MINING AND WATER IN CONTESTED LANDSCAPE:
OVERVIEW OF THE MINING AND WATER STUDY PHASE 1 REPORT

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"All over the blue planet, even in the most rained-upon nations, people are engaged in conflicts over water. There are debates over who should own it, manage it, and have access to it, profit from it, control it or regulate it. Nothing on earth, not even land, is more contested."

Veronica Strang, 2004[1]

INTRODUCTION

A. Locating the Research

In 2007, the three Ateneo universities in Mindanao -Xavier University in Cagayan de Oro City, Ateneo de Davao University and Ateneo de Zamboanga University- commissioned a research team to conduct a collaborative study entitled *Mining in Mindanao: Analyzing Stakeholders and Identifying Strategic Engagements*.[2] This inceptive study was a straightforward stakeholders analysis focusing on five mining areas as case studies. It, covered three different regions of Mindanao where the universities are located (the north for XU, west for AdZU and the south for AdDU), the various stages of mining activity (from exploration to decommissioning), and the different types of mineral agreements issued by the government. Being the only other FTAA in the Philippines, at that time, and the only one in Mindanao, the Tampakan Copper-Gold Mining Project was chosen to be one of the case studies. The team from Davao, in south Mindanao, was assigned to handle it.

Overall, the *Mining in Mindanao* research showed "how stakeholders grapple with [the] . . . impact [of] the various facets of mining."[3] What also kept surfacing in the research were "conflicts and tensions over issues of political jurisdiction and boundaries, indigenous peoples self-governance and right to self-determination in their ancestral domain where mining is located, environmental impacts, human rights and social disruption, economic benefits, transparency on mining feasibility studies, financial and production reporting." The research called for the "conduct of more technical and social researches to improve the understanding of

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[1] Veronica Strang, introduction to *The Meaning of Water* (Oxford and New York: Berg, 2004), 1.

[2] Penelope C. Sanz et al., *Mining in Mindanao: Analyzing Stakeholders and Identifying Strategic Engagements,* (unpublished commissioned research of the Mindanawon Initiatives for Cultural Dialogue by the three Ateneos in Mindanao, 2008).

[3] Sanz, " A Final Report" in *Mining in Mindanao: Analyzing Stakeholders and Identifying Strategic Engagements,* 156.

mining,"[4] and hopefully help the public discover "better options over multiple resource regime conflicts and concerns."[5]

In response to the above challenge, the Ateneo Institute of Anthropology (AIA) and the Tropical Institute for Climate Studies (TropICS) of the Ateneo de Davao University decided to collaborate for a more in-depth study on the Tampakan mining project as a follow-through of a case study done by the Davao team in 2007.[6] Through this ground-breaking research, the two institutes hoped to bring together the academic research rigor and tools of social science (particularly the discipline of anthropology) and the natural sciences (specifically, biology, chemistry and environmental science).

The present research team built on the knowledge culled from the initial case study on the Tampakan mining research project and also re-established ties with the network of contacts that some of its members have formed in the area. The team also took note of the urgency to address people's concerns on water that emerged from the previous study. Stakeholders who were interviewed in that study had shared their fears and apprehensions on the mining project's possible adverse effects on their water resources. Among questions they raised were "how mining might pollute their drinking water and rivers, cause skin diseases, reduce the water supply in the event that the mining operations would require large volumes of water."[7] On the basis of these concerns, the research team decided that a follow-up research is needed, this time focusing on mining and water.

B. The Research Design

Entitled *Mining and Water Use in South Cotabato and Davao del Sur,* the current research project sought to understand the impacts of a mining project on people and the environment, particularly on water use, and how these are currently being considered in environmental decision-making processes. The study aimed to deepen people's understanding of the impact of mining and, through this knowledge, enable them to negotiate with the changes that mining is expected to bring about in their lives. In the end, it hoped to contribute to the development of a participative and responsive mining and water governance in the provinces and municipalities.

This study proceeded from the theoretical assumptions that:

1. "Interactions with water take place within a cultural landscape which is the product of specific social, spatial, economic, political arrangements, cosmological and religious

[4] Sanz, " A Final Report," 157.

[5] Ibid.

[6] Rosalinda C. Tomas and Donnabelle Celebrado, "Contestations in the Mountain of Gold: Digging the Cracks in the Tampakan Copper-gold Project: The South Cotabato Experience" in *Mining in Mindanao: Analyzing Stakeholders and Identifying Strategic Engagements*.

[7] Ibid., 35.

beliefs, knowledges, material culture, as well as ecological constraints and opportunities."[8]

2. "Water is always a metaphor of social, economic, and political relationships --- a barometer of the extent to which identity, power, and resources are shared."[9]
3. Analysis of water and meaning sit alongside research on natural resources and debates about universality.[10]

This immense undertaking, which demanded considerable depth and breadth of research work, was designed to proceed in three (3) stages/phases and layers of investigative efforts:

The first phase of the research was designed to establish the cultural landscape where the mining project is located. Using discourse analysis and stakeholders analysis, it looked into the conflicting concerns and interests of various groups which emerged or were intensified since the entry of mining and development in the area as early as 1995, and which continued to emerge or morph as the project progressed. Also, during this initial phase, the Environmental Impact Statement (EIS)[11], submitted by the SMI-Xtrata to the Environmental Monitoring Board for its Tampakan mining project, was reviewed in terms of its compliance with the implementation process prescribed in the Philippine environmental department's procedural manual.[12] The results of the environmental impact assessment on terrestrial and aquatic resources, water resources and risk analysis were also closely examined from the lens of natural science.

There will be two upcoming phases of the research: Phase Two will scrutinize the actual interactions with water resources within the areas affected by the mining project.; while Phase Three will be an intensive study of the impact and risks posed on resource users by the mining project. At the end of these two phases, it is hoped that the research will be able to analyze and challenge prevailing notions on how environmental decisions and choices are being made.

C. Tracing the Phase I Research Process

This first phase of the research was initially scheduled for eight months but a lot of modifications had to be made along the way to adjust to the reality on the ground. The first decision that had to be made was how much geographical area should be covered. The team decided to focus on two municipalities in two provinces, Tampakan in South Cotabato and Kiblawan in Davao del Sur and to cover several sectors and communities, as well as individuals in various layers of positions: tribal and barangay/municipal chieftains, municipal and provincial offices, government line agencies, church / CSO advocacy groups, and the mining company.

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[8] Strang, *The Meanings of Water*, 4.

[9] Ibid., 21.

[10] Ibid., 5.

[11] AECOM Philippines, "Main Report," in *Tampakan Copper-Gold Mine Project Environmental Impact Statement* (Document No. R10–033). Taguig City, Philippines: AECOM, April 2011.

