could be either a cause or a result of the villagers' inattention to the boards. EGAT employees often misinterpret this inattention as trust (P. Sethakamnert & B. Khampirapawong, personal communication, January 24, 2008). From their side, they believe that villagers fail to update the boards and ignore the information due to their confidence in low pollution levels. In fact, our field work revealed that most often, it is the lack of trust in the presented data that makes villagers not receptive to EGAT's communication efforts. Many villagers, especially in Hua Fai and Na Sak, state that they do not trust EGAT's monitoring. Some believe that EGAT occasionally turns off pollution prevention systems to save money and then manipulates the data to demonstrate that pollution levels fall within the national standards. These trust issues, along with poor accessibility and comprehensibility, are the most important factors that prevent villagers from accepting the environmental boards.

Site Visits and Villager Education. From our interviews and observations we have found that site visits have been generally successful in educating villagers about environmental information. From EGAT's point of view, this is one of the plant's best communication methods because it allows the people to see the monitoring values change in real time (P. Sesth-Gamnerd, personal communication, January 24, 2008). This method is intended to increase villager trust in the accuracy of monitoring processes while educating them about the general workings of the power plant. One particular problem with site visits is overuse of English in graphical explanations of power plant operations (general public, February 5, 2008) (see Figure 6). Participants have found it difficult to follow the explanations and ask questions for clarification during the training lesson.

Village Announcements. This method has enormous success in communicating with the villagers. When environmental information is included in the announcements, it is very easily accessible because village announcements are a part of the villagers' daily lives. They relieve each villager of the responsibility to personally retrieve the data. Villagers in Pong Chai, Hua Fai, and Na Sak all stated that announcements were an effective technique for communicating with the public. This auditory communication also takes into account villager illiteracy. However, despite the increased accessibility, the problem remains in the technical content of the information. Similarly to the boards, it lacks simplicity and relevance to the villagers' lives.

[1] The current year, 2551 according to the Buddhist calendar, is the equivalent of 2008.

Figure 6 Power Plant Operations Graphically Explained in English Only.



Educational Outreach. We identified educational outreach programs as EGAT's most successful communication method. A teacher at the Hua Fai School, stated that the students enjoy site visits and EGAT's curriculum because they provide out-of-classroom learning opportunities and use multi-media presentations to supplement classroom learning (personal communication, February 5, 2008). Educational outreach programs are successful in both accessibility and comprehensibility because they are designed specifically for students and are incorporated into the regular curriculum.

EGAT is currently developing improvements to the educational outreach approach as well. For instance, Wiwat Pukjumpa, senior engineer at EGAT, has created a workshop for students in hopes of allowing them to participate in his lab work (personal communication, January 29, 2008). He wants them to be a part of the soil, dust and water monitoring to increase their awareness and improve trust in monitoring systems.

FINDING 2: INDIVIDUAL POLLUTANT LEVELS ARE NOT REPRESENTATIVE OF WHAT THE VILLAGERS EXPERIENCE.

We found that one specific problem with the content of EGAT's environmental boards and village announcements is that they address levels of pollutants individually (local government

official, personal communication, February 4, 2008). Because the EGAT officials often are not residents of Mae Moh, they may not be aware of how a variety of pollutants affect villagers as a whole. Individual pollutant levels, even when reported as below standard, can add up to a large impact on the villagers' lives. They feel that this individual representation ignores their perspective of experiencing all pollutants simultaneously. Villagers believe that relaying environmental impacts through a method that incorporates a number of effects would provide an outlook that matches their perspectives and therefore promotes information acceptance.

FINDING 3: UNIQUE RELATIONSHIPS REQUIRE UNIQUE COMMUNICATION CONSIDERATIONS.

During our field work, we discovered that the relationship between EGAT and the people in Pong Chai, Hua Fai, and Na Sak is different in every village. Although the three villages we examined are located in the same district, each village is distinct, especially with regard to their concerns about EGAT. Selection of the villages took into consideration their proximity to EGAT, level of impact, and level of satisfaction with EGAT's performance. From interviewing village heads, monks, teachers, and other residents in each village, we determined village specific differences. Pong Chai is generally satisfied with EGAT's operations and communication. Hua Fai is discontent because of significant health impacts and the expansion of a nearby dumping site. Na Sak is more concerned with employment opportunities than communication due to distant location and insignificant impacts. Because of these differences, a "one-size-fits-all" model of communication may not be sufficient to reach all villages. What communicates effectively to the content residents of Pong Chai may not speak to the disgruntled villagers of Hua Fai.

Good Relations in Pong Chai Village. During our village selection process, EGAT recommended Pong Chai (see Figure 4 for locationFigure 4) to represent a positive relationship with villagers. From the discussion we conducted with Pong Chai villagers, we confirmed that the people are generally satisfied with EGAT's operations and practices. The villagers we interviewed are not concerned with air pollution because they believe EGAT's prevention measures are effective. The only problem they mentioned was water shortages that resulted from dust contaminating the river. EGAT has resolved their concerns by supplying drinking water to the villagers free of charge. With their major environmental concern being addressed, Pong Chai residents are relatively quiet, with few complaints about EGAT.

Pong Chai residents often disregard environmental communication because of their general satisfaction with EGAT. Pong Chai currently does not require drastic measures in communication. Continuing current communication may be sufficient to maintain their positive relationship. However, expansions of the mine and other potential sources of discontent that other villages experience may call for communication improvements in the future.

Poor Relations in Hua Fai Village.EGAT recommended speaking with Hua Fai due to their poor relations with EGAT. Hua Fai is located 3km north of the east leg of the mine, in close proximity to one of EGAT's overburden dumping stations (see Figure 4). Many Hua Fai villagers' dissatisfaction falls under two categories. The first is a lack of employment opportunities. The village head believes that EGAT should employ 90-100% of the people in Hua Fai because the dumping site location forces them to suffer more than other villages (personal communication, February 5, 2008). With agricultural productivity suffering (most likely as a result of pollution), villagers must rely on EGAT's employment opportunities. Villagers feel that their employment needs are ignored because EGAT does not meet their demand for jobs. The second major concern is relocation. Because of its close proximity to a dumping area, Hua Fai has always suffered from high dust concentrations. The village is split between those who wish to stay and those who wish to be compensated through relocation. EGAT's current plans for extension of the dumping site worsen this divide and fuel the relocation debate.

The Hua Fai villagers we interviewed do not accept EGAT's communication for two reasons. First, they do not trust in EGAT's monitoring techniques and data. This mistrust comes from the conflicting information they receive from the boards and their daily observations. Second, alternate issues such as job access and relocation take priority over environmental communication in their lives. When asked about possible suggestions for EGAT to improve communication, a villager stated "there is nothing they can do*"* (general public, personal communication, February 5, 2008). He believes that as long as EGAT needs Mae Moh's coal, there will be pollution and poor communication about it.

Some of the most important factors to consider in improving communication strategies for Hua Fai are their more urgent concerns described above and their deep mistrust of EGAT and other governmental organizations. Although employing a credible communicator might appear to improve acceptance, interviewed villagers claim that involving a third party would not help the situation because they are "sick of data" (village head, personal communication, February 5, 2008).

Mixed Relations in Na Sak Village. Na Sak, a village about 12km east of the mine, has a fair relationship with EGAT, falling between the calm indifference of Pong Chai and the heated dissatisfaction of Hua Fai (see Figure 4). Villagers we interviewed in Na Sak were most concerned about employment opportunities and compensation. They believe that EGAT should provide training for jobs more advanced than just unskilled labor. Some villagers also feel under-compensated because of this distance and the relatively low environmental impacts from EGAT. Some of EGAT's community development efforts use criteria such as proximity to the power plant and mine to determine the amount of funding for each village. Na Sak villagers believe their suffering is equal to that of villages closer to EGAT and that they deserve the same amount of funding. In terms of communication, because their relationship with EGAT was between the

two extremes, Na Sak villagers were more objective in analyzing communication effectiveness and suggesting improvements. They believe that their distance from EGAT impacts communication. Because they don't suffer from severe impacts, EGAT does not treat Na Sak as a priority for communication improvements.

Some of the most important factors to consider in improving communication strategies for Na Sak are their more urgent concerns of employment and compensation. They feel that in addition to environmental information, they would benefit from employment opportunities being incorporated into communication strategies. Na Sak residents also suggested a training program to increase comprehensibility of EGAT's current communication. They recommended training village leaders to understand the information presented on environmental boards and requiring them to teach the rest of the villagers.

FINDING 4: MUTUAL MISTRUST PREVENTS EFFECTIVE COMMUNICATION.

Our analysis revealed that the main obstacle in communication between EGAT and Mae Moh villagers is trust. Many villagers distrust not only EGAT and its monitoring systems but also the central government. At the same time, many EGAT officials distrust the villagers' health claims. Lack of trust in *both* directions prevents positive reception of environmental information regardless of content and presentation. Trust issues in Mae Moh are the following:

Villagers do not trust EGAT and its practices. From villagers' interview responses in all three communities, we found that general distrust of EGAT hinders acceptance of its monitoring techniques and data. EGAT acknowledges this mistrust and states that it is currently their largest obstacle in communication with the community (K. Ekapand, personal communication, January 24, 2008). Many EGAT officials believe that the majority of their problems will disappear if the trust problems are eliminated. They are proud to announce trust in EGAT has increased significantly in the last decade. Despite EGAT's views of recent trust increases, villagers remain distrustful of environmental monitoring because officials can easily adjust the data to their advantage. In the past, EGAT has hired the Pollution Control Department (PCD) to assist in monitoring in order to make data more credible. However, this method has proven ineffective due to villagers' beliefs that both institutions are inherently corrupt. Especially dissatisfied villages such as Hua Fai continue to believe that EGAT does not release all information. Some interview responses also revealed that people do not trust the pollution control improvements and suspect that at times EGAT turns off Flue Gas Desulfurization (FGD) systems releasing SO_2 into the air. Both sides agree that this general distrust in EGAT stems from denial of environmental incidents and severity of their impact in the past (K. Ekapand, personal communication, January 24, 2008).

Villagers often do not trust the village headman. In some cases, villagers stated that they are uncertain if they can trust the headman due to employment by EGAT. For example, the

headman of Hua Fai village assists EGAT with monitoring and reporting of environmental data (personal communication, February 5, 2008). On one hand, he has the advantage of easy access to pollution information. On the other hand, he receives 20,000 Baht per month from EGAT for his role in monitoring, which is much more than the 4,000 Baht he receives from the government for performing his duties as village headman. An anonymous Hua Fai villager stated that money has become a big factor in Mae Moh politics and many villagers see some headmen receiving employment from EGAT as being "bought" (personal communication, February 8, 2008). In fact, some headmen do not wish to work for EGAT in order to preserve their trustworthy reputation with the villagers. From EGAT's point of view, hiring village members for environmental monitoring and communication is an effort to increase participation and understanding. However, villagers view it as EGAT bribing village heads to take sides against their own villagers.

EGAT generally does not trust the sincerity of villagers' health claims. The most frequently used method for requesting compensation is assertions of respiratory problems caused by air pollution. The villagers know that health concerns get the most rapid response from EGAT and have the highest probability of compensation. People who claim to be impacted often do exhibit respiratory conditions. However, after examination, doctors have stated there is no way to determine the origin of their condition (H. Poomkachar, personal communication, February 8, 2008). Indeed, there is a history of SO_2 emissions and the dust content in the air is high during dry seasons. However, smoking is also a common habit among the villagers in Mae Moh, as are slash and burn practices used in farming. Therefore, some EGAT officials such as Chatchawan Harina-Adisai from EGAT's Geotechnical department believe that villagers take advantage of EGAT's compensation program by using these disingenuous health claims (personal communication, January 23, 2008). From EGAT's perspective, this indicates that villagers are untrustworthy and that they have a tendency to exaggerate the pollution effects to unfairly receive compensation. Going back to the interlocking issues of mistrust, information accessibility, and comprehensibility, even when the other two issues are addressed, mutual mistrust in Mae Moh prevents positive reception of communication.

FINDING 5: VILLAGERS' URGENT CONCERNS OVERSHADOW EGAT'S COMMUNICATION EFFORTS.

Despite EGAT's programs to communicate environmental information effectively, some villagers' major concerns are not environmental issues. Several accounts from villagers reveal that they ignore environmental communication because the issues of employment, resettlement, and facility expansion have a greater effect on their quality of life.

Employment is a top concern of many villagers. Arrival of the mine and power plant caused occupation and employment prospect changes in Mae Moh villages. Environmental impacts and the growth of the mining area reduced farmland from which most of the villagers derived their

income. This occupational shift compelled villagers to seek jobs as laborers at the EGAT facilities. Proximity to EGAT and competitive salaries make employment at EGAT inviting. However, job opportunities are scarce and are usually for unskilled temporary labor. Villagers feel that obtaining a job at EGAT is too difficult since it is controlled by a lottery system and often requires trips to Bangkok for applications and tests. When such jobs are finally acquired, they are generally temporary work, lasting about a month. Villagers who used to be satisfied with unskilled temporary labor jobs now desire permanent officer positions. Unfortunately, those employment opportunities are limited and require more education than most villagers possess. To respond to the villagers' employment needs, EGAT has made several efforts to increase job opportunities through Population and Development Association (PDA) vocational projects. However, when we asked the villagers about these training opportunities, they were often unaware of their presence. This unawareness could be attributed to insufficient number of training programs or poor communication about them.

Resettlement is another pressing issue that often eclipses communication efforts. Due to environmental impacts, several villagers insist on relocation. EGAT's current resettlement arrangements include financial compensation for the house and one rai[2] of land, which is significantly less than 15 rai needed for a full farm. EGAT's resettlement program also ignores the value of crops that cannot be recovered after relocation. Because of the current terms of resettlement, villagers feel meagerly compensated. In addition, families that relocate are permanently separated from their relatives and neighbors. Due to these concerns and priorities, environmental communication efforts are often overlooked.