[12] DENR Administrative Order 2003–30, "Implementing Rules and Regulations for the Philippine Environmental Impact Statement System," *Revised Procedural Manual*, 2007.

The research team had to surmount many obstacles. The initial contact-building alone took more than a month, from mid-June to July in 2012. Known 'gatekeepers' were contacted, letters sent, telephone calls made and personal visits conducted in order to secure interview appointments. The individuals who had to be interviewed not only had very busy work schedules, but also had to be persuaded of the importance of the research and be assured of the research team's impartiality. The Tampakan mining project has been such a contested issue for decades that stakeholders had to be fully convinced that a third-party study of the issue is necessary.

Most of the interviews were done from August to October, spanning three months. The data-gathering for the Stakeholders Analysis, Conflict Analysis and Advocacy Review were conducted simultaneously. A Policy Study was initially included in the design, but had to be postponed since it would need a different data-gathering approach. The identified stakeholders were asked on their views and activities regarding the mining project, particularly in relation to the water resource in the region. They were also asked about the SMI EIS, on whether they had read it and what they thought of its findings and proposals. They were asked if they were able to take part in the EIA process and recount their experiences.

After the interviews, the content of the SMI EIS had to be closely analyzed. AIA's Prof. Eizel Hilario-Patino did the assessment of the implementation, while Drs. Virgilio Dela Rosa, Lourdes Simpol and Jesse Manuta of TropICS had to closely examine the technical data on the resource assessments. The printing of the whole document with all its annexes took more than a month. Next came the processing of data where the research team went over all documents and reviewed related studies and theories prior to writing down their analyses from November 2012 onwards. In April 2013, the team finally sat down for a group review of the EIA. Finally, in May, two consultants specializing on water study, Ms. Fe Walag of the University of San Carlos Water Center, based in Cebu City and Dr. Toby Dayrit of Ateneo de Manila University Chemistry Department were brought in to review the initial work of the research team.

For three months, from June to August 2013, the research team went around to share the research results with all stakeholders who provided a bulk of the data. The stakeholders shared their own experiences, sentiments and insights regarding the mining project in general and the SMI EIS in particular. Representatives from advocacy groups who wanted to cull data for their campaigns from the research outcome were also invited to these presentations. These fora hoped to raise awareness on the complexity of the issue of the Tampakan mining project and water resource in the region. It is hoped that the study will foment critical thinking and active engagement with those whose lives will be greatly affected by the mining project. Using the knowledge generated in the research they can fully participate in good mining and water governance as they are able to make informed decisions and commitment to the water issue. Upon the request of those who participated in these fora, a *Research Brief on Mining and Water Governance* was produced instead of the initially- planned report card. The research team decided to produce a document with more substantial data that can be used by the stakeholders for their own negotiations with various groups in the contested mining area.

THE RESEARCH RESULTS

A. Reviewing Earlier Studies

"Mining almost always impact upon the natural water environment, and its effects may manifest throughout the mine cycle", wrote Paul L. Younger and Christian Wolkersdofer in *Mining Impacts on the Freshwater Environment: Technical and Managerial Guidelines for Catchment Scale Management*.[13] While some studies have hailed the beneficial impacts of mining on water, Younger and Wolkersdofer, however, cautioned against these positive impacts. They stressed the need for further meticulous investigation, although non-debatable, into the "deleterious impacts such as depletion of water resources by dewatering, or the pollution of surface watercourses by poor quality mine waters and mine waste leachates."[14] These impacts, according to Younger and Wolkersdofer, "can persist for centuries and even millennia after mine closure; (thus), routine approaches to the management of industrial discharges may not be wholly suited to regulation of the impacts of mining on the environment."[15]

In the Philippines, the potential impact of mining on freshwater and marine ecosystems "does not appear to have been studied sufficiently - or it is simply being ignored,"[16] said Robert Goodland, an environmental scientist specializing in economic development, and Clive Montgomery Wicks, a conservation and development consultant specializing on the impact of extractive industries. In a book they co-authored entitled *Philippines: Mining or Food?,* they consider this as a cause for concern especially that water is an essential resource for human survival. This view is reinforced by David Pimentel and his colleagues in Agriculture and Life Sciences in Cornell University in New York who see "water (as) essential for maintaining an adequate food supply and a productive environment for the human population and for other animals, plants, and microbes worldwide. As human populations and economies grow, global freshwater demand has been increasing rapidly. In addition to threatening the human food supply, water shortages severely reduce biodiversity in both aquatic and terrestrial ecosystems, while water pollution facilitates the spread of serious human diseases and diminishes water quality."[17]

But the meanings of water go beyond all of these as illustrated by Veronica Strang, an anthropologist who specializes in the study of water, in her book, *The Meanings of Water* which was based from her ethnographic study in Dorset, England. "Water," according to her, "is not only a physical resource. In every cultural context, it is densely encoded with social, spiritual, political, and environmental meanings, and these have powerful effect upon patterns of water

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[13] Paul Laurence Younger and Christian Wolkersdofer,, eds., "Mining Impacts on the Freshwater Environment: Technical and Managerial Guidelines for Catchment Scale Management," *Mine Water and the Environment* 23 (2004): S2, accessed February 15, 2012, http://resources.metapress.com/ pdfreview.axd?code=319g82b7na8q8j3d&size=largest.

[14] Ibid.

[15] Ibid.

[16] R. Goodland and C.M. Wicks, *The Philippines: Mining or Food?* (London, United Kingdom: The Working Group of Mining in the Philippines, 2008), xii.

[17] D. Pimentel, et. al, "Water Resources: Agricultural and Environmental Issue" *BioScience* 54(10), (2004): 909–918, accessed on February 2, 2012, http://www.bioone.org/doi/abs/10.1641/00063568(2004)054%5B0909:WRAAEI%5D2.0.CO%3B2.

use and upon the relationships of water users and suppliers."[18] In her next book, *Gardening the World (Agency, Identity and the Ownership of Water)*, which was based on her fieldwork done in Australia, Strang further said that "water is perceived, broadly, as the lifeblood of every endeavor, as the essence of spiritual and social identity, as the substance most vital to human health and wellbeing, as the wellspring of individual and collective wealth, and agency and as the fluid manifestation of literal and metaphysical processes of change and transformation."[19]

B. Outlining the Papers

The research is made up of six (6) studies conducted by faculty-researchers from the AIA and TropICS. The first two provide the cultural context of the mining project by looking into the history of the impact of the project on the peoples in the area of the proposed project, and the current concerns of the peoples regarding the said project. The four succeeding papers closely studied and critiqued the process undertaken by the preparers of the SMI EIA and focused on reviewing the contents of the EIS.

The first paper, ***Violence in Kimlawis: Looking into Conflict and Advocacy in the Tampakan Mining Project Area*****,** is written by Atty. Augusto B. Gatmaytan, a faculty-researcher of the AIA who is currently in UK completing his dissertation at the London School of Economics and Political Science. He is a well-published researcher who has done work on indigenous and environmental issues. The paper details the conflict and advocacy surrounding the Tampakan mining project. Taking-off from the current spate of violence in Kiblawan, Davao del Sur, Gatmaytan examined the different responses to the violence of three key sectors/actors: the Kiblawan municipal local government (represented by the mayor and the police chief), the civil society (represented by people from the Social Action Center of the Diocese of Marbel and from the SOCCSKSARGENDS-AGENDA), and the B'laan armed opposition (represented by Dagil Capion). His paper outlined their varying take on violence in the area:

- The Kiblawan local government officials ascribed a 'culture of banditry' among some of the B'laans in Kiblawan hinterlands that became the basis of their general response to the violence, namely to strengthen the policing of the area. This also conveniently rationalised the sidestepping of the issue ~~by~~ of the SMI mining project, the single largest economic, political and cultural actor in Brgy. Kimlawis.
- The civil society groups, on the other hand, established a discourse of authenticity, attributing to those who opposed the planned mining operation as holders of true indigenous values, particularly the desire to protect their territories and resources, and the culture rooted therein. This contended with the MLGUs discourse that the violence was because of banditry, but of defence of land and life. This consequently implied that the B'laans who

[18] Strang, back cover of *The Meanings of Water*.

[19] Veronica Strang, *Gardening the World. Agency, Identity and the Ownership of Water* (Oxford and New York: Berghann Books, 2009), 4.

favoured the mining project are inauthentic, too needy to see beyond short-term gains, even selling out to the SMI.

- Dagil Capion gave voice to two linked but distinct discourses: like the civil society members, he also questioned the authenticity of B'laans who 'sold-out' to SMI and explained his resistance based on this. But he also asserted an indigenous sense of order as a B'laan, different from those of advocacy groups, and asserted that violence is a consequence of the failure to respect that order.

Gatmaytan's study pointed out "the need to fully grasp the local cultural context, including political leadership and representation, values and attitudes relating to land and resources, and even the so-called 'banditry' in the area." This is needed to fully understand the current situation in the mining project area, and map out ways to manage the changes the SMI project will bring to the affected B'laan communities. The SMI EIS did not have all these crucial information needed "by the various stakeholders—the SMI, the state, civil society, and most importantly, the affected B'laan communities—to manage the [impending] change."

Mountain at Risk: Revisiting Stakeholders' Voices in Tampakan Mining is written by Dr. Rosalinda C. Tomas who is a PhD in Anthropology graduate from the University of Queensland. Her special interest is on resource management and her dissertation focused on indigenous peoples participation in protected areas As a member of the research team which conducted the earlier stakeholders analysis on the Tampakan mining project in 2007, she provided the connection between the previous seminal stakeholders analysis and the current study, Not only was the analysis updated in this study, the coverage and focus was also broadened to include the issue of water.

While the initial study only covered stakeholders from one municipality, the present study focused on two municipalities and two provinces, Tampakan (South Cotabato) and Kiblawan (Davao del Sur), which were the major sites for the mine operations. Framed by *watershed and political ecology* approaches, her study was able to identify several layers of stakeholders groups with contending concerns and issues:

- ***Upstream Stakeholders*** composed of IP (B'laans) and non-IP communities (mostly Visayans)
- ***Midstream Stakeholders*** from municipal LGUs with direct administrative jurisdiction in terms of the population and resources, and significant facilitative and leadership roles on mining development
- ***Downstream Stakeholders*** who are:
  - Farmers/irrigators
  - Provincial LGUs
  - Non-government organizations,
  - Institutional Actors: Mining company: SMI, X-Strata Plc. (now Glencore X-Strata), Indophil, Tampakan Group of Companies (Tampakan Mining Corporation and SouthCot Mining Corporation) and the State Actors: DENR-Mines and Geosciences Bureau (MGB), DENR-Environmental Management

Bureau (EMB), National Irrigation Association (NIA), National Indigenous Peoples' Commission (NCIP)

The paper identifies several conflict zones and tension points that are among the layers of concerns and issues of these various stakeholders:

- Much concern revolved around being able to accurately anticipate the **adverse effect** of the mining project on the environment and people. Since the SMI EIS does not have a 'cumulative effects assessment' of the mining project in conjunction with other activities in the surrounding areas,[20] it was not possible for people to fully consider the actual trade-offs that will come about should the project pushes through. Thus, people's concerns regarding the trade-offs between environment and development in general, and food production versus copper-gold production, in particular, could not be addressed.
- Factual forewarning was also critical to be able to design **effective mitigation measures** to address foreseen damaging impacts. Recent Philippine experiences in mining disasters, such as the Philex mining tailings leakage due to unabated rains, established without doubt the need to factor in climate change impacts in development projects, risks that are unfortunately absent in the SMI EIS.
- Concerns over **access and control of water rights** with conflicting interests on water uses were raised. Irrigators worried over the fact that the mining project will allow the enclosure of water resources into exclusive control of the mining company that could result to disenfranchisement of other users of the said resource, particularly the downstream communities in this case.
- Provisions for **public participation** were sorely inadequate. Although public hearings were part of the process to generate feedback, there seemed to be a very limited definition of stakeholders included in these activities. Furthermore, those who gave feedback in the different stages of public consultations were not sufficiently assured that the company would act on their feedbacks.
- Most of the **IP groups** in the affected areas had taken on the identity of customary landowners with a resultant privileged relationship with the mining company. They believe the mining company, in exchange for the use of their lands, would provide jobs and pay royalties that would more than compensate for the risks and losses associated with the mining activity.

  However, there are other B'laan groups who had voiced their fears that the mining project would lead to the destruction of their source of subsistence and income. They had been publicly expressing the need to protect their environment as the seat of B'laan cultural heritage and had been actively resisting the mining project in various ways.
- National government policy was being perceived as continuing to favor the rapid growth of mining investment despite the threat of real economic, social, cultural impacts. Serious gaps in coordination amongst line agencies that have responsibilities on mining impacts had been exposed. The seeming lack of concern for ensuring actual benefit sharing, with

[20] William N. Holden, "Neoliberal Mining Amid El Nino Induced Drought in the Philippines," *Journal of Geography and Geology* 5, no. 1 (2013): 13 .

no mechanisms to facilitate and monitor the flow of benefits, had been pointed out.