Another concern, specific to Hua Fai, is the expansion of a dumping site near the village. EGAT officials held public hearings in Hua Fai during the week of February 4-8th, 2008 seeking the villagers' approval for the dump expansion. The villagers met EGAT's demands for expansion with strong opposition. Villagers feel they are greatly affected by dust from the dumping already and are fearful of increased effects from expansion. One particular villager said that if the dumping station is expanded all Hua Fai villagers will request to move (anonymous villager, personal communication, February 8, 2008). Mae Moh residents also oppose the extension of the mine's east leg (a plan for coming years). They feel that the people of Mae Moh have sacrificed enough and that mine extension is unfair. These issues are just a few of the irritations that Mae Moh villagers must deal with in their daily lives.

From our fieldwork, we have concluded that several pressing concerns that villagers face daily, take precedence over EGAT's environmental communication. These concerns are an underlying cause for the villagers' inattention to EGAT's current communication efforts. Villagers desire that EGAT address these more urgent concerns before focusing on environmental communication. EGATs approaches do acknowledge these concerns, but their number and complexity prevents villager satisfaction.

[2] One rai is equal to 1600m^2 or 0.3954 acres.

FINDING 6: LONG TERM IMPROVEMENTS ARE MORE EFFECTIVE THAN SHORT TERM SOLUTIONS.

Our interviews with Mae Moh leaders revealed their beliefs that EGAT's resources are better spent in community development efforts than in monetary compensation. Some impacted citizens believe that every citizen of Mae Moh should receive compensation from EGAT for using the area's resources and changing their way of life. The leaders, however, feel that this monetary compensation spoils Mae Moh villagers and takes away their desire to help themselves. (local officials, personal communication, February 7, 2008). They believe that it is more beneficial for EGAT to contribute to community development through supporting educational programs and creating opportunities that promote sustainability.

The principal of Hua Fai School confirmed that because of EGAT funding, the equipment in Mae Moh is much better than at other schools where he has taught (personal communication, February 5, 2008). Students also benefit from EGAT scholarship fund, which allows Mae Moh graduating students to continue their education at a university of their choice (teacher, personal communication, February 8, 2008). By increasing educational opportunities for Mae Moh children, EGAT invests in the future of the area.

Other EGAT programs intended to bring long term improvements are Population and Development Association (PDA) and Quality of Life Development Association (QDA) projects. PDA programs, such as integrated farming and sewing group, focus on employment and job training (Refer to Background Section for more information.)

Several local government officials believe that EGAT should continue to promote a sustainable way of life among Mae Moh villagers with the use of such projects rather than providing monetary compensations. In approximately 25 years, the mine and power plant will vacate Mae Moh and villagers will have to be self-sufficient. The leaders believe that these projects work towards this goal, giving villagers the necessary knowledge to help themselves, which leaves a more long-lasting impact than monetary assistance.

CHAPTER SUMMARY

Our discoveries have highlighted the two sides of the story, showing EGAT's commendable efforts and the villagers continued distrust. With these two very different sides concerning trust, compensation, relocation, and employment, we conclude that general communication adjustments will be insufficient in Mae Moh. Because of this, communication strategies here will be more successful if created directly in response to the preferences and needs of individual villages. With this general discovery in mind, we have created recommendations that address the problems specific to Mae Moh: mistrust, information accessibility, and information comprehensibility.

5. CONCLUSIONS AND RECOMMENDATIONS

In this chapter, we give readers a summary of our key findings and provide recommendations for communication improvement in Mae Moh. Through our fieldwork we gained a deeper understanding of the root causes of communication gaps. We analyzed these root problems in the findings and provide practical suggestions for improvement in this chapter. We believe that our recommendations, although focused on communication, can be a beginning to relationship improvement through community consultation and response to community needs. This chapter also includes suggested guidelines towards more effective communication.

5.1 SUMMARY OF KEY FINDINGS

Our observations and analysis have determined the following three areas as the main obstacles preventing effective communication in Mae Moh: mistrust, information accessibility, and information comprehensibility.

TRUST: ONCE LOST, HARD TO REGAIN

We concluded that many communication problems extend beyond the bounds of just communication. The largest obstacle to communication is not the data or presentation, but rather the villagers' lack of trust in EGAT. With trust as the main problem, even ideal communication models are ineffective at increasing information reception. EGAT's previous denial of environmental and health impacts during the SO_2 disasters of the 1990s has aggravated the villagers and caused significant mistrust. Many Mae Moh villagers distrust EGAT as an institution, especially their monitoring systems (local government official, personal communication, February 4, 2008). Many villagers believe EGAT releases only half of the information to the villagers and that pollution control measures such as the FGD systems are occasionally shut off to cut costs. Similarly, some EGAT officials do not trust the villagers, saying they make false health claims to take advantage of EGAT's community support. They maintain that the respiratory symptoms villagers claim are due to SO_2 are actually self-imposed from smoking cigarettes (C. Harina-Adisai, personal communication, January 23, 2008). All these factors undermining trust in both directions between EGAT and Mae Moh villagers, combine to prevent positive reception of information regardless of content and presentation.

ACCESSIBILITY AND COMPREHENSIBILITY: BENEFITS AND DRAWBACKS

Aside from trust, problems with accessibility and comprehensibility factor into communication gaps between EGAT and the villagers as well. For communication success, villagers must not only be able to access the information but also must be able to understand it. Though many of EGAT's current communication strategies reflect these needs, some have fallen short. We have

chosen to focus on the communication strategies of environmental boards, village announcements, and educational outreach, though these are not the entire spectrum of methods used by EGAT. We chose these methods because we found the most information on these topics due to villagers' and EGAT employees' eagerness to cite their benefits and drawbacks.

Despite the good intentions of public participation in updating environmental information, the boards have had little success. With respect to accessibility, in some villages, the boards are not in high-traffic locations and villagers are unaware of their existence. Ease in accessibility, however, does not guarantee effective communication. Even villagers with convenient access to the boards disregard its content. Though EGAT officials see this lack of concern as a result of trust, it is actually due to villagers' inability to connect the figures on the board with the air quality they experience every day. Though EGAT officials believe the board information is properly translated for villager understanding, villagers believe that technical standards are too abstract. They use what they refer to as "perceiving with their minds" to comprehend air pollution. All of these issues combine to prevent the boards from their aim of communicating the environmental information in an accessible and understandable manner.

Village announcements, though not a method mandated by EGAT, are especially effective in communicating with villagers by providing easy access to information. Village heads broadcast daily announcements over loudspeakers and occasionally include environmental information from EGAT (general public, personal communication, February 6, 2008). The weakness here is the informational content. The announcements present the same incomprehensible information from the environmental boards, in terms of standards and scientific units (general public, personal communication, February 6, 2008).

Educational outreach programs are one of the most successful strategies. EGAT created a curriculum for educating Mae Moh children about the local environment and EGAT's operations. Educational programs for adults transport villagers to EGAT to demonstrate power plant and mine operations. These two methods are aimed at improving accessibility and comprehension. The educational programs for children are more successful than those for adults. In general only village heads or other village leaders participate in adult education programs, making it difficult for them to spread the information to all villagers. In addition, those who attended noted that graphical explanations were often in English making them difficult to follow. These educational programs have attempted to cross the barriers of accessibility and comprehensibility but are not without flaws.

5.2 APPROACHING THE PROBLEMS: RECOMMENDATIONS

Keeping these issues in mind, we created recommendations to increase the reception of environmental information. Though the root issues are far deeper than communication, we focus

our recommendations on what can be achieved with more effective environmental communication.

WE RECOMMEND THE FOLLOWING COMMUNICATION GUIDELINES THAT ADDRESS INFORMATION ACCESSIBILITY AND COMPREHENSIBILITY.

To best address the areas for improvement—information accessibility, information comprehensibility, and trust— we created specific communication guidelines. Village announcements proved to be the best method for increasing information accessibility. Because of this, we suggest that EGAT uses village announcements as the communication channel for weekly village contact. Current village announcements lack in comprehensibility. We therefore recommend using the provided guidelines to simplify and personalize information. We included examples where possible to show concrete methods for addressing specific problems. Language and numerical data simplification as well as information personalization apply to this method of communication and could be addressed in the creation of weekly announcement messages.

SIMPLIFICATION AND PERSONALIZATION OF ENVIRONMENTAL INFORMATION TO ADDRESS COMPREHENSIBILITY.

From our fieldwork in Mae Moh, we have concluded that a lack of comprehensibility is one of the main obstacles to EGAT's communication. The effectiveness of a communication model is dependent on its understandability which, in turn, requires simplification and personalization of technical data (Nuclear Regulatory Commission, 2004). Simplification is a difficult process due to the inherent complexity of risk assessment and the public's innate risk perceptions (Sandman, 1987). Personalization is important because "technical experts see risk as a statistical number, whereas lay persons view risk in much more emotional terms" (Covello, Sandman, & Slovic, 1991, p. 78). For the public, risk acceptance is based on values and personal decisions, not on technicalities and statistics. With these complexities in mind, we have created the following techniques to increase information comprehensibility.

Simplifying Language. To simplify the language of a message, communicators can speak or write as though the audience has little or no knowledge of the subject (Nuclear Regulatory Commission, 2004). To accomplish this task, words specific to those who work in a scientific or technical position would be avoided. This includes technical terminology such as particulate matter and decibel noise levels. Titles and labels of figures or graphical material can be simplified as well. They are easier to understand when the main message is clearly spelled out in the title as well as in the actual graph (Hance, Chess, & Sandman, 1990). After simplification measures are taken, it is incredibly helpful to test the information's comprehensibility to assess the effectiveness of simplification. Technical experts often test communication on non-technical persons to get feedback as to which areas contain confusing language (Hance, Chess, & Sandman, 1990).

Example 1: A title such as *Air Quality Control: Average 24 Hours* is less effective than a title such as *How safe is the air?* which directly states the goal of the communication in simple terms.

Example 2: Particulate matter is a term on the board that assumes scientific knowledge. One method of simplifying such jargon is to clarify it in laymen's terms and then drop the original language, using only the laymen's equivalent (Hance, Chess, & Sandman, 1990). A simpler, more descriptive definition for non-technical people could be "dust in the air."

Simplifying Numerical Data. Numerical data within graphical representations can be cut down as well. Data units are easier to understand when they are comparable to each other. Similarly, the public generally understands whole numbers better than fractions of decimals (Hance, Chess & Sandman, 1990).

Example: The vibration information on EGAT environmental boards successfully simplifies the data's effects on the people. The speed of vibration figures are still an area of confusion. They could be removed and replaced with a 1-8 scale or a color scale similar to the AQI to simplify the numerical data further.

Personalizing Information. Personalization of data is the process of making it more applicable to the public. It involves knowing the audience and associating information with their daily lives so that abstract data becomes more relevant. Sandman stated that "perhaps nothing contributes so much to the public's understanding of risk as finding a way to make it personal" (1991, p. 26). Personalizing a message is a difficult process, especially for those who are not members of the group receiving the communication. The most common method of personalization is comparison, using examples based on villagers' experiences. For pollution information, communication should focus on using examples and avoiding abstract language (Sandman, 1987). This is specifically applicable to language about health effects.

Example 1: The environmental boards express noise pollution in decibels giving little explanation of the meaning of this unit. Comparing the noise level to levels that villagers are more familiar with would help them understand what the numbers actually mean. The board displays that noise pollution is less than 70 decibels, a level where noises do not affect hearing. Explaining the level in relation to other familiar noises instead might make the information more comprehensible. Telling the people that noise levels are less than 70 decibels, which is quieter than having a conversation with the person next to you, is more comprehensible. Providing further explanations such as that truck traffic is around 90 decibels and hearing loss can only occur from sustained exposure to noise levels over 91-95 decibels might also help the information's understandability as well (GC Audio).

Example 2: Information on the boards stating health effects can be considered distant and abstract. "Starts to affect health" and "significant health effects" are vague and intangible. When possible, concrete examples should be used to give the people something to relate to. "Starts to affect health" could be further explained in terms of 'how' and 'what.' Significant health effects could also be further explained in the same manner. The vibration effects from the environmental boards are successful at achieving this. The examples of effects are concrete and directly explain information that villagers can relate to.

AUDITORY COMMUNICATION TO ADDRESS ACCESSIBILITY.

With accessibility as one of the main obstacles to communication, we suggest that communication use increased auditory methods. Villagers stated that daily village announcements are a successful way of communicating that does not require personal action to receive information. As a normal part of daily life already, adding additional, simplified environmental information to such announcements would be an extremely effective method of communication. Though actual literacy percentages are unknown, the teachers in Pong Chai village stated that only the village children can read. In addition to making information easily accessible, using auditory communication also addresses the issue of illiteracy. Using these communication techniques would likely increase the percentage of the population reached by the communication.

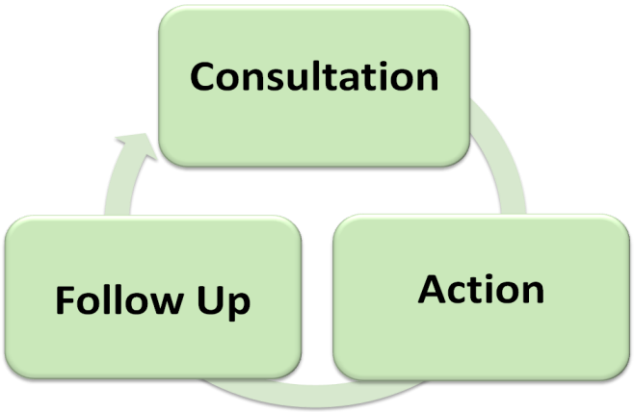
WE RECOMMEND EXPANSION OF COMMUNITY CONSULTATION BEFORE AND AFTER NEW COMMUNICATION METHOD IMPLEMENTATION.