Meanwhile, the local governments, who have to contend with competing concerns on land and water uses,, have raised attention to the lack of technical capacity of their personnel to monitor and evaluate huge impacts of development project such as mining.

Environmental Decision Making on the Tampakan Copper - Gold Mining Project is a study that was undertaken by Maricel P. Hilario-Patiño. She did a very thorough presentation of the Philippine EIA System which was used as the basis of the critique of the environmental impact assessment conducted by SMI. Although she is the youngest member of the research team. Hilario-Patiño brought with her years of experience working with teams who did reviews on EIAs in "environmentally-critical projects and projects done in environmentally-critical areas,"[21] notably the EIA review done on the Didipio in Luzon, the only other FTAA granted along with Tampakan in early 2000. Her study explained that the Environmental Impact Assessment (EIA) process is a planning, decision-making and environmental accountability tool institutionalized to ensure "a rational and orderly balance between socio-economic growth and environmental protection." Hilario-Patiño also "described the legal and policy context of the EIA system that governed the Tampakan Copper-Gold Project." The paper went through an account of "how the Tampakan Mining Project's EIA was conducted and how its Environmental Impact Statement was prepared" as well as a brief description of its contents. The study then discussed the stakeholders perceptions on the EIA process and the EIS produced for the project. Putting together the data on the account of events and the stakeholders' perceptions, Hilario-Patiño then showed the gaps and weaknesses in the conduct of the EIA and the decision-making process of the project. She as well highlighted "the issues that were privileged and the issues that were silenced" in the said process.

Among the study's key findings were the following: Although consultation meetings, public scoping, and public consultation meetings seemed well-prepared, organized, even festive, there is an atmosphere of fear pervading these activities as described by stakeholders because of the history of violence related with the project. The EIA left out the history of violence that had marked the mining area since the entry of the Western Mining Corporation, and was silent on the human rights issues. Data was inaccessible to ordinary people who could not easily understand the EIS because it is too voluminous to read and the language is too technical The study should have looked at the watershed continuum in analyzing the impacts of the project. It should not have separated the off-lease infrastructures even the resettlement sites. It should have seriously considered the plight of the farmers using and integrating their data in the analysis of water use in the area. It should have problematized the issue of power and control over the release of water from the dam. The EIS did not have an actual survey of the occupants in the area, and assessment of the land rights situation in the area. The social and cultural impacts of mining on the B'laans had not been captured in the EIS. It did not study the customary laws on leadership and how the entry of the mining company altered the traditional leadership patterns. There was no discussion on the violence associated with the marginalization of traditional

[21] The legal framework for the conduct of the Environmental Impact Assessment is set by Presidential Decree 1586. Meanwhile, Presidential Proclamation 2146 (***Proclaiming certain areas and types of projects as environmentally critical and within the scope of the environmental impact statement system established under Presidential Decree No. 1586***) defines the projects within the scope of the EIA System established under PD 1586.

recognized leaders like the Capions of Bongmal. The benefits of the mining project should have been problematized more deeply. The study should have assessed if the benefits outweigh the costs, problematized if local communities will really benefit from the mines, looked into the mechanism for distribution of project benefits between areas classified as "direct" and "indirect" impact areas. It did not assess the LGU preparedness in terms of policy, structures and personnel to handle the impact of the mining project on their area.

Dr. Virgilio G. Dela Rosa, a biologist with a special interest in biodiversity, reviewed the ***Tampakan Mining Terrestrial and Aquatic Ecology Assessment*** in the SMI EIS**.** Dela Rosa had conducted rapid site assessments in Mt. Matutum and Liguasan Marsh. Currently, he is part of a research team doing a study in Marilog district in Davao City. His review of the Tampakan EIS showed that despite earlier disturbance from earlier logging activities, the proposed mining area contains numerous Mindanao and Philippine-endemic species as also indicated in the assessment.. There are also a number of species, both flora and fauna, found in the area that are listed as either endangered or threatened under the IUCN Red List and the DENR DAO 2007-01. Dela Rosa proposed that the site's critical nature be considered since its resident flora and fauna are at risk of extinction. The current broadleaf closed canopy forest will be fragmented once the mining project pushes through and this will impact the species through incremental habitat loss. He pointed out the importance of protecting the ecological system and appreciate the critical function of ecological systems as the Earth's life-support system.[22]

EIA Review: Water Quality and Water Quantity in the SMI EIS was conducted by Dr. Lourdes R. Simpol. She is a resource person in designing water monitoring in watersheds since 1998 and has also been training students of Analytical Chemistry the protocol of chemical analysis for many years. The critique on Water Quality in the SMI EIA went through the three phases of Water Quality Monitoring stipulated in International Frameworks of Water Quality Monitoring namely: sampling, analysis and report writing. Simpol's assessment pointed out its weaknesses: The EIA did not use standard practices for water sampling: conditions, such as time and weather, during sampling and the chain or custody were not specified; absence of documentation on instrument calibration and standardization and no indication of the manner by which these were conducted. Although the analysis report was thorough, the problem of the validity of the sampling that was used rendered its analysis questionable. Due to these deficiencies, the water quality data can not be used for future monitoring or modeling. In her review of the study on Water Quantity, Simpol pointed out its lack of data. Compared to the water quality data sets, the water quantity data sets attached in the annexes were very, very minimal. An outline of data source was enumerated in the report for methodology of data collection for the surface water models but proofs of these enumerated data could not be found in the annexes. Only results derived from analysis and simulation were reported in the modeling reports and the limited data hindered an evaluation of the accuracy of the modeling. Additional risks brought about by climate change seemed not to have been factored in in the reports since there was no historical presentation of weather and climate-related extremes in the watersheds within the project site. Finally, an important data gap was on water allocation for all the

[22] R. Costanza, R. d'Arge, R. de Groot, S. Farber, M. Grasso, B. Hannon, K. Limburg, S. Naeem, R.V. O'Neill, J. Paruelo, R.G. Raskin, P. Sutton, M. van den Belt, "The value of the world's ecosystem services and natural capital," *Nature* 387 (1997): 253–260.

stakeholders in the affected watershed.