We discovered that projects for environmental communication often use little direct community consultation to ensure effective methods. Community development sections or third party researchers currently perform most community consultation. With little direct contact for communication strategy development, EGAT's implemented methods often do not address the local residents' concerns. We suggest the use of direct community consultation in two parts, prior and subsequent to communication method implementation for the purpose of developing methods that directly reflect the information needs of the villagers. Consultation before implementation would allow EGAT to test various methods within the communities, discarding those that receive a poor response. Post-implementation consultation would help ensure the methods are working as planned and to allow for feedback on its successes and failures. Both parts of consultation also allow EGAT to address the village-specific characteristics that require unique communication methods.

We suggest that Systematic Client Consultation (SCC) be used in this case. SCC is a group of methods used to improve communication by listening to clients, creating a continual communication plan, and using client feedback for future project design (The World Bank,

1994). This method involves more listening than speaking to increase understanding and information exchange (Nuclear Regulatory Commission, 2004). There are three steps to this process: consultation, action, and follow-up. Consultation involves listening to stakeholder views and preferences. The action stage uses these views and preferences to implement programs that address the public's concerns. The follow-up stage assesses the effectiveness of the newly implemented programs and takes further action to improve methods that have fallen short. These three steps work in a cycle to emphasize persistent, continuous communication (see Figure 7). Researchers call it keeping "a finger on the pulse of client reactions in the field" to keep implemented measures relevant and current (The World Bank, 1994, p. 197).

Figure 7 SCC Cycle of Community Consultation



Specific methods for SCC include village meetings, focus groups, and semi-structured interviews. Village meetings allow researchers to address large groups and gain community support through participation. Focus groups use a facilitator to initiate discussion and can branch off from village meetings allowing stakeholders to share their views on the discussed topic. Semi-structured interviews are similar to focus groups in terms of interaction but are conducted with one interviewee. All of these specific methods are used to achieve the objectives of SCC, listening to clients in order to develop projects that directly address their needs. (Cornwall & Jewkes, 1995; The World Bank, 1994)

Community Consultation methods are not without their obstacles. We predict that Mae Moh villagers may not be ready to answer open-ended questions, responses may not be representative of all villagers, and the villagers' suggestions may not be practical. First, Mae Moh villagers may not be prepared to think in this advice-seeking style because they are not generally consulted in this manner (N. Vichit-Vadakan, personal communication, January 31, 2008). They may not be able to articulate their desired informational content and presentation when asked such broad questions as "what do you want to know regarding environmental communication?" This was observed even in our discussions with villagers. They were able to clearly define problems with current communication but often could not verbalize improvements. Second, villager input may not be representative of the entire village. In such consultation methods, as was the case with

our community discussions, the ideas of more outspoken individuals are heard more often than those of reserved villagers. Lastly, villager input may not always be practical. Aggravated villagers often make unrealistic demands that EGAT simply cannot fulfill. EGAT's inability to heed all demands causes many villagers to feel ignored. This has been the case with employment dissatisfaction. Villagers have previously requested that one person from each family be employed at EGAT (C. Harina-Adisai, personal communication, January 23, 2008). Because this is a request that EGAT cannot satisfy, the villagers feel as though their needs and concerns are ignored (genera public, personal communication, February 5, 2008).

With these obstacles in mind, questioners must choose words and presentation very carefully to obtain most valuable information for forming new communication methods. Yes or no questions might be avoided since they reduce opportunity for elaboration. For villagers who have trouble articulating "what they want to know," an alternative may be presenting them with options for communication ideas and asking which ones would work best. Questioners should also make an effort to hear the concerns of all villagers, not just those who are more outspoken. Methods for doing so are splitting villages into smaller focus groups to give more reserved villagers a chance to voice their opinions. Showing an effort to hear the views of all villagers lets them know that their opinions are important and will be considered in decision making (Nuclear Regulatory Commission, 2004).

Because there is currently little opportunity for villagers to respond to EGAT's communication methods, citing flaws and possible improvements, we recommend follow-up. We recommend that communication channels be created in the opposite direction, allowing villagers to communicate back to EGAT. In the case of environmental boards, EGAT officials perceived the villagers ignoring and not updating the boards as a result of trust in EGAT and its pollution control measures (P. Sethakamnert & B. Khampirapawong, personal communication, January 24, 2008). In reality, the villagers were ignoring the information because of a lack of trust. Opening communication lines in the direction of villagers to EGAT would allow EGAT to learn about the true causes for inattention to communication methods. This would give them baseline knowledge of which techniques are working well and which techniques are failing within the villages.

In addition to providing feedback, this process could improve the relationship between EGAT and Mae Moh simply through increased interaction and giving a voice to villagers who feel marginalized. We believe this method has the potential for success because villagers had much to say in criticism of the current environmental communication methods. Though less passionately expressed, they also had some valid suggestions for improvement. These criticisms and suggestions would be better used if heard directly by EGAT. We believe that this process would be most successful if directed by the environmental division of the mine or power plant because of their knowledge of pollution control measures and environmental monitoring. They are also involved in some of the environmental communication, through written announcements and the

environmental boards. With this knowledge, they are best suited to speak with the community about its information needs.

Using community participation could show the villagers the better side of EGAT, the side that asks for villagers' input on their information needs. This method also encourages the villagers to think critically about what information is important to them and come up with their own solutions or techniques for improvement. In addition to achieving more effective environmental communication, this method could foster relationship building between EGAT and Mae Moh villages through informal, respectful interaction.

WE RECOMMEND A TRAINING PROGRAM TO TEACH THE VILLAGERS HOW TO BETTER INTERPRET ENVIRONMENTAL INFORMATION.

Fieldwork within villages showed that villagers are often unable to interpret or understand the data provided by EGAT. One crucial problem with reception of EGAT's communication is what the villagers refer to as "perceiving with their mind" (village head, personal communication, February 5, 2008). Villagers believe that their perception of air quality through sight, smell, and respiration is more meaningful than reading abstract figures from a board. When there is controversy between villagers' perceived air quality and EGAT's scientific data, villagers become frustrated and confused. To rectify this confusion, some Na Sak villagers (general public, personal communication, February 6, 2008) suggested training of village and household leaders in the meaning and relevance of the presented data. Although some village heads already attend a similar training process, more village members need to be educated to truly reach all villagers, since each village can contain 300 households. In addition, this program's objective would be to make environmental communication more understandable. A training program designed to explain complicated, technical figures could help the villagers accept the information, while also working on improving relationship and trust.

We believe that in order to understand and trust the information, villagers first need to understand EGAT's pollution control measures and how they monitor these measures' effectiveness. Hance, Chess & Sandman, state that communication should go beyond the pollution level data and into prevention and monitoring processes (1990). In order to understand and accept environmental information we propose a three phase program. The first phase would be a brief overview of EGAT's pollution control measures (ex. FGD systems, dust spraying, green belt, etc.). The following phase would be an introduction to the monitoring systems, including a tour of a monitoring station to see the equipment gather data in real time. The focus of training programs would remain, however, on phase three, which involves a lesson in data interpretation, teaching the villagers what each level of pollution truly means and how it affects their daily lives. For instance, people are not concerned with microgram concentrations but how much dust covers their car or crops each day. Individuals trained using the three phase program could then return to their villages and educate others about information interpretation.

Establishing this training session would not address the issue of trust but can serve as a step toward more effective communication.

5.3 SUGGESTIONS FOR FUTURE RESEARCH

Some of our discoveries during this project revealed areas for further research.

1. *We recommend continuing research into further methods for simplifying and personalizing EGAT's environmental data.*

The recommendations for simplification and personalization given here can be expanded with further research. We recommend that further research be performed not only to discover novel methods but also to test each method's effectiveness within villages. Additional simplification and personalization of data, tested in villages, has the potential to greatly increase villager understanding of EGAT's once technical, scientific information.

2. *We recommend future research that focuses on the causes and possible solutions for the problem of mistrust.*

This project's recommendations addressed the obstacles of inaccessibility and incomprehensibility but not the obstacle of mistrust. Because these three ideas are interlocking, addressing one of them doesn't guarantee success in communication. Therefore, research into the causes of the mistrust and possible solutions could have great impacts on the acceptance of environmental information as a whole.

5.4 SUGGESTIONS FOR FUTURE RESEARCHERS

From our field work in Mae Moh, we have determined several elements of our methodology that were especially helpful in understanding the broader context of our project. Although we designed the following elements specifically for our project, we believe they have broader applications for social science research in similar situations.

1. *Building trusting relationships with stakeholders (EGAT employees and Mae Moh villagers) allowed for relaxed, open conversation.*

This goal was the most important part of our methodology, continually opening doors for our research throughout the project. Although the other goals were important, building trust and relationships was the first step necessary to achieve those goals. Without building a relationship with both parties, our interviews would have yielded less open and honest responses. Future social science researchers should aim to build relationships with their interviewees to increase the effectiveness of their information gathering processes.

2. *Using a translator who is experienced in social science research and known in both EGAT and Mae Moh facilitated community interaction and increased our credibility.*

Our translator had skills far beyond speaking two languages. She is a social science researcher at the respected Chulalongkorn University, an association which conferred credibility upon us. Because of her experience in social science research, she was trained in wording questions to elicit the desired information. Perhaps most importantly, she has knowledge of the tensions and history between EGAT and the villagers from her previous research in Mae Moh. All of the above benefits of having an experienced translator were essential for our discussion with the villagers. We highly recommend that future researchers consider obstacles such as language barriers and being researchers as outsiders in selecting a translator who would help minimize their effects.

3. *Learning about interaction between EGAT and Mae Moh beyond environmental communication allowed for a greater understanding of their relationship.*

Though our project was rooted in environmental health communication, we spent much of our fieldwork in areas outside the topic of communication to gain a broader understanding of the context of our project. Touring EGAT facilities (museum, mine, power plant) gave us an idea of the scale of their operations and how departments within EGAT work together. Speaking with villagers about the history of the area allowed us to confirm documented impacts of EGAT on the community with personal accounts. Asking both EGAT representatives and villagers to comment on the effectiveness of community development efforts gave us further insight into factors that contribute to their relationship.

5.5 PROJECT CONCLUSION

The goal of this project was to discover information about the story in Mae Moh in order to provide EGAT with a better understanding of the villagers' concerns, how those concerns influence communication, and how communication can be improved to better address these concerns. We found that although EGAT has put significant effort into its environmental communication, the Mae Moh villagers continue to reject it. This rejection is a result of the information's inaccessibility, incomprehensibility, and the levels of mistrust between EGAT and the villagers. To begin improving these communications, EGAT can focus on the discovered obstacles and the suggestions provided. By following these suggestions and continuing research in this area, EGAT has the potential to improve not only communication but also relationships with villages. This potential improvement can hopefully be a lesson for other large industries struggling with communicating environmental impacts to local villagers.

APPENDIX A: EGAT INTERVIEWS

INTERVIEW AND DISCUSSION CALENDAR JANUARY- FEBRUARY 2008

Mon	Tue	Wed	Thu	Fri
21 Introduction Scheduling	22 Mine Environmental Section Interviews Mining Museum Site Visit Monitoring Station Visit	23 Mine Environmental Section Interviews Main Office Interviews Drilling and Blasting Interviews Mine Site Visit	24 Main Office Interviews General Power Plant Division Interviews	25 Community Development Office Interviews Village Site Visit General Power Plant Interviews
28 Population and Development Association Interviews Village Site Visit	29 Main Office Interviews Mine Public Relations Interviews Mine Site Visit	30 Power Plant Public Relations Interviews Power Plant Site Visit	31 Mine Environmental Section Follow-up Interviews	1 No work
4 Pong Chai Village Visit Teacher, Monk, Village Head, General Public, Sub-District Governor Discussion	5 Hua Fai Village Visit Teacher, Monk, Village Head, General Public, Sub-District Administration Office Discussion	6 Na Sak Village Visit Teacher, Village Head, General Public Discussion	7 Mae Moh District Office Interviews	8 Hua Fai Village Visit Mae Moh High School Interviews

EGAT INTERVIEWEES BY SECTION

COMMUNITY DEVELOPMENT OFFICE

Chaimongkol, Pattana - Community Development Potential Development

Muangkasem, Nipaporn - Community Development Administration and Evaluation

Saengrattanachai, Charan - Community Development Assistant

Thanatvit, Charnnarong - Community Development Project Director

Other Unnamed Community Development Workers

GENERAL MINING DIVISION

Langu, Jeerapun - Drilling and Blasting Director

Potiwong, Nampon– Licensing and Permission

GENERAL POWER PLANT DIVISION

Sethakamnert, Phonrit– Power Plant Senior Engineer

MAE MOH MINING MUSEUM

Anupandhanant, Pairote - Museum Director

MAIN OFFICE OF MINING OPERATIONS

Ekapand, Kiertisan - Assistant Governor of Fuel Operation

MINE ENVIRONMENTAL SECTION

Harina-Adisai, Chatchawan - Geotechnical Department

Khampirapawong, Boontien - Environmental Operations

Thawornvisuttikul, Damrong - Senior Engineer

MINE PUBLIC RELATIONS

Pukjumpa, Wiwat - Chief of Public Relations in Mae Moh Mine

POPULATION AND DEVELOPMENT ASSOCIATION OFFICE

Michimon, Kusuma - Director of Population and Development Association

Saovara, Sunan - Secretary of Quality of Life Development Association

Somduang, Sudarat - Secretary Assistant of Quality of Life Development Association

POWER PLANT PUBLIC RELATIONS

Naopnhthai, Kanlayani - Director of Power Plant Public Relations Level 9

Nantakan, Note - Public relations Officer Level 5

EGAT STRUCTURE

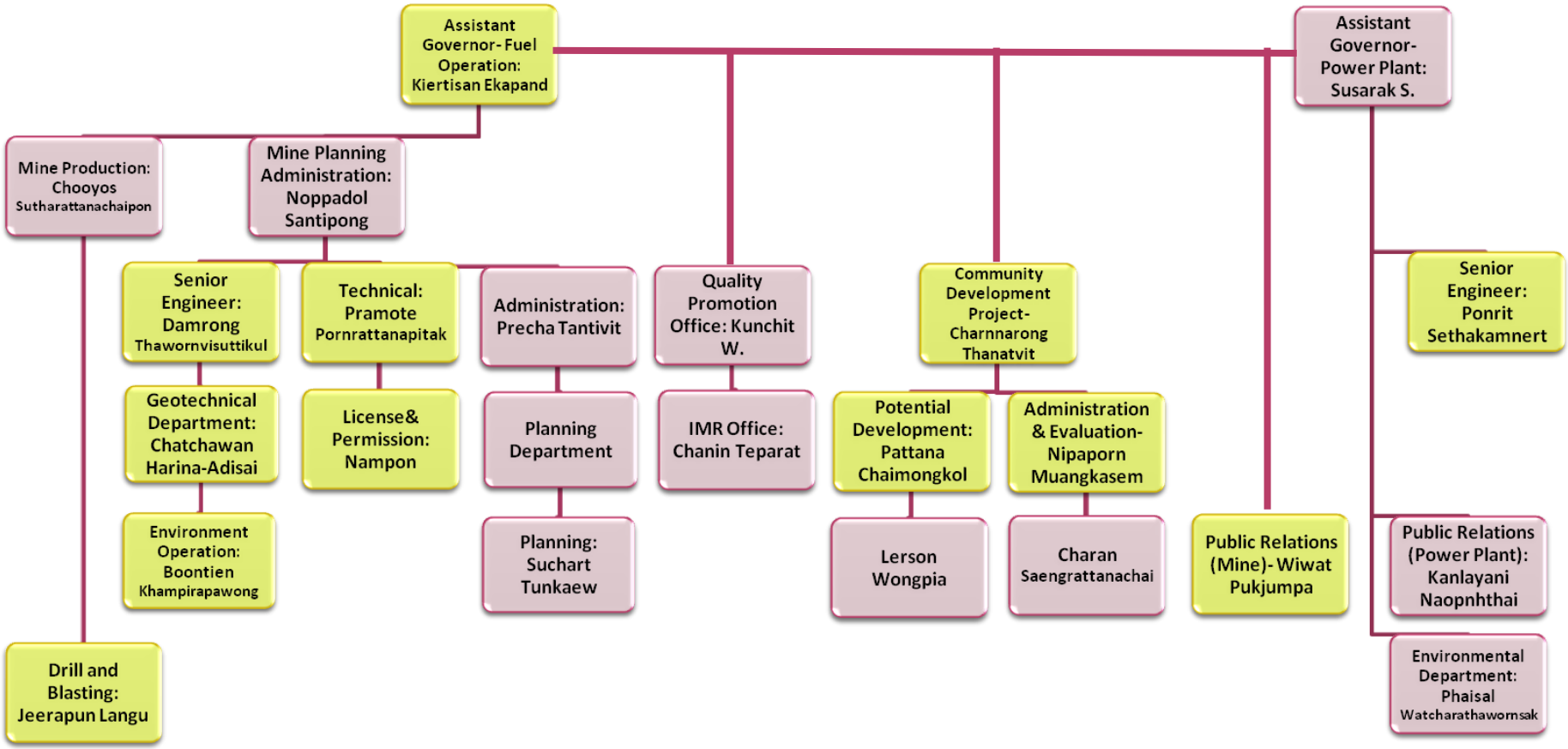


Figure 8 Hierarchical Structre of EGAT Employees. Yellow boxes represent employees who participated in our project

Damrong Thawornvisuttikul- Senior Engineer (23 Jan)

Can you tell us about what do you do to communicate with the public?

We can tell you what we do to communicate, but to tell the result is very difficult. To talk about how to evaluate the effectiveness, maybe talk to another group of people.

In my opinion, the environmental issue and the result of the communication is very difficult to explain to the people. It's too scientific. It will take some time, the way that our people try to set up, a group of people come to monitor the environmental situation with us and explain some of it to these groups. Ask the representative to explain the information to their own people. That might be the best way.

Has this been done?

Started this 1.5 years ago. Boontien can tell more details about this.

What do you specialize in?

Boss of Boontien, and Chatchawan, the technical and environmental groups report to me.

What projects are you involved in?

Involved in planning of mining operations and contractors.

Do contractors hire citizens of Mae Moh?

Before, generally from outside, now try to force to hire local people 30-50%. Local people only have skills to work as labor, this can cause problems. May eventually become technicians.

If there is an environmental concern, what is the process for dealing with this?

There is an environmental group and another group makes the standards (IMR), to improve the system, normally, they go to the IMR standard group when there are problems. Boontien's group is more for engineering and monitoring. Complaints go to Chanin (IMR) for environmental stuff.

If there is concern from villages, what is the first step that is made?

Depends, but mainly, it goes to the IMR office. Some things will go to the resettlement; some will go to Channarong in CD.

Do you have any Questions for us that you might like answered?

I think the most difficult part for you will be language, you can talk to people here but for the village we will need a translator. That will be very difficult.

Chatchawan Harina-Adisai- Geotechnical Departpent (23 Jan)

Can you tell us a little bit more about what you do?

Engineer of geotechnical- look after environmental division, after the environment due to the mining process. I just had a meeting with community leaders about taking land, for the limestone quarry, we are partners, if we can mine, we have income, which we pay taxes to you.

How has the community responded to the department?

There are groups in the community who are trying to sue EGAT, they claim that they are sick from the effects of the power plant (due to dust). They're trying every way to make trouble for EGAT. This brings difficulty in communication with community leaders (for an communication) (like asking for permission to quarry on the land). They think hard before giving permission because this group of people. Leader has to make clear that EGAT has to make every part of this new land use explained. The majority of the community agrees with our activity, because they benefit from us. Tax income.

So, EGAT has a good relationship with majority of community?

I think so.

Which stand out as problem communities?

There is a problem with every community, they network through newspaper, lawyers. Every village has its own problem with these groups of people

Villages are individual but sometimes, if they have the same interests, they will group.

Most of the mine and power plant are in Mae Moh but some is in Bandong, they don't get along well. There are meetings between these district leaders and EGAT, tell them what they like them to know. Like about environmental mining result (how much dust, AQI).

What are the communication problems within the community?

The health problem is the biggest problem. Other ones are complaining that they want more jobs. We try our best because they ask for 1 job for every family in EGAT (which isn't possible)

If there is a public concern, what is the process for taking care of that?

For health, if there is a big enough group, they will inform directly (phone or internet). Those who try to find fault with EGAT will send letters to Thai government, local governor. For jobs, they come directly to us.

Who receives these e-mails?

Claim receiver, decides which section is relevant to the complaint. For example, transportation causes dust, spreading in waste causes dust near the villages. Complaints about this would be sent to the people it is relevant to.

If they were meeting standards, no way of improving, how is this communicated?

CD and PR, once a third party doctor was sent in to find out if it was from power plant or from personal faults, they found out they just smoke too much. (hired by the government)

Which communication methods do you think work best or well?

We try to find an opportunity to give the students lectures about our activity (in school for example), because if the students are knowing about our activity correctly, then they will tell their parents "this isn't so harmful, it's safe" the parents are old fashioned and have less education than the young peoples. The education of the young people's is very effective in my opinion.

The second is to communicate directly with the public. Workshops are done, seminars, meetings, or just visiting them at home and talking with them.

Is there a method that has worked less well? Perhaps a method the community didn't accept?

If we tell them secretly without giving them the whole information, that is the problem, sometimes we had problems with pollution and we tried to say, "oh its not so harmful" we have to say "we have problems but we have fixed them already" this has happened in the last 5 years.

What is the flow of information, after you record data, where does that information get sent?

Combined and report to government, every six months according to the license requirations. Every month there is a summary that people from CD read so they can broadcast it in the community radio. Also for internal use for improvements "oh you didn't spray the water properly, you have to use more water", this is daily

How do you determine or choose the communication strategy to be used?

Most important for the northern culture, is to know their private lives, act like they are friends or a part of their family. This is key, in my private belief. Tell benefits, if you are a stranger you are very hard to accept.

How long have they taken friendly approach?

I think we start 4-5 years before the new Thai constitution, every project has to have the community involved (10 years ago)

Do you have any suggestions for people we should speak with?

CD people (Channarong, Nipaporn, Pattana) and also the people from the power station (they will have more communication for approaching the community. Kiertisan is the head of the mine. K. Chanin (he takes care of the environmental management system, ISO 14000)

CD will tell us who to talk to in the community.

Do you have any questions for us?

I Wonder in the third week, in the community, will you have a translator with you? Our people worry about your project, that you will get the correct data.

Kiertisan Ekapand- Assistant Governor of Fuel Operation (24 Jan)

Can you tell us about your communication measures?

We would like to have a good relationship between the people and EGAT. And so we have a project to do that. For communication that you ask me we have that. By the project team that we set up here, we communicate our policy from that project to the community. And also here and Bangkok we see the community and the village, they will inform our policy to them, we call official communication between EGAT and the community. When we look at the response, it is ok. The community agrees and satisfied by our policy. The important policy for the environmental stuff that EGAT tells the village, the second one is quality of life. How we can improve the quality of life of the community.

How often do officials from Bangkok come up to talk to the community?

Twice a year or once year. Invited to join to the Buddha temple, we will arrange for the governor, etc. to see the community. And it is ok, everyone is satisfied.

How have EGAT's activities (dust control, community development, etc.) been communicated to the people of Mae Moh?

We communicate our policy by monthly meetings. They occur every month, that is the official meeting. The chief of the village is the chairman of the meeting, EGAT will send some people to attend the meeting and inform our policy to the attendees. Also, when the village has a meeting, like a monthly meeting, we will have an opportunity to send some people, and we will do that and inform our policy. The thing we have to do there, is to inform our environmental situation. For example, the data that we get from the instruments, what the result is of something like that.

Are there any communication techniques that work less than well in the community?

I don't think so, every communication that we design is ok.

If a villager has a complaint, what is the process for this, who do they send the complaints to?

To here, if they would like to complain about our environmental control, he can send a complaint to here. We have a project, community development, they have people to work with the community, the community can send some complaint to them. It is the channel to EGAT. Another one, they can make a record to me, another one he can send by e-mail to EGAT e-mail. Another one, they can send some complaint to the sheriff. And they pass to me. When we go to the village, we try to see the leader and talk to them about what would you like to tell us. What are some complaints or requirements or something like that. I think it is very necessary to do

that. When we have some change or some opportunity to do that, its important to talk to the community leader.

Through our research we have found that EGAT performs these methods (education development, community development). Which of these methods have worked well?

Many methods. Official and unofficial. Official means monthly meetings, unofficial means trying to see them.

Unofficial is more of relationship building?

Yes.

What is the public feedback of these methods?

I think, right now, very good relationship between EGAT and community. I like to give you some example. When we have some accident in environmental problem, the village suffers from the accident, you know, they tell to us or the sheriff and we get it. And we inform them and try to fix it. In the past, they will send some sufferer to the newspaper or NGO.

What are the responsibilities of the PDA?

You can ask the details of that from them, that is better than asking me. Channarong will know more on what the success for the area will be.

How do you determine a communication strategy that EGAT will use?

Kiertisan: If we have a strategy on environmental communication, we try to use the participation method. We have the representative from the village, every village, we bring them to do this project, we call the participation on environmental monitoring. We select some people from each village to participate in this project. We would like to call this strategy to communicate. Another thing, we make our area here to be for the tourists. We have the museum, the golf course, the view point. That means, we try to bring the outside people into here and you can see everything here is ok. No problems with the environment. And also, we try to tell people, that the power plant is for tour, educational tours. We invited the governor of Lampang. This is an example of communication, not face to face but by creating an environment.

Boontien: This place is a place to learn environmental.

Kiertisan: The major policy we try to make here, for the student, for the environmental student. The university that has a faculty of environment, they have to send students to visit here how EGAT/Mae Moh manage environmental tasks. How we can control environmental impacts,

anything that we arrange for them. Environmental systems. Right now we get the ISP 14000, and ISO9000, we try to get 18000 for the safety procedures.

Boontien: I think I like to concentrate on this policy, because every meeting he says this, ask the staff to make some plan to support this policy. I think you have asked to have a plan to support this.

Kiertisan: Another, we try to improve the information, in the past all the sections were separate, the environment, operations section. Now we try to compile the sections more. Its like improve the information management for environmental things.

What is the feedback you get on your relationship with the community?

When we have an accident, we can control everything in our area, but not out there.

What kind of problems has EGAT encountered when communicating with the community?

I don't think so, in the past a lot, but right now, I don't think so.

In the past, how was a problem solved?

If we talk about in the past, there would be emissions, and that accident would make the community suffer. If you ask what the reason, I think the coal fire power plant is the first plant in Thailand and at that time, nearly 20 years ago, EGAT engineer no experienced on operations of coal fire power plant. And also, the government never had laws to control how a power plant emits sulfur dioxide and for that reason EGAT cannot control emissions. And I think this is the reason that the relationship between us and the community was very bad at that time. They told the community at that time, there is no problem, we solved the problem and we'd like to commit you in the future no problem. In the next two years, again. Maybe two times. The trust disappears between EGAT and the community. And right now we try to solve the problem. The main problem is the trust between EGAT and the community. Right now we try to solve this.

Is the current trust the result of the communication methods?

Yes

Could you tell us about the resettlement?

I have preliminary data about this, maybe you can ask about K. Channarong from the resettlement project.

Resettlement scheduled now for 4 villages. You have to know that our area, the Mae Moh area, we have two group of people live here. The first group, come from outside, from other villages, maybe from south of Thailand, northeast. They come up here for working, at the power plant,

etc. And the second group, we call the original people, the local people. The groups have different ideas, different lifestyles. There is a big difference in some case. First group likes to get environmental policy and the second group suggests to the government, new policy for them. They disagree on the policy. Sometimes it takes time to solve this problem.