Reviewing the Risk Assessment of the Environmental Impact Statement of the Tampakan Mining is written by Dr. Jessie B. Manuta whose research interest has been in the area of environmental policy, focusing mainly on water management and climate change disaster risk management. In his review of the Environmental Risk Assessment (ERA) of the Tampakan Copper-Gold Mine Project, he stated that the SMI EIS complied with the minimum requirements set by the ERA Guidelines detailed in the Revised Procedural Manual for DAO 2003-30. The SMI EIS's risk assessment focused only on: (1) hazardous materials and substances, and (2) the geologic-structural risks of the project components such as the open pit, waste rock storage facility, fresh water dam, and tailing storage facility, among others. The framework and the scope of the study did not consider that the risks could transform the landscape, specifically the six watersheds in the provinces of Davao del Sur, Sarangani, South Cotabato and Sultan Kudarat (and to some extent Maguindanao and the Liguasan Marsh). Its technical studies on "climate and meteorology" did not include the analysis of the impact of climate change, since this was not required in the EIA guidelines. It created the impression that measures, such as appropriate technology and industrial retooling, can overcome the hazards of mining.[23] However, recent experiences have shown that not all environmental risks can be managed and not all natural hazards can be contained. Manuta argued that such large-scale and environmentally-intrusive projects need to use a more comprehensive and inclusive risks assessment framework and approaches in the risk assessment and valuation. An eventual transformation of the region's hydrology, the risks of extreme events such as intense rainfall, drought and catastrophic earthquakes, need to be studied using an ecosystem approach.

INSIGHTS FROM THE STUDIES AND POSSIBLE WAYS FORWARD

The series of presentations on the studies' findings yielded fruitful exchanges with stakeholders that further crystallized multiple perspectives on the issues. These led to a more holistic framing of the issues and deeper insights for reflection and action that could be taken up by various interest groups. These groups nclude those who are concerned with and are responsible for handling the impact of the Tampakan mining project on water and water users in all of the ecosystems that will be affected by the project.

The researches, particularly the two which looked into the cultural landscape of the project, have shown the importance of **understanding the historical context and the cultural impact of the Tampakan Mining Project.**

The series of violence that have been occurring in the last few years in the Kiblawan area can be understood by tracing the tensions and conflicts that preceded SMI's tenure in the area. The mining project has fueled resistance from various sectors, including members of the B'laan indigenous peoples, for twenty years now. These conflicts have already resulted to violence in the last few years, which could worsen if the causes remain unaddressed.

[23] Holden, "Neoliberal Mining amid El Nino Induced Drought in the Philippines," 71.

In the B'laan communities, the entry of mining had spawned divisions which are generating further tensions and even violence among the people. These divisions are caused by multiple issues. The more current issues include the giving of compensation that benefit, or are perceived to benefit, certain groups to the exclusion of others. These intertwine with several issues: first, regarding appropriate representation or misrepresentation as there appears to be kin-groups or families which have not been recognised and are therefore not being represented; and second, regarding questions over the legitimacy of leaders recognized by SMI. The present B'laan leadership relied upon by the SMI can be traced back to WMC, and to the processes by which the latter determined these leaders. Regrettably, these issues have significantly affected the practice of leadership, and the relationship between B'laan leaders and their constituencies.

The B'laan's notions of land and resource tenure and ownership have not been fully understood while being undermined considerably. There is an asserted link between land ownership, defense of territory, and violence on the part of B'laan who opposed the mining project. Those who have said yes to the project, on the other hand, have insisted not to be resettled too far from their land. These are strongly indicative of the centrality of land ownership and its emotional gravity for the B'laan. This, while the mining project's activities and community interventions have affected the economic strategies and options open to the B'laan.

It is hoped that the NCIP can take these issues into consideration and allow these to inform the FPIC process that will be undertaken in the project area. Also, exploring multi-stakeholder processes that include dialogues, negotiations and collaborations with the B'laan need to be continued**.** These must be done in ways that ensure protection of their rights, acknowledge their limited resources, and consider the welfare of future generations of B'laan. Understanding compensation—rooted in notions of property, rights and standing -- must be addressed in dialogue with the B'laan, These processes must enable different perspectives to be presented and debated, scenarios and options to be evaluated, decisions taken and action implemented.[24] This is to achieve an outcome that is beneficial not only for the company but most especially for the B'laan.

The other studies, specifically the Stakeholders' Analysis and the reviews of the EIA implementation process, called attention to the absence of an **analysis of cumulative effects.** The SMI EIS produced fragmented and compartmentalized studies and assessments, which failed to uncover the complete risks associated with locating the Tampakan mining project in critical areas like watersheds.

The adoption of a watershed perspective would have been a useful tool in surfacing the mounting effects of a massive project that will straddle a whole landscape. From this perspective, the range of stakeholders are seen along the mining waste stream, viewed in a "sequence of linked resource systems" or a "watershed continuum." This starts from the uplands (where the headwaters are located) going to the lowlands and then coastal zone where the

[24] Jim Woodhill, "Facilitating Complex Multi-Stakeholder Processes: A Social Learning Perspective." accessed on 18 February 2013, http:// ec.europa.eu/research/water-initiative/pdf/iwrm.../a3_en.pdf.

outlet of the river system is located.[25] The watershed approach sees stakeholders according to their location in the course of the mining waste stream, looking at the whole breadth of the ecosystem that is affected (or yet to be affected)..

Aside from the watershed perspective, political ecology should have also been integrated into the frame of analysis to capture not only the expanse of its geographical and demographic spread but also the diversity and complexity of contestation and conflict along the highly diverse space of a watershed continuum. There is need to examine the "political, economic, social and cultural contexts of community-ecosystem relationships and . . . [look] into the interactions at multiple scales, among various factors behind environmental issues.[26]"

The use of these frames would have compelled the mining company to fully engage all the various groups of affected stakeholders and to take into account their various concerns. Taking its responsibility seriously, it should then find ways to deal with these issues. Knowledge of the layers of issues that need to be addressed could compel the proponents to respond to them.

The reviews of the SMI EIA's on studies on environmental resources also revealed serious assessment gaps. The review of the Terrestrial and Aquatic Ecology Assessment saw that the study was able to capture the richness of the biodiversity of the Final Mining Area. However, its **analysis of impact on environment** and proposed mitigation measures for the impending resource destruction did not seem to have a valuation assessment of the resources in the area. Dela Rosa pointed out that ecological systems are critical to the functioning of the Earth's life-support system, and therefore represent part of the total economic value of the planet.[27] Humans benefit from wild nature in many ways: aesthetically and culturally, via the provision of ecological services such as climate regulation, soil formation, and nutrient cycling; and from direct harvest of wild species for food, fuel, fibers, and pharmaceuticals.[28] This should have been taken into consideration in a cost-benefit analysis of the mining project which should have included the very thorough study of the terrestrial and marine resources in the SMI EIA.