Policies for hiring…% of native people that villages request to be employed here

By the labor policy, every time we have to hire labor force here, we set up at least 80% from Mae Moh area. They can be both groups

What is the policy with public involvement?

We like to…We have to bring them into participation, we have to do things together. Also monitoring the environment. Also, right now for the power plant, we have what we call (?), for example Mae Moh area, power plant has to take the money from every unit of generation, we generate 18,000 million unit per year, that means the community gets 300 million bath a year for the generation. For the amount of money we have a committee to manage this budge. The purpose is for improvement of quality of life and improvement of infrastructure.

No suffering people around this power plant, a big difference from the past. If the people get money from the power plant, they can use that to improve the quality of life. The people should support our projects here, I believe that. We can solve the problems here around the power plant projects.

Boontien: we think that we use the best technology for environmental management. The perception is the biggest problem. We use what they use all around the world

Kiertisan: the trust is the main point, if we can solve the trust between EGAT and the Thai people, then no problem

How does the communication here in Mae Moh compare to other EGATs across Thailand?

EGATs here and outside are the same. Different people and different concepts. The Mae Moh people have more experience because we have had a problem for a long time. We had the power plant and the mine 30 years ago. After we operate the power plant, about 7 years, we have a big problem, something outside and the community suffered. And we tried to solve each problem, okay community and trust. Power plants, especially coal fired power plants, very good, no problems. But the public, some don't believe or ignore what we say. We tried to make this area like a demonstration, when we go to the public, we bring them here, then we can see, "Oh its better here! It's very fine." After the power plant shut down and the mine closes, EGAT will be gone but the community will still live here. You have to think about the next generation, for the son, something like that. I like to say, you have to think about this you have to think about that. To think in the future. I make myself like a brother or sister or father.

About the eventual closing, what is the response from the community?

The trust I told you about, the trust better and better.

Are there any new methods of communication being developed?

I think right now its ok, but we would like, but we have to get it from the response, for changing or making a new policy. But right now it's good.

So until the response changes, there is nothing being developed?

Yes, right now very good.

Boontien: We do in advance of the law, for the environmental division. We have a new constitution last year but we have done better before that, than the new constitution. They wanted more participation but we had done that before.

Do you have any questions for us?

I ask you, when you see the villager, you will see a good answer about our situation here. They will say its very good, the faces of the people will smile, that means everything is ok.

Boontien: Seeing is better than reading or listening.

Phonrit Sethakamnert – Power Plant Senior Engineer (24 January)

Can you describe your position?

My position is like housekeeper. Power plant's main function is to produce electricity, our organization has production division and administration division. I am assistant coordinator taking care of security, public relations, information technology. Not really concerned in the production department, but I used to be.

How have these activities (dust control, noise control, etc.) been communicated to the public?

I translate, I think in Thai first and then I translate. Previously this area has problems with SO_2 emissions, then we installed to reduce SO_2 emissions. We communicate to Mae Moh hospital so that the community can look any time, how much SO_2 we emit. The meter they see in the computer is the same as what we have here, its real time. We have a wood board, or an aluminum board, in the community, in an important place that shows how much SO_2. We have 11 monitoring stations and we show in all places. We have 5 boards. Dust also.

It is a color scheme, green, blue, AQI to show. Bar graph.

Does every community have a board?

Only 5 areas have boards, we select junctions that many people pass so they can see this board.

The communities that do not have a board, have access to a board by their transportation throughout the day?

Yes. We use community people to collect the data. They are volunteers.

How are they chosen?

The community picks, they are like a representative of the community.

The information on each board, is it the same on all?

Some boards are only SO_2, dust and vibrations. It is up to the impact of the area, what is on the board.

Are the boards also monitored by EGAT?

EGAT people collect the data and translate it to a figure that the people can easily understand. The people pick up the information, we translate first. We train them how we translate the information.

What is the public response to this?

Because SO_2 is very low (lower than standards), they have no interests. Even in hospitals, 3-4 months ago, I asked the hospital director, how many people look at the computer. The doctor said, nobody, only me. Because once per month, there are meetings with the leader of the community, and I have shown the information. They don't ask. I think they trust.

Boontien: Because the SO_2 is very low, it is normal information, the people don't care very much, I think this means they trust.

Right now the public looks more towards other information.

What are some of the methods that have worked well?

I think the board is good method, because it has their participation. They can see the information. Our speaking to the community as well. Another is, we sometimes take the community people to visit our plant and we take them to look at the computer monitoring and they can see the value changes very minute. The best is to take them to our plant. Also newspaper and brochure (monthly) to show the value of emission.

What are some of the methods that have worked less well?

2-3 years ago we have a report by paper every week and we send to the leader of the community After that, 2-3 days we check and the paper was still in their house, they didn't show the people. It is still used, it is official method.

If the air quality is unusually poor on a certain day, what is the specific approach to communicating that?

Last year, there are much dust, at that time, I have to explain to them, here also lots of dust but les than Chiang Mai and Chiang Rai. Because our operations are 24 hours a day… I tell them, and they understand.

There is a special way, different than regular communication?

Collect many information to compare with other areas. Show peak of dust in dry season, not only here but in every presence in dry season. To show them it is the normal way of life in Thailand, that when they burn the forest or the rice field it is normal.

Can you talk about the education outreach?

Education development, we have donated about 378 million bath to build technology university in Mae Moh. This project is about 4 years, started 2 years ago. Construction of the building. After finished, we will transfer to the government so it will be for the community. It is like a

vocational college so they will have experience. They will get trained here before they finish. They have started but they use the old building, the new building is under construction.

How do you determine or choose communication strategies?

Our strategies are like 3. At first we train our people to concern (our staff) communication strategies. So they can help community contact, then we try to communicate with them to reduce some conflict or something happen, and then don't understand it. We have research from third party, that community don't understand or they want to know anything or they want EGAT to do something. We have to use this information to make our plan to fulfill the gap. Third, is (not now) but we will have them partner in our business. We use PDA to build a strong in business, next maybe we can have a business together. Maybe our dress, we will let the community make this and give them some money to do this. Let them have an open market to let them sell to our employees.

Boontien: Train employees to be able to communicate.

Phonrit: We have 2,800 employees, if all EGAT employees can understand our entity then they can have good PR with the people. We tried to briefly explain our activity to all. Because there are some employees from accounting, they don't know how we use the emissions. So we take them to teach them. Some say, "Oh we never know you had this" then if they are a neighbor, they can go and tell this.

How would you describe the rel*ationship between EGAT and Mae Moh?*

I think 99% they accept, but some groups don't agree with our activities. Even though we show them the scientific information, they don't believe. It is difficult to believe, there is no way to make 100% believe. Its like if some people are Islamic and you want them to change to Christianity. The 4-5% of people who don't want the operations are in the 4 villages

The relocated villages, some are native, some are from outside?

They are mixed, some are original, some are ex-EGAT employees. They some have conflicts from a long time ago.

Boontien: Because of the benefit also, they get a lot of money from the land and the plant. Some are retired EGAT employees

Maybe some conflict with their boss, in their mind. There are 17,000 families and 500 of them want to relocate.

For relocating villages, what stage is EGAT at?

Phonrit: It is not EGAT directly, it is by government. We need coordination with everyone because local governments. It is sometimes not fair because when people get relocated, when they move they have two houses. They are supposed to give old land to government. EGAT is involved in support in relocation, but local government is involved as well.

Boontien: May I had, 4 years ago when EGAT had a letter to minister of energy that we do not agree with the decision to remove some. The environmental division sent that environmental data showing it was good then so there was no need to move them. The environmental quality at the place that they move is the same as the environmental data here. We dispute because the reason they want to move it's not fair, it is not good reason to move, it is not based on the data, the information.

Phonrit: EGAT disagrees with the reason for moving the people, if we do something to harm the people, we have to compensate, but not like this. The information shows that there is nothing to harm them, so I don't understand why the government decided this.

Boontien: The politics had no reason.

Are there new methods of communication being developed?

I have a project this year, social mapping, we want to make social mapping for every village. Last year I tried pilot project two villages. We took our employees that are willing to do this go to the village and talk to them about the history. We want to learn the good things from them. Information that we receive is very good, when we want to approach them, we use time that they have big ceremony so we can talk to all of them. They are very friendly, in our culture, if the friend talks to the friend, there is no problem. After we learn about them, it change our attitude, they are very old in culture, it is like respect to each other. This year I do about 10 villages. I cannot do every village (there are 42), so I said every department has to take care of one village because I cannot do all of them. Maybe two times a year, they will have activities with them, with the children there. Better than only me!

How many villages will be going through this?

There are 14 departments so 14 villages, we select them by how close they are to the place. Our people can not travel too far. This project is not implemented, I have to ask for permission from our group of boss. I have to show them our project.

There is data from pilot project?

Yes.

I have some data. (goes to get). We will walk with them to learn who is the leader of the house. We will learn about their history, maybe they moved here 200 years ago. We don't tell them

about EGATs history because maybe they don't interest. We want to learn about them, they say "no one ever asked this."

Can we get a translation?

Some things in here are very interesting in here, can't marry in same family, have to pay homage 1 cow 6 hens if they intend to marry.

We show community to make sure information is correct.

Do you have any questions for us?

With technology we can build any power plant, but without good communication, the people don't understand.

Community Development Department Group Interview

Charnnarong Thanatvit- Community Development Project, Nipaporn Muangkasem- Administration and Evaluation, Pattana Chaimongkol- Potential Development, Charan Saengrattanachai- Community Development among other Community Development Workers (Papapon, Air,) (25 Jan)

What is the community response to your efforts?

Pattana: We communicate with community leaders in meetings and community radio. We have time on air for one hour per day on the radio. We have a new leaflet and EGAT magazine, EGAT newspaper.

What information is on the radio?

Papapon: Information about the environment and activities that we serve for the community. Also we have some music. Music about our environment too.

Who does the radio show?

Papapon: the staff in my staff. It is 11-12 every day. Thursday will be time for PDA. We have another from 10-11. There are two radio stations to communicate our activity to the community, each for an hour, the same content.

From presentation, there was a suggestion from Yonok University for integrated planning, what efforts for involving community in planning have been made?

Pattana: We have invited the community to be involved in planning for a one year plan. We have to educate the activity to the organization with PDA, QDA, and community by district officers.

Boontien: He would like to show example. Village leader EGAT and maybe PDA will learn together

Air: EGAT respond from PDA, donates money for them, activity in this area, majority of each organization not the same, we propose that PDA provide vocational learning for people to live and CD is concerned with education (60% of money for education), this is the same for PDA. EGAT responds for infrastructure, so in three organizations we can monitor and integrate the plan, we have a new organization, called government agency, for development to each tambon, a local organization for each one. District governor is in control of this to integrate the planning. So if we can integrate, the activity should not be overlap. We try to integrate our budget for EGAT first and then integrate other organizations. The PDA project will assist EGAT, we

approved 3 phases of the activity, now we just finish phase 1 and then start phase 2, 77 million. We will consider with the governor, what budge we will have. 3 phases are about 9 years.

QDA- we give them money to make activity, about 30 million/year. I suggest you interview PDA and QDA for more information on monitoring for that.

The organization structure of PDA is for 5 tambon, there is representation for 5 tambon and for EGAT. These come from election from the community, so they have participation. And for PDA, it is from Bangkok but they are very experienced in vocational training.

Has the community responded well to these efforts?

Yes, they like the bank the best.

Pattana: Village bank is the most good.

In terms of tourism, does Mae Moh see its increase as a benefit?

Air: In general, they appreciate to be near, this is objective of EGAT to take Mae Moh after that to tourist. Now we have many activity for tourist.

Pattana: on November every year, we have Mae Moh festival, and many many people come here to attend activity that we have. We have evaluation from the people from the people who come here. The most people attract to this activity.

You stated people have a say in project development, how are projects developed?

Pattana: one is from people communication to propose the activity, and one is from top down from EGAT or from PDA.

Boontien: you can see that there are three main projects, CD, QDA and PDA. PDA is the organization that have the process to get requirements what to do first, what is the proper project to se there. You can see that we have a preliminary phase, they assess for that requirement, and what a project should do first. That is their own process. For EGAT, we give support from policy and official of EGAT. For the QCD…

Air: we have consensus in the village for the requirement, each organization, new ideas here

Pattana: we have process called community assessment, we have meetings with the people in the village to propose the requirements. In every village. And then we have to analyze their requirements with the three organizations.

Who in community is involved in that meeting?

Papapon: the representatives, the community and the village leaders. More than 50% are just community members

Boontien: in CA, they ask for the whole village to be at the meeting. In setting priorities after getting that information, maybe EGAT staff, the leaders to set what the priorities. After the CA, you cannot do all of their needs.

Air: there are two parts, first from all people (more than50% come to join) and after that we do with the leader to compare and balance the need of each village.

Pattana: to set priorities, based on the budget.

How would you describe the relationship between the village and Mae Moh communities? In terms of satisfaction?

Boontien: I think the survey is quite right. In their point of view, it is reliable

If there was an environmental concern, would the community come to this department for help?

Boontien: This is the place.

What is the process for solving those concerns?

Pattana: A leader can come here.

Air: All people.

Pattana: All people and the leader can come here to tell us about the problem, every time. At this time, in another room, with my boss, they are solving some problem.

Air: The problem, EGAT should consider that, if they can help or not, or if they should concern others or not. My boss will try to negotiate or help them, maybe cooperate with other person. The problem with environmental impacts is that we have a complaint channel by website, phone and paper. IMR office, they are the representative of Mae Moh mine for environmental. People can complain here too and then we send to IMR office to, they see how they can control it, we consider if it is fact or not. We use IMS (integrated management systems) with environmental standards.