The reviews of SMI EIS' Water Quality and Quantity Assessments uncovered an insufficient **practice of good science** in its report**.** Maintaining the integrity of scientific process requires a strict observance of protocols, a sufficient database and use of systematic analysis. The reviewed study, however, had fallen short of these standards. Data gaps in the water quality study resulted to a failure to generate the baseline data which will be the basis for present and future analyses of water quality. It was unable to generate a report on water allocation for all the stakeholders in the affected watershed, and did not have a thorough historical weather and climate presentation which are the needed basis for a good hydrologic study.

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[25] Philippines-Canada LGSP, Watershed Management: Saving Forests, Storing Water for the Future (Philippines: LGSP, 2003), 8.

26 Aletta Biersack and James B. Greenberg, Reimagining Political Ecology (Durham and London: Duke University Press, 2006).

[27] Costanza et al., 1997

[28] A. Balmford, A. Bruner, P. Cooper, R. Costanza, S. Farber, R.E. Green, M., Jenkins, P. Jefferiss, V. Jessamy, J. Madden, K. Munro, N. Myers, S., Naeem, J. Paavola, M. , Rayment, S. Rosendo, J. Roughgarden, K. Trumper, R.K. Turner, "Eonomic reasons for conserving wild nature," *Science* 297 (2002): 950–953.

The risk assessment study did not include the risks of altering the hydrological flow of six watersheds that will be radically transformed once the project pushes through. Also, the risks of extreme events such as extreme rainfall and extreme drought (La Nina and El Nino phenomenon) were not considered despite the fact that these are already factored into government policies and plans at all levels.

The ecosystems where the Tampakan mining project will operate support the survival of the inhabitants in their whole landscape. With or without mining projects, they need to be protected with good water governance. A good hydrological study will help uncover the full impact of the destruction of water catchments and eventually the whole watersheds on water supply. This study will need to set up mechanisms for strict water monitoring. It can make use of baseline data from earlier water monitoring done by WMC and from NIA in Davao del Sur and South Cotabato. These baseline data can be used to identify monitoring stations and parameters for present water monitoring that will be set-up. A more complete risk assessment, factoring in the changing climate regime in the region, should also be undertaken.

The **proponent, preparers and EIARC** need to be reminded of their **accountability** for the gaps and weaknesses of the EIS they submitted to DENR**.** AECOM, the recognized preparer of the EIS, with the General Manager of SMI, submitted a sworn statement of accountability certifying that the EIS for the Tampakan Copper-Gold Project are "accurate and complete" to the best of their knowledge, and that "an objective and thorough assessment of the Project was undertaken" in accordance with the dictates of their professional and reasonable judgment**.**

There is still a need to interview the members of the EIA Review Committee or to obtain documents to look into how they deliberated on the Tampakan EIS document. A more in-depth study is further needed to gauge whether the issues of Goodland and Wicks[29] have been captured and considered in the review and decision making process behind the ECC issuance. This review of the EIA has to be done in order to recommend how best improve the EIA system, in general, and the review process, in particular, for future projects.

To develop good Mining and Water Governance in our country**,** this study recommends the **amendment of DAO 2003-30** to improve the EIA System. The following amendments are being proposed:

> The conduct of ethnographic studies of key affected communities should be a required part of the preparation of an EIS. These studies have to meet the standards of the relevant social sciences. These should address various contextual and substantive gaps in the data to help understand and address issues affecting all impact communities.

[29] Robert Goodland is a former Head of World Wildlife Fund UK International Programme based in Asia, Africa, and Latin America and Vice Chair of the IUCN Commission on Environmental, Economic, and Social Policy. Clive Wicks is Former Senior Environmental Advisor to the World Bank and the Technical Director of the Extractive Industry Review. The two together with environmental lawyer Ipat Luna, conducted an independent review of the *Environmental and Social Impact Assessment* of the Tampakan Mining Project, *Tampakan Forum*, 2011: 17.

The EIS should include, consider and address all contextual information relating to a proposed project. More importantly, it should include information on issues and problems surrounding its predecessors-in-interest, and on current or existing impacts the project has already had, even before project approval or implementation,

A more inclusive stakeholders identification based on ecosystem and political ecology perspective should be undertaken. The choice of stakeholders should not be left to the proponent's discretion. Ensuring that all voices and their concerns will be heard is crucial.

Meaningful public participation in the EIA could be ensured by requiring the assessment of social acceptability of the project during the EIA preparation. Having it at a later stage, as part of the Environmental Compliance Certificate (ECC), lessens the weight of their voices in the environmental decision making process.

An analysis of the preparedness of the national agencies and LGUs, in terms of expertise, resources and capabilities, to be able to evaluate / review data of impact assessment of a project and monitor implementation of impact mitigation measures need to be included.

A new framework for environmental risk assessment that incorporates new risk drivers such as the changing climate regimes and the *Mining and Critical Ecosystem Framework,* should be used.

This amended EIA system can be complemented with a **Cost-Benefit Analysis** of projects. Stakeholders should also be engaged in this analysis project to enable them to make informed choices.

AN OVERVIEW OF THE TAMPAKAN MINING PROJECT

A. Tampakan Copper-Gold Mining Project Description

The Tampakan Copper-Gold Mining Project was selected for the research because of its location and scale. It is the only Financial or Technical Assistance Agreement (FTAA) issued by the Philippine Government in Mindanao, and one of the first two issued in the country after the Philippine Mining Act of 1995 was passed. Having an ore reserve of 1.1 B tons, the Tampakan project area is said to be the largest undeveloped copper-gold resource in Southeast Asia Western-Pacific Region. [30] With a capital investment of US $ 5.9 billion, the Tampakan Copper-Gold Mine is the largest foreign direct investment in the Philippines to date. The mining project, which is estimated to produce up to 160 million tons of gold and copper per annum over a period of 20 years, "is expected to boost the economy, not only at the local level, but also at the regional and national levels; provide significant investment opportunities; generate taxes and other fees for all levels of government; and provide employment, community development programs, and shared services to host communities and the surrounding regions."[31]

The gold deposits in Tampakan were first discovered by small-scale miners in the 1980s. Soon after the small- scale miners began their activities, the Tampakan Group of Companies (TGC) applied for a Mineral Production Sharing Agreement (MPSA) covering the area. The TGC is composed of two local companies called Tampakan Mining Corporation and SouthCot Mining Corporation. Upon the invitation of the TGC, the Western Mining Corporation – Philippines, a wholly-owned subsidiary of Western Mining Corp. Holdings Ltd. of Australia, arrived in 1990 and started prospecting activities. A year later, the TGC and WMCP signed an option agreement to conduct exploration activities.[32] WMCP immediately applied for an FTAA over the mining area immediately after it discovered copper and gold deposits in December 1992. The FTAA was granted to WMCP (FTAA 02-95-XI, also known as the Columbio FTAA) on March 22, 1995. The contract, which covered approximately 99,387 hectares, subject to statutory reduction, subsumed the MPSA previously issued to TGC. Under the Mining Act of 1995, an FTAA is a contract entered by a contractor with the Philippine government for a large-scale exploration, development and utilization of minerals except for non-metallic mines for 25 years, renewable for another 25 years.

However, in 1997, the FTAA was challenged before the Supreme Court after a group of petitioners headed by the La Bugal B'laan questioned the constitutionality of the Mining Act of 1995, particularly the provision on 100% ownership and the issuance of the FTAA. The legal battle eventually led WMC to withdraw its operations in the Philippines. Reportedly, WMC found the "political, social and environmental issues" in the Philippines "too complex to proceed."[33] WMC also cited slow rate of return of investment, continuing drop of copper in the world market,[34] and continuing local opposition as its reasons for withdrawal. As TGC exercised their right of refusal to buy the Columbio FTAA, WMCP sold the FTAA to Sagittarius Mines, Inc., a Philippine incorporated company, on January 23, 2001.[35] The Supreme Court upheld the constitutionality of the Mining Act and the FTAA in favor of the La Bugal petitioners in January 2004 after eight years of legal battle. Barely a year later, however, the Supreme Court flip-flopped on its decision arguing that the sale of the FTAA by WMC to SMI already rendered moot and

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[30] "Tampakan Copper Mining Project, Philippines," Mining-technology.com, accessed on March 1, 2013, http://www.mining-technology.com/projects/tampakangoldcopperpr/.

[31] AECOM, Tampakan Copper-Gold Mine Project Environmental Impact Statement, 21.

[32] Indophil Resources NL., Corporate Profile, accessed on March 1, 2013, http://www.indophil.com/projects/tampakan/discovery-history.

[33] Gilbert M. Ralph and Michael D. Softley, "A Brief Illustrated History of Western Mining Corporation" (paper presented at the 14th National Engineering Heritage Conference, Crawley, Western Australia, November 18-21, 2007), 4. Accessed May 24, 2013, http://www.ipenz.org.nz/heritage/conference2007/papers/Ralph_Final_Paper.pdf.

[34] Mariane V, Go, "Australia's Western Mining leaves RP," Philippine Star, October 5, 2002, accessed on March 1, 2013, http://www.philstar.com/business/178588/australia%C2%92s-western-mining-leaves-rp.

[35] "Consortium insists on legal rights over Cotabato minesite," Philippine Star, January 28, 2002, accessed on March 1, 2013, http://www.philstar.com/nation/148587/consortium-insists-legal-rights-over-cotabato-minesite.

academic the legal questions posed by the La Bugal B'laan on the 100% foreign ownership of the FTAA.

Today, SMI's 40% controlling equity shares is a joint venture between Xstrata Copper and Indophil Resources NL, while 60% of its non-controlling equity shares are held by the Tampakan Group of Companies, which is composed of the Tampakan Mining Corporation and SouthCot Mining Corporation.[36] Indophil Resources NL is "an Australian publicly-listed company, incorporated in 1996, to acquire, explore for and develop gold and copper-gold opportunities in the Asia-Pacific region."[37] Indophil, which invested in the Tampakan Copper and Gold Project since mid-2002, currently holds 37.5 percent of the shares in SMI. Xstrata Copper is the fourth largest global copper producer and one of the world's largest producers of smelter, refined and recycled copper, including from third party materials.[38] It is one of the business units of the Xstrata Plc., an Anglo-Swiss mining company based in Switzerland and London. X-Strata acquired 62.7 percent of the controlling shares on the Tampakan Mining Project on December 21, 2006 and assumed control over SMI's management and operations on March 30, 2007.[39]Recently, Xstrata Plc. was acquired by Glencore International Plc., a Swiss-based company engaged in producing, sourcing, processing, refining, transporting, storage, financing and supply of metals and minerals, energy products and agricultural products in various parts of the world[40] for US $ 35B. The acquisition, which was completed in April 16, 2013 after Glencore received final regulatory approval from its biggest trade partner, China, is said to be the biggest merger in the mining industry.[41] At present, GlencoreXstrata Plc. is one of the biggest metals and commodities firms in the world.[42]

B. The Mining Project and Locale

The research made use of maps as visual aids to illustrate the geographical expanse of the mining project and to help navigate the complexity of its impact on the whole landscape.. Created by Ryan G. Olarte of TropICS (Tropical Institute of Climate Studies), the maps provided a graphic representation of the landscape that will be impacted by the mining project not only on the physical but also on the political and cultural levels as well. The locale of the Tampakan Copper- Gold Mining Project can be divided into three major areas depending on its project components. These are the Final Mining Area (FMA), the Resettlement Area, as well as the Off-lease Infrastructure Area (OLI). *(See Figure 1 in the following page.)* The final mining area, or FMA, includes the areas covered by the open pit, waste rock storage facility, waste rock conveyor, tailings storage facility, ore conveyor, concentrator, freshwater dam, and other related structures. The resettlement areas are the places where the people who will be displaced as a result of the project will be relocated. (This will be shown in later maps.) The OLI includes the slurry pipeline that would transport the concentrate produced at the mine site to the filter plant which will dewater the concentrate, a coal fire power station, transmission lines from the coal fire power station to the mining areas, and a port facility.[43]

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[36] SMI, Corporate Profile, undated, accessed on March 1, 2013, http://www.smi.com.ph/en/aboutus/Pages/AboutSMI.aspx.

[37] ndophil Resources NL.,Corporate Profile, undated.

[38] X Strata Copper Plc., Corporate Profile, undated, accessed on March 1, 2013, http://www.xstratacopper.com/EN/AboutUs/Pages/Aboutus.aspx.

[39] "SMI welcomes entry of new Senior Officials," Xstrata Copper News Release, April 2, 2007, accessed March 1, 2013, http://www.smi.com.ph/EN/media/2007/2007-04-02_SMI_Press%20Release_SMI%20welcomes%20entry%20of%20Xstrata%20Copper.pdf.

[40] Glencore, Company Profile, undated, accessed on April 1, 2013. http://www.glencore.com/company-overview.php.

[41] Reuters, "Glencore-Xstrata merger," April 16, 2013, accessed on April 18, 2013, http://www.globaltimes.cn/NEWS/tabid/99/ID/775385/Glencore-Xstrata-merger.aspx.

[42] BBC News, "Xstrata and Glencore merger gets China approval", April 17, 2013, accessed on April 18, 2013, http://www.bbc.co.uk/news/business-22178661.