There are groups in the north that are not happy with EGAT, have they caused problems?

Pattana: It is very difficult to solve this problem. Air for environmental we try to record it, K. Boontien has a figure for, but maybe they cannot accept the figure that we have.

Pattana: Sometimes it's the feelings of the people about noise and dust.

Air: But we are starting to control it, data from K. Boontien goes to the public. For communication now, we have to the community now, we have to perceive the problem in each period. We have a community about this village, from EGAT, community and from government. K. Boontien is one member.

Are there problems, difficulties?

Pattana: Maybe

Boontien: Everything that we do.

Air: I think the problems come more from factors, there is benefit too, maybe from EGAT about environmental impact. We have so many NGO in Mae Moh area. Now we open the mine to lignite for power plant, we have to pay some fee to rural and the process to provide the fee may be, they are not satisfied. Because up to amount of lignite export from the mine, the quantity in the north may be less than in the center. Because the election of the person so we have to balance.

Boontien: Balancing is very difficult.

Pattana: The fee is based on the law.

Boontien: the reason whey they are talking about it, we cannot balance the conflict of interest. The conflict between the politician and the municipal. In every group there will be majority and minority, maybe the minority is not happy with us, we cannot control them at all.

We have seen the village boards, is that something that falls under this department?

Air: We have PR for the board too. The result of the instruments every month, my staff here brings this report to PR and to the meeting, to the leader of the meeting. To the chief every month. The same information is on the radio. We coordinate between environmental section and here and to PR about this.

What is the radio station?

Papapon: 99.5mega hertz and 90.5 (about education), there are two, one just started.

Do the unhappy groups meet with you?

Pattana: Some people.

Boontien: Thai people we talk together. But this morning, one of them, the leader of one of them, here talking. One of them are in K. Channarong room.

Do you have any questions or recommendations?

Pattana: Worry about the communication with the people when you come to interview or ask them. There may be problem with translation.

Ryan: We will have a translator.

Pattana: I am not sure about your translation. Because maybe they don't understand specifically. There is northern language and central language.

Nampon Potiwong– Licensing and Permission (24 Jan)

Can you describe your position?

Land lease and right section, under the head of the section. Responsible for the mining license and the area license from the forest. Most of the land here is the area of the forest so we have to ask for permit from the government to use the area. Then we have to ask for the activity license (like the mining license) from other divisions. We have to deal with the government agency and also with the community, to get approval from local government. Sometimes local government asks us to make some meetings with the community directly, to check if they agree with our project or not. When we have the meeting with the local community directly, this will be the reference for the local government to approve the process. Approval from the local government is first and then from the central government.

What benefits do the communities receive in return?

Royalty fee, it is 20 Baht per ton. The price of the lignite, is approximately 500 Baht/ton. 40% goes to the central government (of the 20) and the rest goes to the local government. We have three local governments to deal with since the area is so big. Two local governments more than 100 million Baht/year, directly. The other income of the local government is the tax. That is why these local governments are rating as a rich local government, they earn income from our company.

How is the relationship between EGAT and Mae Moh?

In my opinion, mostly it is ok. We used to have a problem with the pollution from the power plant. That was a bad impression for the locals, but maybe more than 80% understand what we have done and what we are doing. Some part less than, I mean about 10-20%, there are some activists that try to do something, I mean some activity that sometimes is ok or sometimes is not. Because, the link with the political movement. They tag team all together with the local. They have to set the issue for the political campaign, I think that. Because my background, I study political science and I know about the local leader and the opinion leader. I am the native people here, and I know about the opinion here, I know that. Sometimes we know what happened but on behalf of the organization we know something but in that position we cannot say it.

The minority of people that have issues with EGAT, do they cause disturbances for getting a license?

Yes, they have.

Can you give us examples of this?

The leader of the activists, when they set the issue, they organize the program, and sometimes to have the record of activity, they campaign, then they became the local government. Sometimes the member of the local parliament, so when we asked for approval from the local government, we can explain the cause and effect of our project, finally, they approve, but it takes longer time than ever. And since we are a government organization, so we cannot pay the under the table money. But for the private sector, they don't have such kind of problem because they talk with the money. Ever company has to pay to start with the local government. I have faced with this kind of problem.

How long is the community involvement time for approval?

Since our organization is the big project, so before we start the project, we have existing for example, so we keep contact with the community. We have to add on the new project, but officially it takes about 2-6 months before. It is up to what kind of license. Such as, the license for the area usage takes, all the process, 1.5-2 years, processing until we get the license. For the mining license, it takes about 5 years.

8 year plan for new mining, was done 5 years ago.

Have these problems ever prevented you from getting a license?

Its been delayed, problem is delay, not stop. This is because 80% understands, we call it solid majority.

When the government discusses about us, the administration and the local government

There is one activity in the process, we have grace to extend the permission license, we have to renew the license, we are in the process. The first time the local government disagree with our project and we have to…

There is a time limit on the permission?

10 years for the forest, 25 years for the mining license. One problem of the Thai government, the same area, you have permission for the activity for 25 years and the permission for the land only 10 years, so you have to renew twice. This is my suggestion to extend the land use permit.

Can a renewal get denied?

We renew in advance to prevent this problem, it has never happened.

We have to separate into one small area, less than 300 rai, we cannot get permission for the whole basin.

How many active areas are there?

Let me see, I forget, 9000 rai.

I ask for the approval from 3 tambon. It is the tambon government not the village government.

Kusuma Michimon- Director of Population and Development Association (28 Jan)

Others present: Sunan Saovara and Sudarat Somduang from the Quality of Life Development Association

(Presentation)

I direct the PDA, this year is the 4th year. Today we will introduce you about our activity, because our presentation is in Thai language, maybe you can translate it for them.

Lite: She said that if the community has a problem, with pollution or sulfur dioxide, then they tell her project. She talked about the experience of this project in Mae Moh, after the SO_2, EGAT tried to protect and after that EGAT have a CD project and QDA and PDA to help the community about the health and develop life quality. After the project, but now we have helped the community.

Kusuma: There are three main organizations receive support from EGAT to implement the activity and improve the quality of life for Mae Moh.

I would like to introduce my organization, the PDA. The project of improve quality of life of people in Mae Moh. Before we start the project this is the 4th year of the project, before we start the project, we come to Mae Moh a study about the problem, the attitude of the people, and then we let them evaluate their quality of life. We use a ladder for that, there are 10 steps. We help them to evaluate their quality of life, they have ten steps. Then we conduct a study visit. In the northeast we have many projects to improve the quality of life of those people. And then we come back and we use the AIC, a discussion about how to improve their quality of life. The result of the study, we propose the result to EGAT. The objective of the project, we have 5 main objectives. 1. To improve the quality of life. The second one is to improve, to make them have income, to improve their occupation and their income. The third one is to let the people participate in development. The fourth is to make the people sustainability and the last one is to make understanding among all parts of the community in Mae Moh. The population is almost 40,000. The project, we propose a project for 9 years, it is divided into 3 year period. The first one is the starting period, we have to prepare them, we have to set up the group, arrange the study visit, like eye-opening. And then we come back and plan to improve the quality of life. The second one is t strengthen the group, and the fourth one is to help them to be sustainable. To achieve the project, the ways to implement the activity is divided into 7 categories. 1. To develop the economy, 2. To develop the capital 3. Water resource development 4. Social development, 5. Environment 6. To develop their health, 7. PR- rural development. The strategy of the project is 1. Community participation. Every project in the rural area, the most important strategy is community development, because we are outside, we cannot help them in

everything, they can only help themselves. So we help them help their selves. 2. Develop community organization and strengthen their group. We have many kinds of groups, such as the water resource development group, the youth group, aging people, occupational group, village development bank. We try to help them develop until they can be strengthen and sustainable. The capital in the village, we try to set up the village development bank and the bank is managed by the people. We try to help them organize many kinds of activity, they should do through the bank. As I mentioned we have 7 categories of development, ever activity should be organized through the village development bank. As I mentioned, participation is the most important thing for the rural development. And, with the strategy, people participation and we have the network of the village development bank. They have many agencies, many organizations that implement the activities here. Not only 3 organizations supported by EGAT, but the local government and district government provide activities as well. We try to integrate our activities together. We expect after the project terminated the group will be sustained. We have many kinds of groups, the most important thing is the village development bank. We try to help them create their occupation, help them to set up occupational group. And other kinds of groups, such as youth group, aging group. This is the economic development category, the way of to implement the project, the first one we try to help them like eye-opener, train them about the need and the education. And to promote their occupation, there are two activities, cultural and non cultural.

They like the factory be in Mae Moh but because it takes time for the factory to relocate here, we try to conduct a study visit in the province in Lampang province, they have the factory. After we conduct the study visit, the factory subcontract the order to our group, this is the first stage that we can help them. So we receive subcontract order, the order from the factory to do by ourselves, the solving group.

This is we try to coordinate the marketing and the solving.

This is the study visit, the business, and we try to help them. We try to help them produce the product by themselves. The firs tone is try to make weaving, or mushroom.

This is the training, training about agriculture.

This is during the conduct the study visit, the agricultural and also training.

The pig, pig raising, in Mae Moh, we try to help them raise the pig we call bio-raising, we try to help them because for the pig raising, its not god for the environment. Because for the people, the pigs have disease and insect and some smell. We try to protect some kind of this by using IMO (integrated microorganism) and to make it for bio-pig raising. This means that the smell and getting sick we can prevent them. After this presentation we will conduct a study visit to the agriculture and sewing group. We try to coordinate another agency to help us. We call UFC Company, they produce something and we integrate them to help us.

Another kind of activity is nonagricultural activity. Sewing group like that and wood carving, and the furniture from the teak. An also we try to the brick made from fly ash, that is the product from the electric factory. Another is training how to do the bio-fertilizer. Sometimes, this is during we conduct the study visit about tourism. How to promote our place to be very good for the tourists. This is the place that is very, the soil has made our place very, it is local. They study the impact of soil erosion, this place is different from another place.

This is some activity that we promote for the tourists.

This is the village development bank. Every village we have organized the activity is dependent on their needs and other ability. There is one activity that we can implement in every village, we call this village development bank. This activity can help the people have their own capital in the community. This bank is implemented by the people, PDA we just only guide them, we are the consultant and these kind of activity is outstanding for our project because the people can run it. They can give loans to the members and the members can use the money to invest their business. And, the profit does not go to another place, the profit is in the community. At the recommendation of the community, some, maybe the project 10-20% go to the foundation we call Beneficiary Foundation (benefit to the villagers). 30% goes to the village development. For more information, we will explain more in the village. The community development bank, you can observe, it is open 1 month, only 1 day.

83.3% is the saving of the community.

The villagers borrow the money for their business and the benefit for the people, some people was ill and the manager can give them for the benefit.

This is the activity for water resource development. We have two types of the project, the first is agricultural and the second is drinking water. This is the water resource development bank. Some area, they have the canal on the hill and sometimes it is to prevent a flood, so we produced the dam.

This kind of project, we call vegetable bank, because this is we try to keep/reconstruct the tank, the height tank is about 3 meters. Some areas is 6m, we try to keep the water in some areas, we keep the water in the bank and we also have the small pipes to release the water to the farers. Each land we prepare the land for them. With the water in the tank we release it through the pipe so they can grow the vegetables all year long.

This is the project for the rural development, we implement in the school and in the community. In school, we conduct, we contact with the school, at each school they have one teacher responsible for this project. They select the representative of the student to be the volunteer. They organize activity in the school, the project subsidy the money to implement in the rural area.

In some areas, they have many cows it makes some areas dirty, so we tried to help them to use the residue of the cows to make bio-gas. This is the activity of the environment project, the forests, deforestation project. This is the project for the aging people, in some area we conduct physical checkups for the people. In some areas we coordinate with the local government to conduct the project. In some seasons, they have the diseases.

This is the example of the water resource development, that we try to help them. In some areas they have the watering the canal, but some people cannot access the water so we help them to create the canal to their farm.

This is for the Thai people, we are Buddhists, and some festival. The people, if something is concerning them, if we promise to do this, we cannot promise (if we break the promise it means that this is a sin). So we help to help the people conserve the trees. This kind of activity we call kwaa paa, this is use the religion to help the people. If the festival that we use the cloth, like the monks. We do not cut the tree if you tie the ribbon like monk around it.

This is the social development, we have many target groups, aging is a target group, women is a target group, youth is a target group. To conserve and motivate them to preserve the local cultural. This is our social development also. For the youth development, we have the activity that we call like youth administration organization. Its like imitate the tambon organization administration, we try to train them how to develop their local like adult. We train them how to plan, how to make a project plan, how to implement a project plan and how to be a team leader. During that, their potential will improve. This is the income generating project for the aging people. Sometimes, the wisdom of the aging people compare with the nowadays, modernized, some wisdom should be preserved in the local. So the aging people trained how to do some project, in the traditional way.

This is the promotion project, we have to education. To educate about electrical production. We have many centers to promote rural development in Mae Moh. Sometimes we have the study visit, the visitor to visit us.

They have almost 40,000 people but the people benefit from projects is 60,000 so that means one people can get benefit from more than one project.

Do you talk to the people about the open burning, the open fires for leaves?

Yes, let me present again. Our responsibility here, there are three main organizations, receive the money from EGAT. 1. Project for rural development 2. Foundation for the project, for local development . They have many kinds of activity, such as infrastructure and create jobs for the people of Mae Moh. One kind of activity they have to try to help the people is compost fertilizer because they don't want people to fire their stuff or their tree. I think that is the policy of the

EGAT, they don't want the people to fire, that is why they have the project to help the people make the compost and then they buy from the farmer.

You said something about a 10 step program, can you go into that a little bit more?

The ladder? For the ladder, to teach the people to evaluate their quality of life, we try to ask them, we have 10 steps, they should evaluate by themselves. In the past they are at one step and in the future they can evaluate the next step. It is to teach them to evaluate themselves.