[43] SMI, "Infrastructure Outside the Mine Site," accessed on March 1, 2013, http://www.smi.com.ph/EN/OurProject/Pages/InfrastructureOutsidetheMineSite.aspx.

The map in Figure 2 *(in the following page)* the FMA in detail. The SMI EIS reviewed in this research only covered this part of the total mining project. The open pit and waste rock storage facility will be in the Tampakan area, while the fresh water dam and the tailings storage facility will be in the Kiblawan side. The Final Mining Area (FMA) covers approximately 9,605 hectares of land located between the quadrant boundaries of Kiblawan municipality in Davao del Sur, Columbio municipality in Sultan Kudarat, Malungon municipality in Sarangani, and Tampakan municipality in South Cotabato.

The B'laan's ownership over the ancestral domains affected by the mining project is formally recognized by the Philippine Government. The areas that were identified, delineated, and substantiated with proofs by various indigenous groups as being part of their ancestral territories[44] have been awarded by the Philippine Government with Certificate of Ancestral Domain Titles (CADT). The map in Figure 3 *(in the next page)* shows CADT 102 of Bong Mal, Davao del Sur, CADT 72 of Malungon, Saranggani, CADT 108 of Tampakan, South Cotabato, and CADC 74 of Salnaong. Since the mining project straddles the quadrant boundaries of four municipalities belonging to four different provinces, it creates a very complex political dynamics which require complicated negotiations with and among four municipal LGUs and four provincial. To make matters even more difficult, it forces four heterogenous collection of B'laan clans to negotiate with the mining company, with each other, and several layers of LGUs and government agencies.

[44] The initiatives to secure formal government recognition were all supported by WMC, SMI-Xstrata's predecessor, then, by SMI-Xstrata itself.

In terms of the biophysical environment, the mining project will directly impact on waterways and watersheds, and will have cumulative effects on biophysical elements of whole ecosystems, from ridge to reef, initially in the provinces of Davao del Sur and South Cotabato, but eventually in Saranggani and Sultan Kudarat., The map in Figure 4 *(in the map next page)* shows the existing vegetation cover and the superimposition of the proposed final mining area. The broadleaf closed canopy forest that is shown by the dark green color will be fragmented once the mining project will push through since it will require the clearing of vegetation cover. This will result in the fragmentation of the forested areas.

The project area is located within the headwaters of six catchments: Mal in the east and northeast, Mainit in the east, Manteo in the south, Altayan and Taplan in the west, Dalul in the north. A significant portion of the final mining area lie within the Mal, Altayan, and Taplan catchments. *(see Figure 5 in the page after next.)* The mining project will directly affect two river systems --- the Mal River in the eastern portion, and the Taplan River and its associated tributaries in the western portion.[45] The Mal River, which is fed by the Bong Mal and Tukay Mal Rivers, will be affected by the Tailings Storage Facility and the Fresh Water Dam.[46] This river supplies irrigation systems in Davao del Sur before it eventually joins the Padada River and finally empties into the Davao Gulf some 50 kilometers from the project site. Meanwhile, Taplan River will be affected by the mining project's open pit which will lie within the sub-catchments of Altayan and Taplan Rivers. Both rivers drain to Lake Buluan in Koronadal City, South Cotabato, and some 32 kilometers downstream from the project site.[47]

[45] AECOM, EIS, 2011, ES-9

[46] Ibid.

[47] Ibid.

About 1,000 existing households (approximately 5,000 people) from the directly affected areas, particularly Tampakan and Kiblawan are going to be displaced by the project. They will be resettled after their free and prior informed consent (FPIC) has been obtained before the mining construction begins.[48] In Tampakan, 456 households will be relocated from three affected barangays. Sixty-two of these households are B'laans and 16 are non-IPs. In Kiblawan, on the other hand, 414 households will be relocated, 397 of which are B'laans and 17 are non-IPs.[49] Although not covered by the current EIA, the mining project will eventually tap potential resettlement sites, shown in the map Figure 6 (*see the map in the next page*.) Nine (9) barangays - Datal Blao in Colombio (Sultan Kudarat), Kimlawis, Bololsalo and Tacub in Kiblawan (Davao del Sur), B'laan and Malabod in Malungon (Saranggani), and Danlag, Pulabato and Tablu in Tampakan (South Cotabato) - will be affected.

Also, not included in the submitted EIS is the proposed Off-Lease Infrastructure or OLI. The map Figure 7 *(on the page after next)* shows the four main elements of this component of the mining project. Initially, SMI planned that it shall transport the ore via an underground concentrate pipeline from the Ore Crushing Conveyor Loading Station in Tablu to a purpose-built port complex in Malalag, Davao del Sur. While not abandoning Malalag as an option, SMI explored the possibility of the Kamanga Agro-Industrial Ecozone Development Corporation (KAIDEC) in Maasim, Sarangani as an alternative for their off-lease infrastructure facilities.In the latter option, the copper concentrate from the mining area will be transported to the filtration plant through a 100 kilometer pipeline (see blue line) that would traverse Barangays Tablu, Liberty, Tampakan, Maltana, and Kipalbig in Tampakan; municipalities of Tupi, Polomolok in South Cotabato, and General Santos City and Maasim in Sarangani. The pipeline, which would largely be built parallel to the Maharlika Highway, will be made up of a fully-welded steel pipe with a strong plastic liner, which has a diameter between 9 and 12 inches. The pipeline would be buried approximately one meter below the ground.[50]The transmission line (the red-orange line) designed to bring the power from coal plant to the mining will have a capacity of 230 kilovolts. From Kamanga, 50-meter high transmission towers, protected by 40 meter by 40-meter fence, with a distance of 300-500 meters from each other, depending on topography, will be built through Tinoto, Siguel and Maasim. From Maasim, the lines will be built alongside the slurry pipeline until it reaches the mining site.[51] As stated earlier, this component was left out from the current EIA submitted. But as can be seen in the map, it will have an even wider impact, and will set-off an even more complicated cumulative effect on the environment and political-social-cultural dynamics in the four provinces affected.

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[48] SMI, "Resettlement," accessed on March 1, 2013, http://www.smi.com.ph/EN/Resettlement/Pages/homedefault.aspx.

[49] AECOM, EIS, 2011, 6-5 and 6-6

50 "Tampakan Copper-Gold Project: Off-Lease Infrastructure Project," accessed on March 1, 2013, http://www.smi.com.ph/EN/EnvironmentalImpactAssessment/English%20factsheets/XST%20380%20Offlease%20Infrastructure%20Factsheet_WEB.pdf

51 Ibid.

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