Lite: QDA has a paper in Thai about the development and occupation, such as sewing group and buy the clothes for the students in the Mae Moh School. And support the scholarship and the equipment for learning in the Mae Moh School.

Sunan Saovara- Secretary of Quality of Life Development Association, Sudarat Somduang- Secretary Assistant Quality of Life Development Association (28 January)

Sunan as translated by Kusuma Machima:

Her chairman had to miss this because he had other activities.

The framework of the organization depends upon EGAT regulations that support the budget for the association. The main activity is the support scholarship and occupational development. And also, the health and the environment and also the culture, like our organization. This organization, I mentioned at the beginning there is the foundation. At the beginning it is the foundation but since the last two years it is developed to be the association. The objective is to help the people, through the committee of the organization. Monitor about the activity in schools, it is not only the scholarship for the students, they also help for the learning material in school. For the scholarship for the underprivileged, and for the student who are very good, very clever. Besides the scholarship, the school lunch program, they also provide. It is not for, give the money to the school, they try to help another group. Because one kind of activity for the occupational, they have the women's group or the agriculture group. Instead of giving the money to the school and the occupations group to produce the product such as to give to the school (pig fish vegetables). Another is for the sewing group, they produce for the school and then the uniform we give to the student instead of buying from outside. So it not only help the student, but they can help the occupational group also. As she mentioned, they have the sewing group, the try to help the marketing for the sewing group, not only the uniform for the student. They also produce the sweater for the people during the winter, during the cold season. They give the sweater to the rural people. And, it's not only this, the association, coordinate with another agency to train, internship, to improve the quality of their product. She said, that, the organization also set up IT center, there are 4 IT center in 4 sub districts. To help the occupational group, the association also have the revolving fund, for the group to borrow. And, this is the main activity of the association, another kind of activity that the association subsidy is they have many occasion, for the women group or the aging group, they plan the day. Such as sports day, new year day. They ask for this from the organization and the organization subsidy. For some kind of activity, they donate some money. Again, emphasize that this organization emphasize that the activity on scholarship, on student development, such as scholarship, training material, school lunch program and another tie of activity is depend on the objective of the activity.

Sukarat as translated by Kusuma Machima:

Again, about the association, as we mentioned, this association is supported by EGAT. And this association managed by the community. The association is set up to decrease the tension among the community and EGAT. Because in the past, there are some misunderstanding among the community and EGAT, so EGAT set up this foundation (now an association) and the board of

the association come from the community. So when the board is from the community, so it means that they can understand the needs of the community. The association, their activity will respond to the needs of the community, the real needs of the community. And another kind of activity, they have social development for the unprivileged people. Such as the aging people, handicapped, these kind of people, if they cannot access the government support, they will provide the subsidy for these people.

Sunan as translated by Lite:

The association go to every community, for to find the problem or the need from the community and we have plans for the project in this year.

(AIC process used in meetings)

For the scholarship, what qualifies a student for the scholarship?

Sukarat as translated by Kusuma:

The scholarship for the student is for the people who graduate from the school in Memo and their parents should not be the government officer. They should be the people whoa re very good student and their parents poor. They have three kinds of scholarship, the first one is scholarship for bachelor's degree. They giver the scholarship for the first year only, 15,000 baht. But if the student is very good and they are very poor, the organization will continue support until they graduate. And as the qualifications for the scholarship, as we mentioned, in the past, they support the scholarship a lot. But some people they do not like, sometimes the parents use the money for something else, not for the student. They changed the scholarship, this type I mentioned earlier, will start this year. For the first year 15,000 baht, only first year. But if they are very good student and are very poor, they will continue support. This is the first year for this qualifications. Besides this, they also provide the loan, no interest, for the community leader to improve their potential.

Wiwat Pukjumpa - Chief of Public Relations in Mae Moh (29 Jan)

How do you focus your public relations?

I try to explain you my work. Relay with working groups in my work, not external. Because in Mae Moh, have the develops social projects is the support. Take care of the social. Relation is in my group in the Mae Moh. But, some activity I go in to talk with the social. Example, on sports day and dinner with the social. Sometimes, but a little bit. More works, my product is the news, inside Mae Moh. This news is monthly news, this paper is distributed when the social has monthly meeting. It is separated by month. Inside consists of the knowledge of the environment, some activity it show here. Knowledge, some knowledge, include that. And for health.

This is about mining, not about the power plant?

Yes this is only mining, no power plant.

Can you explain a bit more the environmental information that is inside the magazine/

Inside consists of QCC information. And some place about environment. Some place activity and knowledge and some meeting in Mae Moh mine. And for health. Important activity it shows that.

Is there a copy of this that we can take?

Yes, he will arrange for you.

Do some villages receive more attention than other villages?

Activity for social, in the Mae Moh mine, no have.

Are you involved with the information boards?

Monitoring, vibration, dust, sulfur dioxide.

Do you work with those boards?

No! Khun Boontien, we try to connect with the social, they help Mr. Boontien change the parameter every month. Oh! Every week sorry! 6 boards, 6 points.

How are the mining activities communicated to the public?

Your question is very difficult for me, because more activity I'm working inside Mae Moh, not outside. Outside is the social development project.

So your focus is on the mine and not the community outside the mine?

Yes.

What other involvement do you have with the community?

I try to contact the school. This year and the last two years, Mr. Boontien tried to contact the schools around Mae Moh to train the students about the environment. We want to student understand Mae Moh mine takes care of this area. How we take care of the area.

What do you do to inform the students?

I take the students come her, go to the museum and site seeing of around Mae Moh and they go to the Mae Moh power plant, I try to explain, so the student understand process of the power plant process, so the student understand.

Every school in Mae Moh?

I try every school in Mae Moh but I cannot because many many school in Mae Moh.

How hold are the students?

Approximately, 10-15. More and more the students come.

The teachers, aacaans, do you help provide a curriculum (or program) for them to teach?

More and more the school have the program for teacher to teach the students, but some school have the program same the Mae Moh mine send the knowledge go to the student. The program the same and K. Boontien send an environment team and explain in the around school.

The students learn about electricity, environment, and what else?

Process, process for procedure to take the mine. Procedure to do the mine, how we take the mine. How to monitor environment.

Do the teachers ask to come to the power plant or does EGAT offer first?

Yes, I think the first priority, people come inside the mine.

And the students enjoy coming to the mine?

Yes, fun, they enjoy. And because more and more Thai students is site seeing, not inside the school, they are happy.

The education program, when did that begin for EGAT?

I heard fro Mr. Boontien, because he is the head project, last 3 years ago. But I think this year I continue this project from Mr. Boontien.

Do you plan to change anything with the project?

Yes, this year I include, I want the students to come here, to come visit my working inside the lab. I have set the workshop for students, include test the soil lab and dust lab and water. I want them to know about that.

Are there other projects involved in communication?

Normally I send by e-mail for inside, not outside. Now I want to outside, but I cannot. I can change some inside but up to policy.

Khun Boontien is involved with the outside communication?

Yes, he does the outside.

Kanlayani Naopnhthai - Director of Power Plant Public Relations Level 9 (30 January)

Note Nantakan- Public relations Officer Level 5

First I will describe you about my action plan. First, for my section, public relation of power plant, my duty to communicate about power plant working and maybe special activity in Mae Moh power plant to the target. My target is, Lampang.

Kanlayani:It is separated, internal and external.

Note: Maybe Lampang and all over Thailand. So we separate my tasks for about internal duty. Do you interest in my action plan?

Yes

Note: For internal, we take the media such as paper of news (not news paper) but piece of paper of news information. Second, saying this news for employee. This news not only paper but we send e-mail, direct to employee too. Internal tasks, internal power plant. And we survey.

Kanlayani: For environment, we survey.

Note: More than 20%. This is KPI. You can ask me more at my answer. For external, media such as mass media.

Kanlayani: We use mass media informational, local mass media, involves newspaper, radio, and cable TV. Local in Lampang. Newspaper, the network center in Bangkok too.

Note: For local mass media, we will say news and make relationship. Example, take them site seeing into the power plant. Sport and visit to office or some party too. Make relationship.

Kanlayani: Because not pay for.

Note: We don't pay the fee or expense about media. We make relationship only. Some occasion such as new years, we pay for the first page to celebrate New Year for variety news paper. Only pay. And, ok that is mass media. But the other target, external target is visitor. Each year, about more than 200…

Kanlayani: I think 300,

Note: more than 300 to visit us, a variety of institutes. And so we survey about framework of this group too, because it is my KPI (key performance index) too. From questionnaire.

So after they visit they fill out a questionnaire?

Yea. More than 75% each group standard.

Note: ok this is my

For the newspaper, the news articles, what information is in those?

Kanlayani: Policy of power plant, policy about management, quality of working here, ISO, and safety ISO, and power plant plan,

Note: Important activities such as Mae Moh have. For anniversary, on 7 February, is date of anniversary of Mae Moh power plant opening. Like this information to release to mass media. My objective of communication, we want to release some message to people, to know, to accept, to understand, the tasks, maybe I release about comment of visitor too. Good or bad, everything. We want to release it o the people. So when the people receive the message, we will think that they must understand more understand Mae Moh power plant, and coal power plant.

Kanlayani: Because newspaper always.

Note: Write about bad things, about pollution. The old details, information.

Kanlayani: When we talk about coal, coal power plant, Mae Moh is the bad example. It is important for PR relations at power plant.

Note: The tasks for my section.

Kanlayani: Every information for my task, want people to understand and accept coal, good and bad, but need time to keep and take it for useful, the technology, everything for. Because my country is poor, coal is, we have many coal, lignite.

Note: Because in Thai, we have at Mae Moh mine only. Thai people, is the owner, this mine, not import from other country, it's cheap. We try to manage it.

Kanlayani: But it is very hard, accept about people, they think it bad but to make it good, its very hard.

How often do the newsletters go out?

Kanlayani: For external, one for week. External is the first important, we want employee to speak.

Note: Can be mass media

Kanlayani: We have 2,800 employee for power plant, everybody who speak

Note: Speak in same way, write, positive too

Do you have a good relationship with local newspapers?

Kanlayani: I think because the power plant experience, I think because 21 years, newspaper local we grown with them. It's a friend, although they talk about Mae Moh with the pollution, but the same way he asks me, we explain…

Note: The newspaper sometimes send two ways to reader, maybe his comment or his idea and ask power plant too, what happened.

They send two sides?

Note: yes two sides

Kanlayani: I think we have a good relationship with, every time he have question about Mae Moh, he calling me, ask first, "right or wrong, really?" and I can explain, I think is a friend.

How often are there newspaper articles about Mae Moh power plant.

Kanlayani: They can go everyday, but for my task we have…

Note: Excuse me, you mean newspaper come to ask us?

No, how often are articles, or stories, written about Mae Moh?

Kanlayani : For keeping local newspaper…

Note: The newspaper will release or write the news, this news from PR section, almost all from PR section.

Kanlayani: For one month, for keeping standard, more than 60% percent

Note: For my KPI, we compare the news which is released from PR, compared with the news from the writer. Compare, much more than 60%. We send 10 news, so the newspaper will release 6 news. If more than 6 up, I pass. If pass, it passed, in this standard.

We spoke to the PR division for the mine, how much overlap is there between the mine PR and the power plant PR?

Note: Oh, co-work?

Yes.

Kanlayani: Activity for the reporter for mass media, we together, meeting for…

Note: For some duty, task we co-work, such as please the mass media, to make news inside or Mae Moh EGAT activities. So we will meet, have a meeting together to how to take care how to send them. Some tasks.

There's no overlapping communication that goes out, the mine has these brochures, is there information from the power plant in there?

Note: Not the same, this is Mae Moh mine news letter, for us, it is every week. I will show you. (*Retrieves information packets.)*

Your department makes these information packets?

Kanlayani: No from center of EGAT, we ask them to make these.

Note: This is ours. Internal and external. (*presents information*)

Does this external one go to Mae Moh or to Lampang?

Note: The external news goes to center in downtown Lampang.

Do the villagers in Mae Moh get this information?

Note: Ok for Mae Moh people, we send to Mr. Channarong, we have 250/month and send to Mr. Channarong to give to people.

Note: Channarong is for community develop, we will have a meeting, so he take this Mae Moh news in meeting, one way. And the second way is we send to DJ at development project. This office to broadcast, local broadcast in Mae Moh too.

Do you have plans for future PR that you want to start?

Kanlayani: Mae Moh power plant, TQA, it means Thailand quality of. It means about the total quality management. Because of in Thailand, no…Public relations is the channel for manager to show leadership about…

Note: Ok in the future, Mae Moh plant say that to receive Thailand quality, but now it is in working to contest. Ok so, when we have to receive TQA, Mae Moh power plant work in total quality management, completely. So can receive this award. Its top of standard in TQA is leadership of my executive so PR must show or release or say information about this. In to target, to receive that, Mae Moh power plant want to go to TQA. TQA make many quality organization, top quality.

So the goal is to achieve the TQA?

Note: Yes, my goal, my goal.

Kanlayani: Many KPI, to show that people accept Mae Moh power plant…

Note: We must do more, it is hard to get TQA…in fact, we have important interest in, but we want to adapt or develop our work, every process, all of power plant must use this standard to make better and better.

So the goal is the PR division is to encourage power plant employees to work towards the award?

Note: Yes of course. By news,

Kanlayani: By policy, by meeting, by interview,

Note: My boss too, same example always.

Before finished, I would like you to suggest, my task in PR, maybe I can take it to new strategy, plan. Suggest me my work.

The goal of our project is to provide recommendations, we're working towards coming up with suggestions or recommendations, so right now we don't know. At the end when we are done with our research, we may be able to make some recommendations. We must evaluate all of our interviews.

Can we get copies of these?

Yes, it's not beautiful.

We're concerned with content, not looks, thank you!

Boontien Khampirapawong- Environmental Operations (31 Jan)

Are there other methods, we know about the boards and the meetings?

The radio, CD people usually respond to directly to the leader. I'm not sure about the local newspaper because the power plant PR respond to the local news paper.

For the environmental information, PR CD and environmental section, both sides, power plant and mine. They work together. Sometimes for this kind of case, the environmental staff should go to communicate directly. If there is something they cannot communicate. If the problem was with drilling and blasting, then they would have to go, we work together. It is usually by the CD and PR, by local radio and the meeting.

When you work together, does your section give out the information to the other section or is that done by you?

For the routine, I give them the information, for the mine environmental section, I give to the PR of the mine and the CD. They convert to the proper media that they use, something like internal and public in the meeting board village and district and also the CD will give to the local radio and some meeting also. For the power plant side it seems that because the situation of environmental from the power plant side is quite settled, most of the case is quite routine. Usually by routine and by explaining to the visitor.

The environmental section is responsible for the content, who is responsible for the presentation, example the board, what information goes in the board versus radio?

It's developed.

Who works on those new ideas?

For example, monitoring has developed from the problem that has occurred in 1992, developed from…we have the government official and other party have a meeting together and what we should do is have a board, one of the communication ways is to have a board. There are a lot of asking about what that figure means and they develop the AQI and before that, they have also some requests, both sides, not only from the receptor but from the distributor also. How to normalize this information, make this information more clearer or something like that. We decide to, we got this idea from the USA also. You have in advance, total dust index also, not only fly dust. We got that idea but with the requests, we try to use the color, but different way, you ca see that. Because this board have a lot of information, but how to put in the board with limited area. Some people like Phonrit from power plant, start with the pioneer from public health "it should be something like this" and we decide to use something like this. With the mine, another board is something different, we decide to put many parameter in that board. I

cannot say that who decide but one of them is me, the other head of the environmental section, the CD.

Whose job is it to update the board?

The representative.

When the board is updated, who from EGAT tells them what to update?

There are different parameters, different boards. We have different monitoring frequency so this kind of board and this parameter you have to change every day or every week. That is 2006, the conclusion to tell them. K. Chompuu is the main contact for the representative. Every data from the power plant, from the drilling and blasting, and from environmental, goes to K. Chompuu. And she sends to the representative and then the representative will change the board. The other thing is, not only the board, I'm not sure I told you, we have the board and the local radio. They have the board for put a figure or a bar or something. They have a conclusion of the record that will go to some of them, the representative will use on the local radio and put on the village board also. That the conclusion, in text, most of them in text.

Boontien Khampirapawong and Chomphuu (Assistant to Boontien) (31 Jan)

Which villages have boards?

Boontien: There are 7 boards. For 10 villages.

Do they receive the information by e-mail or paper copy?

Boontien: They receive by fax, they pick it up at the local office. They have three ways, fax, phone, and messenger.

What do these say? (pointing to color scale)

Boontien: Good (blue), middle (green), start to effect health (yellow), significant effects, last one is danger or hazard or something.

The data from the power plant side, at the beginning they just send the fax or the data, but at the moment they do the web and Chompuu can pick that up from the web and print it out for reference. She gets the information and translates to that.

Is the board monitored by EGAT, do they sometimes forget to do it?

Boontien: Yeah, frequently they forget to do it.

Is it used less than it should be?

Boontien: It is up to the village, especially with the sulfur dioxide, they don't change. In my opinion this figure is not important. When you see the date on the top, it is annoying but sulfur dioxide is not an important parameter.

Why do you think the boards are not updated?

Boontien: I think K. Chomphuu has a lot of information.

Chompuu: Maybe these people are busy.

Boontien: Usually they have 5 for one village and for 2 day or one week and another one "you and you." Some guys are lazy, some have another work for the contractor. It separate to two groups, three of them for one wee or something.

This village somewhere down here, two villages respond to one board, one each week but sometimes one village will call her and say "that village is not good" or "she is no good" and she hears a lot of these claims

Do these people get paid?

Yes, 4,000 baht/village/month.

If they don't' do it do they still get paid?

Boontien: Yes, right now they still get paid, it annoys me a lot. Maybe when you go you can ask them to do their job, or tell the leaders that they need a new representative. It is not only joking but if you can do that it would be good!

Chompuu: This is a newspaper that we send to the villages. Every 2 weeks, it goes to the representative on the village board not the EGAT board because it is a conclusion.

Boontien: She got that from the radio, she is very proud that she made that!

Chompuu: Nooo!

Where are the village boards located?

Boontien: It depends on the village, there is usually one per village, I have seen them in front of the leaders house, or maybe in front of the temple also. Usually at a place where the people usually come and join to do something. Maybe you can check and then come back and tell Chompuu, "It not work!" Maybe you make her more sad!

Last year when we visit village, we present you the video with local language and try to communicate what we have done. The villagers talk to her and very happy to talk to her because

they are like very close friend. I am very happy with her, she has a lot of friends from the village. I think for this kind of work, to get trust, more and more people will be our friend. I don't know if it change to another guy or if it would be change. Because of her we have that.

APPENDIX B: TRANSLATED ENVIRONMENTAL INFORMATION BOARDS

Figure 9 Translated Environmental Information Board in Hua Fai Village.

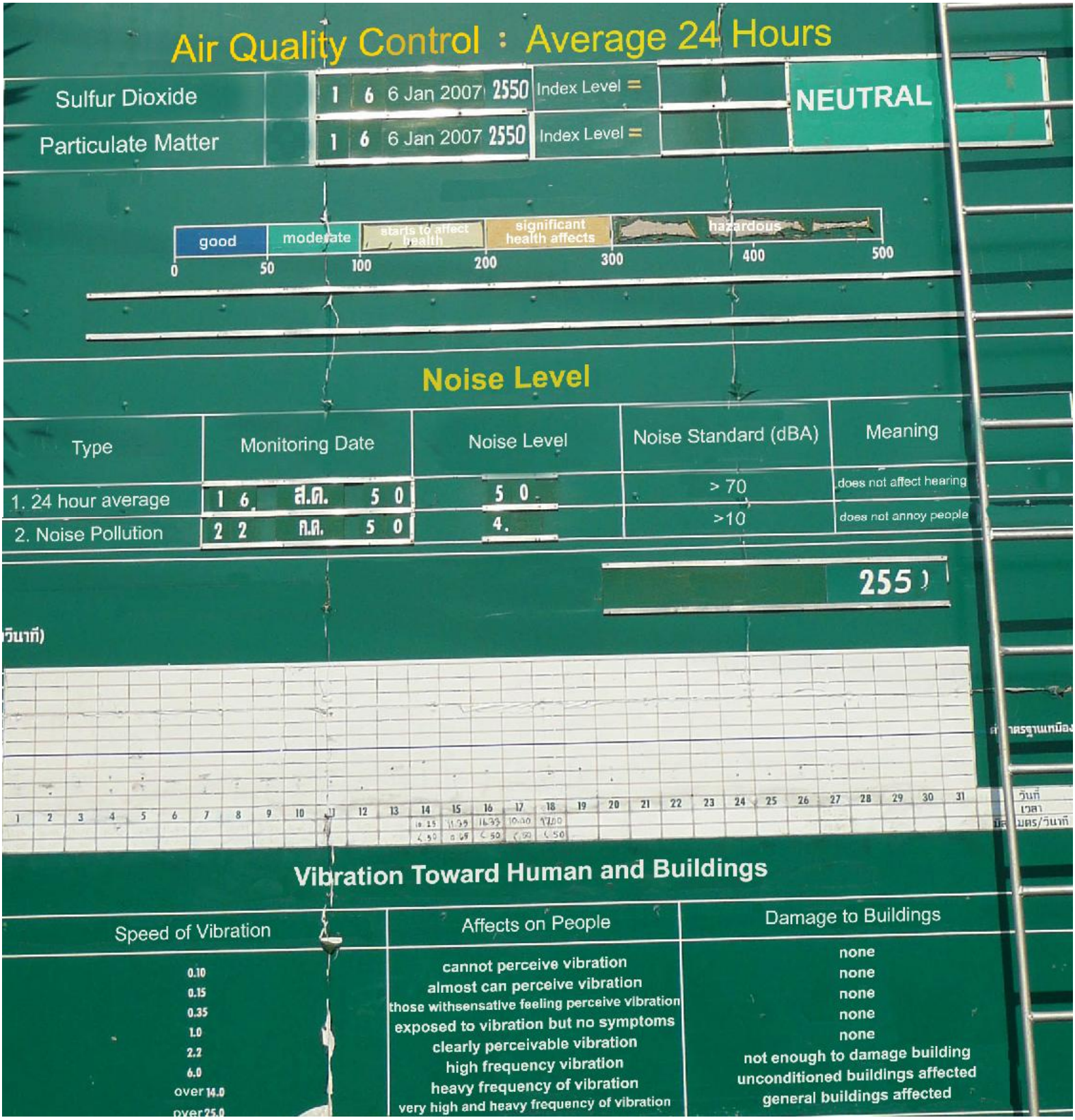


Figure 10 Translated Environmental Board in Huai Khing Village

REFERENCES

Air Pollution Fact Sheet (2002). Electricity Generation and Pollution. Retrieved February 13, 2008, from Environmental Defense Web site: www.environmnetaldefense.org

Cornwall, Andrea, & Jewkes, Rachel (1995). What is participatory research?. *Social Science & Medicine*. *41*, 1667-1676.

Covello, Vincent T., David B. McCallum, Maria Pavlova (1987). Effective Risk Communication: *The Role and Responsibility of Government and Nongovernment Organizations*. Volume 4.

Data Annex: Thailand (2007).From Ideas to Action: Clean Energy Solutions. *USAID- ASIA,* 1-17

Electricity Generating Authority of Thailand. (2006). *Mae Moh Mine, Electricity Generationg Authority of Thailand* [Brochure]. Lampang, Thailand.

Flynn, James, Howard Kunreuther, Paul Slovic (2001). Risk, Media and Stigma: *Undertanding Public Challenges to Modern Science and Technology.*

Hance, Billie Joe, Chess, Caron, & Sandman, Peter (1990). *Industry Risk Communication Manual: Improving Dialogue with Communities*. CRC press.

Hook G.E., Lucier G.W. 2000. The right to know is for everyone [Editorial]. Environ Health Perspect 108:A160–A161.

Johnson, Branden B., (1999). Ethical Issues in Risk Communication: Continuing the Discussion. *Risk Analysis*. *19*, 335-348.

Jungermann, H. (1996). Ethical Dilemmas in Risk Communication in D.M. Messick and A.E. Tenbrunsel (eds.) *Codes of Conduct: Behavioral Research into Business Ethics.* 300-317.

Krimsky, Sheldon & Plough, Alonzo (1988). Environmental Hazards: Communicating Risks as a Social Process. Auburn House Publishing Company.

Lambert, Timothy W., Soskolne, Colin L., Bergum, Vangie , Howell, James , & Dossetor, John B. (2003). Ethical perspectives for public and environmental health: fostering autonomy and the right to know. *Environmental Health Perspectives*. *111*, 133-137.

Löfstedt, Ragnar E. , Risk Communication and Management in the 21st Century (2004). AEI-Brookings Joint Center Working Paper No. 04-10. Available at SSRN: http://ssrn.com/abstract=545724

Mayo, Deborah & Hollander, Rachelle (Ed.). (1991). *Guidelines for communicating information about chemical risks effectively and repsonsibly*. Oxford: Oxford Press.

Minkler, M. (2004).Ethical Challenges for the "Outside" Researcher in Community-Based Participatory Research . *Health Education & Behavior*. *31*, 684-697.

Minkler, M. (2005).Community-Based Research Partnerships: Challenges and Opportunities. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*. *82*, ii3-ii12.

Montgomery Watson Harza. (2002). *Mae Moh Enviromental Evaluation: Final Report.* Asian Data Bank.

Nuclear Regulatory Commission. (2004). *NRC: Effective Risk Communication* [Brochure]. Washington DC: Persensky, J., Browede, S. Szabo, A., Peterson, L., Specht, E., Wight, E.

Office of National Economic and Social Development Board (ONESDB). (2001) Final Report: A Study for Preparation for Operational Plan of Problems Solution in Mae Moh Area. Bangkok: ONSEDB and EGAT.

Rich, Richard, Edelstein, Michael, Hallman, William, & Wandersman, Abraham (1995). Citizen Participation and Empowerment: The case of local environmental hazards. *American Journal of Community Psychology*, *23*, 657-676.

Sandman, Peter (1987).Explaining Risk to Non-Experts: a communications challenge. *Emergency Preparedness Digest*. *Oct-Dec*, 25-29.

Santos, Susan L. (1990). Developing a Risk Communication Strategy. *Journal AWWA, 82, Management and Operations*, 45-49.

Scatterfield, Terre, Mertz, C.K. & Slovic, Paul (2004). Discrimination, Vulnerability, and Justice in the Face of Risk. *Risk Analysis*, 24, 115-129.

Suayson, Kanjana, & Wangwongwantana, Supat Succesful SO2 control at Mae Moh Lignite Fired Thermal Power Plant in the North of Thailand. *Pollution Control Department*

Thomas, M.D., Blacksmith, J., & Reno, J. (2000). Utilizing Insider-Outsider Research Teams in Qualitative Research. *Qualitative Health Research*. *10*, 819-828.

Tickner, J.A. & Gray, H. (1994). *Accidents do happen: Toxic chemical accident patterns in the United States*. Washington, DC: U.S. Public Interest Research Group.

United States Environmental Protection Agency. (1988). Seven Cardinal Rules of Risk Communication. (publication #). City, state: author.

World Bank, Africa Region (The). (1994). *Systematic Client Consultation*. Appendix 1. 181-203.

No author listed (2003). Scrubbers for Bulgaria's Maritza Coal-Plant cut SO2 Emissions.